COMBATING CLIMATE CHANGE:
CRITICAL EVALUATION OF CLIMATE CHANGE ACTION PLANS ON URBAN SCALE

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Approval of the Graduate School of Social Sciences

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ABSTRACT

COMBATING CLIMATE CHANGE:
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Climate change and global warming have potential to evolve into one of the most devastating catastrophes in the history of humankind. Several devastating effects of climate change are already visible. Currently, there are both international and national efforts going on for the solution of this problem. Leaving some exceptional cases out of the topic, it is hard to say any of these actions lead to successful global results yet. Urban areas have increasingly important position in both adaptation and mitigation activities. With current consumption habits and greenhouse gases emission levels, cities are vital part of this problem. Besides, for several opportunities they provide, cities have potential to be solution of this problem as well. Although discussions are generally concentrated on national commitments and targets, it can be argued that it is not possible to achieve these targets without effective city level action. This research will be elaborated on climate change action plans at urban scale. Climate change action plans, are framework documents which outline the specific policies and activities to deal with this phenomenon. In order to

evaluate climate change action planning process, international guidelines for preparing climate change action plans will be researched. The study will involve the assessment of Chicago Climate Action Plan with regard to determined international guidelines. Case study of this research will be the assessment of Gaziantep Municipality's Climate Action Plan. The importance of this research is to reveal successes and weaknesses of this plan, which entered into force four years ago.

Keywords: Environmental Policy, Climate Change Planning, Climate Change Policy, Urban Sustainability

ÖZ

İKLIM DEĞİŞİKLİĞİ İLE MÜCADELE:
KENT ÖLÇEĞİNDEKİ İKLİM DEĞİŞİKLİĞİ EYLEM PLANLARININ
ELEŞTİREL DEĞERLENDİRMESİ

Kocakuşak, Diren
Yüksek Lisans, Kentsel Politika Planlaması ve Yerel Yönetimler Ana Bilim Dalı
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İklim değişikliği ve küresel ısınma insanlık tarihinin yaşadığı en yıkıcı felaketlerden biri haline gelme dönme potansiyeline sahip. İklim değişikliğinin bazı yıkıcı etkileri hali hazırda gözlemlenebilmektedir. Günümüzde bu problemin çözümü için uluslararası ve ulusal düzeyde çabalar sürmekte. Bazı istisnai örnekleri haricinde, henüz bu çabaların başarılı küresel sonuçlar getirdiğini söylemek oldukça zor. Şehirleri hem uyum hem de emisyon azaltma eylemleri için önemi gittikçe artan bir pozisyona sahiptir. Mevcut tüketim alışkanlıkları ve sera gazı emisyonu seviyeleri düşünüldüğünde, kentler bu sorunun önemli bir parçasıdır. Diğer yandan, sundukları birçok fırsat sebebiyle kentler bu sorunun çözümü olma potansiyeline de sahip. İklim değişikliği politikaları tarihinde tartışmaların genellikle ulusal taahhütler üzerinde yoğunlaştığı gözlemlenebilir. Ancak, kent ölçeğinde etkili bir eylem gerçekleşmeden devletlerin bu hedeflere ulaşmalarının mümkün olmadığı belirtilmelidir. Bu araştırmada kent ölçeğindeki iklim eylem planları ayrıntılı olarak incelenecektir. İklim değişikliği eylem planları, bu fenomen ile mücadele etmek için gereken belirli

politika ve aktiviteleri içeren çerçeve dokümanlardır. Bu planlama aktivitesi sürecini değerlendirebilmek için, iklim değişikliği eylem planlarının hazırlanmasına yönelik olarak belirlenen uluslararası standartlar araştırılacaktır. Bu çalışma Şikago İklim Eylem planının belirlenen uluslararası standartlar doğrultusunda değerlendirilmesini kapsayacaktır. Temel örnek incelemesi olarak ise Gaziantep Büyükşehir Belediyesi'nin hazırladığı İklim Eylem Planı'nın değerlendirilmesi yapılacaktır. Bu araştırmanın önemi, dört yıl önce yürürlüğe girmiş olan bu planın başarılı yanları ve zayıflıklarını ortaya koymaktır.

Anahtar Kelimeler: Çevre Politikası, İklim Değişikliği Planlaması, İklim Değişikliği Politikası, Kentsel Sürdürülebilirlik

To the people
who share my journey

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LIST OF SYMBOLS AND ABBREVIATIONS

°C	Degree Celsius
%	Percent
APTA	American Public Transportation Association
CBCC	Coordination Board on Climate Change
CBD	Convention on Biological Diversity
CC	Climate change
CFC	Chlorofluorocarbons
CO_2	Carbon dioxide
CO_2e	Carbon dioxide-equivalent
COP	Conference of Parties
CMP	Parties to the Kyoto Protocol
EPA	U.S. Environmental Protection Agency
GDP	Gross Domestic Product
GEF	Global Environment Facility
GHG	Greenhouse gas
HFC	High-Fructose Corn Syrup
ICLEI	Local Governments for Sustainability
INDC	Intended Nationally Determined Contributions
IPCC	Intergovernmental Panel on Climate Change
LEED®	Leadership in Energy & Environmental Design
LULUCF	Land Use, Land Use Change, Forestry
$MMTCO_2e$	Million Metric Ton of Carbon Dioxide-equivalent
MOP	Meeting of Parties to the Kyoto Protocol
Mm	Milimeters
NF3	Nitrogen Trifluoride
PFC	Perfluorinated Compounds
Ppm	Parts per million

SF6	Sulfur Hexafluoride
TMN	Transnational Municipal Networks
Tüvik-Der	Tüketiciyi ve İklimi Koruma Derneği
UN	United Nations
UNCDD	United Nations Convention to Combat Desertification
UNCED	United Nations Conference on Environment and Development
UNCSD	United Nations Conference on Sustainable Development
UNEP	United Nations Environment Programme
UNESCO	United Nations Educational, Scientific and Cultural Organization
UNFCCC	United Nations Framework Convention on Climate Change
U.S.	United States
WMO	World Meteorological Organization
WSSD	World Summit on Sustainable Development
WWF	World Wildlife Fund

CHAPTER I

INTRODUCTION

Human impact on nature increased perceptibly since the Industrial Revolution. In the following period, several environmental issues were experienced on both natural and human systems worldwide such as air pollution, water pollution, and loss of bio-diversity. With the acknowledgement of threatening alterations on the life-sustaining services of nature, international community has been discussing environmental problems as political issues since the 1960s. Even though environmental problems are experienced divergently in different parts of the world, the fact that such problems are without national boundaries caused strategies to be developed for common action. For this reason, environmental challenges occupy a cumulative place in international politics in the last couple of decades.

Among several environmental problems, climate change and global warming have the potential to evolve into one of the most devastating catastrophes in the history of humankind. Although there are skeptics who question the existence or importance of global warming and climate change; several scientific findings reveal that both issues will yield serious and irreversible outcomes on the planet. In the previous decade, improvement of the technology enabled scientists to discover more about the causes and effects of the climate problem. Indeed, greenhouse gas (GHG) emissions that originate from anthropogenic factors are distinguished as the main reason for global warming, underlining that current climate change is human-induced. Scientific observations prove that increasing greenhouse effect due to anthropogenic factors has been causing changes in climatic conditions, which occur at a faster rate compared to normal levels. More than that, several devastating effects of climate change are already visible such as sea/ocean level rise, extreme weather events, flooding, heat waves, air pollution, water pollution, and water shortages. In order to

take necessary actions to reduce GHG concentration in the atmosphere and to be prepared for the likely consequences, proper policies should be developed.

In the broadest sense, Intergovernmental Panel on Climate Change (IPCC) defined climate change as alterations in the mean and/or variability of climate's properties which shows continuity for an extended period of time. Moreover, mentioned changes might be causing from internal or external processes (2013, p. 1450). The signs of this phenomenon were identified for the first time in 1896 by Svante Arrhenius, who argued that temperature changes for land surface might occur in the existence of heat-absorbing gases (as cited in Crawford, 1997). Nonetheless, it took several decades for climate change issue to find itself a place in environmental politics at national and international level.

Stockholm Conference, which was organized by United Nations in 1972, is considered as the first mega environmental conference that led to many other international initiatives in environmental politics to be carried out in the following decades. Participation of 114 governments to the conference and agreement on outcome documents played an important role in the history of international policy-making on environmental issues including climate change. The conference resulted in the establishment of United Nations Environment Programme (UNEP), which coordinates and supports numerous environmental projects at regional, national and international levels. The United Nations Conference on Environment and Development (UNCED), which was held in 1992 in Rio, has had more direct outcomes with regard to the climate problem. This conference should be considered as one of the most important milestones for combating climate change at the international level. Substantial number of participation by governments to the Rio Conference was important and the several vital outcomes of the conference negotiations shaped international environmental politics in the following decades.

First of all, Agenda 21 Document, which aims to promote the development of principles of enhancing environmental protection, social equality, and economic prosperity at micro and macro scales was developed and declared. Local Agenda 21, on the other hand, targets to enhance the implementation of sustainable development principles at localities, which brings us to the second important outcome of the

conference; recognition of local bodies in dealing with climate change. Also, creation of transnational municipal networks (TMNs) was encouraged in this conference to support local bodies by providing various opportunities and knowledge in this pursuit. Finally, three major international agreements were signed in the Rio Conference, one of them being the United Nations Framework Convention on Climate Change (UNFCCC).

Main aim of the UNFCCC can be explained as; stabilizing GHG emissions within the limits that, anthropogenic factors would not put climate systems at risk (United Nations, 1992, p. 4). The convention entered into force two years after the conference and has 198 parties as of 2014 (UNFCCC, 2014b). Conference of Parties (COP) meetings were held annually within the scope of this convention. In the 3rd COP meeting in Kyoto, Japan, the Kyoto Protocol was adopted by the parties with aims parallel to the UNFCCC. Two conditions, which were required to put the treaty into the force, were met almost a decade later and this situation partially interrupted the success of the treaty. Even though the success of the protocol can be questioned, it was an important milestone to understand the necessity of a binding document in combating climate change. The first commitment period of the Kyoto Protocol finished in 2012 and the protocol has expired since then. It took quite long for the international community to agree on a new regime or protocol to succeed the Kyoto Protocol. Finally, in the COP 21 meeting in Paris in December 2015, the Paris Agreement has been reached. The agreement outlines the major aspects of the international climate regime that will enter into force after 2020 with the aim of keeping further global warming below 2°C (UNFCCC, 2015a, p. 21).

In order to develop more efficient environmental policies to deal with climate change, the issue should be well recognized in all relevant fields like economy, industry, transportation, education, social justice, and equity. Climate change action plans, as framework documents that outline specific targets, strategies and policies, may help local and national governments to mainstream climate change issues into relevant other policy fields. Both mitigation and adaptation strategies can be covered in the scope of climate change action planning activity and the action plans can be prepared for international, regional, urban, or even more micro scales. At this point,

several scientific studies suggest that cities have increasingly important position in conducting adaptation and mitigation activities. The fact that different geographies have different conditions and unequal vulnerabilities vis-à-vis devastating effects of climate change provides an opportunity to build more resilient urban areas as well as less GHG emitting settlements. Ever increasing number of people living in the urban areas has several consequences and makes urban level mitigation and adaptation strategies more vital. More than 52% of the world population lives in the urban areas as of 2011 and this number is expected to increase to 64-69% by 2050 (IPCC, 2014b, p. 25). Besides, activities that took place in these places accounts for 70% of CO_2 emissions and about two-thirds of the total energy consumption globally (International Energy Agency, 2008, p. 179). Apart from that, implementing adaptation and mitigation activities at urban scale have some advantages like being able to develop more straightforward solutions and create more resilient cities (Balaban, 2012, p. 23). IPCC also supported such opportunities by highlighting the fact that large portion of cities will be developed in the following couple decades (2014b, p. 25). Until the last decade, discussions on climate change policy-making were mainly focused on national responsibilities and commitments. Yet, it should be noted that without effective city level action, nations will not be able to reach their goals. For the reasons briefly stated above, urban areas should be considered as vital places and city governments should be considered as vital administrative units to conduct climate change action planning activities.

1.1. Scope and Purpose of the Research

This research aims to elaborate on *climate change action plans at urban scale* and attempts to contribute to literature on this topic. In order to achieve this, historical background of climate change will be discussed and recent literature discussions on climate change action planning and importance of cities for climate change will be presented. The author regards such research activity as important, since *importance of developing urban scale strategies is on the increase as opposed to national or international strategies*. This uptrend is presumed to continue in the future and revealing strengths and weaknesses of existing examples, as well as providing recommendations, is expected to contribute to similar planning activities.

Investigated examples and ongoing discussions on the issue enabled the determination of research question and main objectives. Main research question of this research is determined in parallel frame of mind with the objectives of the research, and can be acknowledged as the question to be answered in order to fulfill the objectives presented below. This question can be stated as, *what is the relationship between climate change and policy planning and to what extent planning can contribute to the solution of the climate problem*. Moreover, in order to carry out this research in an organized way, three main objectives are identified:

1. To explore the details of climate change action planning activities that were implemented at urban scale and to determine international standards,
2. To investigate why global successful results have not been achieved yet, even though there are numerous initiatives at national and international scale on the issue of climate change,
3. To evaluate "Climate Change Action Plan of Gaziantep", which is the only initiative at urban scale in Turkey, and to state its compatibility with determined international standards. Also, to make recommendations based on the evaluation for better implementations in future for both Gaziantep and other similar cases.

While initial objectives are focused on these points, main hypotheses of this research revolve around the reasons of "failure of climate change action planning in Turkey". There can be two hypotheses identified that are partially linked with each other. One of them can be simply described as such; *climate change action plans in Turkey are developed in order to fulfill international obligations rather than taking voluntary action to combat climate change*. The other hypothesis is this: *even though climate change action planning documents seem carefully prepared, there are several deficiencies in some fundamental matters that cause failure during the implementation period*. In order to test these hypotheses, history of climate change policy of Turkey at international and national levels will be examined and Climate Change Action Plan of Gaziantep will be evaluated with regard to international

guidelines and principles for climate action plans. Finally, the thesis will highlight and discuss the reasons behind the shortcomings of the Gaziantep case.

1.2. Method and Methodology of the Research

From the outset, an objective research strategy and methodology were attempted to be developed in order to answer research questions and fulfill the requirements of research objectives stated above. The author of this thesis aimed to detect existing facts and causal relationships between events. Therefore, a qualitative research method has been followed in order to analyze and interpret data from various sources. Moreover, eagerness of the author in providing descriptive details, approaching events as processes, relating data analysis to the research literature, and constant investigation of underlying reasons behind results supports suitability of qualitative method for this research (Bryman, 2008, pp. 373-389).

By collecting comprehensive data from academic publications, scientific findings, online sources, and personal in-depth interviews, which are conducted by the author, important inferences are tried to be generated within the scope of this research. As mentioned, the recent academic literature on the issue of climate change was examined, and the literature review constituted the first main source of data and information. Secondly, reports from both scientific institutions and international organizations such as United Nations, IPCC and ICLEI-Local Governments for Sustainability were investigated and utilized in this research. In order to follow most recent advancements on both development of climate change science and status of two cases evaluated, the author benefited from credible online sources as well. Finally, in order to gather the required data and information on Climate Change Action Plan of Gaziantep, in-depth interviews were conducted with officials of Gaziantep Municipality. Two officials, who took an active role in the planning process in Gaziantep Municipality, were interviewed. Dr. Şafak Hengirmen Tercan was one of the interviewees who is a civil engineer and was the head of the Environmental Protection and Control Department during the planning process. Second interviewee was Gökhan Yaman who is an environmental engineer and was an official at the Environmental Protection and Control Department at that time. Both interviews were conducted in October 2015 in Gaziantep. Questions from

Acknowledged Guidelines and Principles for Climate Action Plans were modified as to allow participants to give open-ended answers. During the interviews, not only questions with No Evidence as an answer were asked; but also questions, based on information gathered from secondary documents and reports, were asked to interviewees in order to confirm the accuracy of the information. Interviewees have contributed to this research under no pressure and with their own decisions. Background information about the research, convenience of the research to scientific ethics, and their right on not to answer any questions of their choice and the chance of leaving the interview any point were clarified to the interviewees before the beginning of the interview. Their approval for being completely informed on such information was stated on the letter of approval signed by them and presented in the Appendix B.

In simple terms, the research has proceeded in three steps. In the first step, the literature and scientific information on research topic were discussed in a systematic way. During the second step, Acknowledged Guidelines and Principles for Climate Action Plans were researched and rendered in operational and objective form to carry out evaluation of the cases. Finally, both City of Chicago and Gaziantep examples were analyzed and evaluated with regard to these guidelines.

As mentioned above internationally accepted standards for climate change action planning are researched and determined as a vital part of this thesis. There are various international organizations involved in determination of international standards in maintaining such activities on this issue. There are also numerous academic publications commenting on this aspect, and ICLEI's guide titled "Cities for Climate Protection Milestone Guide" is often regarded as the most comprehensive document in this manner. There are five main milestones stated in this guide namely; calculating emissions, adopting targets, developing action plan, implementing action plan, and monitoring results. As can be understood, developing the climate change action plan document itself forms one of the milestones in the whole planning process. Indeed, these five milestones can also be regarded as five main stages of carrying out climate change action planning. In order to make this base information operational in evaluating case studies, sub-requirements of each

stage are investigated and prepared as yes/no questions. However, during the research conducted from both primary and secondary sources to reveal answers for each question, it was realized that quality of information should also be taken into consideration in order to ensure objectivity of the research. That is to say, some of the information might offer limited evidence, while some offer completely satisfactory content and proofs to answer these questions. More than that, possibility of not reaching to any information at all was possible and it should also be considered. As a result, instead of answering these questions with simply yes/no answers, author of this thesis conducted a systematic answering schema. When encountered satisfactory content and proofs for answering the questions for positive answer, the term "Sufficient Evidence exists" was used. If the information for answering the questions was not completely satisfactory but still proves the fact that sub-requirement is fulfilled, the term "Limited Evidence exists" was used. When there was no information found on the issue and it was not possible to answer the question as yes or no, the term "No Evidence exists" was used. Finally, if requirement of the question was not fulfilled, the term "Unaccomplished Phase" was used.

There are two cases in this research. One of the examples is Chicago Climate Action Plan which will be presented and evaluated as the best case scenario. Undertaking such research is thought to be helpful in reaching more sophisticated work. Moreover, the success of such planning activities does not solely depend on the statistical results but also qualitative results and co-benefits. That is to say, investigating this example is also considered to be important since this research may lead us to determine causal relationship between comprehensive planning process and achieving successful results. Apart from the justification of the reasoning in carrying out this research, deciding to use Chicago example in this research is another question that should be answered. Apart from its success that was mentioned in academic literature and experience in dealing with climate change over the years; accessibility of information was also important. The City of Chicago publishes information about the process quite perspicuously, runs climate action campaign through its website and publishes progress reports about the plan.

The second case that will be analyzed in this thesis is the Climate Change Action Plan of Gaziantep, which is the case study of this research. Main reason in choosing the Gaziantep example is the fact that Gaziantep is the first and the only city that developed and declared a climate change action plan at urban scale in Turkey. Moreover, the plan entered into force in September 2011 and preliminary investigation to carry out this research was started in June 2015. Considering the fact that majority of the starting periods for actions stated in the plan took place between 2011 and 2015, sufficient time passed to observe the consequences of these actions. Main motivation in conducting this case study was to reveal successes and weaknesses of the example, and to find out its compatibility with international standards. The research also aims to provide policy implications and for following implementations in the near future.

1.3. Structure of the Thesis

This thesis consists of seven chapters. Subsequent to the introduction chapter, information will be provided on climate change and historical background in the **second chapter**. To begin with, scientific explanation of climate change will be presented and contribution of anthropogenic factors to this phenomenon will be highlighted. Afterwards, historical background of international environmental policy-making will be covered in order to narrate readers the evolution of progress over the years. As being one of the important aims of the thesis, the question of "why cities are important in dealing with climate change?" will be discussed. Finally, requirement of carrying out two different approaches, which are reducing GHG emissions activities and preparing for the devastating impacts of climate change, at the same time as to effectively deal with climate change, will be explained in details. The flow of information provided in this chapter will prepare the readers to literature review on climate change action planning in the next chapter.

Chapter three mainly presents the findings of the literature review to answer several questions on climate change action planning with the purpose of analyzing the process in details. First of all, the relationship between climate change action planning and policy-making will be established. The definition of climate change action planning will be presented and extent of these documents will be discussed.

Also, findings on when and why did these plans have come forward will be presented. Moreover, acknowledgement of climate change as a vital problem and rising attention towards climate change action planning activity will be clarified. Later on, detailed explanations of mitigation and adaptation practices will be submitted. At the end of the chapter, the findings of the research to constitute "Acknowledged Guidelines and Principles for Climate Action Plans" will be presented. Main outcomes of this research consist of set of questions analyzing five main stages of climate action planning process. This research can be considered as one of the main pillars of the thesis.

In chapter four, "Chicago Climate Action Plan" will be analyzed in details as a best case scenario. The efforts and experience of the City of Chicago in dealing with environmental issues are considered quite advanced by many scientists and international organizations on this topic. In addition to the research on main case study -approached in following chapters- studying Chicago Climate Action Plan is thought to broaden and enrich this research. For that purpose, whole planning process of this plan will be analyzed in details with regard to *Acknowledged Guidelines and Principles for Climate Action Plans* that were determined in the previous chapter; after providing sufficient background information about the effects of climate change on the City of Chicago and their experience in combating climate change so far.

In the **fifth chapter**, readers' focus will be directed to climate change action planning in Turkey. After a brief introduction, the effects of climate change on Turkey will be mentioned. In order to provide basis for this, some vital information that has been gathered from GHG emissions inventory of Turkey will be presented as well as future projections. Later on, Turkey's climate change policy will be discussed in a dual aspect. Firstly, Turkey's involvement in international organizations, conventions, and agreements will be presented chronologically in order to demonstrate her status over the years in international arena. Secondly, nationwide policies and programs that were developed to deal with climate change will be discussed. This dual approach will enable us to answer the question,

“whether the climate change policies of Turkey directed by international obligations instead of volunteer action to take willing and concrete steps or not?”

Sixth chapter is devoted to main case study of this thesis, critical evaluation of Climate Change Action Plan of Gaziantep. In the beginning of the chapter, the reasons of why Gaziantep example was selected as a case study will be presented. Next, information on main sources of direct and indirect GHG emissions of the city will be presented in order to provide readers with the necessary background information. Later on, the core of the case study, findings from the detailed analysis of the Climate Change Action Plan of Gaziantep will be given. As like in the Chicago example, this analysis will be completed with regard to Internationally Accepted Standards for Climate Change Action Planning that were determined and stated in the third chapter. This chapter will end with a detailed evaluation of the case study research.

In the **conclusion chapter**, readers will find a brief summary of what have been discussed throughout the thesis. Moreover, based on the findings of the case study, policy implications will be made with the aim of paving the way for better implementations in future for both Gaziantep and other similar cases. Suggestions that will be presented in this part will be directed to both Gaziantep Municipality and national authorities. Finally, author’s intention is to end the conclusion chapter and the thesis with further remarks for future research.

CHAPTER II

HISTORICAL BACKGROUND OF GLOBAL WARMING AND CLIMATE CHANGE

2.1. Technical Aspects of Global Warming and Climate Change

Global warming along with climate change are significant environmental problems threatening natural and human systems worldwide. Many research point that, since the beginning of Industrial Revolution high dependency on fossil fuels and the ecocide caused by industrial activities have yield such problems. To be more precise; facts like increase in average temperature, abnormal precipitation patterns and retreat of glaciers are caused by post-industrial human activities and release of GHG emissions into the atmosphere (IPCC, 2013, p. 17).

Global warming is briefly described by the U.S. Environmental Protection Agency (EPA) as, ongoing increase in global average temperature levels near Earth's surface (2014, p. 3). Greenhouse effect is considered to be one of the most important reasons for this change in global average temperature level. This phenomenon can be defined as absorption of the terrestrial radiation in the atmosphere (troposphere) by GHGs, clouds, and aerosols; then re-radiation back towards the earth’s surface. Infrared radiation is being emitted by these constituents to all directions; however, net amount emitted to space is less compared to amount in the absence of these absorbers. The reason for this difference is the decrease of the temperature with altitude and the consequent weakening of emissions in the troposphere. As a result, augmentation in the concentration of the infrared-absorbing substances in the atmosphere increases the magnitude of such infrared radiative effect (IPCC, 2013, p. 1455). Furthermore, contribution of the anthropogenic emissions is distinguished and named as enhanced greenhouse effect. It is noted that (Gómez-Echeverri, 2000, p. 431):

> Increased concentrations of carbon dioxide, methane, and nitrous oxide, CFCs, HFCs, PFCs, SF6, NF3, and other photochemically important gases caused by human activities such as fossil fuel consumption, trap more infrared radiation, thereby exerting a warming influence on the climate.

As it was mentioned above, climate change refers to identifiable changes in the mean and/or variability of climate's properties which shows continuity for an extended period of time. In the broadest sense, it could be on the occasion of internal or external processes, for instance modulations of the solar cycles, volcanic eruptions, and alterations in the composition of the atmosphere or in land use caused by human related sources (IPCC, 2013, p. 1450). United Nations Framework Convention on Climate Change (UNFCCC), in its Article 1, explains climate change as "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." (United Nations, 1992, p. 3). As can be observed in both definitions, natural and anthropogenic causes may have an effect on climate change, but it should be noted that anthropogenic factors are differentiated and highlighted as the major causes of the current climate change. In the Figure 2.1 below, main drivers of the climate change as well as greenhouse effect are illustrated.

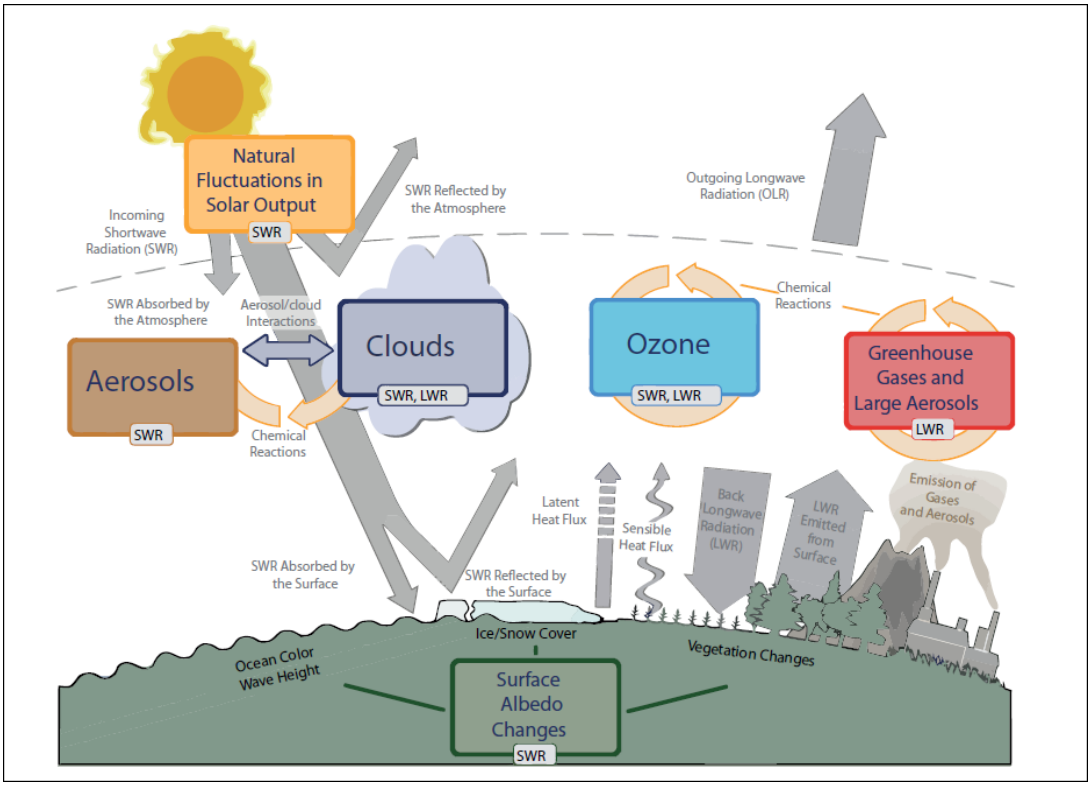

Figure 2.1: Main Drivers of Climate Change. (Source: IPCC, 2013)

Changes in climatic patterns due to natural causes were observed in the previous eras. Fluctuations in the short term or long term can be discussed in this manner. For instance, Earth's orbit around the Sun, volcanic activities, and solar output were some of the main reasons for climatic changes before anthropogenic causes. Volcanic activity and solar radiation are relevant factors considering the timescales of contemporary climatic changes. Volcanic activities are episodic events and they have relatively short term effects on climate patterns. On the other hand, it is known that solar radiation have been effective at the climatic changes over the past century. Nevertheless, such natural causes are insufficient in explaining observed temperature trend over the mentioned period (NASA, 2015).

Humans have had an increasing effect on climate change since the Industrial Revolution, particularly by emitting a huge amount of GHGs into atmosphere.

Considering the changes in the past 50 years, anthropogenic factors such as burning of fossil fuels, conversion of land for agriculture and deforestation due to human activities have become prominent. It is noted that, such activities can both have warming or cooling effect on climate, by influencing the balance of incoming and outgoing energy. Emissions of GHGs caused overall warming effect since the Industrial Revolution, and have the potential to carry this trend towards the levels that have never been experienced in the history of human civilization (Climate, B.A.S. and Council, N.R. and Change, A.C.C.P.A.S.C. and Studies, & D.E.L., 2010).

Certain devastating impacts of climate change are already observable. Some of the events that have been already occurred or predicted in near future can be listed as follows:

a) sea/ocean level rise,
b) extreme weather events,
c) coastal and inland flash flooding,
d) temperature rises and heat waves,
e) air pollution,
f) water pollution, and
g) water shortages.

It should also be noted that these impacts vary among global regions. Moreover, limiting global average temperature increase to 2°C (compared to pre-industrial levels) has become de facto target for international policy-makers. Initially, in 1975, economist William Nordhaus pointed 2°C increase as the critical limit and added that "… this would take the climate outside of the range of observations which have been made over the last several hundred thousand years" (Nordhaus, 1977, pp. 39-40). Later on, as the climate change issue is debated in international politics, this target has been recognized repeatedly in different declarations, meetings, agreements, and conferences. Ultimately, keeping the further global warming below 2°C has also been identified by several researchers, anticipating that beyond this limit, future environmental effects of climate change may not be estimated and the cost of adaptation may increase substantially.

According to the Fifth Assessment Report of the IPCC, which was published by IPCC in 2013, throughout the period 1951 to 2010, GHGs contributed to global mean surface warming in the range of 0.5°C to 1.3°C, with contributions from other anthropogenic forcing, including the cooling effect of aerosols is in the range of −0.6°C to 0.1°C. The contribution of the natural forcing is in the range of −0.1°C to 0.1°C. Hereby, it can be concluded that observed warming of approximately 0.6°C to 0.7°C (over the same time period) is coherent with these assessed contributions of anthropogenic and natural forcing. Figure 2.2 illustrates global average temperature changes for land surface, land and ocean surface, and ocean heat content (over 1910 to 2010); considering the comparison of observed and simulated climate change and impact of anthropogenic reasons (2013, p. 17).

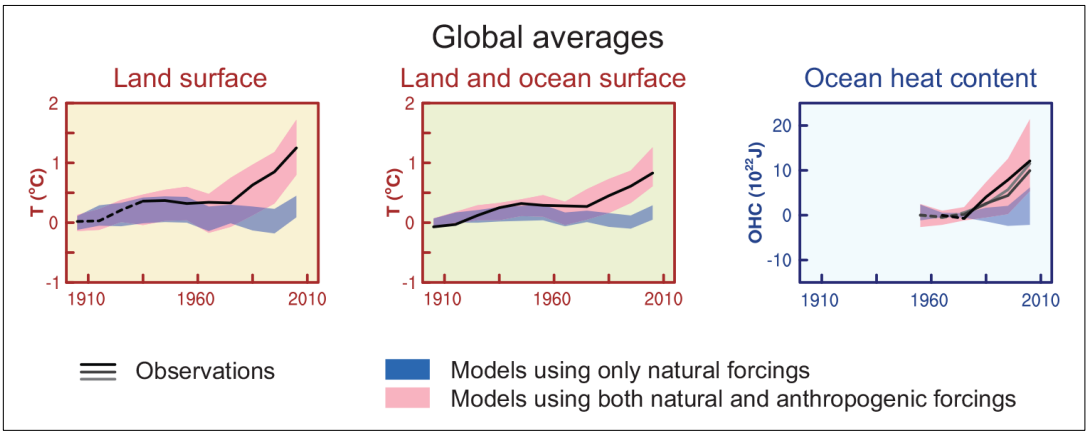

Figure 2.2: Global average temperature changes over the period 1910 to 2010 (Source: IPCC, 2013)

As mentioned above, the effect of anthropogenic factors on climate change is important especially considering the environmentally hazardous activities since the Industrial Revolution. Moreover, models and projections present that ongoing trend in climate change may lead to far-reaching social, environmental and economic

consequences. In these circumstances, as being primarily responsible for this issue, turning the tide falls to the humankind. Herein, the roles that can be played by policy planning, architecture, engineering, and other disciplines are substantial in combating climate change and global warming. In this manner, the importance of policy-making will be discussed in subsequent sections after providing information on historical background of climate change issue.

2.2. Historical Background of Climate Change

When climate change examined in a historical manner, the connection between scientific findings on environmental conditions, increase in the overall awareness of the issue, and international environmental politics becomes prominent. These outlined topics, including underlying matters and timelines of the events regarding these topics can not be considered separately from each other. For this reason, information on history of climate change policy-making will be presented considering this connection.

Although first environmental movements took place in industrialized countries in 1960s, scientific findings that point out the hints of "how increase of CO_2 would affect the climate" date back to 1896. Svante Arrhenius, who was a Nobel winning economist, mentioned in his articles that the presence of heat-absorbing gases can cause alterations on temperature changes for land surface. Moreover, the connection that he made between the fossil fuel consumption by industries and global warming was important (as cited in Crawford, 1997, p. 6). In 1930s, it was confirmed that the overall temperature increase is related to the increase in GHGs and this finding was supported with Arrhenius' report. Two decades later the United States Department of Defense allocated a fund for research activities related to climate change at the demand of Pentagon (Duygu, 2007, s. 590-591).

Apart from that, international organizations on environmental issues have been established and developed since the beginning of the 20th century. Especially after the World War II, the number of such organizations rapidly increased (Berg, 2009). In their article Biermann, Siebenhüner and Schreyögg identified several reasons for this progress. Firstly, transformation in international politics from intergovernmental

politics to global governance enabled international organizations to increase their responsibility and influence in world politics. Secondly, increasing attention towards environmental issues since 1960s was quite important in growth of such organizations. Finally, "the emergence of environmental policy as a distinct field of international politics" paved the way for establishment of the new international organizations (2009, pp. 1-2). Until these advancements took place in international environmental politics, environmental issues were regarded as minor issues. These developments also led to composing of various environmental conferences, agreements, and further institutions from 1970s onwards.

In 1972, United Nations Conference on the Human Environment was held in Stockholm, Sweden. This conference, also known as Stockholm Conference, is considered as the first mega conference[1] with participation of representatives from 114 governments. The conference has played an important role for development of international policy-making for environmental issues and resulted in declaration of three important documents. First, declaration on the Human Environment, also known as the Stockholm Declaration, endorsed by all the states and important principles were settled which emphasized the connection between inequalities among different countries and their environmental responsibilities. The importance of planning is underlined by acknowledging it as a solution for environmental problems, and key to obtain maximum social economic and environmental benefits for all (United Nations, 1973, p. 5). The second document was the Action Plan, which included 109 environmental actions and recommendations and was adopted by unanimity. Resolution on Financial and Institutional Arrangements is the third document that was adopted in Stockholm Conference. Additionally, governments that participated to the Stockholm Conference decided to establish the United Nations Environment Programme (UNEP) to provide coordination and promotion of the international agenda within the United Nations system. Since its foundation, UNEP contributed to implementation of environmental policies through national and

[1] Environmental conferences generally focus on specific regional or sectoral problems; while, mega conferences take general overview of the relationship between humankind and environment unlike other environmental conferences. As Seyfang mentioned, "they are consequently preceded by years of preparations and negotiations and are held less frequently than single issue meetings; and they are large scale in every sense, attracting the participation of heads of state and thousands of individuals and groups, as well as capturing the attention of the world's media". (2013, p. 224).

regional bodies, advancement of environmental science, and development of many treaties and guidelines for environmental issues. Today, UNEP is considered as one of the most important international environmental organizations with an active role in climate policy-making.

In 1979, First World Climate Conference was organized by World Meteorological Organization (WMO) and held in Geneva, Switzerland. Discussions mostly focused on how human activities might be affected by climate change. In the final declaration of the conference, world's governments were called "to foresee and prevent potential man-made changes in climate that might be adverse to the well-being of humanity" (UNEP & UNFCCC, 2002, s. 17). This could be accepted as the first time in the recent history when the international community was warned about the climate problem.

In 1983, a commission named World Commission on Environment and Development (also known as the Brundtland Commission) was formed with the aim of bringing countries together to interoperate and pursuing sustainable development goals. After a comprehensive work for four years at the global level, the commission published its famous report, namely the Brundtland Report, also known as "Our Common Future", which provided the seminal definition of the term "sustainable development" as the development that "meets the needs of present without compromising the ability of future generations to meet their own needs" (1987, p. 16). The emphasis on differentiation between the needs of present and future is important in this definition. In addition, Brundtland Report also recognized the importance of poverty reduction, balance in the wealth distribution, and gender equality in dealing with environmental problems. More than that important role of urban policy-making in achieving sustainable development and possible challenges arising from increasing population in cities were identified (World Commission on Environment and Development, 1987, p. 22).

One important development regarding international policy-making on climate change was the establishment of Intergovernmental Panel on Climate Change (IPPC) in 1988 by WMO and UNEP. Initial task of the IPCC was defined as to prepare comprehensive review and recommendations with respect to; the state of knowledge

on climate change science, social and economic impacts of climate change and global warming, mitigation strategies to deal with these impacts, and identification of possible opportunities and instruments for future actions (United Nations, 1988). Since its foundation, IPCC collected scientific and socio-economic information from all around the world and provided objective, comprehensive, and transparent data on climate change. On a regular basis, IPCC published Assessment Reports which is considered as the most comprehensive scientific reports on the subject. First Assessment Report was published in 1990 and other four reports followed consequently in 1995, 2001, 2007, and 2013/14. There are three main working groups gathered in the body of organization. Working Group I focuses on the physical scientific aspects of climate change. Working Group II works on socio-economic and natural vulnerabilities caused by climate change along with possible consequences and adaptation strategies. Lastly, Working Group III investigates the ways of mitigation by limiting and preventing GHGs and enhancing the capacity of carbon sinks. In addition to being one of the most credible scientific institutions on climate change issues, IPCC has been influencing the international environmental politics since its foundation.

In 1990, Second World Climate Conference held in Geneva and co-sponsored by WMO, UNEP, United Nations Educational, Scientific and Cultural Organization (UNESCO), and some other international organizations. Acknowledgement of special requirements of developing countries, while coping with climate change and defining climate change as a common concern of humankind was important. Moreover, steps were taken towards a global climate treaty in this conference (UNFCCC, 1993).

In order to regulate the provision of funds for the projects related to climate change, biodiversity, chemicals and waste, international waters, and land degradation; the Global Environment Facility (GEF) was founded by World Bank in 1991. Environmental projects in some cases may comprise long term benefits with possibility of little or no income generation (Schaltegger, Bennett, Burritt, & Jasch, 2008, pp. 153-155). For this reason, issues related to finding financial resources pose insuperable obstacles for such projects. Unlike World Bank and many other

international funding organizations, GEF provides grants to developing countries instead of loans or debts. Since 1991, GEF has provided "$13.5 billion in grants and leveraged $65 billion in co-financing for 3,900 projects in more than 165 developing countries" and became leading institution for international funding to deal with environmental issues (GEF, 2013).

In 1992, United Nations Conference on Environment and Development (UNCED), also known as the Earth Summit, was held in Rio de Janeiro and considered as the second mega conference in the history of international environmental politics. It was such a major conference that 172 governments attended with 108 sending their heads (United Nations, 1997). Additionally, representatives from non-governmental organizations showed great interest in the conference. Three major conventions on global environmental challenges were developed and agreed on during the conference; United Nations Framework Convention on Climate Change (UNFCCC), Convention on Biological Diversity (CBD), and United Nations Convention to Combat Desertification (UNCDD). Due to enormous number of participation and adaptation of important decisions and documents, it can be asserted that this conference influenced the international environmental politics for the next couple of decades. Furthermore, the Earth Summit paved the way for inclusion of local bodies in combating climate change, since it led to creation of important transnational municipal networks (TMNs)[2] and development of Agenda 21 which is an action plan that included the principles of enhancing environmental protection, social equality and economic prosperity. Agenda 21 is a non-binding document and aimed to include local level authorities and initiatives from international, national, and regional scales in accordance with this purpose. Additionally, a parallel program to Agenda 21, which is implemented by local governments, is called Local Agenda 21. Smardon reported that especially local governments in Europe were observed to be successful and 5,292 of them in 36 countries integrated Local Agenda 21 to their action plans (2008, p. 124).

[2] Transnational Municipal Networks provide opportunities for localities to interact with other localities as well as emphasizing their presence and capacity. This is an important factor since the mechanisms of influence are several and non-state bodies have an important role in the multilevel governance arena (Toly, 2008, p. 351).

UNFCCC was signed in 1992 and entered into force two years later. Main purpose of the convention was defined in Article 2 as "to achieve stabilization of greenhouse gases concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system." (United Nations, 1992, p. 4). Two main principles of this convention can be referred as "precautionary principle" and "common but differentiated responsibilities". Precautionary principle implies avoiding catastrophic events despite their potential harm is not scientifically proven (United Nations, 1992, p. 4). Considering the uncertainties of the events in causal chain of climate change, this principle is important in decision-making. The principle of common but differentiated responsibilities acknowledges the historical differences of the states in both contributing to environmental problems and capacities in tackling these problems (CISDL, 2002, pp. 1-3). In this sense, parties of the convention were classified under three groups. Annex I countries are developed countries and economies in transition (EITs)[3], and these countries are responsible for the stabilization of their emission levels. Annex II parties consist of the members of Organization for Economic Cooperation and Development (OECD) except for South Korea and Mexico. These parties are responsible for providing financial and technical support to the mitigation or adaptation projects of developing countries and EITs. Non-Annex I countries are formed of low income developing countries. As of 2014, the convention has 198 parties including observer states (UNFCCC, 2014b). Since UNFCCC was entered into force, regular meetings under the name of "Conference of Parties (COP)" have been held annually with the purpose of discussing the progress in dealing with climate change. The first COP meeting was held in Berlin in 1995, in which parties outlined specific targets for GHG reduction.

Debates on the necessity of a binding agreement to fight against climate change have begun right after the UNFCCC entered into force. In the 3rd COP meeting in Kyoto (Japan), Kyoto Protocol was adopted with the same objective of UNFCCC (United Nations, 1998, p. 1). The principle of common but differentiated responsibilities was followed in the protocol and thus developed countries were forced to reduce their

[3] Transition Economy refers to the structural changes in the mechanism of a country's economy towards market based system, where prices are set by market forces. This change implies a transition from a centrally planned economy to a market economy and also involves changes in the role of the state.

GHG levels in the atmosphere due to their historical responsibilities. More than that developing mitigation programmes at regional level, which focuses on improving local emission factors were supported (United Nations, 1998, p. 9). In the Article 25 of the protocol, two conditions were stated to put the protocol into the force. These conditions were stated as follows (United Nations, 1998, p. 18):

> This Protocol all enter into force on the ninetieth day after the date on which not less than 55 Parties to the Convention, incorporating Parties included in Annex I which accounted in total for at least 55 per cent of the total carbon dioxide emissions for 1990 of the Parties included in Annex I, have deposited their instruments of ratification, acceptance, approval or accession.

First condition was satisfied with the ratification of the protocol by Iceland on 23 May 2002. On 18 November 2004, ratification of Russia fulfilled the second condition and Kyoto Protocol was put into force 90 days later, on 16 February 2005. As of May 2013, there are 192 parties to the Kyoto Protocol (UNFCCC, 2014c). First commitment period (2008 to 2012) for Annex I parties defined in the Article 3 of the protocol as, at least 5% reduction of GHGs compared to base year 1990 (United Nations, 1998, p. 3). It should be noted that since the ratification period took long time, this created an obstacle for the success of the treaty. Even though all goals of the Kyoto Protocol were not met, it was reported that some of the industrialized countries (especially countries in European Union) were successful to meet the collective target (Olivier, Janssens-Maenhout, Peters, & Wilson, 2011, pp. 24-26). The second commitment period or extension to the Kyoto Protocol can not be clarified so far, as the negotiations in Copenhagen in COP 15 failed to come up with an agreement. Nevertheless, Kyoto Protocol was an important milestone in understanding the necessity of a binding document in reducing the level of GHGs as well as realizing the importance of national programs.

10 years after the Earth Summit in Rio de Janeiro, another mega conference was held in Johannesburg in 2002 under the name of World Summit on Sustainable Development (WSSD), also known as Rio +10 Meeting. The summit had two main outcomes: Johannesburg Declaration and Johannesburg Plan of Implementation. However, the summit was criticized for not bringing any concrete outputs and

commitments. President of the United States at that time, George W. Bush, boycotted the summit and the negative attitude of the U.S. Government had widespread media coverage (Ludington Daily News, 2002). Chasek, Downie and Welsh Brown discussed Bush administration's reluctance in taking steps in environmental issues. It can be asserted that globalization paradigm was considered as supplanting the sustainable development paradigm. With the shift of paradigm, U.S. policy-makers favored trade and globalization and thus environmental issues lost their priority eventually. In Earth Summit discussions were also focused on "whether the sustainable development paradigm failed or not" by reviewing the implementation of Local Agenda 21 (2010, pp. 38-39).

In 2007, United Nations Climate Change Conference was held in Bali with participation of the representatives from over 180 countries. The conference also hosted important meetings of COP and Meeting of Parties to the Kyoto Protocol (MOP). Debates generally focused on the necessity of a new treaty after the Kyoto Protocol. Governments agreed on a timetable and set of decisions, called Bali Road Map, in order to adopt a new plan at COP 15 meeting in Copenhagen. The basis of the Bali Road Map (also includes Bali Action Plan) is stated in the website of UNFCCC as "new, comprehensive process to enable the full, effective and sustained implementation of the Convention through long-term cooperative action, now, up to and beyond 2012." (UNFCCC, 2014a).

The Third World Climate Change Conference was held in Geneva in 2009. Main focus and discussion topic of the conference was on establishing "Global Framework for Climate Services" that would support decision-making processes by providing better and more comprehensive science-based climate predictions. By achieving this, governments and climate sensitive sectors (food producers, water suppliers, energy generating sectors etc.) would become better equipped in order to minimize possible future climatic risks.

United Nations Climate Change Conference, also known as Copenhagen Summit was held in Copenhagen in 2009. COP 15 meeting, which was the biggest COP meeting, was gathered in this conference. Also, Covenant of Mayors meeting was held and local actions to deal with adverse effects of climate change were promoted

(Covenant of Mayors, 2010). As mentioned before, parties came together in order to make a new agreement for post Kyoto period after 2012. In order to achieve this, Copenhagen Accord was drafted as the main outcome document of this conference. However, the document was subjected to many disputes by governments and non-governmental organizations. There were two main criticisms against Copenhagen Accord. First criticism was that the negotiations between states were not democratic, transparent, and discussions mainly dominated by the U.S. Government (BBC, 2009). Second, although the Accord recognized 2°C rise in overall global temperatures as the critical level, there was no reduction target determined for GHGs. For these reasons, it can be stated that there was not reliable, binding, and sustainable agreement to replace Kyoto Protocol at the end of Copenhagen Summit.

In 2012, United Nations Conference on Sustainable Development (UNCSD) was organized in Rio de Janeiro and this conference was also named as Rio +20 to mark the 20th anniversary of the 1992 UNCED. Discussions were focused on two main themes such as green economy to achieve sustainable development and eliminate the poverty, and building an institutional framework in order to achieve better international coordination. The absence of key leaders like President of United States Barack Obama, Prime Minister of United Kingdom David Cameron, and Chancellor of Germany Angela Markel was remarkable. Main outcome of the conference entitled "The Future We Want" was a non-binding document. The importance of urban planning and policy-making was emphasized. In the document, opportunities to combat climate change at urban scale were discussed considering different aspects such as settlements, transportation, production activities, green spaces and urban regeneration (United Nations, 2012, pp. 20-24). Both document and conference were criticized since governments mainly re-declared their commitments for sustainable development without any binding documents and failure in addressing real sources of existing problems (Netzer, Detsch, Gross, Maihack, Oesterdiekhoff, & Wetzig, 2012).

COP 18 Meeting, also known as Doha Climate Conference, was held in Doha. Meetings were started on 26 November 2012, almost a month before the expiration of first commitment of the Kyoto Protocol. For this reason, discussions were focused

on second commitment period of the Protocol. As a consequence, parties adopted the Doha Amendment, which implies the second commitment period of Kyoto Protocol. The length of the second commitment period would be running from 01 January 2013 to 31 December 2020. However, Doha Amendment is still not in effect, since the conditions are not met. As of 21 December 2015, Doha Amendment has been ratified by 59 countries (UNFCCC, 2015d), whereas acceptance of 144 countries is required to put the treaty into the force. Apart from that, "Doha has opened up a new gateway to bigger ambition" and parties also agreed to adopt international agreement on climate change by 2015 (United Nations Environment Programme, 2012).

The 20th session of COP, also named as Lima Climate Change Conference was held in Lima in 2014. Details of adopting new international agreement, which was scheduled to be agreed in Paris in 2015, were discussed during the discussions. Also, it was agreed that countries would submit their contributions to new agreement in the first three months of 2015 (UNFCCC, 2014d). Eventually, it can be argued that COP 18 and COP 20 meetings paved the way for Paris Agreement.

Most recently, COP 21, also named as Paris Climate Change Conference, was held in Paris between 30 November 2015 and 12 December 2015. It is vital to analyze this conference in detail in order to have an insight on the most recent developments of international policy-making on climate change. This conference was referred as one of the most critical meetings on climate change. There can be two points briefly mentioned to explain the importance of the conference. Firstly, nations showed great interest and more than 190 nations participated to discussions. Secondly, since national commitments on GHG emissions will end in 2020 with the expiration of Doha Amendment, Paris Agreement was adopted unanimously on the last day of the discussions. The main aim of the agreement was stated in the Article 2 as, "to strengthen the global response to the threat of climate change, in the context of sustainable development and efforts to eradicate poverty". Moreover, the target of holding the global average temperature limits well below 2°C compared to pre-industrial levels and making an effort to limit increase to 1.5°C was mentioned in the agreement (UNFCCC, 2015a, p. 21). Even though great number of countries coming together and agreeing upon 2°C target (even improving this target) looks promising,

there might be some problems reaching these targets. First of all, as it was published by CNN that achieving 1.5°C target would mean reaching zero net carbon emissions sometime between about 2030 and 2050 according to some researchers (Sutter, 2015). Secondly, individual contributions of the countries to achieve this target look insufficient. Prior to the conference, Intended Nationally Determined Contributions (INDCs) were publicly presented by 146 countries. However, it was noted that these draft programs of the countries can achieve limiting global temperature level as far as 2.7°C by 2100 (UNFCCC, 2015c). Paris Agreement was not put into force since the condition, which is at least 55 parties, accounting for at least 55% of the global GHG emissions, depositing instruments of ratification, acceptance, approval or accession, was not fulfilled (UNFCCC, 2015a, p. 30). Apart from that, there were some criticisms expressed after the Paris Conference. In their report, Elver and Falk asserted that climate change negotiations are becoming more focused on finance, development and energy politics instead of preservation of the nature. They added, there is an ongoing competition between the nations in the backstage about financial aids, credits, and countries who are responsible for creating funds (2015). Another criticism was on neglecting vulnerable and special interest groups who experience water and food scarcity, extreme climatic events, and need tangible actions as soon as possible to survive (Harvey, 2015). As a consequence, it can be argued that decision to take initiative in preparing for devastating effects of climate change and combating against this phenomenon is still at nations' sole discretion. Apart from the national commitments, initiatives at local scale were enhanced both directly and indirectly Paris Climate Change Conference. Firstly, in ICLEI World Congress 2015 more than 100 mayors came together and new program was launched in order to progress local and subnational action before Paris Climate Change Conference in December 2015 (Bridging the Gap, 2015). Finally, importance of capacity building at national, subnational, and local levels was highlighted in Paris Agreement (UNFCCC, 2015a, p. 27).

Figure 2.3: Important Milestones and Events for Climate Change History

Thus far, historical background of climate change policy was introduced briefly. In the Figure 2.3 above, the timeline of milestones and events for climate change was presented. More important events are written in bold and highlighted. Nevertheless, it is not possible to argue that the solutions and progress that have been achieved led to long term and permanent success so far. For instance, despite the increasing awareness and political efforts in the past couple of decades, concentration of CO_2 in the atmosphere has increased dramatically since 1960s and almost reached 400 ppm[4] in 2010 according to report published by IPCC (2013, p. 12). Ever increasing trend of Atmospheric CO_2 is illustrated in the Figure 2.4 below.

[4] Parts per million: ratio of molecules of pollutants to the total number of molecules of dry air.

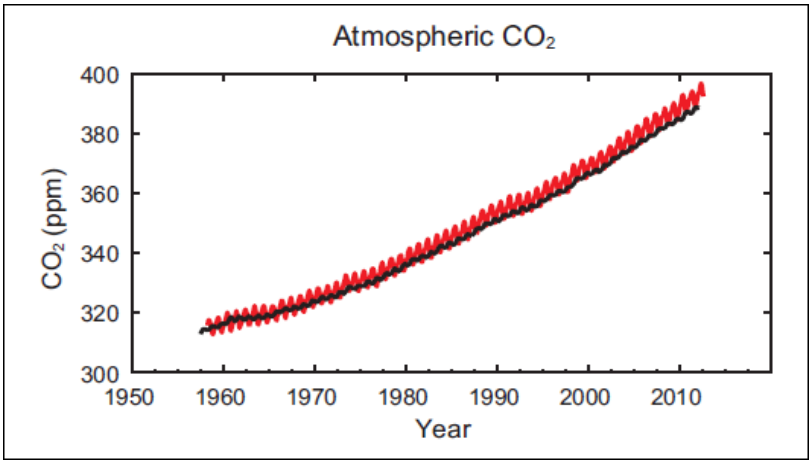

Figure 2.4: Atmospheric CO_2 Concentration (Source: IPCC, 2013)

2.3. Importance of Cities in Dealing with Climate Change

As it was mentioned, anthropogenic factors can be considered as the most important reason for increasing trend of GHGs in the atmosphere. It can be asserted that both macro-scale causes (like industry and energy production) and micro-scale causes (like consumption habits and lifestyles) contribute to GHGs. At this point, the importance of analyzing problems and performing required intervention is highly important. With this in mind, the importance of intervention at micro-scales –cities to be particular– while dealing with devastating effects of climate change will be discussed.

Starting from 1970s, when environmental policy-making processes were developing rapidly, discussions were focusing on common vulnerabilities of global warming and climate change. However, it was appeared that different geographies have different and unequal vulnerabilities, which means they face different environmental hazards and thus have different responsibilities. Hence, it is important to deal with climate change at local level, in other words at urban scale. By this means, it may be possible to make cities more resilient to adverse effects of climate change by considering possible dangers and vulnerabilities they encounter specifically.

Another important factor which highlights the importance of cities in dealing with climate change is the ever increasing number of people living in urban areas and several outcomes caused by this fact. In the Fifth Assessment Report published by IPCC, urbanization is defined as a global trend which is associated with higher urban incomes that lead to higher GHG emissions and energy consumption (2014b, p. 25). According to data gathered from The World Bank, for the first time, ratio of urban population[5] to total population[6] passed 50% in 2008 (2015a; 2015b). This increasing trend is illustrated in the Figure 2.5 below. More than that, the percentage of people living in urban areas is expected to increase to 64-69% (corresponds to 5.6-7.1 billion people) by 2050 (IPCC, 2014b, p. 25). Moreover, International Energy Agency, in 2008, published in its report that, urban areas are responsible for two-thirds of the world's energy consumption and more than 70% of CO_2 emissions (2008, p. 179).

[5] Urban population refers to people living in urban areas as defined by national statistical offices. It is calculated using World Bank population estimates and urban ratios from the United Nations World Urbanization Prospects. Aggregation of urban and rural population may not add up to total population because of different country coverages (The World Bank, 2015b).

[6] Total population is based on the de facto definition of population, which counts all residents regardless of legal status or citizenship--except for refugees not permanently settled in the country of asylum, who are generally considered part of the population of their country of origin. The values shown are midyear estimates (The World Bank, 2015a).

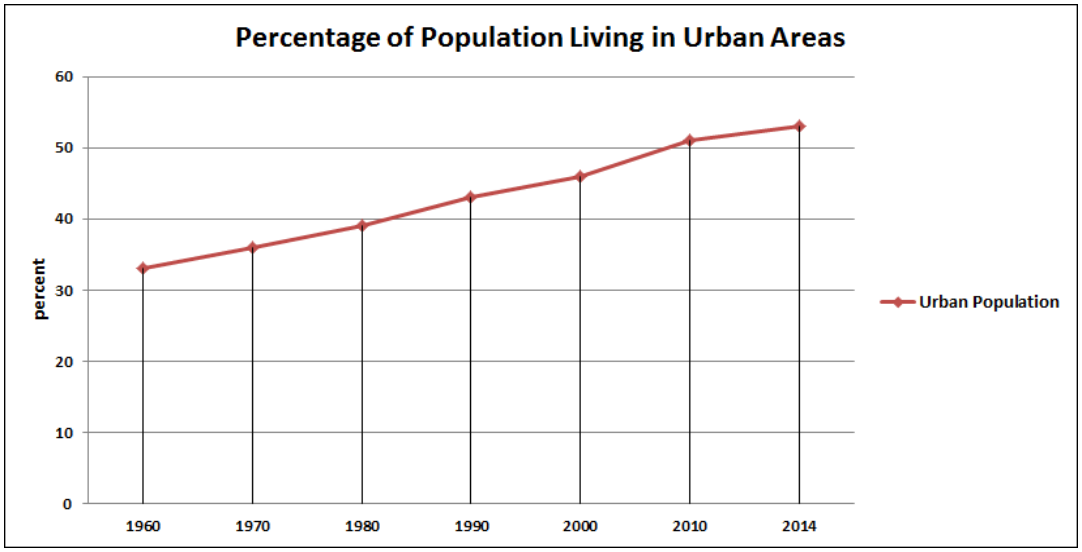

Figure 2.5: Percentage of Population Living in Urban Areas (Source: The World Bank 2015a; The World Bank 2015b)

Beyond any doubt, such findings reveal that the increasing proportion of population living in cities creates vulnerable circumstances at the local level. At the same time, urban areas become centers for massive production and consumption activities, which also enhances the importance of cities, considering the fact that production and consumption constitute one of the major causes of climate change. Lindfield underlined this issue by clarifying that people living in the urban areas consume most of the energy with everyday activities such as cooking, household heating, and transportation. On the average, he added, cities and people living in the cities are responsible for 75% of the GHG emissions (2010, p. 111).

Despite mentioned vulnerabilities and possible dangers, cities also provide some opportunities and advantages in fighting against climate change. To begin with, being closer to the sources of micro-scale problems and playing an important role in implementation of most of the projects enable local governments to generate more straightforward solutions. Moreover, as it was asserted by Balaban, local governments, as being closest governmental organization to citizens, can create more

resilient society and undertake city-wide actions (2012, p. 27). Finally, it was stated by Working Group III in the IPCC's Fifth Assessment Report that "the next two decades present a window of opportunity for mitigation in urban areas as a large portion of the world's urban areas will be developed in this period." (2014b, p. 25).

Local governments, by being in charge of main fiscal and technical sources, certainly present various opportunities to provide micro-scale interventions. However, embodying other actors and networks in such pursuit is rather important. Bulkeley pointed that, "it is necessary to consider how, why, and with what implications other actors are seeking to govern the climate through the city." (2010, p. 233). TMNs hold an important position in this manner and the capacity of such organizations increased since the acknowledgement of opportunities that cities provide. United Nations Conference on Environment and Development can be regarded as initial point that led to the establishment of some of the most important TMNs of today, namely; ICLEI, Climate Alliance, and Energie Cités. Currently, there are numerous TMNs focusing on climate change and global warming with the aim of enabling communication between municipalities and offering knowledge from varied previous experiences. These networks also provide opportunities for funding and technical expertise to their members.

As a consequence, environmental risks mentioned above, vulnerabilities, and opportunities caused by continuous urbanization trend, and future projections, illustrate the importance of cities while combating climate change. In this regard, as to achieve success at urban, regional, national, or international scale, there are several approaches which will be introduced and exemplified in the next section.

2.4. Approaches to Dealing with Climate Change

Several impacts of climate change have already been already experienced while more effective alternates are likely to come true in future. Authorities in charge and decision-makers, regardless of the extent of the ground they manage, have adopted some approaches in order to avoid and reduce negative effects of climate change. In principle, these approaches serve to provide agreeable or improved life quality to people who already faced or likely to face devastating effects. Especially in the

planning processes of environmental projects, in which advantages can be observed in long term or financially less feasible, adopting such approaches would be beneficial in order to have an idea about the whole picture. Beyond any doubt, developments in environmental science and research partially eliminated uncertainties by providing reliable information about physical indicators like GHG emissions, other air pollutants, or ecological footprints (yet the incapability to determine social and environmental outcomes should be noted). At the same time, these developments guided the enhancement of the approaches that will be introduced in this section. Two different approaches to deal with climate change can be simply differentiated from each other as one focuses on increasing the capacity to cope with the negative effects of climate change, while the other endeavors to reduce or eliminate the causes of global warming and climate change. These approaches or policy options are widely known as climate change mitigation and adaptation.

IPCC, in its Fourth Assessment Report defines adaptation as "initiatives and measures to reduce the vulnerability of natural and human systems against actual or expected climate change effects". Moreover, importance and requirement of adaptation policies are underlined in the same report by mentioning the unavoidability of the effects of climate change (2007, p. 76). Although adaptation measures contribute to increase resilience of cities and communities at various scales; it can be argued that this is an effective approach for micro-scales. As mentioned before, environmental problems, such as drought, water and air pollution, flooding, heat stress, and extreme weather events; diversifies across different localities. For this reason, responding to and preparing for particular possible risks are relatively less complicated tasks compared to a general approach in the existence of all uncertainties involved. In this manner, many local governments and responsible authorities currently develop adaptation strategies. Moreover, compared to mitigation, adaptation measures generally yield results in shorter term and require less budget to implement. Füssel discussed adaptation measures in two categories as hazards-based approach and the vulnerability-based approach. Hazards-based approach uses climate change projection models and centers upon incremental environmental impacts. Social and other non-climatic factors are limited in this approach. On the other hand, social factors are involved in vulnerability-based

approach which uses current climate risks in order to determine future changes (2007, p. 7). These two different approaches for adaptation offer different advantages for particular environmental risks. Separately, there are several guiding principles for adaptation in order to achieve successful practice. IPCC Working Group II listed several principles of effective adaptation for decision-makers to benefit. For instance, the importance of consistent actions across different scales, acknowledgement of diversifying interest of parties, and comprehensive planning with accurate determination of short term outcomes and responsibility is highlighted (2014a, s. 25-28).

As being second approach to deal with climate change, mitigation simply covers any intervention in order to reduce GHG emissions and enhance carbon sinks. IPCC define mitigation as "technological change and substitution that reduce resource inputs and emissions per unit of output." (2007, p. 84). The approach of reducing GHG emissions, which is the cause of increase in global average temperature levels, is important considering the fact that anthropogenic factors have an important effect in such change from the beginning of Industrial Revolution. Unlike adaptation approach, mitigation policies can be successfully implemented on both micro and macro levels and results can be observed not only locally but also globally. According to IPCC report that was published in 2014, projections demonstrate that without any further mitigation measures, global mean surface temperature will increase from 3.7°C to 4.8°C in 2100 compared to pre-industrial levels (2014b, p. 8). Considering the 2°C threshold in average global temperature levels, mitigation approach should be embraced carefully in the period ahead. Although mitigation measures generally require more budget compared to budgets in adaptation projects, in order to make important progresses towards reducing GHG emissions; mitigation policies intersects with other sectoral purposes which creates co-benefits (IPCC, 2014b, p. 26). At this point, it should be noted that effective mitigation can be achieved only if such co-benefits are considered carefully and each party does not seek for its own benefits independently. In this sense, cities as being places for clustering many sectors and parties, come into prominence again for fighting against climate change and the implementation of mitigation projects.

It should be noted that, in order to fight against climate change effectively, principles of mitigation and adaptation should be pieced together. Both reducing GHG emissions and preparing for devastating impacts of climate change is crucial in this pursuit. Various differences between two approaches mentioned in terms of required budget, scale of effect, beneficiaries and time span. As it is frequently quoted, it can be asserted that “adaptation is about managing the unavoidable; whereas mitigation is avoiding the unmanageable” (Scientific Expert Group on Climate Change (SEG), 2007). Obviously, initiatives that lack embodying adaptation and mitigation approaches properly will cause loss of time and resources. Strategic plans and action plans developed in different scales appear as framework documents that achieve maintaining this harmony in the light of scientific findings. Details, importance, historical background, and standards of climate change action planning that constitutes the core of this research will be discussed in the next chapter.

CHAPTER III

CLIMATE CHANGE ACTION PLANNING

3.1 Importance of Climate Change Policy-Making

As mentioned in the previous chapter, during the last 40 years the issue of climate change has moved to a central stage in politics in a remarkable way. Nonetheless, political discussions in this field, as also argued by Anthony Giddens, tend to be partial and disparate. Many of the discussions are unable to go beyond providing evidences and scientific findings to prove the existence of climate change, initiating estimations for possible future impacts and asserting the necessity for national and international collaborations in order to deal with climate change (2008, p. 3). However, the success of the environmental policies and projects up to the present should be questioned, considering the fact that major part of the human and natural systems are still vulnerable to impacts of climate change and remarkable amount of decrease in GHG levels have not been achieved yet.

In order to achieve efficient environmental and climate change policies, this issue should find place in every aspect of life and should not be marginalized from some sectors. To be more precise, successful environmental policies may be possible if relevant policies have an authoritative voice in all fields like economy, service industry, transportation, education, and social equity. At this point, the question that Giddens raised in his article should push us to think over it: “How can the climate change dimension be built into every relevant aspect of public policy?” (2008, p. 4). So, it can be asserted that dealing with climate change is not simply comprised of adaptation and mitigation practices, but it should also pursue equity between different shareholders among different scales and broader perspectives that require common action. For this reason, policy-making and planning are quite important in dealing with climate change in the sense of integrating different aspects of life.

Balaban categorized the policy responses that have been developed at urban scale as political, sectoral and spatial. Political policy responses simply cover political processes like changes in decision-making and implementation processes alongside redistribution of polices and mechanisms. Relevant projects in transportation, construction, and energy sectors constitutes second group since common outcomes can be obtained. Finally, policies related with spatial structures (from building scale to regional scale) are stated as the third group (2012, p. 26).

In order to increase the interconnectivity between these projects and embed climate change problem into every aspect of life, a current approach should be improved. As Lindfield argued, in order to achieve this, we need to develop new forms of engagement, new forms of finance, and the flexibility to adopt the circumstances of each city (2010, p. 105). In this context, climate change action plans provide an opportunity to involve different political, sectoral, and spatial policies to cover many aspect of life and provide solutions to enhance new approach at the same time.

3.2. Basics of a Climate Change Action Plan

In order to deal with climate change, responsible authorities may decide to carry out planning activities through different types of plans. Boswell, Grave, and Seale, in their book, asserted that many communities have integrated climate change programs into other planning documents. These documents can be exemplified as sustainability and "green" plans, energy plans, and comprehensive/general/community plans (2011, p. 9). As it is understood, these plans do not directly address climate change as a focal issue but concentrate on other topics like land use or embrace environmental problems in broader sense. On the other hand, climate change action plans, being stand-alone plans, are framework documents which outline the specific policies and activities in order to deal with climate change. These documents both cover actions to reduce GHG emissions, and increase resilience of human and natural systems in the presence of devastating effects of climate change. General description is provided on EPA's website as "a climate change action plan lays out a strategy, including specific policy recommendations, that a state will use to address climate change and reduce its greenhouse gas emissions" (2015). Another description which presents more detailed

explanation about the scope and intention of these plans is "… [they] provide a feasible, bottom-up means to establish strategic goals to lower emissions, identify emission sources and amounts, make appropriate policies and establish mechanisms for co-ordination, monitoring, measuring and reporting performance" (Tang, Brody, Quinn, Chang, & Wei, 2010, p. 42).

Briefly stated, climate change action plans generally comprise of certain sections. These plans generally base upon GHG inventory of the region in question. Plan document typically proceeds with forecasts of the future GHG emissions and targets. Furthermore, policies and programs to reach those targets along with adaptation measures are presented in detail. Actions within the scope of these programs should be developed in the most feasible way, which generally projected in fields such as energy, industry, land use, and transportation. In order to achieve a successful and comprehensive action plan; costs, partnerships, and financing mechanisms should also take place in the planning document in order to undertake projected programs in the most cost effective manner. Ultimately, monitoring programs are important in order to make necessary regulations and collocations after the implementation stage of the actions started. Although there is no one exact set of criteria for gradation and context of these sections, there are technical guidelines helping professionals in order to attain a certain standard. These technical guidelines for preparing of climate change action plans will be discussed in forthcoming sections.

As like any other planning documents, climate change action plans can be prepared for international, regional, urban, or even more micro scales. In addition to the previous discussion, about the importance of taking action in micro scales, these plans have certain functions in local community such as bringing local parties together, increasing awareness of the public, strengthening the local economy through building energy efficient systems, and responding specific conditions of the locality (Boswell, Greve, & Seale, 2011, p. 8). More than that, climate change action plans serve to enhance the integrity of actions among different scales.

Climate change action plans, apart from being strategic and policy documents that involves abovementioned programs and activities, also consists quantitative work that originates from GHG inventories, future projections, and reduction targets. For

instance, generating GHG inventory requires technical proficiency, as the Boswell, Grave, and Seale explains, emissions are not directly measured but rather estimated through the activities and behaviors of the community such as electricity consumption of the residences and businesses (2011, p. 11). Because of the mentioned reasons, preparing climate change action plan is a professional activity which requires experts from various branches to come together and collaborate. In addition to international organizations like United Nations, which deals with climate change and environmental problems in general; city networks provide technical assistance and support for preparation of these documents. More than that, collaborations with universities is observed quite often in overcoming technical limitations.

3.3. When and Why Did Climate Change Action Plans Come Forward?

Historical background of climate change action planning has parallels with the history of climate change policy. Indeed, as the acknowledgement of this problem in global level increased, climate change is recognized also as a planning problem. As it was mentioned by Wheeler, as the local jurisdictions in United States started to adopt more comprehensive plans to reduce GHG emissions, climate change planning developed in the mid-to-late 1990s. Although EPA started to support states financially in order to build GHG emissions inventory and mitigation plans in this period (Wheeler, 2008, p. 481); some pioneer cities already started implementing climate change action plans beforehand. For instance, the City of Vancouver adapted a broad range of climate change policies in the beginning of 1990s. It could be argued that the fact that Vancouver's potential to experience several environmental disasters, led city to develop one of the world's earliest climate change action plan in 1990, Clouds of Change Report. This report includes two volumes that cover the recommendations to be adapted by Vancouver City Council; original report of the Task Force on Atmospheric Change and appendices respectively. In addition to visionary and realistic recommendations on issues like energy efficiency, transportation, and air quality, 20% reduction target for CO_2 emissions (based on 1988 levels) by 2005 was stated in the report of the Task Force (City of Vancouver

Planning Department, 1990, p. 1). More than that, city enhanced its mitigation and adaptation activities over the years and adapted related policies to its future plans.

In the later years, when examining the development of climate change action planning, the positive effect of the technical, monetary, and other assistance of intergovernmental and international organizations' and governments' can be observed. In addition, several agreements, collaborations, and organizations at global level encouraged (and enforced sometimes) both national and local authorities to carry out planning activities in order to get to the root of this problem. To begin with, UNFCCC conditioned countries to develop GHG emissions inventory, national programs including mitigation and adaptation measures for climate change, and report their activities to Conference of the Parties (United Nations, 1992, p. 15). Undoubtedly, these practices paved the way for countries to follow a systematic and planned strategy in this pursuit. In a similar manner, Kyoto Agreement imposed an obligation on countries to make a notice and develop the programs that enhance mitigation and adaptation measures and develop inventory of GHG emissions. Apart from that, the establishment of ICLEI can be considered as a milestone for development of climate change planning activities in local governments. Since its establishment in 1990, ICLEI provided technical assistance to its members in order to develop a local action plan. Today, the network has more than 1,000 cities, towns, and metropolises that are committed to build sustainable, resilient, and healthy cities of future (2015, p. 2). Another important step persuading local governments to prepare climate action plans is Local Action 21, which can be acknowledged as the second phase of Local Agenda 21. At the World Summit on Sustainable Development, in 2002, leaders of local governments as well as representatives from international organizations launched Local Action 21 with the motto of "Moving from Agenda to Action". There are three main targets identified, which gave raise local governments to carry out planning activities: identification and overcoming barriers to sustainable development, reducing environmental degradation and depletion of resources, and ensuring implementation, effective monitoring, and continual improvement of municipal sustainability management (ICLEI, 2008). In addition to Action 21, there are several national agreements that promote climate change action planning in local level such as U.S. Mayors Climate Protection

Agreement. The agreement was first signed in 2005 by 141 mayors across the United States and within four years this number increased to 944. There are three main actions stated in the agreement namely; to meet the targets of Kyoto Protocol through actions in their own operations, to urge the U.S. Congress to pass bipartisan GHG reduction legislation, and to urge federal government and state governments to implement such policies and programs to meet the target of reducing GHG emissions suggested in Kyoto Protocol for United States (7% reduction from 1990 levels by 2012) (The United States Conference of Mayors, 2008). Actions stated in the agreement reveals that climate change action planning does not always triggered by macro scale organizations. To be more precise, there is a perception that international and intergovernmental agreements generally put pressure on nations or local governments to take the action in environmental issues. However, as can be observed, local governments may show critical approach and urge national governments to implement such programs along with them or to take responsibility of their own share in international community.

During the last couple of decades, cities and countries considered being responsive to environmental issues and fighting against them as a sort of competition between each other. Moreover, it can be argued that mayors and presidents used this to attract communities and promote their cities and countries. For example, more than 30 countries including United States, Norway, Mexico and Switzerland prepared climate change action plans and made their contribution to Paris Climate Change Agreement of 2015 (UNFCCC, 2015b). Coupled with countries' ambition to deal with climate change, taking active role in the agreement, and benefiting from leadership title plays an important role in this intense interest.

Apart from the points stated above, one of the most important reasons for increased attention in climate change action planning is the recognition of climate change as a planning problem. Indeed, this fact is important in both understanding when and why climate change action plans come forward. Considering the historical background and scientific literature on the subject, not a single event or milestone can be pointed in this alteration in attitude. Intrinsically, historical background of climate change and evolution of policy-making processes reveal that increasing role and recognition

of planning is important at this point. Bassett and Shandas commented on development of such approach in their article as, "… planning scholars have paid little attention to climate change as a planning problem, and the planning literature contains little discussion of the potentials and pitfalls of this emergent type of planning." (2010, p. 436). However, in the last couple of decades, climate change policy planning, which also denotes the increasing role of planning discipline in the field, is on the rise and findings of the research titled "The 2015 Global Climate Legislation Study" supports this argument. The study covers 99 countries worldwide and it was stated that climate change planning policies has doubled in number every five years since Kyoto Agreement in 1997. Moreover, there were 426 climate laws and policies in 2009, the year when the Copenhagen Accord was signed; this number has increased to 804 by the end of 2014 (Nachmany, et al., 2015, pp. 14-20).

As discussed before, climate change can not be addressed at any single scale. Alternatively, local, national, and international collaboration is needed in order to adequately deal with this issue, which once more underlines the necessity of planning activities. Furthermore, unpredictability of the extent of environmental hazards should not drive us to delay action. The main reason of climate change we experience since the last century is mostly due to anthropogenic factors. In order to avoid unpredictable environmental hazards arising from climate change, authorities should get to the root of the problem; acknowledge climate change as a planning problem, implement necessary policies, and take actions to decrease total amount of GHGs in the atmosphere.

Contrary to arguments of some researchers, solution of environmental problems should not be given up only to market mechanisms. Instead, responsible authorities, communities and individuals should actively be involved in this pursuit. In this regard, only way to avert the damage we caused is acting conspiratorially. The importance of climate change action planning gains significance once more, as the requirement of actively involving to the solution of this problem is scientifically proven and expressed by authorities and researchers over the last 40 years. Boswell, Grave, and Seale pointed eight reasons for preparing local climate change action plans which also stands for reasons why climate change action plans come forward

at local scale. Titles of reasons are listed as; global readership, energy efficiency, green community, state policy, grant funding, strategic planning, public awareness, and community resiliency (2011, p. 24). This categorization covers what have been introduced in this subject adequately; considering the fact that dealing with climate change requires interdisciplinary cooperation and this can not be succeeded unless harmonious acting between these disciplines.

3.4. Successful Climate Change Action Planning Examples

Successful climate change action planning examples that will be presented in this chapter are confined by 2 different aspects as to obtain operational sample set of planning activities. Primarily, it should be noted that climate change action planning activity is an entirely holistic and comprehensive work. Climate change action plans, as described before, stands for the final framework documents of such activities that outline specific policies and activities. Detailed research about entire planning processes and climate change action plans itself will be submitted in the next section. As introduced in the previous chapter, dealing with climate change consist of different approaches like mitigation and adaptation, which is also indispensable part of climate change action planning. Secondarily, planning work in dealing with climate change takes place in different scales (international, national, urban, or even micro scales). Still, considering the framework, extent, and implementation capability of the plan; competent authority should have sufficient fiscal, technical, and other resources in order to fulfill the requirements of the comprehensive climate change action plan. Consequently, in order to introduce successful climate change action planning examples, mitigation and adaptation examples from national and urban scale will be presented.

To begin with, there are numerous successful adaptation examples, benefited from principles of effective adaptation. Flooding is the one of the most important threats for cities of the Netherlands such as the City of Rotterdam, considering lower-lying polders and other settled areas under the sea level (Rotterdam Climate Initiative, 2013b, p. 4). Rotterdam City Government started the Rotterdam Climate Initiative in 2008 with the partnership of Port of Rotterdam, DCMR Environmental Protection

Agency Rijnmond, and Deltalinqs (Rotterdam Climate Initiative, 2009, p. 5). One of the biggest aims of this program is to make the City of Rotterdam completely resilient by 2025 and maintain safety of the port against negative effects of climate change. In the initiative's Climate Change Adaptation Strategy, vulnerabilities of being settled on a delta land are recognized for example, higher sea and river levels in the event of excessive precipitation, risk of water damage and disruption, longer periods of drought, and heat waves. Primary objectives of the strategy are listed as; protection of the city and inhabitants from rivers and sea, eliminating possible disasters causing from too much or too little precipitation, keeping the Port of Rotterdam safe, increasing the awareness of inhabitants, and strengthening the economy of city through adaptation measures (Rotterdam Climate Initiative, 2013a, p. 4). Although main strategy of the adaptation seems to rely on drainage system, storm surge barriers and dikes, canals, lakes, sewers, and pumping stations; many supportive and alternative projects were developed in which time periods, responsible organizations, and commissions specifically elaborated. A follow-up report published by the initiative in 2013, which reveals adaptation strategy is making "full progress" to achieve its goals. There are several notable projects completed so far as a part of the strategies like water plazas and floating pavilion (Rotterdam Climate Initiative, 2013b).

Secondly, in the previous decades many urban municipalities involved in activities as to reduce GHG emissions. As is known, China along with United States is one of the highest contributor countries to global warming. Although World Bank's data for 2010 presents that China's 6.2 metric tons per capita CO_2 emissions[7] contribution remains low compared to other developed countries; its enormous population, extreme economic growth, and low energy efficiency with heavy reliance on coal, moves China to top of the environmental pollutants (2010). Chinese cities, possessing dense population and being center of the production and consumption activities, offers remarkable opportunities for mitigation measures. For instance, Beijing is the second biggest city of China by population after Shanghai and almost

[7] Carbon dioxide emissions are those stemming from the burning of fossil fuels and the manufacture of cement. They include carbon dioxide produced during consumption of solid, liquid, and gas fuels and gas flaring (The World Bank, 2010).

20 million people lives in the urban areas (National Bureau of Statistics of China, 2014). In order to reduce total GHG emissions and improve air quality (which is another important environmental issue) of the city, Beijing Municipal Government together with the Beijing Academy of Environmental Sciences and Tsinghua University have been implementing a series of programs and projects. In brief, some of the programs being implemented are related with industrial energy conservation, urban transportation, and development of renewable energy technology which also have potential to deliver co-benefits. In her report, Zhao stated that for its successful mitigation projects about increasing energy efficiency and energy intensity reduction in the previous years, Beijing proceeds to the first place amongst other Chinese cities. Moreover, Beijing has also contributed to CO_2 reduction through the absorption by forest and wetland by enhancing its carbon sinks (Zhao, 2011, p. 13).

As can be perceived from the examples, integration of planning discipline into the every aspect of policy and programs is quite important in order to achieve success in fighting against climate change. Having said that, so as to build comprehensive and prospering climate change action planning, on the assumption that fiscal boundaries are accomplished, there are several international organizations that provides technical assistance to responsible authorities. Guidelines and principles that will be introduced in the next section can be regarded as one of the most important tools in order to carry out successful climate action planning process in its entirety.

3.5. Internationally Accepted Standards for Climate Change Action Planning

As mentioned before, there are several international organizations that support decision-makers at various levels in order to sustain successful and comprehensive climate change action planning process. These organizations aim to help climate change action plans to reach certain level of standards which are developed in different geographies, conditions, and scales. Simply, in order to achieve success in climate change action planning; primarily research and comprehensive analysis should be done, clear objectives and goals should be determined in the light of findings, implementation projects should be supported with appropriate policies and strategies accordingly to objectives and goals, and finally monitoring and evaluation processes should be carried out (ICLEI, 2012, pp. 14-15). In this field, there are

several academic research, in addition to studies of international organizations, which contribute to determination of international standards of climate change action planning. Nevertheless, it can be argued that "Cities for Climate Protection Milestone Guide" which was presented by ICLEI stands as the most comprehensive document. In short, this guideline consists of five milestones and approaches that each climate change action planning process should involve. Five milestones can be listed as (2012, pp. 14-15):

1. Calculating Emissions: generating baseline greenhouse gases inventory and climate impacts assessment
2. Adopting Targets: determining targets and identifying possible adaptation responses
3. Developing Action Plan: developing policies, strategies, and basis for implementation
4. Implementing Action Plan: implementing measures
5. Monitoring Results: monitoring, evaluating the results and reporting

These five milestones can also be regarded as five main stages of climate change action planning process. ICLEI's framework, which was also recognized by responsible authorities, professionals, and academics, was used as a base in order to generate "Acknowledged Guidelines and Principles for Climate Action Plans" in this study. Additionally, it was conceived that more detailed examination should be carried out in order to evaluate whether the requirements of each stage were fulfilled in case studies. In this regard, sub-requirements of each stage were researched from the literature. During the literature research, author benefited from several studies that focuses on these stages and discusses best practices in order to fulfill the requirements. In this direction, apart from ICLEI's contribution to the subject (2012), reports of international organizations like, Intergovernmental Panel on Climate Change (2013; 2014a; 2014b; 2014c) American Public Transportation Association (2011), and EPA (2015) were made use of. In addition, author gathered information from several academic studies commenting on the issue (Boswell, Greve, & Seale, 2011; Füssel, 2007) and also several similar research evaluating climate change action plans (Wheeler, 2008; Tang, Brody, Quinn, Chang, & Wei, 2010). As a result,

sub-requirements, which are required to be fulfilled in order to successfully complete each stage, were determined by the author. Also, in order to create an objective and operational tool while evaluating case studies, findings were organized and prepared as yes/no questions.

Calculating emissions stage generally involves preliminary research, generating GHG emissions inventory and future projections. Questions for this stage examine the suitability of the methods to generate GHG inventories to international standards and projections made for future scenarios.

Determining and adopting targets should be made considering possible future impacts. To this end, mitigation and adaptation targets should be identified for both long term and short term. Finally, these targets should be rationally determined and quantitatively identified so far as possible (Boswell, Greve, & Seale, 2011, pp. 8-9).

As can be seen, development of climate change action plan constitutes only one stage of the entire planning process, yet it can be asserted that it is the most important part. While developing action plan, it is essential to investigate previous successful practices. After the steps that were identified before are completed, it is possible to develop strategies for adaptation and mitigation in this stage. Besides, existing measures should be differentiated from proposed actions clearly (ICLEI, 2012). Moreover, considering possible co-benefits arising from proposed strategies is important. However, determining actions is not the only aspect of developing climate change action plan stage. Stakeholders should be engaged and their engagement should be identified in order to secure support for implementation period (American Public Transportation Association, 2011, pp. 5-8). Furthermore, financial resources should be determined and implementation program for actions should be clearly stated in developing action plan stage (Wheeler, 2008, p. 481).

Most of the practices in implementing action plan stage were identified while developing action plan. In this regard, following identified implementation program is essential. When it is necessary, additional policies and programs should be developed and new partnerships should be established in this stage as well (American Public Transportation Association, 2011, p. 7). Most especially,

stakeholders should be regularly engaged and informed about the implementation process.

Monitoring results stage simply involves gathering data, evaluating the results, reporting, and making improvements on the plan when required. For climate change action planning practices at urban scale, municipalities are expected to take an active role in monitoring stage. Initially, tools and mediums to enable data gathering should be established (ICLEI, 2012, pp. 56-57). Afterwards, gathered information should be compared with baseline statistics, if possible, so that the performance of the plan can be identified. Finally, if results reveal unforeseen consequences, improvements should be made based on the feedbacks and gathered data (American Public Transportation Association, 2011, pp. 20-21).

Question set was completed with regard to requirements of each stage that were presented above. Examples from Chicago and Gaziantep cities were investigated accordingly and final adjustments were made on the question set. Herewith, "Acknowledged Guidelines and Principles for Climate Action Plans" were finalized. During the latest investigation it was realized that instead of answering these questions with simply yes/no answers, quality of evidences should also be taken into consideration. To this end, systematic answering schema was developed by the author. When requirements of the question were fulfilled and satisfactory evidences were found, the term "Sufficient Evidence exists" was used. If the content for answering the question was not completely satisfactory but still proves the fact that requirements were fulfilled, the term "Limited Evidence exists" was used. When the author was not able to find any proof to verify or falsify the question, the term "No Evidence exists" was used. Finally, if requirement of the question was not fulfilled, the term "Unaccomplished Phase" was used. Final state of the research to determine internationally accepted standards for climate change action plans is presented in Table 3.1 below.

Table 3.1: Acknowledged Guidelines and Principles for Climate Action Plans

Acknowledged Guidelines and Principles for Climate Action Plans
1- Calculating Emissions
Were GHG emissions calculated according to scientific methods and international guidelines?
Were GHG emissions broken down by sectors?
Were future projections and modelling made for different GHG emissions scenarios?
2- Determining and Adopting Targets
Were possible future impacts of climate change determined?
Were GHG reduction targets determined?
Were short term targets for adaptation and mitigation determined?
Were long term targets for adaptation and mitigation determined?
Are these targets quantitative and rational?
3- Developing Action Plan
Were previous national and international practices investigated for mitigation and adaptation?
Were emission mitigation strategies determined?
Were emission adaptation strategies developed?
Were new or proposed actions described clearly?
Were new or proposed actions differentiated from the existing measures?
Were co-benefits for each action and strategy determined and considered?
Were the stakeholders and their engagement identified?
Were implementation program (including timeline, assignment of responsibilities etc.) clearly stated for actions?
Were financial tools, funding resources and cost analysis clarified for actions?
Were these actions also discussed with residents?
Were performance metrics established for actions?
Were recalculations made in order to eliminate double-counting?
Is Climate Action Plan related and coherent with other sectorial plans and documents?
4- Implementing Action Plan
Was the implementation program followed properly?
Were necessary policy, guidance or program created to carry out Climate Action Plan principles?
Was there any public and private partnership established during implementation?
Was internal and external personal training occurred?
Were stakeholders regularly engaged throughout the process?
5- Monitoring Results
Does municipality have any commitment in fulfilling monitoring tasks?
Were data gathering carried out in order to enable monitoring?
Were monitoring stages/timelines followed according to the plan?
Did gathered data evaluated and compared to baseline statistics in order to measure performance?
Is there any auditing made?
Was there any improvement made based on the feedbacks and gathered data (if necessary)?

CHAPTER IV

BEST CASE SCENARIO IN CLIMATE CHANGE ACTION PLANNING: THE CITY OF CHICAGO

4.1. Introduction to the Best Case Scenario Analysis

The concept of climate change action planning diversifies considerably. If we were to investigate climate change action planning approaches from past to today, we can observe the changes in approaches over time. Having said that, differences in the understanding of climate change action planning is in question in today's conditions. Some of the planning documents stand as more motivational documents, while others consist detailed scientific preliminary investigations, clear objectives, enforcements, and implementation programs. Both academic research and international organizations, which focus and specialize on climate change present that most successful climate action planning examples involve research based on scientific methods, keep both mitigation and adaptation measures together, and develop comprehensive point of view towards the issue (Nachmany, et al., 2015; Boswell, Greve, & Seale, 2011). Apart from this, the importance of dealing with climate change problem at urban scale is conceived throughout the discussions in the previous chapter. In the light of this information, climate change action planning practice in the City of Chicago, which can be considered one of the most successful examples in this sense, will be presented as the best case scenario in this chapter.

Right along with the Climate Change Action Plan of Gaziantep, which is the case study of this research, studying Chicago Climate Action Plan was considered to broaden and enrich the analytical dimension of the research. The main reason of this analysis is not only to reveal deficiencies and weaknesses by making comparisons but also to put forward strengths and benefits of a well-managed planning process

and comprehensive understanding of climate change action planning. Furthermore, the best case analysis will also reveal that success of this kind of planning is not limited to reduction in GHG emissions and adaptation precautions in order to avoid possible disasters in future, but there are also economic and social co-benefits exist additively. Another question which is intended to be highlighted in this study is "to what extent climate change action planning and environmental policies are effective?" Understanding this fact is important in order to contribute to the condition that climate change studies will evolve.

Another important point that needs to be clarified regarding the best case scenario analysis is to find out "how can any climate change action plan can be determined as the best example among others". It should be noted that just like any other policy documents, climate change action plans can not be sorted out from best to worst. Nonetheless, targets of these plans are usually involves quantitative objectives and ratio of meeting these targets can be taken into consideration. For instance, considering GHG emissions reduction, as a mitigation approach, is one of the main targets of climate change action plans. In this manner, reduction level achieved by projects which were implemented within the context of the plan can be regarded as an indicator. Still, there are some problems in determining success with this kind of approach. Firstly, not all the benefits of climate change action plans can be measured quantitatively. Indeed, since these plans contain quite a few social, economic and environmental objectives, it is important that assessment should be made qualitatively as well. Secondly, since each plan faces different problems that emerge from the specific geographical conditions; solely comparing ultimate quantitative results may make way for misleading results. For example, similar positive quantitative progression of two different plans, which have different starting conditions and hence focuses on different issues, does not necessarily indicate the level of successes are the same.

None of the climate change action plans were entitled as the best example in academic publications about climate change literature. Nevertheless, several successful examples from both national and urban scale come to the forefront eventually. Undoubtedly, these examples decided to be "successful" based on

observations, different assessments and indicators. To exemplify, Germany, Denmark and the Netherlands are the countries that took important steps in fighting against climate change and considered to be successful. Similarly, Chicago, Curitiba and Rotterdam submit successful examples of projects and policies developed at urban scale.

In particular, the success of Chicago Climate Action Plan has been recognized and subjected to some academic research. For instance, a research conducted by Headwaters Economics investigated 10 local climate change planning examples and also presented lessons learned from these experiences. In the research Chicago Climate Action Plan was asserted as a successful example and also a template for other cities (2012, pp. 9-15). Other research conducted on Chicago Climate Action Plan by Gregg and Hitt, in which they commented that considerable progress has been made since the plan was entered into force. Tools, resources and products that the City of Chicago published were helpful for other urban areas to prepare their own climate change plans in future (2013). Further research commented that although the plan is still in the process, the City of Chicago proved that cities are capable of "making a genuine impact" in combating climate change (Pamukçu, 2015). Additionally, Chicago is recognized by World Wildlife Fund (WWF) for its efforts in dealing with climate change. According to the news from ICLEI USA website, for their efforts in preparing for extreme weather events and promoting renewable energy Chicago, Cincinnati, and San Francisco have been recognized as successful examples in the United States. It was also added in the bulletin that "Chicago is setting a high bar for local governments with its ambitious climate action plan and work engaging citizens about citywide efforts to reduce emissions and prepare for climate change" (2013).

Apart from being recognized for its success by both academics and international organizations, there are several reasons behind the fact that Chicago Climate Action Plan is chosen for this study. First reason is that, Chicago has an experience in dealing with environmental issues for more than a decade. In 2006, research activities started in Chicago to generate today's climate change action plan (Parzen, 2009, p. 3). The significance of the experience stated here expresses municipality's

insightful view for developed projects and implementing actions towards the solution of the issue. Second reason is that the Municipality of Chicago publishes their climate change activities quite perspicuously to share the process and progress with public. The information and reports being published through the official website of Chicago Climate Action Plan named Chicago Climate Action[8] on one hand ensures the increase in public awareness for climate change and on the other hand composes a resource for academic research like this one. As a result of briefly stated reasons, Chicago Climate Change Action Plan will be analyzed in accordance with the "Acknowledged Guidelines and Principles for Climate Action Plans" that were introduced in the previous chapter. Before proceeding to this detailed analysis, brief information will be provided regarding history of city's environmental policies and possible future impacts of the climate change to the city in order to provide required background knowledge about the city of Chicago.

4.2. Background Information on the City of Chicago

The question of "can political actors' passion and desire be determinative in environmental politics?" could be answered by looking at the actions taken by Richard M. Daley, after he was elected as the mayor of the city of Chicago. After he took the office in 1989, Chicago started to take many actions and achieve remarkable progress towards environmental issues. In his first year, Daley started a tree planting campaign with the help of public and private partnerships. Over time, more than 500,000 trees have been planted. The acknowledgement of the benefits of forestation such as trapping GHGs, minimizing urban heat island effect, and reducing energy consumption has enabled Chicago Climate Action Plan to set a goal of planting more than a million new trees until 2020 (Alliance for Community Trees, 2009, p. 4). As of 1991, Landscape Ordinance was updated by adopting the following goals (City of Chicago, 1991, p. 1);

[8] http://www.chicagoclimateaction.org/

a) greener neighborhoods,
b) tree-lined streets and boulevards,
c) more attractive commercial streets, and
d) enhanced property values.

Furthermore, transportation has always been an important topic in climate change action planning. Under the aegis of municipality and the mayor, the usage of alternative transportation modes have been encouraged and required infrastructure for these modes has been provided in Chicago. Municipality also pioneered alternative fueling by converting their fleet to cars running on alternative fuels and installing first alternative fueling station in 1999 (City of Chicago, 2008, p. 9). Moreover, Chicago is considered one of the most bicycle-friendly cities in United States. Completed projects and successful policies have led to an enormous increase in number of bicycle commuters between 2000 and 2010, from 0.5% to 1.3%. In virtue of contribution of the Richard M. Daley and current mayor Rahm Emanuel, more than 200 miles of on-street bikeways and 36 miles of trails have been constructed until today (City of Chicago Department of Transportation, 2012, p. 10). Green roof implementations are other well-recognized projects for sustainable urban planning and design. Probably the most famous green roof demonstration project, namely City Hall Rooftop Garden, was officially launched in 2001. More than four million square feet of green roofs were completed or under construction until 2008 (City of Chicago, 2008, p. 9).

In addition to the projects stated above, there are many other environmental projects like improving air and water quality, and decreasing energy consumption were performed in the Richard M. Daley's mayoralty period. For instance, returning of brownfields back to productive use, converting asphalt play lots to green spaces, retrofitting projects and conserving fresh water, and benefiting from rain water to improve water quality can be named as pioneering projects of this period. When Richard M. Daley has declined to run for the 7^{th} term in 2011, many questions and concerns -even in academic circles- have been raised on whether the new mayor would follow Daley's passion in turning the City of Chicago into one of the most environmental friendly cities in the world (Sustainability Studies @ Roosevelt

University, 2010). After Richard M. Daley, Rahm Emanuel was elected as the mayor of the City of Chicago in 2011. Despite the concerns described above, mayor Emanuel has been supporting environmental projects about bicycles, retrofitting and most important of all, climate change action plan itself.

Apart from the political alterations, Chicago is likely to experience several problems, causing from changing climatic conditions and specific to its geographical circumstances. Increase in average temperature levels, for instance, can be observed as the main outcome of climate change. According to "Climate Change and Projected Temperature Changes for Chicago" report, more than 1.1°C increase recorded in Chicago's annual average temperature since 1945 (Chicago Climate Task Force, 2008f, p. 1). Black line in Figure 4.1 below illustrates recorded changes until 2008; whereas, blue and red lines indicates projected increases for two different future scenarios.

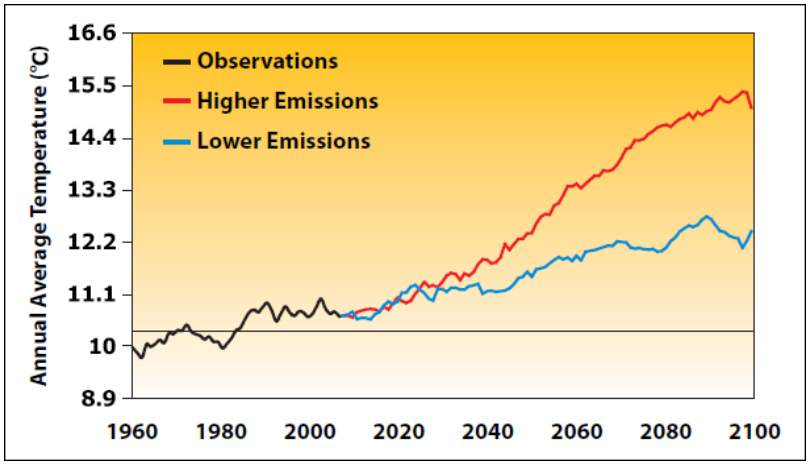

Figure 4.1: Chicago's annual average temperature changes (Source: Chicago Climate Task Force, 2008f)

As can be observed, in both higher emission scenario and lower emissions scenario certain level of increase in annual average temperature will be expected. Higher emissions scenario, in which no measures taken to avoid climate change and decrease energy consumption, foresees 3.8°C to 4.4°C increase in annual average temperature. On the other side, lower emissions scenario, where mitigation measures are thought to be implemented and renewable energy sources are considered to become primary energy sources, foresees 1.6°C to 2.2°C increase. Undoubtedly, there will be several impacts of this inevitable increase in temperature levels. First of all, warmer summers are likely to take place which threatens young children and elderly into danger. Secondly, heat waves are expected to become more frequent, intense, and long-lived. Finally, less frost deep is expected which may affect agricultural activities (Chicago Climate Task Force, 2008f, p. 1). In addition to impacts which are likely to occur, increase in annual average temperature levels being inevitable in both scenarios, highlights the importance of dealing with climate change.

As being another most visible impact of climate change, precipitation patterns are expected to change in Chicago according to the report published by Chicago Climate Task Force in 2008. While in winter and spring seasons rainfall trends are expected to increase dramatically, annual precipitation could increase by about 20% by the end of this century (2008a, p. 1). Figure 4.2 illustrates observed precipitation increase as well as projected increases with regard to lower and higher emissions scenario.

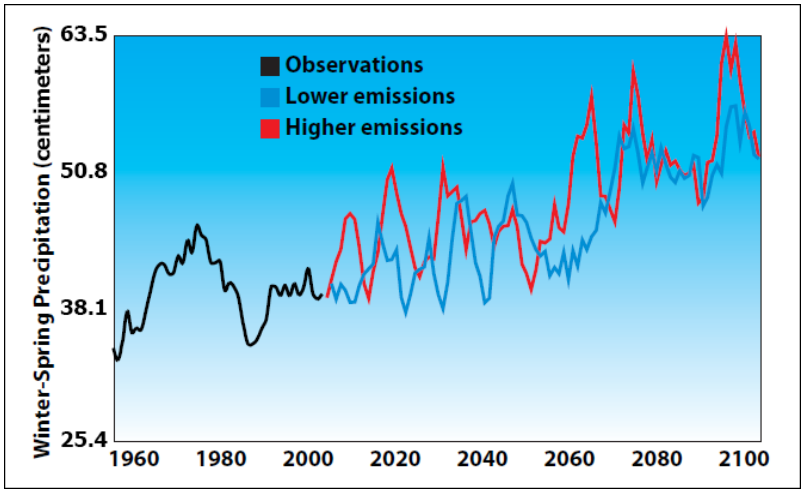

Figure 4.2: Rise in winter & spring precipitation in Chicago (Source: Chicago Climate Task Force, 2008a)

Increase in heavy rain trends will have some expected consequences. For instance, risk of flooding due to heavy rainstorms may cause soil erosion, damage crops, and contaminate water supply of the city. More to that, summer precipitation trends are expected to change. Expected longer dry periods between heavy rain trends are likely to cause water shortages, reduced agricultural efficiency, and some important risks to wilder life (Chicago Climate Task Force, 2008a, pp. 1-2).

Changes in temperature and precipitation trends may affect natural ecosystems[9]. In other words, some plants and animal species may move out of the region or extinct while some new species may move in. This alteration in ecosystem may cause disastrous outcomes in natural habitat and agriculture. According to the "Climate Change and Changes to Ecosystems and Agriculture" report published by Chicago Climate Task Force in 2008, 46 to 51 species are expected to lose at least half of their suitable habitat in Chicago region due to climatic changes. On the other hand, increased CO_2 concentration stirs up invasive plants to become more aggressive and

[9] Community of plants, animals, smaller organisms and their habitats

hence more difficult and costly to control (2008b, pp. 1-2). Agriculture is an important part of food supply and economic activity in Chicago and Illinois[10].

Figure 4.3: Location of Chicago in United States (Source: Google Maps)

At state level, soybean along with corn constitutes about three-four billion dollars part of nine billion dollars agricultural economy in total. Corn is less temperature sensitive and expected to be influenced relatively less to temperature increase. However, 1°C increase in temperature causes 17% estimated drop in soybean crop. By the end of this century, decline between 30 to 55% drop is expected for soybean production in northern Illinois (Chicago Climate Task Force, 2007b, p. 15).

Climate change is expected to impact water sources and waterways as well. Many aspects of the changes in water systems have been examined by researchers and several outcomes are reported to be expected in future. For instance, changes in river flow, lake levels, ice cover, and aquatic systems may cause vital problems. For a city

[10] State that is inclusive of the City of Chicago

like Chicago, which is located close to Great Lakes[11] area, the issues mentioned above pose an important threat. Some of the changes in temperature, precipitation patterns, and other climatic conditions may result in an increase in the lake level while other changes may cause decrease. Increased lake level raises the risk of flooding and composes a potential damage for buildings and infrastructure. Moreover, flooding may disable Chicago's drainage systems and polluted water may promote infectious diseases (Chicago Climate Task Force, 2008c, pp. 1-2). On the other hand, low lake levels may threaten persistence of wetlands and aquatic ecosystems. Considering the fact that Lake Michigan has a place in several recreational and commercial activities for the city of Chicago, the impacts of climate change on water systems should be researched meticulously.

Figure 4.4: The Great Lakes Basin (Source: Google Maps)

[11] Interconnected lakes located in the North America, consisting of Superior, Michigan, Huron, Erie, and Ontario lakes

In addition to examples provided before, climate change generates some other direct and indirect effects on human health. Most obvious and direct effect of increasing temperature is heat waves. The research of Chicago Climate Task Force projects an increase in number and severity of heat waves which would put children, elderly, and people with pre-existing health conditions at risk. Mentioned research recognizes extreme heat event that was experienced in 1995 as a limit and assesses severity of the future projections compared to this incident. For seven consecutive days maximum temperatures were equal to or greater than 32.2°C, and greater than 37.7°C for two days at the peak. It was also reported that more than 500 deaths and 3,000 hospital visits caused from this heat wave (Chicago Climate Task Force, 2007a, p. 2). Projection of number of 1995-like heat waves per decade is provided in the Figure 4.5 below.

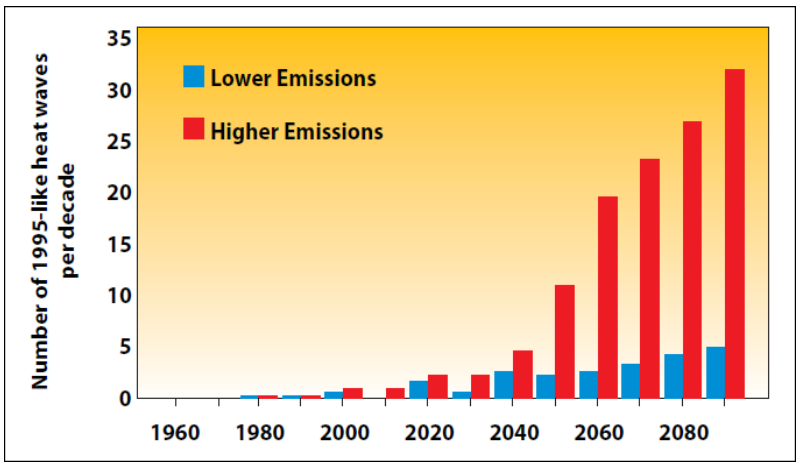

Figure 4.5: Number of 1995-like heat waves per decade in Chicago (Source: Chicago Climate Task Force, 2008d)

Projections are created considering both lower emissions and higher emissions scenarios. As can be observed, even in the lower emissions scenario similar incidents

are likely to occur more frequently over the years. This fact underlines the importance of implementing adaptation and mitigation measures simultaneously one more time.

Drop in air quality due to ground-level ozone is another important factor threatening health. Primary reason of ground-level ozone is burning coal and driving vehicles with traditional fuels. Air quality in Chicago is expected to drop further as the climate warms and air circulation patterns change (Chicago Climate Task Force, 2008d, p. 2). Finally, many animal and plant species will move into and out of the Chicago area as it was mentioned earlier. Disease-carrying insects and animals become a great threat for health in this regard. Combining with warmer weather conditions, researchers expect a great challenge fighting against such diseases (Chicago Climate Task Force, 2008d, pp. 1-2).

Apart from the impacts listed above, infrastructure and superstructure of Chicago city are expected to be affected as climatic changes occur. One particular change in the city's infrastructure is destructions causing from such changes. For instance, roofs and facades may require more maintenance or natural hazards may destruct roads, bridges, gardens, and rail systems (Chicago Climate Task Force, 2008e, pp. 1-2). Another important effect will be the increased energy consumption and additional costs related with superstructure emergent from this change. After all, additional costs of cooling or heating and higher capital, maintenance, and insurance costs for buildings can be revealed as examples to negative changes of climate change on infrastructure and superstructure of Chicago (Chicago Climate Task Force, 2008e, pp. 1-2).

4.3. Chicago Climate Action Plan

Chicago Climate Task Force was formed by the City of Chicago in November 2006 in order to prepare an action plan for climate change. Until that time, there were already important steps taken in order to reduce GHG emissions but more comprehensive set of practices needed as to expose more efficient action. However, in order to achieve more comprehensive plan, broader input and involvement from communities, institutions, and businesses was required. As a result, the Department

of Environment (DOE) both investigated climate change action plans in other cities and communicated with other initiatives in United States to figure out how to establish a comprehensive plan (Parzen, 2009, p. 3). Finally, under the light of these facts and possible outcomes along with the other findings appointed in Chicago Climate Task Force Reports, current Climate Change Action Plan of Chicago was prepared. Preliminary preparations before the launch of the plan took almost two years and Climate Change Action Plan of Chicago is in the force since 18 September 2008.

The Chicago Climate Task Force was formed by former Mayor of Chicago Richard M. Daley in order to determine possible environmental impacts that the city will face and prepare a comprehensive plan shaping future projects. The Task Force included experts and professionals from various areas such as universities, city and state government, business and labor, and local communities. Apart from that, communication established with stakeholders and leading scientists in order to discuss various scenarios. It was stated in the plan that different groups and teams were formed in order to implement guidelines of IPCC, analyze the costs and benefits of the proposed actions, and prepare optimum practices to be prepared for environmental changes in the future (City of Chicago, 2008, p. 10).

As a result of these efforts, the Chicago Task Force produced a plan which;

a) determines the challenges that will cause from climate change,
b) describes the sources of GHG emissions,
c) involves mitigation and adaptation activities,
d) increases the awareness towards the issue, and
e) outlines concrete and achievable goals.

Moreover, goals and quantitative targets are determined with respect to Kyoto Protocol and other governing bodies in the United States. Initial mitigation target of the plan is 25% reduction in GHG emissions by 2020 compared to 1990 levels. In the long term, the City of Chicago aims to achieve 80% reduction from 1990 levels by 2050 which will contribute to improve overall air quality as well as reducing other harmful gases (City of Chicago, 2008, p. 11). Some of the projects within the

plan are considered as cost effective since they will often pay for themselves after certain amount of time. Apart from that, Climate Change Action Plan of Chicago was supported by many different sources including, national and local foundations, Federal Stimulus Funds, City of Chicago, and utility partners. In the first two years it was noted that project leveraged more than $142 million in total (City of Chicago, 2015a).

After comprehensive analysis and discussions, Climate Change Action Plan of Chicago settled on 26 mitigation and nine adaptation actions. While determining each action several criteria were taken into consideration such as, GHG emissions reduction potentials, balance between costs and potential savings, feasibility, drawbacks and advantages of the actions, opportunities to pursue and improve regional impacts, and rapid implementation opportunities. It is noted that stakeholders are able to enter information to a web-based platform regarding their contribution to progress, which enables monitoring process to be more precise (City of Chicago, 2015a).

In order to reach 2020 target, total of 35 actions are grouped under five main strategies in the plan. First strategy is energy efficient buildings and it is important since approximately 70% of the GHG emissions are emitted from urban buildings. There are residential, commercial, and industrial buildings in the city and improving the energy efficiency of these buildings stated as the key opportunity for this strategy. Clean and renewable energy sources stands as the second strategy which mainly focuses on replacing traditional energy sources with sustainable solutions. Just like any other urban area, transportation is one of the biggest sources of emissions and appears as the third main strategy of the plan. In Chicago, transportation accounts for 21% of the total emissions. Actions under this strategy aim to decrease usage of vehicles in the city as well as improving fuel efficiency. Fourth strategy of the plan is about reducing wastes and industrial pollution. Finally, all the adaptation targets grouped under the last strategy. In order to plan accordingly to already occurred or possible changes, there are several actions stated under this strategy.

4.3.1. Detailed Analysis of the Chicago Climate Action Plan

In order to analyze Chicago Climate Action Plan, questions in previously presented document titled as "Acknowledged Guidelines and Principles for Climate Action Plans" will be examined. Accordingly, the examination will be carried out regarding five stages of climate change action planning that was stated in the guideline document.

Calculating emissions stage simply consisted generating GHG inventory and making future projections. As one of the most important preparatory work, calculation of GHG emissions was made according to scientific methods and international guidelines in Chicago case (*Sufficient Evidence exists*). The Center for Neighborhood Technology (CNT) was appointed to conduct this research to assist Chicago Climate Change Task Force in preparing climate action plan for the city. This research also included calculation of emissions for six county metropolitan regions and forecasting future emissions. In their report, it was mentioned that inventory developed for the years 2000 and 2005 abiding by IPCC's methodology. Direct emissions from, natural gas, transportation, and industrial process and product use; and indirect emissions from electricity and waste were included in the calculation. Six major categories of GHGs were calculated and were converted to CO_2e using global warming potentials from IPCC's Third Annual Assessment Report (Center for Neighborhood Technology, 2008, p. 9). According to findings, in 2000 2.9 million residents of the city emitted 34.7 $MMTCO_2e$ of GHGs. In 2005, this number increased to 36.2 $MMTCO_2e$. Detailed analysis of the sources of these emissions was made and information of contribution by each sector was provided (*Sufficient Evidence exists*). Emission inventory for energy, transportation, industrial processes and product use, waste and wastewater, agriculture and forestry, and local governments was presented in Chicago Greenhouse Gas Emissions report published by Center for Neighborhood Technology. In the same report, different scenarios and future projections for GHGs were also modeled and published (*Sufficient Evidence exists*). According to business as usual scenario, in 2050 Chicago's GHG emission levels will increase 35% compared to 2000 levels and reach 47.0 $MMTCO_2e$. On the other hand, if precautions are taken and targets are reached, this number may be

reduced to 47.0 $MMTCO_2e$ in 2050. Figure 4.6 illustrates the different scenarios in detail. It was also noted that historic emission trends and federal government forecasts were used as well as demographical changes and local historic trends for emission generating activities (Center for Neighborhood Technology, 2008, p. 44). Final target for best case scenario was based on the contribution of each action for reducing emissions. For this reason, it can be asserted that, these targets are supported with evidences and developed logically.

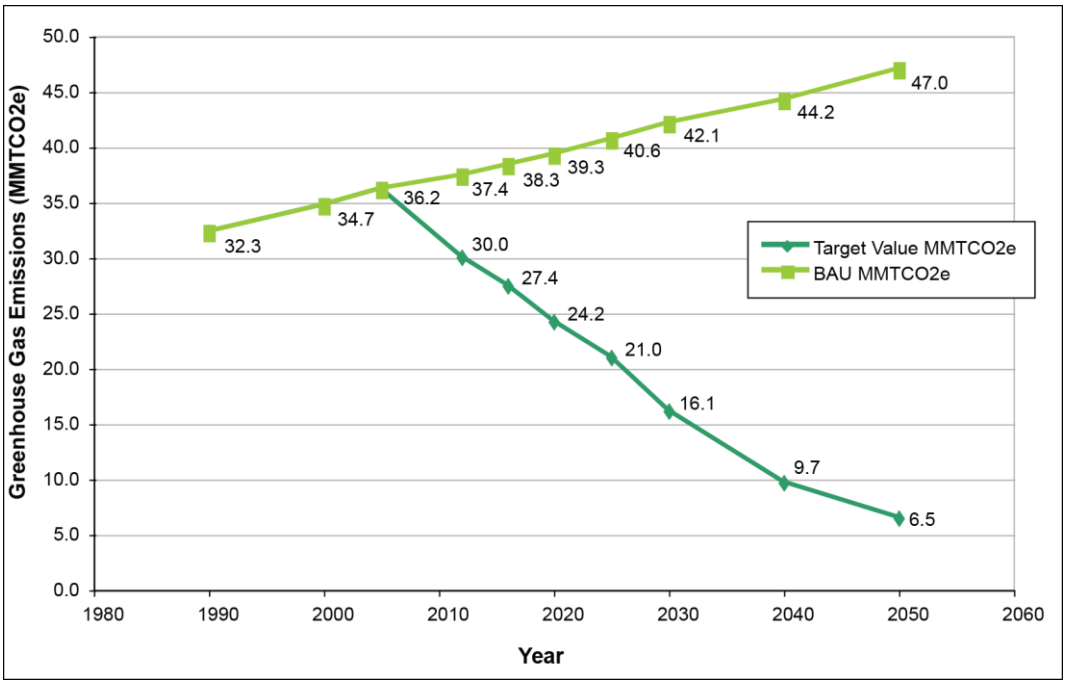

Figure 4.6: Chicago's GHG Emissions Projections (Source: Center for Neighborhood Technology, 2008)

Determining and adopting targets stage should be carried out based on the information gathered from GHG inventories and future projections. In Chicago

example, possible future impacts of climate change were determined by the comprehensive study carried out by the Chicago Climate Task Force (*Sufficient Evidence exists*). Chicago's ecosystem was analyzed in detail and reports were presented under six chapters; temperature, precipitation, ecosystem, water, health, and infrastructure. Main findings of these reports are already presented in the beginning of this chapter. Later on, GHG reduction targets were determined in order to prevent such disasters (*Sufficient Evidence exists*). With the contribution of scientists and experts, set of comprehensive research were carried out in order to investigate the ways to achieve these targets. 25% reduction target (based on 1990 levels) is consistent considering the projected emission reduction potential of each action that was included to the plan. Some of the mitigation and adaptation actions in the plan have short term targets (*Sufficient Evidence exists*). Moreover, for these actions, short term cost and investment analysis and payback opportunities (if exist) were also investigated. Such information can be found in Chicago Climate Action Plan while more detailed analysis for mitigation actions are presented in Chicago Greenhouse Gas Emissions report. In addition to individual targets of the actions, cumulative mitigation and adaptation targets were also determined. As it was mentioned before, long term targets were determined within the scope of this research (*Sufficient Evidence exists*). Most of the actions stated in this document are planned to be completed by 2020. However, there are some actions like "Align Chicago's Energy Conservation Code with latest international standards" that sets targets for 2020 and beyond. For such actions, detailed long term targets are described in the Chicago Greenhouse Gas Emissions report. In addition, it was observed that this research set intermediate targets between 2020 and 2050; and road map after the Chicago Climate Action Plan completes its duty is also provided. Both short and long term targets are quantitatively stated in details and can be asserted as rational targets to reach (*Sufficient Evidence exists*). In the plan it was mentioned that these targets are determined in accordance with the principles Kyoto Protocol. In this regard, 25% reduction target for 2020 and 80% reduction target for 2050 stands as an important decisions. Even though these targets might be considered as hard to reach, possibility to achieve this goals by adopting actions and contribution of each action to reach these targets justifies the rationality of these targets. Beyond that, Progress

Report that was published in 2010 investigating the first two years of the plan reveals that 1.2 $MMTCO_2e$ (of total 15.1 $MMTCO_2e$ in 2020) reduction in GHG emissions already achieved. In this manner Chicago Climate Action Plan progressed 8% of its general aim in its first two years (City of Chicago Department of Environment, 2010, p. 1).

Developing action plan stage of Chicago Climate Action Plan involved investigation of other national and international practices (*Sufficient Evidence exists*). In the report that was prepared by Parzen, examples of New York City, Seattle, Toronto, London, and some other cities have been benefited (Parzen, 2009, p. 4). Additionally, in the Chicago Greenhouse Gas Emissions report, which also includes the details of initial states of the actions, information provided if the action was implemented in elsewhere before. In order to reach the targets, mitigation strategies and actions were determined in the plan (*Sufficient Evidence exists*). In the final document, 26 individual mitigation actions are stated under the four main mitigation strategies. Similarly, adaptation actions were also determined (*Sufficient Evidence exists*). One main strategy is devoted to adaptation, which includes nine actions. These 35 actions in total were described clearly in the planning document. In addition, majority of the mitigation activities have very detailed explanation in the Chicago Greenhouse Gas Emissions report. However, differentiation from new measures from already existing measures (before the plan run into operation) was done for some actions only (*Limited Evidence exists*). It is stated that existing actions had been considered while developing the action plan (Parzen, 2009, p. 5). In addition to that, in the Chicago Greenhouse Gas Emissions report, current situation regarding the proposed actions can be found under "Current Initiatives and Models" title whenever possible. Still, this information is not accessible for all the actions identified in the plan. Co-benefits for each strategy and action have been researched and determined (*Sufficient Evidence exists*). Co-benefits for five main strategies were indicated in the plan and Chicago Greenhouse Gas Emissions report contains co-benefits for majority of mitigation actions. In order to put best practice efforts for these suggested actions, stakeholders and their contribution identified (*Sufficient Evidence exists*). First of all, municipality's many departments contribute to plan in

many ways. Secondly, partnerships established with Global Philanthropy Partnership, Civic Consulting Alliance, Green Ribbon Committee, and some other organizations (City of Chicago, 2015a). There are many channels created in order to enhance ongoing communications with these stakeholders during the development period and implementation period. Implementation program and related details like assignment of responsibilities were stated for majority of the actions in the plan (*Limited Evidence exists*). Similarly, since this information can be found in Chicago Greenhouse Gas Emissions report, only mitigation actions have such implementation details. Apart from that, financial tools, funding resources, and cost analysis are researched and presented in plan and supporting documents (*Sufficient Evidence exists*). It is stated that Chicago is the first city that carry out economic risk analysis for climate change impacts on municipal functions. This helped to calculate the cost of climate change for municipality and hence catalyzed determining for action. Even though the payback in short term was possible for most of the actions in the plan, installment costs were high and strategies were developed to leverage the required amount to start the projects. In addition, throughout the planning and implementation period, events organized and partnership opportunities were pursued to increase funding resources (Parzen, 2009, p. 22). Apart from the shareholders, actions and the Chicago Climate Action Plan itself were discussed with residents whenever possible (*Sufficient Evidence exists*). In the beginning of the process about 100 individuals and companies came together to discuss the research findings and discuss ideas on mitigation and adaptation actions. Moreover, residents' were contacted in many different ways. The Field Museum conducted a research in order to find out the perception of climate change in different communities. Findings of this research were incorporated into the discussions later (City of Chicago, 2015a). As being another stakeholder, municipality also engaged with businesses in order to guide them about how to adapt Chicago Climate Action Plan in their own activities and environment. Finally, after the plan enter into the force, event named "Carbon Nation Celebration" organized in order to increase awareness for the commitment to combat climate change and celebrate what have been achieved so far (City of Chicago, 2015b). In order to assess the efficiency of actions, performance metrics developed for actions whenever possible (*Sufficient Evidence exists*). Ongoing

measurement, verification and developing metrics have been identified as key to achieve success in the plan. Moreover, municipality has a data sharing policy that ensures transparency of the actions and increases participation of the public. While evaluating the data, recalculations were made in order to eliminate double-counting (*Sufficient Evidence exists*). It was also stated in the plan that all the results can not be simply added together while calculating total emission reduction. For this reason, every change in the combination of actions was recalculated (City of Chicago, 2008, p. 17). Lastly, it was asserted that this plan is coherent with other plans of City of Chicago (*Limited Evidence exists*). Departments of the municipality created their own mitigation plans in parallel with Chicago Climate Action Plan (Parzen, 2009, p. 11). Moreover, the City of Chicago Climate Action website also confirms the coherence of this plan and other plans that was prepared by the Chicago Metropolitan Agency for Planning.

Implementing action plan stage was started after the plan was put into force in September 2008. Despite the lack of information in this manner, it can be asserted that implementation program was followed properly (*Limited Evidence exists*). Progress report that was published in 2010 contains both qualitative and quantitative achievements of five main strategies of the plan. Considering this fact, it can be deduced that important steps have been taken to reach the goals determined for 2020. However, information of progress for each individual action is not provided. In order to carry out plan's principles, required policy and programs were created by municipality during the implementation period (*Sufficient Evidence exists*). For instance, MeterSave program, which enables tracking water usage with meters and increases water conservation of residents significantly, was started in 2009. Another successful example is, in order to enhance Leadership in Energy & Environmental Design (LEED®) system in private sector; municipality's updating its building code to encourage developers to build more efficient and sustainable buildings (City of Chicago Department of Environment, 2010, p. 3). In addition to the partnerships established during the development of the plan, there are other public and private partnerships formed during implementation period (*Sufficient Evidence exists*). For example, in order to renew household appliances and lighting with new and energy

efficient ones, municipality and ComEd have collaborated. Municipality's engagement with Environmental Law and Policy Center (ELPC) in order to promote clean energy to businesses and civic leaders in 2009 is be another example. It was observed that, internal or external training was not necessary in order to realize actions stated in the plan (*Limited Evidence exists*). Instead, municipality, through its partners, was able to work with experts and leaders of the topic for most of the cases. However, training program named Chicago Conservation Corps (C3) was organized for local people to impact and drive their communities in environmental action (City of Chicago Department of Environment, 2010, p. 12). This caused environmental actions to be supported by residents during implementation. In order to conduct coordinated implementation period, regular meetings with stakeholders were planned throughout the process (*Limited Evidence exists*). Before the implementation period, it was decided to organize events called "Climate Summits" to come together with 50 to 100 key stakeholders every six months to get feedbacks and input from them. Moreover, a public website was launched by Department of Environment and Global Philanthropy Partnership where stakeholders post their thoughts (Parzen, 2009, p. 34).

Monitoring results stage mainly carried out by The City of Chicago. Municipality took an active role during monitoring program (*Sufficient Evidence exists*). Before the plan go into operation, establishing performance monitoring tools and ensuring on-going planning, monitoring, and reassessment was stated in the checklist for Chicago Climate Action Plan (Parzen, 2009, p. 5). A convenient online system was setup for stakeholders to enter about their contribution to plan to ease monitoring process (City of Chicago, 2015a). Moreover, Green Ribbon Committee was commissioned to monitor, review, and assess the process and publish their findings in an annual report (City of Chicago, 2008, p. 48). The existence of progress report, which shows the advance in the first two years of the plan, shows that data gathering successfully carried out in this period (*Sufficient Evidence exists*). However, information on whether the monitoring timelines were followed according to plan or not was not provided (*No Evidence exists*). Nevertheless, in the progress report both qualitative and quantitative data evaluated and compared to base year statistics

(*Sufficient Evidence exists*). According to the report energy efficient buildings strategy achieved 0.33 $MMTCO_2e$, clean and renewable energy strategy achieved 0.11 $MMTCO_2e$, improved transportation options strategy achieved 0.2 $MMTCO_2e$, reduced waste and industrial pollution strategy achieved 0.26 $MMTCO_2e$ decrease in GHG emissions. Additionally, actions under adaptation strategy have increased the quality of life as well as safety and health. Totally, in the first two years 1.2 $MMTCO_2e$ decrease has been achieved which corresponds to 8% of 2020 targets (City of Chicago Department of Environment, 2010, p. 1). There is no evidence found regarding any auditing made (*No Evidence exists*). Similarly, there is no evidence for any improvements or change in the plan based on the feedbacks (*No Evidence exists*). Still, bi-annual meetings of work groups were planned in order to review performance and made improvements in the plan if necessary (Parzen, 2009, p. 32). Besides, it was mentioned that some pilot projects were completed and feedbacks gathered on these projects (City of Chicago Department of Environment, 2010, pp. 6-8). However, there is not any information provided whether these feedbacks cause any update on the actions or not. Finally, it was stated in the plan that Green Ribbon Committee has duty to recommend any revisions, adjustments and improvements if required (City of Chicago, 2008, p. 48).

4.3.2. Evaluation of Chicago Climate Action Plan

The City of Chicago, apart from the aspects that have been analyzed, is a pioneer city government in dealing with climate change. First of all, transparency in municipality's work is significant and this is the main factor which made this best case analysis possible. Majority of the questions specified in the guideline document have been answered as "yes" with sufficient evidence. Several other questions have been answered "yes" with limited evidence and only three of the questions were not answered due to lack of information. It should also be noted that none of the questions has been answered "no", which shows the extent to which officials of Chicago City considered the international guidelines and scientific literature while preparing the climate change action plan. Findings of the best case analysis are summarized in Figure 4.7 given below.

Apart from its mentioned benefits, Chicago Climate Action Plan also enables communities, businesses, and individuals to profit through various actions. For instance, Green Office Challenge helped reducing waste energy and water use and saved commercial and office buildings more than $5 million (City of Chicago, 2015a). O'Hare Modernization Program reduced 43 million miles in truck trips, 6.5 million gallons in fuel and saved more than $120 million. 2,384 homes in Chicago, with the guidance of community-based organizations, decreased their energy use by 20% (City of Chicago, 2015a). Besides, value of the continuous service of the ecosystems in Chicago, trees parks, wetlands, beaches, and lake is far beyond these numbers.

Another important reason behind the overall success of this plan should be highlighted. Role of the partners of the municipality in this challenge has an important value. Beyond any doubt, Chicago having an active role in both international networks like C40 Cities and ICLEI and national associations like U.S. Conference of Mayors Climate Protection Agreement enabled municipality to find support when Chicago Climate Action Plan come into question. Finally, lack of federal climate change policy raises an important question on sustainability of these actions in the future. By virtue of the awareness raising activities that the municipality started, communities embraced this plan and residents feel responsible for taking action for themselves and future generations. It was reported that many actions on environmental issues were carried out by different communities throughout the city with the help of experts and 20 city departments. For this reason, another success of Chicago Climate Action Plan might be mentioned as creating "green-minded" citizens for the future (City of Chicago, 2015a).

Acknowledged Guidelines and Principles for Climate Action Plans
1- Calculating Emissions
Were GHG emissions calculated according to scientific methods and international guidelines?
Were GHG emissions broken down by sectors?
Were future projections and modelling made for different GHG emissions scenarios?
2- Determining and Adopting Targets
Were possible future impacts of climate change determined?
Were GHG reduction targets determined?
Were short term targets for adaptation and mitigation determined?
Were long term targets for adaptation and mitigation determined?
Are these targets quantitative and rational?
3- Developing Action Plan
Were previous national and international practices investigated for mitigation and adaptation?
Were emission mitigation strategies determined?
Were emission adaptation strategies developed?
Were new or proposed actions described clearly?
Were new or proposed actions differentiated from the existing measures?
Were co-benefits for each action and strategy determined and considered?
Were the stakeholders and their engagement identified?
Were implementation program (including timeline, assignment of responsibilities etc.) clearly stated for actions?
Were financial tools, funding resources and cost analysis clarified for actions?
Were these actions also discussed with residents?
Were performance metrics established for actions?
Were recalculations made in order to eliminate double-counting?
Is Climate Action Plan related and coherent with other sectorial plans and documents?
4- Implementing Action Plan
Was the implementation program followed properly?
Were necessary policy, guidance or program created to carry out Climate Action Plan principles?
Was there any public and private partnership established during implementation?
Was internal and external personnel training occurred?
Were stakeholders regularly engaged throughout the process?
5- Monitoring Results
Does municipality have any commitment in fulfilling monitoring tasks?
Were data gathering carried out in order to enable monitoring?
Were monitoring stages/timelines followed according to the plan?
Did gathered data evaluated and compared to baseline statistics in order to measure performance?
Is there any auditing made?
Was there any improvement made based on the feedbacks and gathered data (if necessary)?

Yes, Sufficient Evidence	Yes, Limited Evidence	No Evidence	Unaccomplished Phase

Figure 4.7: Evaluation of Chicago Climate Action Plan

CHAPTER V

THE PROBLEM AND POLICY OF CLIMATE CHANGE IN TURKEY

Environmental concerns in Turkey rose in 1980s in the political arena. At national level, there were several institutional progresses and regulations on environmental issues in that period. Yet, first concrete steps, which specifically focus on climate change issue, can be regarded as the establishment of a Coordination Board on Climate Change in 2001 (Balaban & Balaban, 2015, p. 11). Delegates from the Turkish government, from the beginning of 1980s, attended some of the important international meetings and conferences. Since then, Turkey's environmental actions were based on fulfilling the responsibilities that were arising from international agreements that Turkey play a part. For the most, Turkey content herself with the actions required to meet minimum international criteria and did not show any decisiveness in order to become a pioneer by seizing the initiatives. Nonetheless, Turkey's attitude should not be acknowledged as a complete deficiency considering some external causes. For instance, it should be noted that Turkey is regarded as a developing country[12] like many other countries in international environmental debates. Compatibility of the decisions that have been made, targets that have been set at the international level along with nationwide implementations, and regulations stands as an important factor at this point. As long as this balance has been redressed, not only Turkey but also any country that has similar restrictions has the potential to take care their own responsibility in dealing with climate change. It should not be forgotten that, implementations both ensures nation's reputation at global level and actual progress for mitigation and adaptation. On the other side, having a good reputation strengthens nation's hand at negotiations in finding any

[12] a country having a standard of living or level of industrial production well below that possible with financial or technical aid

kind of resources for carrying out these projects. For the reasons stated above, conformably determination of national and international policies is an important matter.

In this chapter, the effects of climate change on Turkey will be introduced by also providing brief information about Turkey's most recent GHG emissions inventory and future projections. Thereafter, Turkey's climate change policy history at international and national scales will be discussed in order to clarify whether such developments are realized accordingly in both levels. In order to achieve this, international organizations and agreements that Turkey became a party will be mentioned chronologically as well as regulations and implementations at national scale.

5.1. Climate Change and Turkey

In order to provide broad perspective of vulnerabilities to changes in climatic conditions, brief background information about Turkey's geographical position and features should be clarified. Turkey is situated within the Mediterranean Basin and Climate Zone, which is one of the most negatively affected regions in the world according to the Fourth Assessment Report of the IPCC (2007, p. 49). There are five different climate types identified across the country, namely; Mediterranean climate, Black Sea climate, Semi-dry Marmara climate, Semi-arid steppe climate, and Continental Eastern Anatolian climate (The Ministry of Environment and Urbanization, 2013, p. 27). Geographical distribution of these climate types are illustrated in the Figure 5.1 presented below.

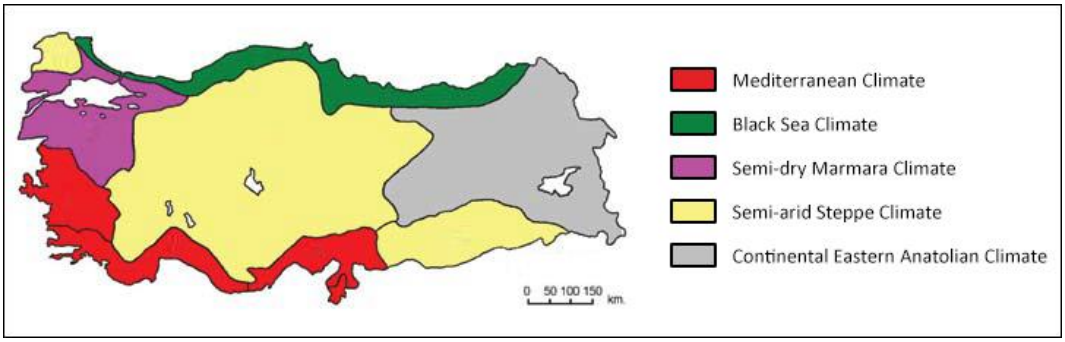

Figure 5.1: Geographical Distribution of Climate Types in Turkey (Source: The Ministry of Environment and Urbanization, 2013)

In 2006, for the first time, Turkey submitted its national emission inventory report for 1990-2004 period. The Turkish Statistical Institute (TurkStat) is the responsible authority to collect required data together for National Greenhouse Gases Inventory and delivering it to the UNFCCC Secretariat. Apart from the Turkish Statistical Institute, there are several ministries and associations involved in Greenhouse Gases Inventory Working Group.

There are different methods developed by IPCC, for countries to use while preparing their inventories. These methods usually consist of multiplication of emission generating activities with national data. There are different tiers of methods exist for each emission source considering the fact that each country have different capacity and resources for building their inventory. There are generally three tiers (Tier 1, Tier 2 and Tier 3), in which higher tiers require more complex data and resource to operate (National Research Council, 2010, p. 22). It is known that Turkey uses Tier 1 method to form its GHG inventory that requires least data. In the "report of the individual review of the inventory submission of Turkey submitted in 2011" by UNFCCC, Turkey is recommended to use higher-tier methods for calculating its emissions (UNFCCC, 2012, pp. 7-13).

Most recent declaration of Turkey's GHG inventory to UNFCCC was in the Turkey's Fifth National Communication under UNFCCC in 2013. However, on 25 May 2015, a press release was published by the Turkish Statistical Institute, indicating that there are some revisions made and methodological changes occurred in the calculations. It was stated that emissions from energy, industrial processes and product use, agriculture, forestry, and other land use and waste sectors are revised for the period between 1990 and 2012 (Turkish Statistical Institute, 2015, pp. 1-2). It is observed that GHG levels are slightly increased retrospectively. Figure 5.2 is generated depending on the revised data that was publicly published by Turkish Statistical Institute.

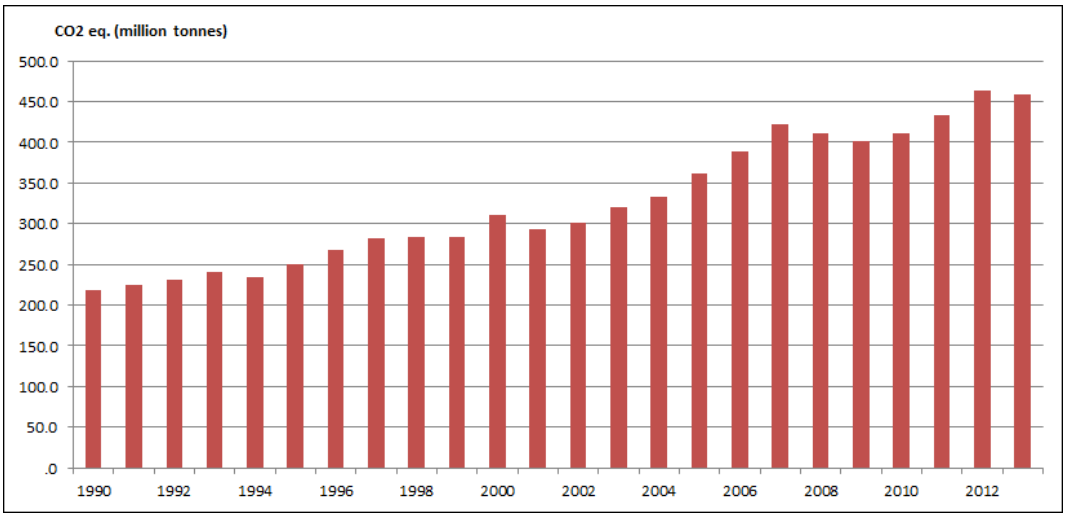

Figure 5.2: Greenhouse Gas Emission trend in Turkey between 1990 and 2013 (Except LULUCF) (Source: Turkish Statistical Institute, 2015)

Continuous increase is observed in total emissions except for the years 1994, 1999, 2001, 2008, 2009 and 2013, where decrease occurred in GHG levels. In the Turkey's

Fifth National Communication under UNFCCC, it was mentioned that GDP increased by 33.9% between 2000 and 2009 in Turkey, whereas total emissions increased by 28.9% (according to revised numbers), which was stated as a positive trend comparing the growth of economy and emissions concentrations (The Ministry of Environment and Urbanization, 2013, p. 10).

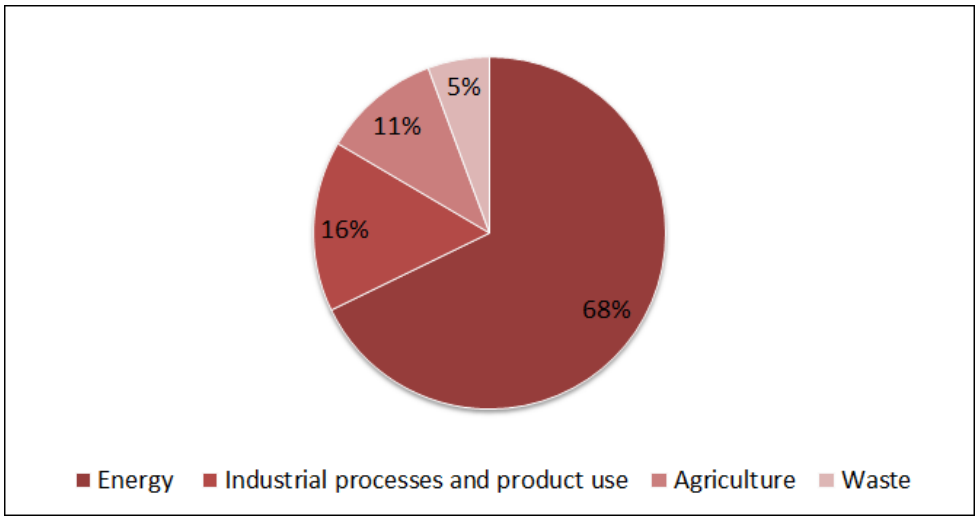

Figure 5.3: Greenhouse Gas Emission trend in Turkey by sectors in 2013 (Except LULUCF) (Source: Turkish Statistical Institute, 2015)

The distribution of the energy, industrial processes and product use, agriculture, and waste sectors to the total GHG emissions is illustrated in Figure 5.3. Highest percentage of total CO_2 emissions was originated from the energy sector by 67.8%.

Due to increase in GHG and climatic changes, Turkey will inevitably face several alterations in temperature, precipitation patterns, water resources, vegetation, and agriculture. These alterations are likely to cause drought, declination in water

streams, deforestation, erosion, desertification, and some other important ecological changes.

There are several projection models exist, illustrating possible scenarios in short, medium and long term. In 2002, Technology Development Foundation of Turkey published Climate Change and Sustainable Development National Evaluation Report, which includes several possible outcomes based on modeling and scientific data. In the report, it is stated that the results of United Kingdom Meteorological Office Hadley Centre's Second Climate Model was used as a base. The results were published regarding three different scenarios that predicts keeping CO_2 concentration in the atmosphere under 750ppm, 500ppm and no precaution measures were taken in order to control CO_2 concentration by 2080 (2002, p. 18).

If there is no precaution taken to reduce CO_2 concentration in the atmosphere, 3°C to 4°C increase is expected in average temperature levels by 2080 compared to 1990 level. This increase in average temperature level reduces as the mitigation actions become effective. If CO_2 level can be kept under 550ppm by that time, overall expected increase would be between 1°C to 2°C (Technology Development Foundation of Turkey, 2002, p. 19). According to report of Turkish State Meteorological Service, most of the cities in Turkey had above normal temperature levels in 2015, which was the fifth warmest year since 1971 (Turkish State Meteorological Service, 2016, p. 2). Spatial distribution of mean temperature differences can be observed in Figure 5.4 below.

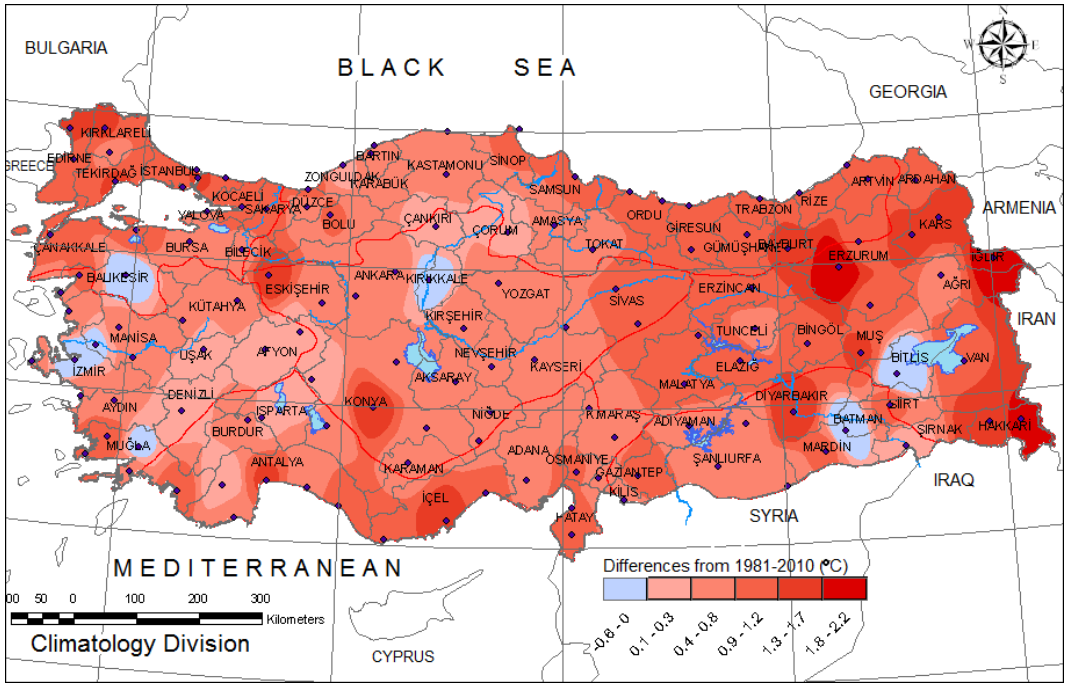

Figure 5.4: Mean temperature differences in Turkey in 2015 (Source: Turkish State Meteorological Service, 2016)

In precipitation trends certain amount of decrease is expected by 2080. If the emissions are not controlled, 0mm to 1mm reduction per day is expected in yearly average precipitation amounts. In the better scenarios where CO_2 concentration limited under 750ppm and 550ppm, 0mm to 0.5mm reduction per day is expected (Technology Development Foundation of Turkey, 2002, p. 19).

Water resources and surface flows are expected to decline and water stress is likely to occur in some regions in Turkey. The findings of the Technology Development Foundation of Turkey suggest that in the worst scenario where emissions are not controlled, yearly stream flow of rivers are expected to decline by 20% to 50% by 2080. If CO_2 concentration stays under 750ppm level, foreseen decline percentage will be between 5% and 25% and in the best scenario where 550ppm level would not reached, 0 to 15% is expected (Technology Development Foundation of Turkey, 2002, p. 19).

In the vegetation biomass, significant change is not expected where CO_2 concentration are kept under 750ppm and 550ppm by 2080 (Technology Development Foundation of Turkey, 2002, p. 19). On the other hand, it should be noted that forests are in danger due to climatic changes. Duration, impact area and frequency of the forest fires may increase due to the changes in the period and impact of hot and arid days.

Agricultural production will also be affected by these changes. It is suggested that 0 to 2.5% decrease is expected where emissions are not controlled by 2080. However, 0 to 2.5% increase in agricultural production is also possible where CO_2 concentration stays under 750ppm and 550ppm (Technology Development Foundation of Turkey, 2002, p. 20). Apart from the productivity measures, changes in the overall temperature trends and precipitation cause shifts in the dates of agricultural activity.

At first glance, it can be assumed that these changes will only result in environmental outcomes such as decrease in air and water quality, loss in natural areas, and deterioration in ecosystem. Nevertheless, such changes may cause social and economic outcomes as well. For instance, several economic outcomes can be listed as: increase in energy consumption, decrease in agricultural production, and difficulties in reaching resources. On the other hand, increase in poverty, food shortages, and unexpected migration can be named as certain social outcomes. In the light of the findings presented in this section, Turkey's climate change policies, in order to prevent such devastating effects, will be scrutinized in the next section.

5.2. Turkey's Climate Change Policy

5.2.1. International Dimension

In this section, Turkey's international climate change policies will be introduced chronologically. There are two main purposes for such chronological analysis. First one is to observe the development of Turkey's involvement in environmental issues at global level over the years. Second purpose is to reveal whether Turkey's

involvement in different agreements has been originated from political pressure at different levels of international politics.

The establishment of UNFCCC at United Nations Conference on Environment and Development in Rio de Janeiro in 1992 and the importance of this convention on international environmental politics were presented in previous chapters. UNFCCC is also important because it can be regarded that, this was the beginning of Turkey's involvement in international environmental politics. Turkey, as a member of OECD, was listed as both Annex I and Annex II country (United Nations, 1992, pp. 23-24). Later on, Turkey made several applications to be expelled from both lists due to her position. This situation delayed Turkey's becoming party to UNFCCC and Kyoto Protocol (Balaban & Balaban, 2015, p. 10).

In the first six COP meetings, Turkish delegation showed notable efforts for their requisition (United Nations, 2000, p. 62). Only after acknowledging that it would not be possible, Turkey went towards alternative solutions. Finally, as a consequence of persistent efforts in 2001, during COP 7 meeting Parties of the Convention accepted that Turkey will become a party to the UNFCCC as an Annex I. Moreover, parties recognized special circumstances of Turkey which puts her in a situation different from that of other Parties included in Annex I to the Convention (United Nations, 2002, p. 5).

However Turkey's participation to UNFCCC took three years and on 24 May 2002, Turkey joined to UNFCCC as 189th party. Upon its participation to the convention in 2005, Turkey started working on its First National Communication document, which involves its future environmental policies, strategies, and precautions she will follow. Turkey's actual membership to UNFCCC occurred almost a decade after the establishment of convention and this situation also caused her late ratification of Kyoto Protocol. When Kyoto Protocol was adopted in 1997, Turkey was not a member of UNFCCC.

During the next couple of years, membership negotiations for European Union were also determinative in Turkey's international environmental politics. Turkey's relationship with European Union dates back to 1959. Turkey's environmental

development process is evaluated in the direction of Accession Partnership Documents, National Programmes for the Adoption of the Acquis (NPAAs), and Progress Reports. The Progress Report which was published in 2006 by European Commission, Turkey's being not able to achieve certain level of progress in environmental issues was described in Chapter 27 as, "No substantial progress can be reported in the field of horizontal legislation. The overall level of alignment in this area is limited. Turkey has not ratified the Kyoto Protocol, nor has it transposed the Emissions Trading Directive and related decisions. Though some elements are present in the current Turkish legislation, no progress can be reported on the transposition and implementation of the environment liability and reporting directives…" (2006, p. 64). Similar warnings to Turkey can be visible in the next reports and documents as well. The important point here is that all the deficiencies that were pointed out were directly related with climate change practices.

In 2007, Turkey submitted its First National Communication on Climate change to UNFCCC Secretariat as a part of her obligation to the convention. Ministry of the Environment and Forestry was responsible for the coordination process of the document. As many as 20 institutions and 100 academicians and experts from different sectors, like climate, ecology, energy, industry, forestry, agriculture, waste, and economy were involved to the preparation of the document. It was also stated in the forewords that awareness raising in the public for the issue of climate change and supporting science to develop cleaner technologies are both in the purposes of this document (Ministry of Environment and Forestry, 2007, p. 3).

Grand National Assembly ratified Kyoto Protocol on 5 February 2009 and Turkey officially acceded to the protocol on 26 August 2009. There are 192 parties involved to the Kyoto Protocol as of May 2013 (UNFCCC, 2014c). Turkey is a non-Annex-II country and has no commitment for both first (2008-2012) and second (2013-2020) commitment periods of Kyoto Protocol. Although Turkey has no commitment for emission reduction, as a party she has serious responsibilities to deal with climate change. According to data of Emission Database for Global Atmospheric Research (EDGAR), as of 2013, Turkey listed as the 18^{th} highest country that produces CO_2

emissions from fossil fuel use and industrial processes (Emission Database for Global Atmospheric Research, 2015).

Table 5.1: CO_2 Emissions by countries in 2013 (Source: Emission Database for Global Atmospheric Research, 2015)

Rank	Country	Ktons CO2 in 2013
1	China	10281178.02
2	United States	5297581.2
3	India	2071514.36
4	Russian Federation	1803249.09
5	Japan	1360570.22
6	Germany	844980.81
7	Korea, Republic of	626648.31
8	Canada	551247.5
9	Brazil	511981.95
10	Indonesia	487282.53
11	Saudi Arabia	478637.45
12	United Kingdom	475118.67
13	Mexico	474582.61
14	Iran, Islamic Republic of	407362.97
15	Australia	394843.49
16	Italy	389674.86
17	France	368085.12
18	**Turkey**	**330273.63**
19	South Africa	329782.06
20	Poland	323563.28

In 2013, Turkey published Fifth National Communication under the UNFCCC, which was coordinated by the Ministry of Environment and Urbanization. It was stated that several institutions, private sector representatives and nongovernmental organizations took an active role in the preparation of the report (2013, p. 11). There are eight chapters in the document which involves most up to date information about the status of Turkey in dealing with climate change. Moreover, it was published by

The Ministry of Environment and Urbanization that, project for Sixth National Communication have been started on 27 December 2013 (The Ministry of Environment of Urbanization, 2014).

In 2004, Turkey started working on the project of its first biennial report, which is another obligation under UNFCCC. Main focus area of this report is climate change and environment. It was stated in the United Nations Development Programme's website that, initiating the preparation of mitigation action concepts, improving national capacities in Measurement, Reporting and Verification (MRV) and sectoral assessments, and supporting to make up a shortages that were stated in-country review of the national communication are also within the purposes of this project. Project regarding preparation of this report has an estimation date of May 2016 (United Nations Development Programme, 2014).

A news bulletin about United Nations Climate Change Conference (COP 19) and Kyoto Protocol Conference of Parties (CMP 9), involves important clues to estimate how Turkey's climate change policies will be shaped in future. It was stated that parties were invited to prepare and present their clear and transparent plans regarding their post 2020 actions in the first three months of 2015. Turkey undertaking G20 Platform presidency in 2015 also lead to a high expectation to prepare for their national contribution and present their plan. While discussions going on for post 2020 actions, the importance of determining tangible targets for the period before 2020, is highlighted. As a consequence Turkey can be forced to present their targets for both before and after 2020 periods (Gencel & Yaşarkurt, 2013, p. 41).

5.2.2. National Dimension

In general, it can be argued that Turkey's reluctance in climate change policies at international level manifests itself at national level as well. Although interest in environmental issues increased in Turkey in 1980s, just like similar movements that were experienced in many other countries, this ambition was not reflected into concrete policies in order to take concrete steps.

As it was described in detail before, Rio Earth Summit in 1992 invited local authorities to enhance environmental protection, social equality, and economic prosperity in their territories. In other words, the idea behind Local Agenda 21 was to promote the principles of sustainability for future local plans. In order to undertake such responsibility, different localities produced their own set of strategies in accordance with the unique conditions of the localities. In Turkey, Local Agenda Project titled "Promotion and Development of Local Agenda 21s in Turkey" developed by the Association of International Local Administrations, East Mediterranean and Middle East Regional Organization (IULA-EMME) in 1997. There were numerous implementations made under this program. Although existence of successful studies is known, there were some deficiencies in turning this vision into long term goal. Genli Yiğiter and Yirmibeşoğlu identify these deficiencies as, existing planning measures does not provide required means to learn from successful results of Local Agenda 21 (2003, pp. 16-17).

In 2000, Climate Change Specialization Commission report was published in order to sort out and reflect public opinion on climate change to the 8th Development Plan (2001-2005) of Turkey. The report consisted detailed information regarding GHG inventory and projections. Considering climate change as a vital input, supporting this approach with required policies was highlighted. The importance of joining UNFCCC and Kyoto Protocol was also mentioned in the report (Devlet Planlama Teşkliatı, 2000, pp. 92-97). This document of specialization commission can be considered as a successful attempt to report current situation of the country at that time. Climate change issues are examined by the Environment Specialization Commission for the 9th Development Plan (2007-2013). Although broad information covered about climate change in 10th Development Plan (2014-2018), Specialization Commission was not established on the issue of climate change.

The establishment of Coordination Board on Climate Change (CBCC) in 2001 can be considered as one of the biggest steps in national policy-making history of Turkey. Main purpose of this board was to determine and coordinate mitigation and adaptation measures in order to deal with climate change. The board was re-structured in 2004, 2010 and 2012. Board is composed of representatives of different

ministries, state planning organization, union of chambers, and some other representatives from public institutions.

Between 2009 and 2011 there are several climate change action plans and strategy documents published by The Ministry of Environment and Urbanization. During these years, for many policy related issues, targets set and policies developed for 2023 year, since it is the 100th anniversary of the foundation of the Turkish Republic. Environmental issues and climate change get its share from this, which can be observed by looking through the documents that have been published in those years. Climate change action plans and strategy documents can be named respectively; Republic of Turkey Climate Change Strategy 2010-2020 (2009), Republic of Turkey Climate Change Strategy 2010-2023 (2010), Republic of Turkey National Climate Change Action Plan 2011-2023 (2011), Turkey's National Climate Change Adaptation Strategy and Action Plan 2011–2023 (2011). Among these, Republic of Turkey National Climate Change Action Plan 2011-2023 will be discussed separately since this document emerges is the main climate change framework document.

Necessity and importance of developing national program and action plan is stressed beginning with the 8th Development Plan (2001-2005). As a consequence, project for the preparation of National Climate Change Action Plan started in 2009. The project was coordinated by the Ministry of Environment and Forestry with the executive partnership of United Nations Development Programme. Project was also supported financially by the United Kingdom Ministry of Foreign Affairs' Strategic Programme Fund. After 18 months of work, plan was completed in July 2011. Main purpose of the plan is stated as; dealing with climate change by mitigating GHGs, encouraging mitigation and adaptation measures by providing realistic and powerful policy framework and increasing resilience by managing the adverse effects of climate change (The Ministry of Environment and Urbanization, 2011, pp. 9-10). In order to achieve this, the project was conducted in six steps respectively; evaluation of the current situation, evaluation of the comparative examples, generating strategical framework for the climate change national action plan, development of the climate change national action plan, national conference for climate change

national action plan, and improving technical and institutional capacity (Tüketiciyi ve İklimi Koruma Derneği, 2013, p. 18). There are seven different sectors identified for mitigation actions namely; energy, industry, transportation, building, waste, agriculture and land use, and forestry. On the other hand, water resources management, agriculture and food security, ecosystem services biodiversity and forestry, natural disaster risk management, and public health are the main titles for climate change adaptation actions. In addition to these, cross-cutting issues for both mitigation and adaptation actions are studied and presented. In the aggregate, there are 541 actions identified in order to achieve 107 goals within 49 main objectives.

At first appearance, it can be argued that actions are identified in the plan with high importance and goals of the plan comprehensively cover most of the issues related with climate change. However, it should also be noted that there are significant deficiencies in public participation while determining these actions and goals. There was a report published by Tüvik-Der, which is an association specialized in environmental issues, in 2013, evaluating the National Climate Change Action Plan and actions in its first two years. There are several insufficiencies are mentioned in the evaluation of the plan. First of all, it was mentioned that, majority of the actions do not involve any concrete quantitative targets set related to GHG emissions reductions, while other determined quantitative targets trail existing global policies and implementations. Moreover, report reveals that there are considerable amount of actions described in the National Climate Change Action Plan, which describes already existing actions and this proves the lack of innovativeness of the plan. Finally, the existence of policies that accelerates climate change was also presented in the report (Tüketiciyi ve İklimi Koruma Derneği, 2013, pp. 20-21).

As a result, when national dimension of climate change policies of Turkey is examined, set of deficiencies can be observed, despite the efforts made in the last decade. In general, environmental problems in national politics are not approached in the agendas of political parties and often regarded as supra-party issue. This also reflects to the policies that have been developed and commissions that have been established on this issue. Consequently, it can be claimed that there is a lack of experience in dealing with climate change through political procedures. In order to

establish solid political frameworks and take concrete steps in the solution of this issue, stronger institutional agreements should be made, more realistic development plans should be developed, and necessary investment should be made on capacity building.

Deficiencies that have been mentioned chronologically in this chapter also reflect to the works in more micro scales. There is neither enforcement nor incentive for municipalities to carry out mitigation or adaptation actions at urban scale. Nevertheless, there are few voluntary endeavor carried out by municipalities with their own resources. For instance, it is known that some municipalities become a member of international networks to seek for support on their projects on the issue. Most important voluntary work of the municipalities on climate change in Turkey is Gaziantep Municipality's Climate Change Action Plan, which was published in 2011. This plan is the first example of climate change action planning at urban scale in Turkey. Therefore, Gaziantep Municipality's Climate Action Plan and up to date practices will be analyzed in the next section as the main case study of this research.

CHAPTER VI

CASE STUDY ANALYSIS: GAZIANTEP CITY CLIMATE CHANGE ACTION PLAN

6.1. Introduction to the Case Study

Progress towards development and implementation of climate change action planning as an urban initiative to address climate change in Turkey has been minimal so far. Several reasons could be shown for this limited progress. First of all, there is low political commitment and awareness at the national level to deal with the climate problem (Balaban & Balaban, 2015, pp. 14-16). Responsible ministries are incapable or reluctant to encourage local governments to carry out such planning activities. Although organizational structure exists within the Ministry of Environment and Urbanization, the institutional capacity is limited and importance of the issue of climate change has not been deeply acknowledged and thus reflected into other related policy fields and processes. Second, problems also exist with regard to local governments' attitudes and approach towards climate change action planning. Since economic growth and profitability is one of the main determinants of local policies and climate change related policies and projects are regarded as not profitable by local governments; climate change actions generally can not find a place in local policy and management agendas. Long term benefits of investing in environmental issues and incalculable services provided by nature are often neglected in this manner. Even the biggest cities and local governments in Turkey are not exceptions for this situation. Ankara, the capital city of Turkey, does not have an action plan for climate change, which brings together actions and form a framework to address the problem. On the other hand, the mayor of İstanbul has announced that efforts for preparing the Climate Change Action Plan of İstanbul will start in early 2016 during his press conference and meetings in the COP 21 Meeting in Paris in December 2015

(Haber7, 2015). Indeed, as of 2011, Gaziantep was the only city having climate change action plan at urban scale in Turkey. For this reason, Climate Change Action Plan of Gaziantep constitutes the only case study of this research.

The main objective of this research is to reveal successes and weaknesses of the case study planning practice, which entered into force four years ago. Carrying out such research is important since this is the first initiative to address climate change at urban level and evaluating this plan would guide similar planning practices in the future. In order to analyze and evaluate the Climate Change Action Plan of Gaziantep, "Acknowledged Guidelines and Principles for Climate Action Plans will be used just as it was done in the best-case scenario example. Answering the questions in the guideline will enable us to examine both the planning process in detail and the coherence of the plan with international standards. Planning document itself will be the first source to find answers to related questions. Furthermore, interviews were conducted with officials from Gaziantep Municipality who took an active role during the whole planning process. One of the interviewees is Dr. Şafak Hengirmen Tercan who is a civil engineer and was the head of the Environmental Protection and Control Department when the plan was prepared and approved. The department is stated as the main partner of climate change action planning studies and hence Tercan was one of the most experienced people in the preparation stage of this plan. Other interviewee is Gökhan Yaman who is an environmental engineer and was an official at the Environmental Protection and Control Department at that time and also took an active role in the planning process. Interviews were conducted in October 2015 and questions from Acknowledged Guidelines and Principles for Climate Action Plans were asked in order to gather correct and sufficient information to fulfill the requirements of this research. Finally, information that was gathered from Gaziantep Municipality's website as well as other reports from the municipality and the Silkroad Development Agency will be used in the case study analysis.

Before proceeding to the details of the case study analysis, background information on environmental indicators and situation on direct and indirect GHG emissions will be provided. Unlike Chicago example, detailed analysis of possible future impacts of climate change on Gaziantep could not be found. For this reason, information on five

main topics introduced in the plan will be provided. These five topics can be regarded as main sources for direct and indirect GHG emissions and hence constitute the main focus areas of the plan. After providing background information, findings of the research will be presented with short introduction to the planning document itself.

6.2. The City of Gaziantep in the Context of the Climate Change Problem

In order to enhance more sustainable life in Gaziantep, several environmental projects have been implemented. It was reported that preparation of Climate Change Action Plan of Gaziantep enabled the determination of top GHG emission contributors in terms of sectors. Thus and so, actions identified in the final document were shaped with regard to these sectors. Total GHG emissions balance of Gaziantep is measured as 4,560 $KTCO_2e$, which is equal to 3.52 TCO_2e per person (Metropolitan Municipality of Gaziantep, 2011, p. 3). Breakdown of direct and indirect GHG emissions is presented in Figure 6.1 below.

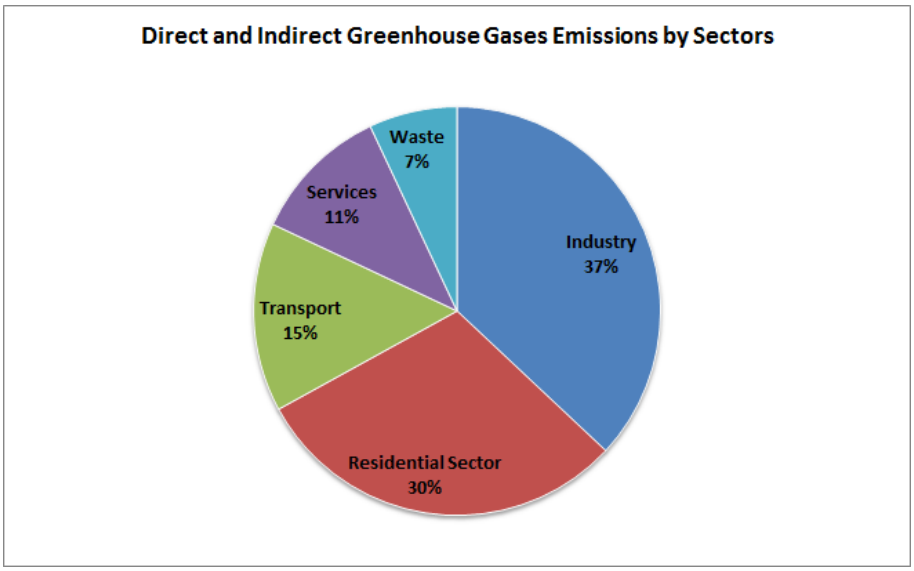

Figure 6.1: Gaziantep's Direct and Indirect GHG Emissions by Sectors (Source: Metropolitan Municipality of Gaziantep, 2011)

Industry sector, with its 37% share, stands as the top contributor to the GHG emissions in Gaziantep. This sector is one of the main pillars in Gaziantep's economy and it grows day by day. Beyond any doubt, being a leader in its region (Silkroad Development Agency, 2014, p. 85) caused this sector to have a big share in overall GHG emissions. Before the Climate Change Action Plan of Gaziantep was entered into force, there were few projects launched by Gaziantep Municipality in order to increase efficiency of the industry by decreasing consumption. It was reported that decrease in the industrial companies' energy consumption levels was observed since 2000 (Metropolitan Municipality of Gaziantep, 2011, p. 37).

Housing related emissions like heating, hot water, and air conditioning constitutes the second biggest source for GHG emissions in Gaziantep with its 30% share. Accordingly, heating has the biggest share when the types of consumption are examined (Metropolitan Municipality of Gaziantep, 2011, pp. 26-27). There might be two main factors named as to explain this fact. First one is the agedness of the building stock. According to the data provided in the plan, 25% of the buildings were built before 1950; whereas, 70% were built between 1950 and 2000. Year 2000 is important since thermal regulation was put into force this year. Second reason is the use of coal by most of the residential buildings for heating. It was stated that about 70% of the buildings are heated with coal facilities in Gaziantep (Metropolitan Municipality of Gaziantep, 2011, p. 31). Although some incentives are planned to encourage residents to switch their facilities that use coal as a source to more environment friendly systems, certain level of success was not achieved yet. Main sources of energy used in housing can be found in Figure 6.2 below.

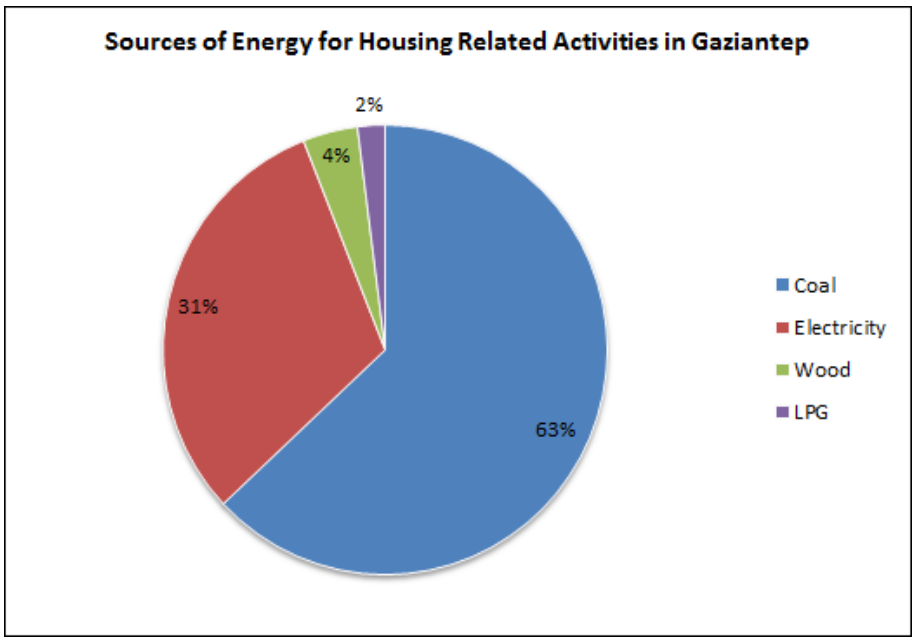

Figure 6.2: Sources of Energy for Housing Related Activities in Gaziantep (Source: Metropolitan Municipality of Gaziantep, 2011)

Emissions causing from transportation and urbanism listed as the third highest emitter sector. However, it was noted that when indicators are compared to cities with similar population; it was revealed that Gaziantep is emitting lesser GHGs. One reason for this is the low trip ratio of residents of Gaziantep. On average, population between 15 and 75 years old has 1.2 trips per day. Another reason is high share of walking (58%) in total trips and popularity of public transport modes (75%) among trips done with vehicles (Metropolitan Municipality of Gaziantep, 2011, p. 41). Moreover, light rail system in Gaziantep was launched in 2010 and it was improved over the years by both growing in distance and replacing engines with more efficient ones (Silkroad Development Agency, 2014, p. 263).

Services constitute the fourth biggest source of direct and indirect GHG emissions in Gaziantep. However, it was noted in the plan that consumption averages were not

calculated due to lack of information. Still, it is known that coal forms biggest source of energy in the sector (Metropolitan Municipality of Gaziantep, 2011, pp. 35-36).

Solid waste and water is the last sector in the list of GHG contributors of Gaziantep. It is known that Gaziantep Municipality is playing an active role and take several precautions in managing wastes. There are several facilities, which were established before the Climate Change Action Plan of Gaziantep, for waste management and water treatment in the city.

Apart from the sectoral indicators mentioned above, there are some other inputs that can be benefited in order to determine the source of emissions. Gaziantep is listed as one of the cities with highest GHG emission level in both overall and per person statistics in Turkey. Urbanization and migration have an important role in determining the emission levels in the future in this regard. According to report of Silkroad Development Agency, population growth rate of the city is twice as high as the national average (2014, pp. 4-5).

Consequently, planned urbanization is crucial in order to demonstrate comprehensive action in environmental issues. Similarly, combating climate change at urban level and carrying out action planning activities is rather important for cities like Gaziantep. In what follows, critical evaluation of Climate Change Action Plan of Gaziantep with reference to international guidelines and standards is presented.

6.3. Climate Change Action Plan of Gaziantep

Preparation of Climate Change Action Plan of Gaziantep started during the duty term of previous mayor of Gaziantep Asım Güzelbey in mid-2010. Güzelbey mentioned the main target of this plan as to establish a permanent connection between planning and environment. He added that in order to achieve mitigation of GHG emissions and adaptation to climate change, public policies of the municipality will be redefined and required organizational structure will be established within the municipality (Haberler.com, 2010). It is known that Gaziantep Municipality interested to take part in international community on the subject before the planning process started. Enthusiasm of the mayor along with national and international

incentives enabled climate change action planning project to find itself a place in Gaziantep Municipality's agenda. Güzelbey commented on the issue as, "Turkey's environmental responsibility in international arena depends on local actions as well. In this regard, Climate Change Action Plan of Gaziantep is expected to find itself a support from both related ministries and international organizations" (Haberler.com, 2010). Moreover, during the interviews conducted in Gaziantep, it was mentioned by Tercan that Gaziantep Municipality was already conducting several environmental projects and their intention was to unite existing projects – as well as new projects – under a comprehensive plan, which is compatible with international standards (Ş. H. Tercan, personal communication, October 22, 2015).

It was stated in the planning document that Gaziantep Municipality prepared, preliminary research for the plan, which included assessment of the risks and possible actions as well as possible developments related with climate change in the future. The study have been conducted by ICE, Mavi Consultants, and University of Gaziantep and financed by French Development Agency (AFD) and Metropolitan Municipality of Gaziantep (2011, p. 2). Preparation of the plan took slightly more than a year and final draft of the plan was published in September 2011 with title "Climate Actions Plan of Gaziantep: Energy and Greenhouse Gas Emissions Profile Preliminary Actions Plan and Implementation Strategy". Being the first city to carry out climate change action planning activities at urban scale enabled Gaziantep to become a nationwide pioneer in this manner (Gedikli & Balaban, 2014).

Under the methodology section of the plan, it was reported that bottom-up analysis method was used which allows global balance calculations based on macro-economic and technical determinants to be used. Bilan Carbone® of ADEME France standard is taken as a base for this methodology (Metropolitan Municipality of Gaziantep, 2011, p. 2). All the required data was provided by Gaziantep Municipality for this research. Taking into account all the emissions from direct sources, indirect sources, non-energy emissions related to waste, and transportation, Gaziantep's CO_2 emissions per capita was calculated as 3.52 tonnes of CO_2e (Metropolitan Municipality of Gaziantep, 2011, p. 3). After determination of the emissions and main sources, mitigation and adaptation targets were determined. It

can be observed that while determining reduction targets, national data and emission reduction targets are considered as well. As a consequence two main mitigation targets were adopted in this plan. First, 15% decrease in CO_2 emissions in 2023 and reducing emissions per capita levels as low as 3.00 tonnes of CO2e. Second, 15% decrease in energy consumption per capita by 2023 (Metropolitan Municipality of Gaziantep, 2011, p. 4). Regarding these reduction targets, information on which year taken as a base year was not provided.

In order to reach these targets, 26 actions were identified with actions fiches. Objectives, targets, issues and challenges, already completed works, schedules, partners, monitoring indicators, and performance indicators are mentioned for each of the actions. Most of the actions were concentrated on mitigation, while some of which also included adaptation targets. Explicit separation was not made for these actions so that it can be argued, none of the actions focusing solely on adaptation. These actions were grouped under five main categories namely; housing, service, industry, transport, and water. As it was mentioned before, these five categories can also be regarded as main sources of direct and indirect GHG emissions in Gaziantep. On another level, actions address climate change related issues according to three axes, which are, management of urban renewal, planning for urban sprawl, and indirect intervention. Implementation period of identified actions was planned to start right after Climate Change Action Plan of Gaziantep entered into force.

6.3.1. Detailed Analysis of the Climate Change Action Plan of Gaziantep

Acknowledged Guidelines and Principles for Climate Action Plans will be used in order to analyze Climate Change Action Plan of Gaziantep. As in best case scenario, research will be carried out with respect to five stages of climate change action planning determined in the guideline.

Calculating emissions stage was carried out accordingly to scientific methods and international guidelines (*Sufficient Evidence exists*). It was stated in the plan that methodology used in this plan is based on Bilan Carbone® standards developed by French Environment and Energy Management Agency (ADEME). This tool is used to determine GHG emissions of the companies and local authorities resulting from

their activities. Moreover, the tool comprise of possible financial savings resulting from decreased energy consumption, recommendations to lower carbon footprints, and determination of emissions sources according to scale (Metropolitan Municipality of Gaziantep, 2011, p. 21). It should also be noted that, in order to create GHG emissions database, Turkish Statistical Institute and Provincial Environmental Directorate involved in the project and database of Gaziantep Governorship was benefited (Ş. H. Tercan, personal communication, October 22, 2015). Moreover, direct and indirect GHG emissions were broken down and information was published in the plan (*Sufficient Evidence exists*). According to research, industry sector, with its 37% share is the top contributor. Residential sector listed in the second place by generating 30% of total emissions. Rest of the contributors can be listed as; transportation in the third place with 15%, services sector in the fourth place with 11%, and waste in the last place with 7% (Metropolitan Municipality of Gaziantep, 2011, p. 3). However, it was appointed and also confirmed with interviews that no future projections or modeling were made for different GHG emissions scenarios *(Unaccomplished Phase)*.

Determining and adopting targets stage did not involve investigation of possible future impacts of climate change in Gaziantep example (*Unaccomplished Phase*). It was observed that some superficial deductions made based on the British Met Office's Hadley Centre for Climate Prediction and Research study on climate evolution in Turkey. However, specific research was not carried out in this regard. During the interviews, absence of such research was also highlighted. It was noted that, nothing but a study on pistachio production, which is the most important agricultural product for the region, carried out to determine climatic effects, with the efforts of the head of the Environmental Protection and Control Department (Ş. H. Tercan, personal communication, October 22, 2015). Moreover, during the interview Yaman added that municipality considers switching to agricultural products that are more suitable with climate patterns but no research has been done yet (G. Yaman, personal communication, October 22, 2015). As it was mentioned above, GHG reduction targets were determined in the planning document (*Sufficient Evidence exists*). 15% reduction in CO_2 per capita is aimed by 2023. Even though mitigation

targets were set for 2023, actions and implementation period starts right after the plan put into force. Obviously this does not create a contradiction considering the required time span for several actions to become effective after implementation. However, quantitative targets in the short term do not take place in the plan (*Unaccomplished Phase*). Still, it should be noted that some actions were divided into stages in schedule and implementation targets for these middle stages were determined. On the other hand, quantitative targets in the long term were identified as it was mentioned before (*Sufficient Evidence exists*). Moreover, mentioned 15% reduction targets for both CO_2 emissions and energy consumption by 2023 can be stated as rational (*Sufficient Evidence exists*). Only ultimate targets were published and information on how much emission reduction each actions would provide was not provided. Still, considering the targets determined by central government, 15% reduction target is quite rational. Yaman also added, considering Turkey set 21% reduction goal for 2030 at COP 21 in Paris, targets identified in Climate Change Action Plan of Gaziantep stays within the logical limits. Although such targets might be considered hard to reach in practice, as long as whole planning and implementation process carried out with the support of shareholders, they are reachable (G. Yaman, personal communication, October 22, 2015).

Developing action plan stage of Climate Change Action Plan of Gaziantep involved partial investigation of other national and international examples (*Limited Evidence exists*). During the interviews, it was revealed that "Paris Climate and Energy Action Plan" was analyzed. Indeed, an action was adapted from Paris example to the Climate Change Action Plan of Gaziantep, which is about increasing public awareness to enhance reduced energy consumption in housing sector. In this sense, energy advice centers, named "Energy Info Points", would be setup to inform residents. Nevertheless, it should be noted that this is a unique example for adoption of projects from other practices. It was highlighted by Tercan that adequate preliminary research was not made in order to find out about previous or similar climate change practices. Also, it was noted that a substantial part of the projects comprise of improvement of existing initiatives (Ş. H. Tercan, personal communication, October 22, 2015). It was previously mentioned that majority of the

projects are focused on emission mitigation strategies in the plan (*Sufficient Evidence exists*). Adaptation strategies on the other hand, were integrated into actions but were not separated from mitigation strategies. Yet, it would not be wrong to state that strategies for adaptation were developed as well (*Sufficient Evidence exists*). More, these mitigation and adaptation actions were described in details in action fiches (*Sufficient Evidence exists*). Information on main objective, targets, issues and challenges, timelines, stakeholders, and monitoring and performance indicators are were provided for each action. Moreover, new and proposed actions were differentiated from existing projects clearly (*Sufficient Evidence exists*). Present policies and actions were mentioned for five main topics of the plan. More than that, in the explanation of each action, under the title "What have been done", information provided regarding existing measures implemented related with that action. This differentiation between existing and new actions is vital since, as Tercan mentioned, there are many environmental practices carried out by Gaziantep Municipality before the plan. So, substantial part of actions was comprised of improvement to existing measures (Ş. H. Tercan, personal communication, October 22, 2015). Information regarding possible co-benefits for each action was not provided in the planning document (*Unaccomplished Phase*). It was also confirmed during the interviews that such research was not carried out while determining actions (Ş. H. Tercan, personal communication, October 22, 2015). Stakeholders of the plan mentioned at the beginning of the plan and their engagement is identified in the description of each action (*Sufficient Evidence exists*). Within the Gaziantep Municipality; Environmental Protection and Control Department, Housing and Urban Planning Department, Science Works Department, Energy and Lighting Department, Transportation Planning and Rail Systems Department, Financial Services Department, and Legal Consultancy Department were identified as key stakeholders. Some other private and public stakeholders of the plan can be named as, the Provincial Administration, Şahinbey, Şehitkamil, Oğuzeli District Municipalities, The State Railways, Gaziantep Airport, GAZDAS, and some professional chambers (Metropolitan Municipality of Gaziantep, 2011, pp. 13-20). Moreover, during the interviews Yaman added on the issue that meetings were organized with stakeholders while preparing the plan. However, there were some complaints raised

about miscommunication while determining actions by the chamber of industry and some other stakeholders (G. Yaman, personal communication, October 22, 2015). Implementation programs for actions were decided roughly whenever possible and can be found in action fiches (*Limited Evidence exists*). Yet, Tercan added during the interview that, these timetables were not precise and binding (Ş. H. Tercan, personal communication, October 22, 2015). Similarly, research regarding financial tools, funding resources, and cost analysis was made up to a certain level (*Limited Evidence exists*). It was noted that, municipality officials believe that preliminary research was enough in order to determine budgeting and implementation period (Ş. H. Tercan, personal communication, October 22, 2015). It was also mentioned during the interviews that communication with residents partially established during development stage of action plan (*Limited Evidence exists*). On this issue, Tercan added that, meetings were organized with non-governmental organizations. In the course of five or six meetings, outcomes of the discussions contributed to decisions in the plan (Ş. H. Tercan, personal communication, October 22, 2015). Apart from this, performance metrics are also roughly established and presented in the description of each action (*Limited Evidence exists*). Nonetheless, it should be noted that quantitative identification for metrics was note made. Instead, information on what would performance metrics be provided, such as number of people attending to the briefings or impact of the actions in terms of GHG emission reduction would be the indicator for related action. Regarding calculations of the contribution of each action, there is no evidence of recalculations made in order to eliminate double-counting (*No Evidence exists*). Limited evidences reveal that Climate Change Action Plan of Gaziantep is coherent with other sectoral plans and documents of the municipality (*Limited Evidence exists*). It was mentioned in the plan that Climate Change Action Plan of Gaziantep will be embodied into Strategic Action Plan of Gaziantep between 2011-2015 (Metropolitan Municipality of Gaziantep, 2011, p. 5). However, during the interviews it was revealed that most recent strategic action plan involves only one entry regarding climate actions. It was also mentioned in the interviews that compatible regulations were prepared for energy efficiency in residential sector (Ş. H. Tercan, personal communication, October 22, 2015). Yet, these examples are limited and especially after current mayor of Gaziantep Fatma

Şahin took office in 2014, coherence of climate actions with other planning activities were no longer maintained.

Implementing action plan stage reported to be interrupted due to change of the mayor of Gaziantep Metropolitan Municipality in local elections held in 2014. As a consequence, determined implementation program was not followed properly (*Unaccomplished Phase*). It was stated that only few actions (two in transportation, one in waste and one in residential sector) were completed. Indeed, it was mentioned by in our interviews that these completed actions were also part of some other programs conducted by Gaziantep Municipality (G. Yaman, personal communication, October 22, 2015). Right after the plan was put into force a management unit, named "Climate Change Branch Office", was established under the Environmental Protection and Control Department. However, concrete steps were not taken in order to create required policy, guidance, and program to carry out actions stated in climate action plan (*Unaccomplished Phase*). Moreover, it was reported that mentioned management unit was shut down right after the new mayor was elected. For mentioned few actions, which were completed, some public and private partnerships were established during implementation period (*Limited Evidence exists*). For instance, one of the projects in transportation sector was carried out with the support of European Investment Bank. However, since most of the projects were canceled, it would be misleading to state such partnerships established throughout the implementation stage. Regarding capacity building, internal and external personnel trainings were not occurred (*Unaccomplished Phase*). Although, in the plan such training are planned and mentioned, Yaman stated that those activities were not conducted. Still, he added, himself and other personnel were sent to some symposiums, meetings, and conferences in order to increase their knowledge about climate change practices (G. Yaman, personal communication, October 22, 2015). Finally, since the majority of the actions were not implemented, there was not any opportunity to engage with stakeholders throughout the implementation stage (*Unaccomplished Phase*).

Monitoring results stage was also not actualized for Climate Change Action Plan of Gaziantep similarly to implementation period. It was also mentioned in the

interviews that municipality does not have any commitment for monitoring stage (*Unaccomplished Phase*). Only consideration regarding monitoring is related with air pollution. There is an air condition reading station in the city established by Directorate General of Environmental Management under the Ministry of Environment and Gaziantep Municipality which would enable monitoring of the air quality in the city (Ş. H. Tercan, personal communication, October 22, 2015). However, as it was mentioned since the actions were not implemented, data gathering was not carried out as well (*Unaccomplished Phase*). Although there are several pilot implementation phases and monitoring stages identified for the actions, these stages were not followed (*Unaccomplished Phase*). Since there was no data gathering in the monitoring stage, it was not possible to compare these data to baseline statistics (*Unaccomplished Phase*). Similarly, there was no auditing made regarding operation of the plan and implementation (*Unaccomplished Phase*). Tercan commented on this issue as, since whole planning process was a voluntary activity, there was not any auditing mechanism established (Ş. H. Tercan, personal communication, October 22, 2015). Yaman on the other hand, argued the fact that they did not have required tools to measure contribution of each action to overall GHG reduction targets, is the main reason for deficiencies in monitoring and conveying auditing in later phrases (G. Yaman, personal communication, October 22, 2015). Indeed, it was noted by Tercan that provision of such tools were agreed upon in the beginning of the meetings with French Development Agency. However, in the later stages of the agreement, related terms are terminated and they were offered personnel training instead – which was not occurred as well (Ş. H. Tercan, personal communication, October 22, 2015). Finally, it was not possible to make improvements on the plan based on the data at monitoring stages and feedbacks since none of the stages mentioned actually realized (*Unaccomplished Phase*).

6.3.2. Evaluation of Climate Change Action Plan of Gaziantep

Gaziantep Municipality, as it was mentioned before, is the first municipality to carry out climate change action planning activities at urban scale in Turkey. This was the main reason that Climate Change Action Plan of Gaziantep was selected as case study for this research. Preliminary research for this study contains planning

document itself as well as the information published on Gaziantep Municipality's website, other planning documents prepared by municipality and Silkroad Development Agency. Associated with personal interviews conducted with officials from municipality, majority of the questions in the Acknowledged Guidelines and Principles for Climate Action Plans were answered. There is only one question, which could not be answered neither from sources mentioned above nor by the interviewees. Findings of this research are illustrated in the Figure 6.3 below.

Figure 6.3: Evaluation of Climate Change Action Plan of Gaziantep

As can be observed from the figure, except for several unaccomplished answers, majority of the requirements were fulfilled while calculating emissions, determining and adopting targets, and developing action plan. However, implementation and monitoring stages of the plan are rather dramatic, since a clear majority of the actions were not implemented. During the personal interviews, change of the mayor was pointed out as one of the main reasons for this failure. That being said, the

findings of this research reveal that there are different facts that cause this failure in the implementation and monitoring stages. Therefore, the rest of the chapter will be elaborated on underlying reasons for failure of the implementation of Climate Change Action Plan of Gaziantep.

First of all, main problem that was stated by officials during the personal interviews will be discussed. Beyond any doubt, such a fundamental change in the management of local governments may play an important role, especially if new elected officials have different perspective of view towards the local issues. It is known that, interruption of ongoing agendas and actions started by previous mayors, when new mayors take office is an ongoing debate. In point of fact, such concern is not specific to Turkey, but it was also mentioned in Chicago case regarding Rahm Emanuel taking office after Richard M. Daley. For our case, the scene that we generally used to encounter in Turkey occurs, if political parties of the previous and new mayors are different. In that case, people expect that the programs that have been started before the election period to be ended (even if they are not completed), and the implementation of programs from the new mayor's agenda would start after that person takes office. Indeed, similar alterations were confirmed by Einstein and Glick's research, which they focused to mayors in United States. When they investigated the differences between different mayor's choices over the same issue, they find out that the partisanship is the most obvious divider. Moreover, the party of the mayors' also shapes their policy priorities, political capital expenditures, climate change and so on. So it would be safe to argue that agendas of the mayors' are linked with their partisanship (2014, p. 37). Although we can make some inferences out of the information there, it should be noted that it was not the same case for Gaziantep. Both the previous mayor Asım Güzelbey and new mayor Fatma Şahin are members of the same party. Still, it was stated recurrently by officials and residents that Güzelbey's approaches, not only for environmental issues but also for any other issues, were idiosyncratic considering his party's strategy at national scale. On the other hand, Şahin's attitude and point of view towards local issues can be described more conservative and coherent with her party's general political concerns. Herein, varying enthusiasms of the mayors for solution of an issue become important,

considering the fact that there are no regulations to obligate them to carry out climate action planning. On the other hand, it could be argued that some mayors decide to focus on programs with concrete results which will be finalized within their period of service and strengthen their propaganda for upcoming elections (in the event that they are willing to continue their duty). Considering the fact that dealing with climate change may not yield results in five years[13], taking responsibility to start this activity requires full volunteerism and enthusiasm. However, as it was the case in Gaziantep, new mayor not having same enthusiasm may result in such programs to be pushed into the background and ended in progress of time.

Apart from this issue, as it was stated in the beginning there are various different reasons for the failure of the Climate Change Action Plan of Gaziantep. For instance, there are fundamental deficiencies in the preliminary research and determining the targets stages. As it was revealed, potential impacts of climate change on the region were not investigated and determined. In addition, there are some inexplicit information on GHG inventories and mitigation calculations. It was mentioned by the officials during the personal interviews that municipality did not have sufficient information on how much reduction each strategy would provide. Beyond any doubt, this would decontextualize mitigation actions, decrease the motivation for implementation process, and blocks prioritization of the actions between each other. If and only these requirements are fulfilled, it is possible to determine strategies and targets in the short run and long run. However, it can be observed that only ultimate targets were focused and these targets were not supported with sufficient information due to shortcomings stated above. Performing such preliminary research and study can be argued to be important since it enables policy-makers and practitioners to evaluate different options to meet targets, verification, and comprehensive approach towards the issue. These factors were discussed in detail and highlighted during the literature discussions before.

There can also be some deficiencies mentioned during the determining actions and developing plan. After the completion of mentioned steps above, it is possible to determine actions in order to solve problems specific to that area. To be more

[13] Turkish local elections are held every five years in order to elect mayors.

specific, it is necessary to prioritize actions considering the conditions of the region instead of embodying wide range of mitigation and adaptation actions that are being implemented worldwide. Neglecting this would cause passing over the advantages of carrying out climate change action planning at urban scale, which have been discussed throughout the literature discussions. In addition, there is another factor that should be considered while determining mitigation and adaptation actions, co-benefits. It was clarified during the personal interviews that, co-benefits were not investigated while determining the actions of Climate Change Action Plan of Gaziantep. Pursuing intersecting targets of climate change actions with sectoral goals will strengthen the basis and support for effective climate planning. As it was published in The Guardian website, research conducted by Bain revealed that climate change actions with co-benefits have potential to receive support from climate change deniers as well. Bain added that this may also enhance climate change actions to become more efficient as well as achieving broader social benefits through these actions (Abraham, 2015). While developing the planning document, comprehensive research on potential costs of the actions and determining financial resources is also crucial. In the Gaziantep case, it can be argued that this research is superficially made before the implementation period. However, it should be taken into consideration that some of the environmental projects might have high costs or long payback periods. As a consequence, undertaking this research beforehand and taking steps to find financial resources for the actions will prevent such actions to be cancelled after plan enter into force. Last but not the least, another thing that should have been considered during the development of the plan is ensuring the principles of climate change action planning to be embodied to other plans and documents prepared by municipality. Unlike Chicago example, it was observed that Climate Change Action Plan of Gaziantep is not coherent with other sectoral plans and documents. Bulkeley commented on the perspective towards climate change policies as, “within both local governments and other organizations, researchers find that climate change remains a marginal issue, usually confined to the environmental wing of local authorities and disjointed from other areas of policy making” (2010, p. 235). This argument once more highlights the importance of adapting principles of

environmental friendly planning to every possible policy-making area, as to normalize environmental issues and climate change in this manner.

Necessary effort was not exerted for monitoring stage as well in the Gaziantep case. It should be noted that Gaziantep Municipality lacks technical information in order to calculate the contribution of individual actions which is crucial for monitoring stage. It was stated during the interviews that municipality not having any commitment concerning post-implementation period was the consequence of this fact. Nevertheless, no endeavor was made to carry out qualitative assessments or any kind of auditing throughout the process. In fact monitoring does not only reveal the ultimate results of the actions as being successful or unsuccessful. Additionally, it is also possible to avoid some mistakes and steer alternatives, prevent possible financial losses in future, and improving the programs through the feedbacks that have been received through monitoring.

Another important aspect missing in the action plan of Gaziantep is about the public awareness, which also have been discussed earlier. There are some drawbacks on the issue although it was reported that several activities carried on with non-governmental organizations. For instance, more effort should have been made to communicate with residents directly to take their support. In order to achieve this, municipality had adequate tools and mediums which were not put into operation such as organizing meetings at various locations to increase participation and regularly posting updates about the plan progress through municipal media organ's and local press. Importance of increasing public awareness is also highlighted in the handbook published by UNEP. Apart from getting local residents' support for implementation program, it may lead to changes in daily habits, convince the opponents of specific actions for implementation and generate awareness in younger generation about climate change (2006, p. 1).

Apart from the things that needed to be done in the individual stages of climate change action planning, some steps should be taken considering the long term benefits. For instance, capacity building is one of the most important topics not only for climate change issue but also for any other fields that municipalities perform and

action. During Gaziantep's climate change action operation, it can be argued that, there were little or no efforts made for that purpose. Apart from being frequently used as a fancy word, capacity building means building upon or strengthening existing technical, informational, and fiscal capacity and potential against an issue. The benefits of capacity building while dealing with climate change issue can be briefly listed as it paves the way for expertise in the future, improves relationships and networking, enhances effective political discussions and expands potential resources (Castle, Tan, & LaGro, 2015, pp. 82-83). By looking poor results of the case study, it can be asserted that most of the troubles that have been encountered could have been avoided with proper investment on capacity building. For instance, most important cause for implementation period to be failed, that is outcomes of new mayor taking the office (which was mentioned during the personal interviews), would have less impact on the running of the plan. Indeed, with the favorable capacity building if principles of climate change action planning could find itself a place in other plans and documents that were prepared by municipality; many implementation projects would still be shaped by these principles in the future period, when new mayor (whose agenda does not prioritize climate change actions) took office.

Also related with capacity building issue, being an active member of international community is an also vital subject. TMNs present various opportunities to cities for the climate change action planning activities. It is known that Gaziantep is a member of some of these networks, such as ICLEI and Energy Cities. In addition, it should be noted that Gaziantep has a pioneer role in this sense compared to other cities in Turkey. However, there are various other networks that Gaziantep needs to become a member of. Although some of these networks are appointed in the plan, Gaziantep did not join to these networks, such as Covenant of Mayors, C40 Cities, and International Network for Sustainable Energy (INFORSE). As Toly discussed in his article, in addition to the various opportunities and inter-municipal dialogue provided by these networks, it is also possible to argue that climate change activities of cities leverage global influence more than they would separately get (2008, p. 352). It can be asserted that, if Gaziantep would have been a member of such networks earlier, it

could both benefit from the support and make progress on the issue of capacity building discussed above. From another viewpoint, the difference between taking an active role and becoming a member should be discussed in different extent.

In addition to discussions conducted and observations stated above, policy implications deduced from Climate Change Action Plan of Gaziantep will be made in the conclusion chapter; in order to pave the way for both Gaziantep and other similar agents to carry out efficient climate change action planning at urban scale.

CHAPTER VII

CONCLUSION

The findings of the research are emphasized and discussed with regard to literature on climate change planning in the conclusion chapter. This chapter consists of three parts. In the first part, overall summary of the literature review and findings of the case study will be presented. Second part covers important inferences from the case study. Also, this part involves policy implications for Climate Change Action Plan of Gaziantep with the aim of paving the way for similar climate change action planning studies at urban scale in the future. It should be noted that, these policy implications were not generated solely considering the deficiencies of Gaziantep Municipality. Since some of the problems arise from institutional issues, arguments will be asserted considering deficiencies at national policies as well. In the final part of the conclusion chapter, further remarks for future research on climate change issue will be presented.

This thesis mainly focused on climate change action plans at urban scale. Like other studies on the environmental issues and climate change, background information was provided on climate change primarily. Afterwards, broad academic literature on the subject was presented in a systematic way, in order to answer set of questions with the aim of better understanding the details of climate change action planning. Having a critical approach towards existing planning activities considered to be suitable for this research, since it is hard to argue that any of the planning activities achieved successful results except for few examples. In order to generate operational and objective tool to evaluate existing plans, acknowledged guidelines and principles for climate action plans were researched and generated. In this context, the study involved assessment of the Chicago Climate Action Plan with regard to determined

international guidelines. Finally, main case study of this research included the assessment of Gaziantep Municipality's Climate Change Action Plan.

7.1. Summary and Findings of the Research

Throughout this research, the relationship between climate change, policy-making, and planning was investigated in order to discover the contribution of planning to the solution of the problem. Including the introduction and conclusion chapters, this thesis consists of seven chapters. After providing the information on the subject, scope and purpose of the research, method and methodologies that the author made use of, and structure of the thesis, the issue of climate change was introduced in the second chapter. In the beginning, scientific explanation for both global warming and climate change was presented. Global warming can simply be described as the continuous increase in global average temperature levels, whereas climate change implies identifiable changes in properties of climatic conditions for an extended period of time. This phenomenon that the Earth has been experiencing is explained with greenhouse effect by scientists. It is known (and also generally asserted by climate change deniers) that such long term fluctuations were also experienced in the previous eras. At this point, the contribution of direct and indirect human activities to changes in climatic conditions is separately identified as enhanced greenhouse effect. By investigating both causes (GHG levels in the atmosphere) and results (glaciers melting, temperature levels, air and water pollution and so on), it can simply be argued that the conditions that the world is facing today are clearly different from the historical experiences. Moreover, GHG levels from past to present and models for future, remark that rise of the GHG levels in the atmosphere will be continuous. Afterwards, the meaning and importance of limiting global temperature increase under 2°C, which was mentioned by William Nordhaus for the first time, was presented. After providing sufficient information on climate change and global warming, historical background of climate change policy-making initiatives at international level was discussed. Most important international conferences were introduced chronologically. Information that was provided can push readers to think about both the reasons of not achieving global results towards the issue in the existence of such initiatives, and increasing necessity of binding agreements and

approaching this issue at micro levels. In this regard, the questions of "why cities are important in dealing with climate change?" and "why cities are both part and solution of this problem?" were discussed. Considering the fact that some of the effects of climate change are inevitable now, chapter was concluded with the presenting findings on the importance of carrying out mitigation and adaptation activities simultaneously. The discussions that were made throughout the chapter, enabled readers to think over one of the objectives of the study and even tender some clues for the answer, which is "*to investigate why global successful results have not been achieved yet, even though there are numerous initiatives at national and international scale on the issue of climate change*".

Academic literature on climate change action planning was scrutinized and presented in the chapter three. The importance of policy-making while dealing with climate change was highlighted to answer the question raised by Giddens, "how can the climate change dimension be built into every relevant aspect of public policy?" (2008, p. 4). The fact that climate change is generally perceived as a marginal issue by the decision-makers at different scales leads to important part of climate change policy-making problems. Requirement for more comprehensive approach along with new forms of engagement, new forms of finance, and the flexibility (Lindfield, 2010, p. 105) was put forward in the beginning of the chapter. Later on, author focused on the description of climate change action plans, their types, and extents. Climate change actions can be either organized as stand-alone documents or integrated into other planning documents. They can be simply described as, framework documents which outline the specific policies and activities, which can be carried out at different scales. Planning documents are generally expected to include certain sections such as GHG inventories, future forecasts, targets, implementation strategies, and monitoring programs. Apart from the formats of the plans, they are also expected to involve both mitigation and adaptation actions with rational and quantitatively identified targets. Even though there are no obligations to develop climate change action plans according to any pattern, majority of the literature agrees upon the necessity of carrying out whole planning activity in a parallel manner. In fact, while investigating successful examples from all around the world, it was

observed that planning activities were generally coherent with the format presented above. In order to analyze successful examples in detail, mitigation and adaptation activities from other countries were identified. To that end, an adaptation project from Rotterdam City and a mitigation project from Beijing Municipal Government were discussed. Finally, the findings of the research conducted within the scope of this thesis, were presented while fulfilling another objective mentioned in the introduction chapter: "*to explore the details of climate change action planning activities that were implemented at urban scale and to determine international standards*". Five main milestones stated in the ICLEI's "Cities for Climate Protection Milestone Guide" used as a base and sub-requirements of each milestone were determined and presented. Main outcome of this research consist of *yes/no questions* which were used in the evaluation of best case scenario and main case study. Details like "the methodology that was used to carry out this research" and "transforming questions to operational and objective format", were discussed in the introduction chapter.

In the next chapter, Chicago Climate Action Plan was analyzed as a best case scenario by using the acknowledged guidelines and principles for climate action plans. Carrying out this research is thought to broaden this thesis by revealing the underlying reasons behind achieving successful results. The experience of the City of Chicago, in combating climate change, is recognized in many studies (Headwaters Economics, 2012; Gregg & Hitt, 2013; Pamukçu, 2015; ICLEI USA, 2013). Additionally, complete details of the reasons why this example was chosen for this research, were mentioned in the beginning of the chapter. Research about the possible effects of climate change in Chicago region, illustrates that there will be serious consequences on the temperature, precipitation trends, ecosystem, water, health, and infrastructure. With the efforts of Chicago Climate Task Force, climate action plan of Chicago was completed in 2008. Evaluation of the plan revealed that most of the requirements specified in acknowledged guidelines and principles for climate action plans were fulfilled within the extent of whole planning process. Findings of the research once and again justified the indication of Chicago Climate Action Plan as one of the best examples at urban scale in the world.

Fifth chapter was on Turkey's climate change policies at both international and national levels. Broad information was provided on Turkey's GHG emissions inventory, the methods that have been used, and findings from the most recent report submitted to UNFCCC. Later on, the effects of climate change on Turkey were introduced regarding the topics; temperature, precipitation patterns, water resources, vegetation, and agriculture. Next, climate change policy of Turkey was discussed in dual aspect. First, Turkey's participation to international initiatives and agreements was presented chronologically in order to demonstrate her status over the years. In this context, discussion on how Turkey's involvement to Kyoto Protocol and membership process to European Union changed its position at international arena was conducted. Second, climate change action strategies and programs carried out at national scale were introduced. Several climate change planning documents, which were prepared and published years between 2009 and 2011, were mentioned. In addition, the preparation of main framework document, Republic of Turkey National Climate Change Action Plan 2011-2023, was also mentioned in detail as well. Discussing Turkey's climate change policy by both tracking the progress at international and national scale, enabled us to partially justify one of our hypotheses; that is, "*climate change action plans in Turkey are developed in order to fulfill international obligations rather than taking voluntary action to combat climate change*". It can simply be described that, although there were some efforts observed in the five-year development plans of Turkey, important strides made only after international pressure was exposed. The flow of discussions that were provided in this chapter prepared readers to focus on main case study of the thesis, evaluation of the climate change action plan at urban scale from Turkey.

As the case study of this thesis, Climate Change Action Plan of Gaziantep was evaluated in the sixth chapter. The fact that Municipality of Gaziantep is the only municipality at urban scale that prepare climate change action plan, is the main reason for this example to be chosen for case study. The effects of climate change on the region could not be presented due to lack of investigation on the subject. Yet, background information on five main topics, which were introduced in the plan (industry, housing, transportation, service sector, and waste), were presented in order

to provide readers required information before in-depth analysis of the plan. It was discovered during the research that Gaziantep is one of the highest GHG emitter cities in Turkey. Beyond any doubt, continuously developing industry sector, migration, and unplanned urbanization are some of the major causes (Silkroad Development Agency, 2014, pp. 4-5). Preparation of Climate Change Action Plan of Gaziantep was started in 2010 during the duty period of previous mayor Asım Güzelbey. In September 2011, final draft of the plan was published with title "Climate Actions Plan of Gaziantep: Energy and Greenhouse Gas Emissions Profile Preliminary Actions Plan and Implementation Strategy". Majority of the actions in the plan were estimated to start between 2011 and 2015. For this reason, it can be claimed that enough time passed to evaluate the plan; considering the fact that preliminary research on the case study was started in June 2015 for this thesis. Similarly to best case scenario, the questions in acknowledged guidelines and principles for climate action plans were used to evaluate the coherence of the plan with international standards as well as examining the planning process in detail. Planning document constituted the main source of information for this research. In addition, personal interviews conducted in October 2015 with officials from Gaziantep Municipality who took an active role during the whole planning process. Undertaking this research enabled fulfilling one of the objectives stated in introduction: "*to evaluate "Climate Change Action Plan of Gaziantep", which is the only initiative at urban scale in Turkey, and to state its compatibility with determined international standards. Also, to make recommendations based on the evaluation for better implementations in future for both Gaziantep and other similar cases*". Carrying out this research was important since Gaziantep was the first city to have climate change action plan in Turkey; hence, highlighting strengths and weaknesses and providing recommendations have potential to be enlightening for similar experiences in future. Nonetheless, findings of the research implied that the ultimate results can be labeled as unsuccessful for this case. Despite the fact that requirements of earlier stages of the plan seem to be fulfilled, great majority of the actions were not implemented. One of the main reasons, which were pointed by the officials during the personal interviews, for this failure is the new mayor taking the office in the third year of the plan. However, detailed analysis revealed that there are other

deficiencies for this failure as well. In fact, these deficiencies are in fundamental subjects such as preliminary research, uncertainty of the financial resources, capacity building, and benefiting from international community. As a consequence, author argued that, negative outcomes of change of mayor could have been prevented and more successful results could have been achieved, if required investment was made on these fundamental issues. Hereby, other hypothesis of the research, "*even though climate change action planning documents seem carefully prepared, there are several deficiencies in some fundamental matters that cause failure during the implementation period*" is verified.

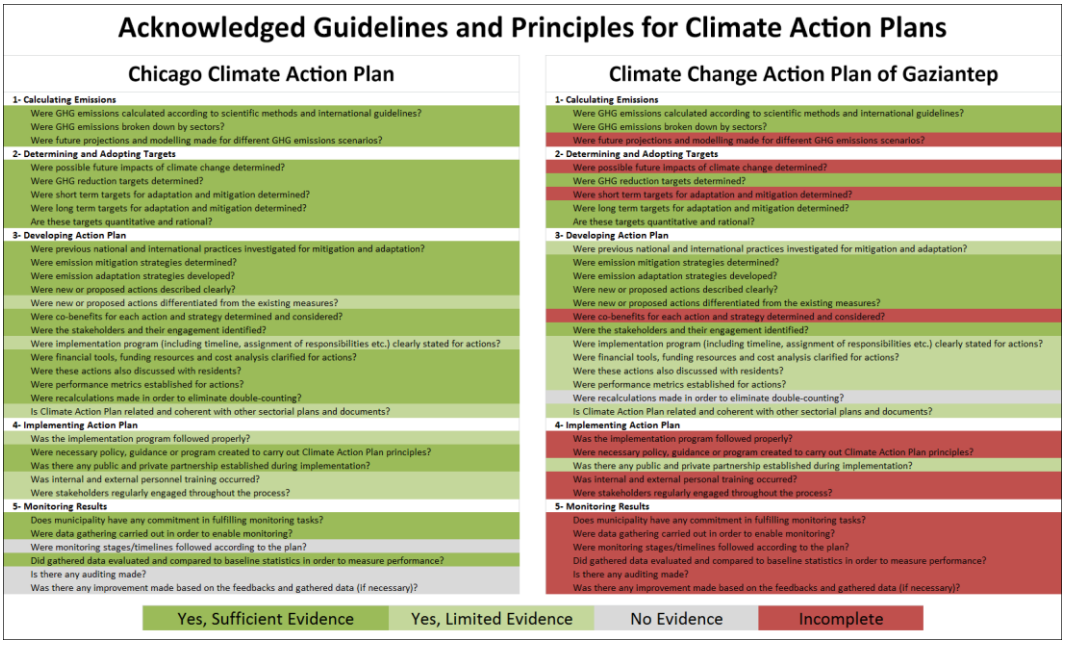

Figure 7.1: Comparison of the Findings for Chicago and Gaziantep Cases

In the Figure 7.1 above, comparison of the findings from the evaluation of Chicago Climate Action Plan and Climate Change Action Plan of Gaziantep is illustrated.

Evaluation of Chicago Climate Action Plan is placed on the left and evaluation of Climate Change Action Plan of Gaziantep is placed on the right in the figure. During the calculating emissions stage, Chicago example fulfilled all sub-requirements, whereas Gaziantep example had some deficiencies. Yet, these deficiencies in preliminary research caused several problems in subsequent stages according to the findings. For instance, due to the lack of research conducted in the region, information on possible future impacts of climate change was not available while determining targets in the next stage. Apart from that, ultimate goals were identified for Climate Change Action Plan of Gaziantep but short term targets were not determined. Regarding developing action plan stage, examples provided adequate evidences for their actions and most of the sub-requirements were fulfilled in both plans. Nonetheless, it was revealed that co-benefits for actions were not considered in Gaziantep example. Implementation stage should be considered core of the planning process since this is the period where proposed projects come into reality. Difference between two examples in this stage illustrated clearly in the figure. As it was discussed in previous chapter, almost none of the projects were implemented in Gaziantep example, and thus sub-requirements in the implementation stage were not fulfilled. On the other hand, Chicago Climate Action Plan carries its success to implementation stage as can be observed. Finally, monitoring stage demonstrates similar results with implementation stage for both Chicago and Gaziantep examples. Main reason for this difference between two examples and dramatic failure of Gaziantep example in last two stages was discussed in the previous chapter. Next, some suggestions and policy implications will be presented considering the findings on shortcomings of the Climate Change Action Plan of Gaziantep.

7.2. Policy Implications

During the evaluation of Climate Change Action Plan of Gaziantep some major problems were identified such as deficiencies in preliminary research and technical expertise, reluctance of the new mayor on combating climate change, capacity building, and monitoring. After the determination of underlying reasons, policy implications will be mentioned in order to avoid similar shortcomings in future practices. As it was mentioned in IPCC's Climate Change 2014 Synthesis Report,

which was published to inform policy-makers, successful climate change actions relies on the integration of mitigation, adaptation, and other societal objectives through integrated approach. In order to enhance this, relevant tools should be accessible, suitable governance structure should be established, and required investment should be made on capacity building (2014c, p. 31). Therefore policy implications that will be mentioned in this chapter are focused on the importance of developing integrated approach, capacity building at different scales while dealing with climate change, and necessity of framing this issue in the agendas of political parties. Before proceeding, it should be noted that not all of the policy implications stated here are within the scope of application area of municipalities in Turkey, but necessary improvements should be made at national level to enhance these implications as well.

To put more explicitly what author means by integrated approach; beyond considering adaptation and mitigation strategies simultaneously for the city, projects in other areas should be integrated to climate change planning strategies as well. In the report of IPCC, it was stated on the topic that "integrated responses are especially relevant to energy planning and implementation; interactions among water, food, energy and biological carbon sequestration; and urban planning, which provides substantial opportunities for enhanced resilience, reduced emissions and more sustainable development" (2014c, p. 31). In other words, climate-resilient pathways for sustainable development should be developed, while chasing to increase social and economic well-being of people living in the cities. As it was discussed earlier, considering this fact may enhance support from local residents. On the other hand, limitations arising from financial resources are generally the biggest problems in front of environmental programs. As a solution, author argues that developing integrated approach would be also beneficial in minimizing the financial limitations. It can be asserted that it is possible to inform decision-makers that projects on environmental issues do not always requires high budgets. Indeed they are also profitable in the long term, especially considering the invaluable price of services done by nature. While analyzing the details of best case scenario, it was observed that decision-makers in City of Chicago have similar understanding towards

environmental programs. Nevertheless, developing such approach may not be achieved only by the efforts of municipality, considering the complexity of management mechanisms and effective role of the actors from private sector (and also non-governmental organizations in some cases). In addition, it can be argued that municipalities do not have mediums and generally enough resources to run such complex and integrated approaches. In order to provide these conditions, authorities at both national and local scales should take necessary steps. If and only after this, cities would have the potential to bring all these actors and constituents together as it was discussed, while highlighting the advantages of combating climate change at this scale. At this point, it would be useful to finalize the first policy implication by repeating the point that was stressed by Bulkeley, "it is necessary to consider how, why, and with what implications other actors are seeking to govern the climate through the city" (2010, p. 233).

Next, capacity building issue will be mentioned as the second policy implication. Even though Gaziantep has a pioneer role among other cities in Turkey on dealing with climate change; the issue of capacity building is often neglected. This is thought to be one of the major problems for not achieving successful results. In this section, discussion will be elaborated on "how to achieve prospering capacity building", separately from the discussion that was made in the previous chapter on the advantages of having strong technical, informational, and fiscal capacity. Because of the challenges to achieve capacity building, arguments will be presented in dual aspect; international and national dimensions. These main challenges can be briefly named as; technical specialization requiring issues (producing information by processing raw data, modeling etc.), financial limitations (finding financial sources, decisions on how budget will be allocated etc.), and necessary institutional improvements (strengthening the relationship between institutions, establishing new institutions etc.). Some of these challenges might be overcame by benefiting from international experiences, while some others require proper regulations at national level. As it was discussed in the previous chapters, benefiting from the expertise of TMNs and international organizations is quite important. In this sense, United Nations (through UNDP and UNFCCC) supports many countries and can be

considered as one of the most important organizations. In fact, UNDP made contribution to the preparation of Republic of Turkey National Climate Change Action Plan 2011-2023, which was introduced as the main climate change framework document of Turkey in chapter five. Similarly, case study of this thesis, Climate Change Action Plan of Gaziantep, was developed with technical and financial support of French Development Agency (AFD). Without any doubt, before coming to a conclusion on the success of Turkey's coordination with international organizations in this sense, comprehensive research should be carried out. However, considering the examples provided, it could be claimed that certain level of progress was observed on the subject. Main point that will be criticized on the issue is responsibilities at national level. In order to achieve successful capacity building, financial obstacles should be overcame and institutional improvements should be made. Even though climate change action planning will be carried out at city scale (or even micro scales), national policies often mark off what cities can and can not do while dealing with climate change. Obviously, supportive national regulations are required and national policy frameworks should be well aligned in order to ensure municipalities to reach sufficient resources (OECD, 2014, p. 3). Therefore, in order to carry out an effective climate change action at city scale, well-regulated public administration and governance should be established as like Balaban argued in his article. In this regard, Balaban highlighted three factors within this multi-dimensional approach namely; further intervention of the state, strengthening local and regional administrations, and enhancing coordination and collaboration between different administrative levels (2010, p. 86).

Environmental problems and climate change in particular, were often regarded as supra-party topics in Turkey. It causes such problems to take limited or no part in the agendas of political parties. When the examples from other countries examined, it can be observed that climate change issue is widely discussed in political arena. Indeed, different attitudes of the parties for climate change become question of debate during the election periods in the countries like United States, United Kingdom, Canada, and Germany. Beyond that, there are some "green parties", which shape their agendas around environmental issues. Coming back to examples from

Turkey, it should be noted that hardly any of the parties did not mention climate change in their election bulletins for the elections held in Turkey in November 2015. This being the case, responsibilities that should be discharged at national level remains in the background. For this reason, it can be asserted that environmental issues and climate change should find themselves a place in the agendas of political parties in following years. If and only after political parties consider climate change as a vital issue, it is possible to undertake required institutional improvements at national level.

7.3. Further Remarks for Future Research

In this thesis, the author attempted to examine the details of climate change action plans at urban scale. It became obvious during the research that such planning activities carried out at urban scale rapidly came into prominence as opposed to nationwide actions in the previous decade. It can be estimated that the importance of cities will be better understood in the future. In order to make contribution to the literature on the topic and similar practices in future; Chicago Climate Action Plan and Climate Change Action Plan of Gaziantep examples were investigated in detail. Some of the points asserted during the policy implementations section are thought to have a value for future research. For instance, a research could focus on *the importance of international organizations and TMNs and optimal ways to benefit from them*. Also, another research could be directed to *required institutional improvements and regulations in order to provide best conditions for carrying out climate change action planning at urban scale*.

In addition to the remarks stated above, conducting brief discussion on the research topics, which the author considers as follow-up for this thesis, would be seminal. There are various approaches in policy-making to alter anthropogenic factors. However, these approaches brought us to certain point in combating climate change until now. The importance of analyzing the underlying problems properly and performing necessary intervention has become significant. Beyond any doubt, new and more comprehensive approaches are required in order to develop more efficient environmental policies in the future. In his article, Donaghy comments on the issue

as, “the physical and economic problems posed by C.C. can neither be adopted to nor mitigated without also addressing social problems of inequalities within and between countries” (2007, pp. 3-4). At this point, it can be also argued that there is a poor relationship between scientific rational and normative values. Susskind defines optimal balance and relationship as, “scientific data are needed to inform policy-making, while policy-making and planning need to take account of the political realities that circumscribe collective action” (2010, p. 224). In conclusion, *ways, tools and, methods to develop a new approach should be investigated with considering the complexity of enhancing a balance between scientific legitimacy and political accountability simultaneously; in order to provide new and more comprehensive approaches to the cities which aims to combat climate change and grow in the future in a triumphant way*.

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APPENDIX A: ACKNOWLEDGED GUIDELINES AND PRINCIPLES FOR CLIMATE ACTION PLANS

1- Calculating Emissions

- Were GHG emissions calculated according to scientific methods and international guidelines?
- Were GHG emissions broken down by sectors?
- Were future projections and modelling made for different GHG emissions scenarios?

2- Determining and Adopting Targets

- Were possible future impacts of climate change determined?
- Were GHG reduction targets determined?
- Were short term targets for adaptation and mitigation determined?
- Were long term targets for adaptation and mitigation determined?
- Are these targets quantitative and rational?

3- Developing Action Plan

- Were previous national and international practices investigated for mitigation and adaptation?
- Were emission mitigation strategies determined?
- Were adaptation strategies developed?
- Were new or proposed actions described clearly?
- Were new or proposed actions differentiated from the existing measures?
- Were co-benefits for each action and strategy determined and considered?
- Were the stakeholders and their engagement identified?
- Were implementation program (including timeline, assignment of responsibilities etc.) clearly stated for actions?

- Were financial tools, funding resources and cost analysis clarified for actions?
- Were these actions also discussed with residents?
- Were performance metrics established for actions?
- Were recalculations made in order to eliminate double-counting?
- Is Climate Action Plan related and coherent with other sectorial plans and documents?

4- Implementing Action Plan

- Was the implementation program followed properly?
- Were necessary policy, guidance or program created to carry out Climate Action Plan principles?
- Was there any public and private partnership established during implementation?
- Was internal and external personnel training occurred?
- Were stakeholders regularly engaged throughout the process?

5- Monitoring Results

- Does municipality have any commitment in fulfilling monitoring tasks?
- Were data gathering carried out in order to enable monitoring?
- Were monitoring stages/timelines followed according to the plan?
- Did gathered data evaluated and compared to baseline statistics in order to measure performance?
- Is there any auditing made?
- Was there any improvement made based on the feedbacks and gathered data (if necessary)?

APPENDIX B: LETTERS OF APPROVAL FOR IN-DEPTH INTERVIEWS

Yüksek Lisans Araştırması Mülakatı Onay Mektubu

Orta Doğu Teknik Üniversitesi, Kentsel Politika Planlaması ve Yerel Yönetimler Anabilim Dalı'nda Yüksek Lisans öğrencisi olan Diren Kocakuşak'ın yürüttüğü araştırma kapsamında yapılacak bir mülakata katılımınız beklenmektedir. Çalışma temel olarak iklim değişikliği eylem planlaması çalışmalarının kent ölçeğinde ele alınmasına dayanmaktadır. Bu doğrultuda Gaziantep Büyükşehir Belediyesi'nin geçmişte yürüttüğü ve halen yürütmekte olduğu çalışmalar da incelenecektir. Araştırmanın tamamlanmasının ardından bulgular Diren Kocakuşak'ın yüksek lisans tezinde kullanılacaktır. Araştırmaya katılmayı kabul etmeniz halinde lütfen aşağıdaki hususlar konusunda bilgilendirildiğinizden emin olduktan sonra formu doldurunuz.

- Bu çalışmaya katılımın tamamen gönüllülük esasına dayandığı, cevaplamayı tercih etmediğim soruları cevaplamak zorunda olmadığım bana bildirildi.
- Uygun bulmam halinde mülakatı herhangi bir sebeple ve tamamlamadan yarım bırakma hakkım olduğu bana bildirildi.
- Mülakat sırasında ses kaydı tutulması durumunda, bu durum daha önceden bana bildirildi ve rızam alındı. Ses kaydı tutulmasının kabulü durumunda, kaydın isteğim doğrultusunda durdurulabileceği ve/ya kesilebileceği bana bildirildi.

Yukarıda bahsi geçen hususları anladım ve kendi rızam doğrultusunda kabul ediyorum. Bu formun bir kopyası bana verildi.

Katılımcının:

Adı ve Soyadı SAFAK TERCAN Tarih 22/10/2015

Araştırmacı:

Adı ve Soyadı Diren Kocakuşak Tarih 22/10/2015

Yüksek Lisans Araştırması Mülakatı Onay Mektubu

Orta Doğu Teknik Üniversitesi, Kentsel Politika Planlaması ve Yerel Yönetimler Anabilim Dalı'nda Yüksek Lisans öğrencisi olan Diren Kocakuşak'ın yürüttüğü araştırma kapsamında yapılacak bir mülakata katılımınız beklenmektedir. Çalışma temel olarak iklim değişikliği eylem planlaması çalışmalarının kent ölçeğinde ele alınmasına dayanmaktadır. Bu doğrultuda Gaziantep Büyükşehir Belediyesi'nin geçmişte yürüttüğü ve halen yürütmekte olduğu çalışmalar da incelenecektir. Araştırmanın tamamlanmasının ardından bulgular Diren Kocakuşak'ın yüksek lisans tezinde kullanılacaktır. Araştırmaya katılmayı kabul etmeniz halinde lütfen aşağıdaki hususlar konusunda bilgilendirildiğinizden emin olduktan sonra formu doldurunuz.

- Bu çalışmaya katılımın tamamen gönüllülük esasına dayandığı, cevaplamayı tercih etmediğim soruları cevaplamak zorunda olmadığım bana bildirildi.
- Uygun bulmam halinde mülakatı herhangi bir sebeple ve tamamlamadan yarım bırakma hakkım olduğu bana bildirildi.
- Mülakat sırasında ses kaydı tutulması durumunda, bu durum daha önceden bana bildirildi ve rızam alındı. Ses kaydı tutulmasının kabulü durumunda, kaydın isteğim doğrultusunda durdurulabileceği ve/ya kesilebileceği bana bildirildi.

Yukarıda bahsi geçen hususları anladım ve kendi rızam doğrultusunda kabul ediyorum. Bu formun bir kopyası bana verildi.

Katılımcının:

Adı ve Soyadı _____ Tarih 22.10.2015

Araştırmacı:

Adı ve Soyadı Diren Kocakuşak Tarih 22/10/2015

APPENDIX C: TURKISH SUMMARY

İnsanların doğa üzerindeki etkisi Sanayi Devrimi'nden bu yana gözle görülür bir şekilde artmıştır. Takip eden dönemde hava kirliliği, su kirliliği ve beklenmedik hava olayları gibi bazı çevresel problemlerle karşı karşıya kalınmıştır. Doğanın yaşamın devamlılığını sağlayan hizmetlerinin risk altında olduğu gerçeğinin anlaşılması ile beraber, çevre sorunları özellikle 1960 ve sonraki yıllarda uluslararası toplum tarafından tartışılmaya başlanmıştır. Çevre problemleri her ne kadar dünyanın farklı yerlerinde farklı şekillerde etkisini gösterse de, bu problemlerin ulusal sınırlardan bağımsız olan etkisi, stratejilerin ortak bir mücadele için geliştirilmesi gerekliliğini doğurmuştur.

Birçok çevresel tehdidin içinde iklim değişikliği ve küresel ısınma, insanlık tarihinin bugüne kadar karşılaştığı en yıkıcı facialardan birisine dönüşme potansiyeline sahiptir. Her ne kadar iklim değişikliğinin varlığını sorgulayanlar ve inkâr edenler olsa da, bulgular bu değişimin gezegen üzerinde ciddi ve onarılamaz sonuçlara sebep olacağını göstermektedir. Geçtiğimiz dönemde teknolojinin gelişmesi ile birlikte bilim insanları iklim değişikliğinin sebepleri ve sonuçları üzerine daha çok şey keşfetme fırsatı bulmuştur. Örneğin insan kökenli faktörlerden dolayı atmosferdeki yükselen sera gazı seviyesinin, bugün yüzleştiğimiz küresel ısınmanın temel nedeni olduğu tespit edilmiştir. Bilimsel göstergeler iklim koşullarında yaşanan bu değişimin, insan kaynaklı etkenler sebebiyle, normalde olması beklenenden çok daha hızlı bir şekilde gerçekleştiğini ortaya koymaktadır. Bununla beraber iklim değişikliğinin; deniz ve okyanus seviyelerindeki değişimler, sert hava koşulları, sel, sıcak dalgaları, hava kirliliği, su kirliliği ve su kıtlığı gibi bazı yıkıcı etkileri hali hazırda hissedilmektedir. Atmosferdeki sera gazı seviyesini düşürmek ve gelecekte yaşanması beklenen iklimsel olaylara karşı önlem almak için, uygun politikaların geliştirilmesi gerekmektedir.

Bu çalışma temek olarak kent ölçeğinde hazırlanan iklim değişikliği eylem planları üzerinde durmaktadır. Çevre ve iklim değişikliği gibi konularda yapılan benzer çalışmalarda olduğu gibi, öncelikle iklim değişikliği hakkında bazı temel bilgiler sunulmuştur. Sonrasında iklim eylem planlamasının detaylarını okuyuculara daha iyi aktarabilmek için akademik yazında yer alan bazı tartışmalara değinilmiştir. Bu çalışma kapsamında var olan planlama aktivitelerine karşı kritik bir yaklaşım sergilemek araştırmanın amaçları açısından uygun bulunmuştur. Tez kapsamında incelenen örneklerin değerlendirilmesi amacıyla "İklim Eylem Planları İçin Kullanılan Prensip ve Kılavuzlar" araştırılmış ve belirlenmiştir. Bu bağlamda Şikago İklim Eylem Planı'nın belirlenen uluslararası standartlar doğrultusunda değerlendirilmesi yapılmıştır. Temel örnek incelemesi olarak ise Gaziantep Büyükşehir Belediyesi'nin hazırladığı Gaziantep İklim Eylem Planı'nın değerlendirilmesi yapılmıştır.

Kapsamı bahsedilen araştırmanın yürütülmesinin *iklim değişikliği ile mücadele konusunda kent ölçeğinde geliştirilen stratejilerin, ulusal ve uluslararası stratejilerle kıyaslandığında gittikçe önem kazanması* düşünüldüğünde önemli olduğu ileri sürülmektedir. Bu konuda var olan örneklerin ve akademik yazının incelenmesi, araştırma sorusunun ve temel hedeflerin belirlenmesini sağlamıştır. Araştırmanın hedefleri temel araştırma sorusu ile paralel bir düşünce yapısı içerisinde belirlenmiştir. Bu bağlamda temel araştırma sorusu, "*İklim değişikliği ve politika planlaması arasındaki ilişkinin boyutu nedir ve planlama disiplini bu sorunun çözümüne ne ölçüde katkı sağlayabilir?*" olarak ifade edilebilir. Araştırmanın sistematik bir şekilde ilerlemesi ve bahsedilen araştırma sorusunun cevaplanabilmesi için üç temel hedef belirlenmiştir:

1. Kent ölçeğinde gerçekleştirilen iklim değişikliği eylem planlamasının detaylarını araştırarak uluslararası standartları belirlemek,
2. İklim değişikliği ile mücadele konusunda uluslararası ve ulusal ölçekte birçok girişim bulunmasına rağmen, günümüzde neden küresel ölçekte bir başarının henüz elde edilemediğini araştırmak,
3. Türkiye'de kent ölçeğinde geliştirilen tek örnek olan Gaziantep İklim Eylem Planı'nı değerlendirmek ve belirlenen uluslararası standartlara

uygunluğunu saptamak. Ek olarak değerlendirme sonuçlarından yola çıkarak gelecekte hem Gaziantep'te hem de başka örneklerde gerçekleşecek benzer uygulamalar için bazı önerilerde bulunmak.

Araştırma sorusu ve hedefler yukarıdaki şekilde belirlenirken, temel hipotezler "Türkiye'de iklim eylem planlamasının başarısız oluşu" üzerine kurulmuştur. Bu bağlamda birbiriyle ilişkili olarak geliştirilen iki temel hipotezden söz edilebilir. Birincisi, "*Türkiye'de geliştirilen iklim eylem planlarının iklim değişikliği ile mücadele konusunda gönüllü olarak harekete geçmekten ziyade uluslararası yükümlülükleri yerine getirmek üzere yapıldığı*" şeklinde ifade edilebilir. Diğer hipotez ise, "*Her ne kadar iklim eylem planları özenle hazırlanmış dokümanlar olarak görünse de, uygulama döneminde başarısızlıklara sebep olan bazı temel konularda eksiklikler bulunmaktadır.*" olarak belirlenmiştir.

Yukarıda bahsedilen kapsamda araştırmanın gerekliliklerini yerine getirebilmek için tarafsız bir yöntem geliştirilmeye çalışılmıştır. Araştırmada var olan gerçekler ile eylemler arasındaki nedensel ilişki kurulmaya çalışılmış ve farklı kaynaklardan elde edilen veriler araştırmaya dâhil edilmiştir. Ayrıca araştırmadaki betimleyici detayların önemi, olayların süreçler olarak ele alınması ve akademik yazın ile ilişki kurulması hesaba katılarak nitel araştırma yönteminin bu çalışma için uygun olduğu düşünülmüştür (Bryman, 2008, pp. 373-389). Araştırma boyunca akademik yayınlardan, bilimsel bulgulardan, çevrimiçi kaynaklardan ve araştırmacı tarafından yürütülen derinlemesine görüşmeler sonucu elde edilen bilgilerden yararlanılmıştır. İklim değişikliği üzerine geliştirilen akademik yazın bu çalışmada yararlanılan birincil kaynakları oluşturmaktadır. Bilimsel araştırma grupları ile birlikte IPCC ve ICLEI gibi uluslararası kuruluşların yayınladığı raporlardan faydalanılmıştır. Ayrıca, iklim değişikliği konusunda gerçekleşen son bulgulara ulaşmak ve ele alınan örnek çalışmalar hakkında güncel bilgi toplamak için güvenilir çevrimiçi kaynaklar da kullanılmıştır. Son olarak Gaziantep İklim Eylem Planı'nın incelenmesi sırasında gereken bilgilerin toplanabilmesi ve sahip olunan bilgilerin doğrulanabilmesi amacıyla Gaziantep Büyükşehir Belediyesi çalışanlarıyla derinlemesine görüşmeler gerçekleştirilmiştir. Bu kapsamda Gaziantep İklim Eylem Planı'nın geliştirilmesi sürecinde aktif olarak görev alan iki kişi çalışmaya katılmayı gönüllü olarak kabul

etmiştir. Görüşmecilerden ilki eylem planının geliştirme aşamasında, çalışmanın ana ortaklarından olan Çevre Koruma ve Kontrol Daire Başkanlığı'nın başkanlığını yürütmüştür. Bir diğer görüşmeci ise yine aynı dönemde Çevre Koruma ve Kontrol Daire Başkanlığı'nda Çevre Mühendisi olarak görev yapmış ve sürece aktif olarak dâhil olmuştur. Bahsedilen derinlemesine görüşmeler Ekim 2015'te Gaziantep'te gerçekleştirilmiştir.

Araştırma temel olarak üç bölümden oluşmaktadır. İlk bölümde iklim değişikliği konusundaki yazın ve bilimsel bulgular okuyuculara sistematik olarak sunulmuştur. İkinci kısımda "İklim Eylem Planları İçin Kullanılan Prensip ve Kılavuzlar" araştırılmış, belirlenmiş ve bulgular, Şikago ve Gaziantep örneklerinin tarafsız bir şekilde incelenmesini mümkün kılacak şekilde işlevsel hale getirilmiştir. İklim eylem planları için standartların belirlenmesi konusunda bazı uluslararası kuruluşların çalışmaları mevcuttur. Bu konuda ICLEI'nin hazırladığı "Cities for Climate Protection Milestone Guide" isimli doküman genel olarak en kapsamlı çalışma olarak nitelendirilebilir. ICLEI iklim değişikliği planlaması sürecini emisyonların hesaplanması, hedeflerin belirlenmesi, eylem planının geliştirilmesi, eylem planının uygulanması ve sonuçların gözlemlenmesi şeklinde sıralanabilecek beş temel aşamaya ayırmıştır (2012, pp. 14-15). Görüldüğü üzere iklim eylem planının geliştirilmesi bu aşamalardan sadece bir tanesini oluşturmaktadır. Elde edilen bu bilgiyi işlevsel hale getirmek için, bahsi geçen her aşamanın alt gereklilikleri yazar tarafından belirlenmiş ve bu alt gereklilikler *evet/hayır soruları* şeklinde düzenlenmiştir. Ne var ki yapılan araştırmalar sırasında bu soruları cevaplarken yararlanılan bilginin niteliğinin de hesaba katılmasının, araştırmanın tarafsız şekilde yürütülmesi açısından gerekli olduğu kanısına varılmıştır. Bir başka deyişle, soruları cevaplamak için elde edilen bazı bilgiler sınırlı delilleri barındırabileceği gibi, bazıları ise şüpheye yer bırakmayacak delilleri barındırabilecektir. Buna ek olarak, bazı soruları yanıtlamak için herhangi bir bilgiye ulaşılamaması ihtimalinin de göz önünde bulundurulması gerekliliği düşünülmüştür. Sonuç olarak, oluşturulan soruları basitçe *evet/hayır* şeklinde cevaplamak yerine, bahsedilen endişelerin giderilmesi adına sistematik bir yöntem geliştirilmiştir. Bu doğrultuda; soruları olumlu olarak cevaplamak için yeterli kanıta ulaşıldığında "*Yeterli Kanıt bulundu*", ancak ulaşılan bilgilerin tatmin edici olmadığı düşünüldüğünde "*Sınırlı Kanıt bulundu*", konu

hakkında herhangi bir bilgiye ulaşılamadığında "*Kanıt bulunamadı*" ve eğer ilgili gereklilik yerine getirilmemişse "*Tamamlanmamış aşama*" ifadeleri kullanılmıştır. Araştırmanın üçüncü kısmında ise hem Şikago İklim Eylem Planı hem de Gaziantep İklim Eylem Planı yukarıda bahsedilen yöntem çerçevesinde detaylı olarak incelenmiştir. Bu incelemeyi yapmaktaki temel amaç seçilen örneklerin güçlü ve zayıf yanlarını ortaya koyarak gelecekte gerçekleştirilecek benzer planlama çalışmalarına ışık tutmak olarak ifade edilebilir.

Yukarda bahsedilen ana konu, kapsam ve yöntem doğrultusunda bu tez çalışması, giriş ve sonuç bölümleri dâhil olmak üzere yedi bölümden oluşmaktadır. Çalışma konusunun tanıtıldığı, tezin amacı, hedefi ve yöntemlerinin ifade edildiği giriş bölümünden sonra ikinci bölümde iklim değişikliği konusu üzerinde durulmuştur. Öncelikle küresel ısınma ve iklim değişikliği hakkında bilimsel açıklamalara yer verilmiştir. İklim değişikliği, EPA tarafından Dünya yüzeyindeki ortalama sıcaklık değerlerinde devamlı olarak meydana gelen artış olarak ifade edilmiştir (2014, p. 3). Sera gazı etkisi, küresel ölçekte meydana gelen bu değişikliğin temel sebebi olarak gösterilmektedir. İnsan kaynaklı aktivitelerin bu etkiye olan katkısı da ayrıca irdelenmiştir. İklim değişikliği ise, iklimsel koşullarda meydana gelen ve uzun süreli olarak devam eden değişimler olarak ifade edilebilir. En geniş kapsamıyla bu değişikliklerin sebebi içsel veya dışsal faktörler olabilir (IPCC, 2013, p. 1450). Birleşmiş Milletler İklim Değişikliği Çerçeve Sözleşmesi (BMİDÇS) iklim değişikliğini, doğal iklimsel değişimlere ek olarak insan kaynaklı aktiviteler tarafından doğrudan ve dolaylı etkiler dolayısıyla iklimsel özelliklerde gerçekleşen uzun süreli değişimler olarak tanımlamaktadır (United Nations, 1992, p. 3). Her iki tanımda da görülebileceği üzere, hem doğal hem de insan kaynaklı faktörler bu değişimde rol oynamaktadır. Doğal faktörlere (Dünya'nın Güneş etrafındaki hareketi veya volkanik hareketler gibi) bağlı olarak yaşanan iklimsel değişimlerin daha önceki dönemlerde de gerçekleştiği bilinmektedir. Ancak bu gibi doğal faktörler, günümüzde yaşanmakta olan değişimleri açıklamak konusunda yetersiz kalmaktadır. Ayrıca iklim değişikliğinin hem sebeplerine (atmosferdeki sera gazı seviyesi vb.) hem de sonuçlarına (buzulların erimesi, sıcaklık seviyeleri, hava ve su kirliliği vb.) bakarak, karşı karşıya olduğumuz tehlikenin geçmişte yaşanılan değişimlerden farklı olduğu anlaşılabilir.

İklim değişikliği ve küresel ısınma hakkında gerekli bilgilerin sunulmasının ardından, uluslararası arenada geliştirilen iklim değişikliği politikalarının tarihsel gelişimi üzerinde durulmuştur. Bu bağlamda önemli uluslararası organizasyon ve anlaşmalardan bahsedilmiştir. Özellikle BMİDÇS'nin kabul edilmesi ve Kyoto Protokolü gibi önemli olaylar hakkında ayrıntılı bilgi verilmiştir. Ek olarak yakın Aralık 2015'te gerçekleşen Paris Konferansı ve sonuçları hakkında bir tartışmaya yer verilmiştir. Bu kısımda okuyucuyla genel olarak uluslararası girişimlerin varlığına rağmen henüz küresel bir başarı elde edilememesi konusunda bulgular paylaşılmış ve yaptırımı olan bir anlaşmanın gerekliliği ve iklim değişikliği sorununu yerel ölçekte ele almanın önemi üstünde durulmuştur. Ayrıca, kentlerin iklim değişikliği ile mücadelede önemi vurgulanmıştır. Bu bağlamda kentler, iklim değişikliği sorununun hem kaynağı hem de çözümü olarak karşımıza çıkmaktadır. Kentlerin sorunun kaynağı olarak düşünülmesinin başlıca sebepleri; kentlerin yüksek enerji tüketim oranı ve tüm emisyonların %70'inin kentsel alanlardan salgılanması (International Energy Agency, 2008, p. 179) ve dünya nüfusunun hızla artan bir şekilde kentsel alanlarda yaşamaya başlaması olarak düşünülebilir (The World Bank, 2015a; The World Bank, 2015b). İklim değişikliği ile mücadelede önemli rol oynayan bir diğer faktör olan teknolojik gelişmelerin kentlerde gerçekleşmesi ve önümüzdeki dönemde yeni gelişecek kentsel alanlarda yaşanması beklenen artış (IPCC, 2014b, p. 25) ise, kentlerin neden bu problemin çözümüne sunduğu fırsatları özetlemektedir. Son olarak iklim değişikliği ile mücadelede iki farklı yaklaşım hakkında bilgi verilmiştir. Bu çerçevede sera gazı emisyonları azaltımı ve iklim değişikliğine uyum konuları irdelenmiş ve bu konuda bazı örnekler sunulmuştur. Bu bölüm boyunca yapılan tartışmalar doğrultusunda okuyucular çalışmanın hedeflerinden birisi olan "*iklim değişikliği ile mücadele konusunda uluslararası ve ulusal ölçekte birçok girişim var olmasına rağmen, günümüzde neden küresel ölçekte bir başarının elde edilemediğini araştırmak"* konusu üzerinde düşünmeye teşvik edilmiş ve bu konudaki bulgular sunulmuştur:.

Üçüncü bölümde iklim değişikliği eylem planlaması hakkında akademik yazın araştırması sırasında elde edilen bulgulara yer verilmiştir. Giddens'ın yönelttiği "iklim değişikliği konusu kamu politikalarının ilgili her alanıyla nasıl bütünleştirilebilir?" (2008, p. 4) sorusu doğrultusunda; iklim değişikliği

mücadelesinde politika yapımının önemi vurgulanmıştır. İklim değişikliği konusunun karar vericiler tarafından sıra dışı bir konu olarak görülmesi, farklı ölçeklerde baş gösteren bazı sorunların temelini oluşturmaktadır. Bu bağlamda, daha kapsamlı bir yaklaşım ile birlikte, yeni etkileşim yolları, yeni finansman yolları ve yeni esnek mekanizmaların üretilmesi gerekmektedir (Lindfield, 2010, p. 105). İlgili tartışmadan sonra iklim eylem planının tanımı, türleri ve kapsamına yer verilmiştir. İklim eylem planları bağımsız dokümanlar olarak geliştirilebileceği gibi, diğer planlama dokümanlarıyla da bütünleştirilebilirler. İklim eylem planları özetle, iklim değişikliği ile mücadele için uygulanacak eylem ve politikaların sınırlarını çizen ve farklı ölçeklerde geliştirilebilen dokümanlar olarak tanımlanabilir. Planların genel olarak sera gazı envanteri, gelecekteki olası değişimler, hedefler, uygulama stratejileri ve izleme programları gibi bazı bölümleri ve çalışmaları barındırmaları beklenmektedir. Ayrıca bu planların hem sera gazları azaltımı hem de iklim değişikliği uyumu konularında stratejileri, sayısal ve rasyonel hedefler ile birlikte içermeleri beklenmektedir. Her ne kadar iklim değişikliği eylem planlarını geliştirmek için uyulması zorunlu olan bir kurallar bütünü bulunmasa da, bu konudaki yazın yukarıda kısaca bahsedilen süreçlerin planda yer almasının faydalı olacağını işaret etmektedir. Tez kapsamında incelenecek örneklerin belirlenmesi aşamasında yapılan araştırmada da, başarılı olarak kabul edilen planların benzer şekilde geliştirildiği saptanmıştır. Sonrasında, iklim eylem planları üzerine yapılan bu araştırmada elde edilen bulgular, araştırmanın hedeflerinden bir diğeri olan "*kent ölçeğinde gerçekleştirilen iklim değişikliği eylem planlamasının detaylarını araştırarak uluslararası standartları belirlemek*" konusu üzerinde durulmuştur. Daha önceden de bahsedildiği gibi ICLEI'nin sunduğu "Cities for Climate Protection Milestone Guide" raporunda geçen beş temel aşama esas alınarak geliştirilen *İklim Eylem Planları İçin Kullanılan Prensip ve Kılavuzlar* paylaşılmış ve sonraki bölümlerde yer verilecek örneklerin incelenmesinde faydalanılmıştır.

Şikago Eylem Planı kent ölçeğinde yapılan iklim eylem planları arasındaki en başarılı örneklerden birisi olarak dördüncü bölümde incelenmiştir. Bu planın başarılı olmasının sebeplerini ortaya koymanın tezi zenginleştireceği düşünülmüştür. Şikago kentinin iklim mücadelesindeki başarısı ve deneyimi, hem akademik çalışmalar tarafından hem de bu konuda faaliyet gösteren uluslararası kuruluşlar tarafından

belirtilmiştir (Headwaters Economics, 2012; Gregg & Hitt, 2013; Pamukçu, 2015; ICLEI USA, 2013). Bu örneğin inceleme için seçilmesinin en önemli sebeplerinden birisi de budur. Bölgede yapılan araştırmalar, iklim değişikliğinin sıcaklık, yağış rejimleri, ekosistem, su, sağlık ve altyapı gibi farklı alanlarda bazı sonuçlara sebep olacağını ortaya koymuştur. Yapılan kapsamlı çalışmalar sonucunda Şikago İklim Eylem Planı; iklim değişikliğinin yarattığı zorlukların belirlenmesi, sera gazı emisyonlarının kaynaklarının belirlenmesi, sera gazı azaltımı yapılması ve iklim değişikliğine uyumun sağlanması, konu hakkında toplum bilincinin arttırılması ve somut ve ulaşılabilir hedefler belirlenmesi gibi amaçlar doğrultusunda 2008 yılında tamamlanarak yürürlüğe girmiştir (City of Chicago, 2008, p. 10). Plan temel olarak beş ana başlıktan oluşmakta ve toplamda 35 eylem içermektedir. Bu eylemlerin 26 tanesinin sera gazı azaltımı, 9 tanesinin ise iklim değişikliğine uyum sağlanması ile ilgili olduğu saptanmıştır. Planda belirlenen hedefler Kyoto Protokolü'ndeki hedeflerle uyumlu olacak şekilde belirlenmiş ve bu doğrultuda 1990 yılı değerleri esas alınarak 2020 yılı için %25, 2050 yılı içinse %80 sera gazı azaltımı hedefi konmuştur (City of Chicago, 2008, p. 11). Ayrıca tez kapsamında yapılan detaylı inceleme sonucunda Şikago İklim Eylem Planı yapım sürecinde "İklim Eylem Planları İçin Kullanılan Prensip ve Kılavuzlar" kapsamında yer alan gerekliliklerin çok büyük bir kısmının yerine getirildiği saptanmıştır. 2010 yılında yayınlanan ve Şikago İklim Eylem Planı'nın ilk iki yılını değerlendiren ilerleme raporuna göre sera gazı azaltımı hedefinin %8'lik kısmı bu dönemde sağlanmıştır (City of Chicago Department of Environment, 2010, p. 1). Tez kapsamında yürütülen bu çalışma, Şikago İklim Eylem Planı'nın kent ölçeğinde geliştirilen iklim eylem planları arasında başarılı bir örnek olarak gösterilmesinin sebeplerini bir kez daha ortaya koymuştur. Ayrıca yapılan ayrıntılı inceleme sonucunda Şikago örneğinin; saydamlık, kamu ve özel sektör ortaklıkları ve uluslararası organizasyonlardan faydalanma gibi konularda başarılı olduğu saptanmıştır ve bu başarının planın başarısında önemli bir rol oynadığı düşünülmektedir.

Beşinci bölümde Türkiye'nin iklim eylem planı politikaları uluslararası ve ulusal ölçekte tartışılmıştır. BMİDÇS'ye yapılan bildirimlerden edinilen bilgiler doğrultusunda Türkiye'nin sera gazı envanteri ve hesaplamalar için kullanılan metodolojiler hakkında bazı bilgiler sunulmuştur. Türkiye İstatistik Kurumu'nun

(TÜİK) yayınladığı verilere göre 1994, 1999, 2001, 2008, 2009 and 2013 yılları haricinde salınan sera gazı seviyesinde sürekli olarak artış görülmüştür (Turkish Statistical Institute, 2015, pp. 1-2). Sektörlere göre dağılım incelendiğinde ise enerji sektörünün %67.8 oranla sera gazı salınımına en çok katkı yapan sektör olduğu görülmektedir (Turkish Statistical Institute, 2015). Şüphesiz ki iklim koşullarının değişimi sıcaklık, yağış rejimleri, tarım ve bitki örtüsü gibi konularda bazı değişikliklere de sebep olacaktır. Buna ek olarak olası etkilerin farklı ekonomik ve sosyal sonuçları beraberinde getirmesi de beklenebilir. İklim değişikliğinin Türkiye üzerindeki etkileri hakkında temel bulgular sunulduktan sonra, Türkiye'nin iklim eylem politikaları ikili bir yaklaşımla tartışılmıştır. Öncelikle Türkiye'nin uluslararası arenadaki politikaları kronolojik olarak aktarılmıştır. Bilindiği üzere Türkiye'nin BMİDÇS'deki konumu öncelikle hem Ek 1 hem de Ek 2 ülkesi olarak tanımlanmıştır (United Nations, 1992, pp. 23-24). Ancak Türkiye her iki listeden çıkartılması ile ilgili olarak taleplerini defalarca dile getirmiştir (Balaban & Balaban, 2015, p. 10). Bu belirsizliğin Türkiye'nin BMİDÇS ve Kyoto Protokolü'ne geç dahil olmasına yol açtığı ileri sürülebilir. Son olarak COP 7 toplantısında Türkiye'nin Ek 1 ülkesi olarak tanımlanmasına karar verilmiş ve Türkiye 189. ülke olarak 24 Mayıs 2002'de BMİDÇS'ye katılmıştır. Türkiye Kyoto Protokolü'ne ise 26 Mayıs 2009'da katılmış olup birinci (2008-2012) ve ikinci (2013-2020) dönem için herhangi bir sera gazı azaltım taahütü bulunmamaktadır. Bununla beraber, Türkiye'nin 2013 itibariyle dünya sıralamasında en fazla sera gazı salgılayan 18. ülke olduğu tespit edilmiştir (Emission Database for Global Atmospheric Research, 2015). Ulusal boyuttaki politikalar incelendiğinde ise çevre konularına karşı duyulan hassasiyetin 1980'lerde başladığı görülmektedir. Ne var ki, bu alanda somut adımlar atmak için uluslararası arenada gösterilen isteksizlik ve direnç kendisini ulusal boyutta da göstermektedir. 2001 yılında İklim Değişikliği Koordinasyon Kurulu'nun (İDDK) kurulması bu anlamda atılan ilk somut adım olarak düşünülebilir. Bu dönemden başlayarak yayınlanan 8. Beş Yıllık Kalkınma Planı (2001-2005), 9. Beş Yıllık Kalkınma Planı (2007-2013) ve 10. Beş Yıllık Kalkınma Planı'nda (2014-2018) iklim değişikliği konusuna yer verildiği gözlemlenmiştir. Ayrıca 2009 ve 2011 yıları arasında Çevre ve Şehircilik Bakanlığı tarafından iklim değişikliği ile mücadele konusunda bir dizi strateji ve eylem planı geliştirilmiştir. Bu dokümanlar arasında "Türkiye

Cumhuriyeti İklim Değişikliği Eylem Planı 2011 – 2023" iklim mücadelesi konusunda temel stratejileri barındırdığı için tez kapsamında detaylı bir şekilde tartışılmıştır. Türkiye'nin iklim eylem politikalarını uluslararası ve ulusal boyutu gözeten ikili bir yaklaşımla tartışmak tezin hipotezlerinden bir diğerinin (*Türkiye'de geliştirilen iklim eylem planlarının iklim değişikliği ile mücadele konusunda gönüllü olarak harekete geçmekten ziyade uluslararası yükümlülükleri yerine getirmek üzere yapıldığı*) doğrulanmasını sağlamıştır. Bu bağlamda, her ne kadar ulusal ölçekte bazı gelişmeler gözlemlense de bu gelişmelerin ancak uluslararası yükümlülüklerin ortaya çıkması ile yerine getirildiği öne sürülebilir. Ayrıca bu bölümde yapılan tartışmaların akışı, okuyucuları Türkiye'de kent ölçeğinde yürütülen iklim eylem planları konusuna hazırlamıştır.

Çalışmanın temel örnek incelemesi olarak Gaziantep İklim Eylem Planı altıncı bölümde ele alınmıştır. Gaziantep Büyükşehir Belediyesi'nin kent ölçeğinde iklim eylem planı geliştiren tek belediye olması bu örneğin seçilmesindeki temel sebeptir. Ne var ki iklim değişikliğinin bölgedeki olası etkileri ile ilgili bir araştırma yapılmadığından, bu bilgiler tez kapsamında sunulamamıştır. Yine de sanayi, konut, ulaşım, hizmet sektörü ve atıklar gibi konular hakkında bazı temel bilgilere okuyucuya sunulmuştur. İpekyolu Kalkınma Ajansı'nın raporuna göre Gaziantep, Türkiye'de en çok sera gazı salınımı yapan kentlerden birisidir. Sürekli gelişen sanayi, göç ve plansız kentleşme bu sorunun temel sebepleri olarak ortaya çıkmaktadır (Silkroad Development Agency, 2014, pp. 4-5). Bu soruna müdahale etmek için Gaziantep İklim Eylem Planı'nın hazırlık çalışmaları 2010 yılında başlatılmıştır. Eylül 2011'de plan tamamlanmış ve "Gaziantep İklim Değişikliği Eylem Planı: Enerji ve sera gazı emisyon profili Ön eylem planı ve Uygulama Stratejisi" adıyla uygulamaya konulmuştur. Planda belirtilen uygulamaların önemli bir kısmının 2011-2015 yılları arasında başlayacağı öngörülmüştür. Tez çalışması için ön araştırmanın Haziran 2015 tarihinde başladığı düşünüldüğünde, planın sonuçlarının incelenmesi için yeterli sürenin geçtiği düşünülmektedir. Şikago örneğinde olduğu gibi, "İklim Eylem Planları İçin Kullanılan Prensip ve Kılavuzlar" bu planın değerlendirilmesinde kullanılmış ve planın uluslararası standartlara uygunluğu araştırılmıştır. Bu araştırmada Gaziantep İklim Eylem Planı temel kaynak olarak kullanılmıştır. Buna ek olarak Ekim 2015'te, planın yapım aşamasında aktif

olarak görev alan Gaziantep Büyükşehir Belediyesi çalışanları ile gerçekleştirilen derinlemesine görüşmelerden faydalanılmıştır. Bu araştırmanın tamamlanması aynı zamanda tez için belirlenen bir başka hedef olan "*Türkiye'de kent ölçeğinde yapılan tek örnek olan Gaziantep İklim Eylem Planı'nı değerlendirmek ve belirlenen uluslararası standartlara uygunluğunu saptamak. Ek olarak değerlendirme sonuçlarından yola çıkarak gelecekte hem Gaziantep'te hem de başka örneklerde gerçekleşecek benzer uygulamalar için bazı önerilerde bulunmak*" maddesinin gerçekleştirilmesini sağlamıştır. Ne var ki araştırma sonucunda elde edilen bulgular bu örneğin uygulama sürecinin başarısızlıkla sonuçlandığını göstermektedir. Her ne kadar planın hazırlık aşamasında yerine getirilmesi önem taşıyan gereklilikler sağlanmışsa da, planda belirlenen eylemlerin çok büyük bir bölümü uygulanmamıştır. Derinlemesine görüşmeler sırasında bu başarısızlık için gösterilen temel sebeplerden birisi, Mart 2014'te gerçekleşen yerel seçimler sonucunda Gaziantep Büyükşehir Belediye'si yönetiminde meydana gelen değişikliklerdir. Ancak yapılan detaylı analiz buna ek olarak ön araştırmaların yapılması, finansal kaynakların belirsizliği ve kapasite gelişimi gibi bazı temel konularda eksikliklerin olduğunu ortaya koymuştur. Sonuç olarak, eksiklikler tespit edilen temel konulara yeterli yatırımın yapılmış olması durumunda, belediye yönetiminde gerçekleyen değişiklik sonucu ortaya çıkan sorunların aşılabileceği düşünülmektedir. Bu vesile ile tezin bir diğer hipotezinin (*her ne kadar iklim eylem planları özenle hazırlanmış dokümanlar olarak görünse de, uygulama döneminde başarısızlıklara sebep olan bazı temel konularda eksiklikler bulunmaktadır*) de doğru olduğu kanısına varılmıştır.

Gaziantep İklim Eylem Planı'nın incelenmesi sonucunda tespit edilen eksiklikler doğrultusunda bazı politika önerileri sunulmuştur. Ancak bu kısımda sunulan öneriler, sorunların önemli bir kısmının ulusal politikalardan kaynaklandığı düşünülerek, yalnızca Gaziantep Büyükşehir Belediyesi'nin yetkileri dâhilinde hayata geçirilemeyecek ulusal düzenlemeleri da içermektedir. Çalışma süresince vurgulandığı üzere, iklim değişikliği ile mücadele konusunda daha kapsamlı bir yaklaşım geliştirmek gerekmektedir. Ancak iklim değişikliği eylemlerini diğer politika alanları ile bütünleştiren bir yaklaşımın geliştirilmesi ile mevcut durumda uygulama süreçlerinde ortaya çıkan problemlerin aşılmasının sağlanabileceği

düşünülmektedir. Ayrıca kapasite gelişimi konusunda yeterli yatırımların yapılmadığı bu çalışma kapsamında tespit edilmiştir. Bahsedilen kapasite gelişiminin hem yerel hem de ulusal ölçekte sağlanmasının, yerel ölçekte geliştirilecek uygulamaların ulusal kaynaklar tarafından desteklenmesini sağlayacağı öne sürülebilir. Son olarak iklim değişikliğinin Türkiye'de siyasi partiler üstü bir konu olarak algılanmaması gerekliliği tartışılmıştır. Tez çalışması daha sonra gerçekleşebilecek benzer araştırmalar için bazı notlar sunularak sonlandırılmıştır. Şüphesiz ki, iklim değişikliği konusunda aktif şekilde uygulama ve politikalar geliştirmek suretiyle, gelecekte sürdürülebilir bir şekilde gelişmeyi hedefleyen kentler için yeni yaklaşımların, yöntemlerin ve araçların geliştirilmesi oldukça önemlidir.

APPENDIX D: TEZ FOTOKOPİSİ İZİN FORMU

ENSTİTÜ

Fen Bilimleri Enstitüsü	
Sosyal Bilimler Enstitüsü	x
Uygulamalı Matematik Enstitüsü	
Enformatik Enstitüsü	
Deniz Bilimleri Enstitüsü	

YAZARIN

Soyadı : Kocakuşak
Adı : Diren
Bölümü : Kentsel Politika Planlaması ve Yerel Yönetimler

TEZİN ADI (İngilizce) : Combating Climate Change: Critical Evaluation of Climate Change Action Plans on Urban Scale

TEZİN TÜRÜ : Yüksek Lisans [x] Doktora [ ]

1. Tezimin tamamından kaynak gösterilmek şartıyla fotokopi alınabilir. [ ]
2. Tezimin içindekiler sayfası, özet, indeks sayfalarından ve/veya bir bölümünden kaynak gösterilmek şartıyla fotokopi alınabilir. [ ]
3. Tezimden bir bir (1) yıl süreyle fotokopi alınamaz. [x]

TEZİN KÜTÜPHANEYE TESLİM TARİHİ: