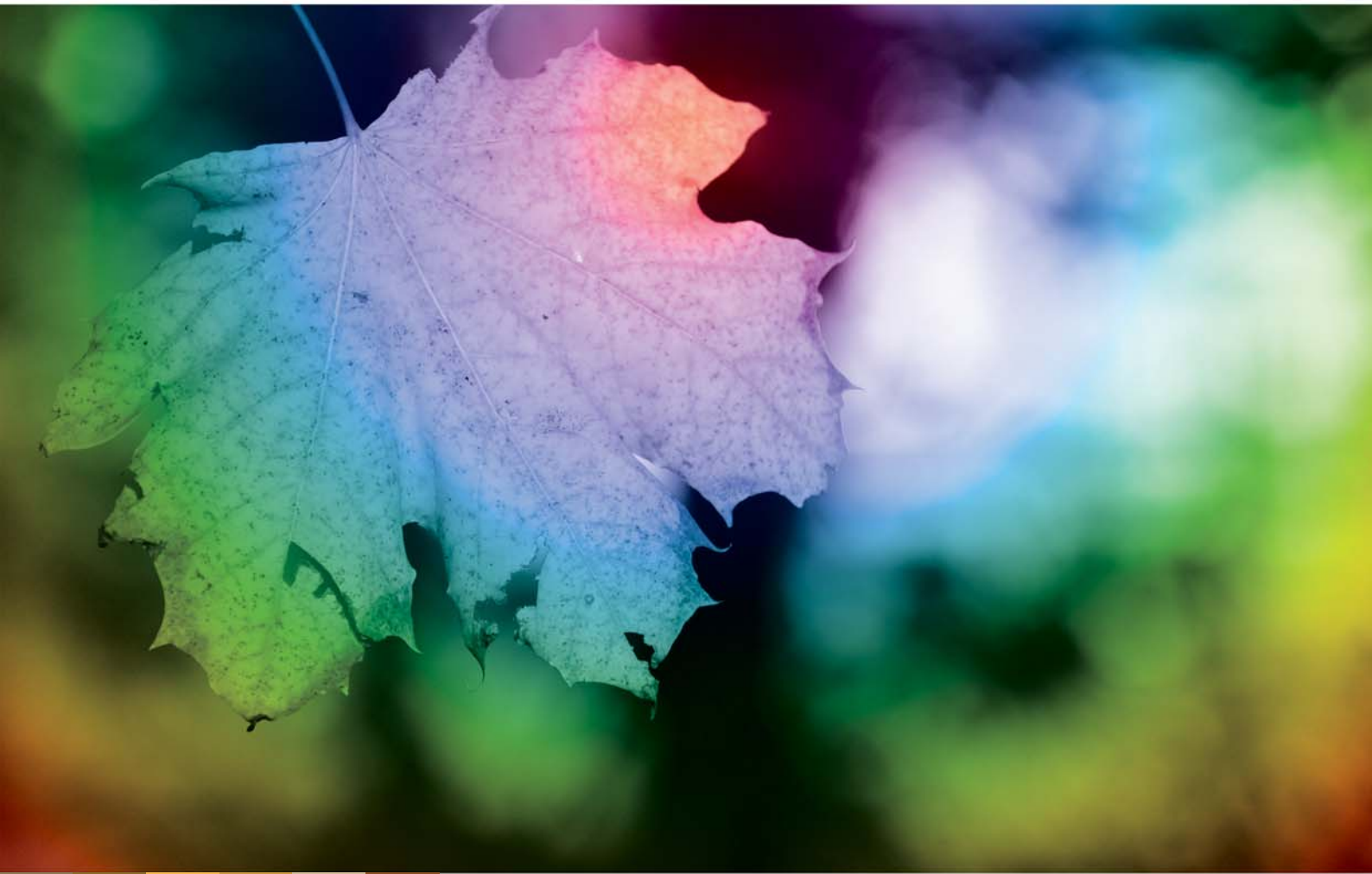


Enhancing the Capacity of Turkey to Adapt to Climate Change

Participatory Vulnerability Analysis



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Enhancing the Capacity of Turkey to Adapt to Climate Change

Participatory Vulnerability Analysis

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Abbreviations

IPCC	Intergovernmental Panel on Climate Change
Km	kilometer
Km ²	Square kilometer
MDG-F	Millennium Development Goals Achievement Fund
MEU	Ministry of Environment and Urbanization
MFAL	Ministry of Food, Agriculture and Livestock
PVA	Participatory Vulnerability Analysis
TURKSTAT	Turkish Statistical Institute
UN	United Nations
UNDP	United Nations Development Programme
UNEP	United Nations Environment Programme



Understanding Vulnerability

1.1 Introduction

In the Fourth Evaluation Report of the Intergovernmental Panel on Climate Change (IPCC) it is indicated that a 1°C - 2°C increase in temperatures in the Mediterranean basin would be observed, that aridity will be felt in an even wider area, and heat waves and the number of very hot days will increase especially in inland regions. For Turkey, on the other hand, the average increase in temperatures is estimated to be around 2.5°C - 4°C, reaching up to 5°C in inner regions and up to 4°C in the Aegean and Eastern Anatolia. The IPCC report and other national and international scientific modeling studies demonstrate that Turkey in near future will get hotter, more arid and unstable in terms of precipitation patterns.

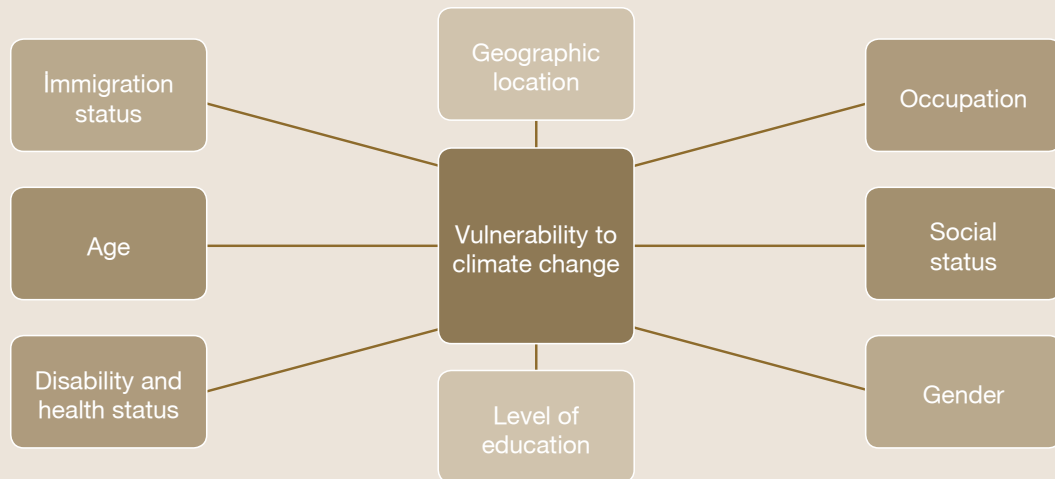
Turkey's First National Communication on Climate Change prepared in 2007 indicates the impacts of climate change in Turkey as; increasing summer temperatures, decreasing winter precipitation in western provinces, loss of surface water, increased frequency of droughts, land degradation, coastal erosion and floods. This situation is expected to have; negative impacts on water and soil resources that are necessary for food production and security and therefore on development estimates in rural areas, and; gradual increase of these impacts' severity. It is anticipated that 50% of the surface waters in the Gediz and Greater Menderes Basins will be lost by the end of the century and that water scarcity will be faced in agricultural, domestic and industrial water usages.

Diminishing water resources, forest fires, aridity, desertification and ecological degradation linked to these are the impacts of climate change that are evident in Turkey. Climatic forecasts that are carried out within the scope of the UN Joint Program on Enhancing the Capacity of Turkey to Adapt to Climate Change also produced similar outputs to support other work, indicating noticeable temperature increases and a precipitation regime that can impact all economic sectors, all settlements and climate-related natural disaster risks. The latter, in other words, is the alteration of the water cycle.

1.2 What is Vulnerability?

Vulnerability can be defined as the degree to which a person, system or unit is likely to experience harm due to exposure to perturbations or stresses.

Figure 1: Determinants of Vulnerability





2

Participatory Vulnerability Analysis (PVA)

Participatory Vulnerability Analysis (PVA) has been carried out at local level as one of the main activities which have been realized in order to determine the impacts of the climate change and to put forward the vulnerable areas in Turkey.

Participatory Vulnerability Analysis has been realized in the context of UN Joint Programme on Enhancing the Capacity of Turkey to Adapt to Climate Change which has executed under the coordination of Ministry of Environment and Urbanization. In the process of the Participatory Vulnerability Analysis which was realized in 2009 and 2010, vulnerabilities against the impacts of climate change were determined at local level in 11 provinces that were chosen; the impacts on relevant sectors or themes in changing climate conditions were analyzed; sustainability levels of ecosystem services and natural resources were examined as much as possible and preparedness level against natural disasters originating from the climate was observed.

The fact that Turkey is a notably broad country in geographic aspect and has many environmental and climatic varieties has necessitated that certain studies are carried out at the local level in order to make effective contributions to the preparation process of National Climate Change Adaptation Strategy and Action Plan.

1

The reader is referred to the Resource Guide for a glossary of terms, bibliography, and additional details regarding the stages of the PVA undertaken in Turkey.

2.1 Scope

This report provides a summary of findings from a Participatory Vulnerability Analysis (PVA) that was carried out in several regions in Turkey during the period November 2009 through January 2010. PVA is a systematic process that involves local communities and other stakeholders in a rapid examination of their vulnerability to climate change, and at the same time facilitates the identification of actions that can reduce local vulnerability to climate change. This PVA process seeks to analyze root causes of community vulnerability through a fourfold focus on climatic hazards, factors that make people vulnerable to climate change, levels of adaptive capacity, and local strategies to cope with a changing climate.

The results of the PVA represent an important input to the development of a national adaptation strategy for Turkey. The findings of the assessment provide insight into the sectoral, geographic, and socioeconomic diversity of Turkey's vulnerability to climate change. At the micro level, such information is vital to better understanding the local climate change vulnerability situation, and hence to identify and prioritize adaptation strategies. At the macro level, such information is essential to the development of a national policy framework for managing the risks associated with climate change.

This report describes the methodology, conclusions, and recommendations associated with the PVA. This report outlines the methodological basis for the assessment, including major goals, site selection criteria, stakeholder engagement, and the overall assessment process. Moreover the report describes the implementation modalities for the PVA including the regional context of each of the PVA sites, logistical arrangements, and information solicitation framework. In addition to that, the key findings of the PVA are discussed and summarized in a series of vulnerability maps and discussion of coping and adaptation strategies. The report describes how the PVA results are planned to be integrated into the wider national climate change adaptation strategy development process. Finally, last section offers concluding observations and parting thoughts.

2.2 Methodology

The basis for the PVA process undertaken is based on the methodology described in "Assessing Vulnerability to Climate Change in Turkey: A Resource Guide for Participatory Vulnerability Analyses" and reviewed during a training workshop held in Ankara during 11-12 November 2009. Underpinning the methodology is the premise that communities know their situations best and the development of a national adaptation strategy should be built on a synthesis of pertinent local knowledge concerning socioeconomic conditions, current climatic hazards, major vulnerabilities, and evolving coping strategies.

2.3 Aims, Goals, and Outcomes

The ultimate aim of the PVA process was to contribute to the formulation of a National Climate Change Adaptation Strategy for Turkey. Through a series of local consultations, the PVA process sought to identify the various dimensions of how communities and provinces in Turkey are vulnerable to climatic variability as well as how coping strategies are emerging in the face of intensifying climate hazards. Specifically, Turkey's PVA process had the following major goals:

- Assess the local climate change vulnerability situation and gauge local understanding of climate hazards;
- Analyze the causes of current and anticipated vulnerability;
- Assess local adaptation capacity (identify current coping strategies/mechanisms, assessment of effectiveness/shortcomings);
- Identify barriers to adaptation/coping (financial, material, knowledge, institutional, political);
- Develop a set of potential adaptation strategies; and
- Integrate findings and recommendations of the PVA into the process for the development of a national adaptation strategy for Turkey.

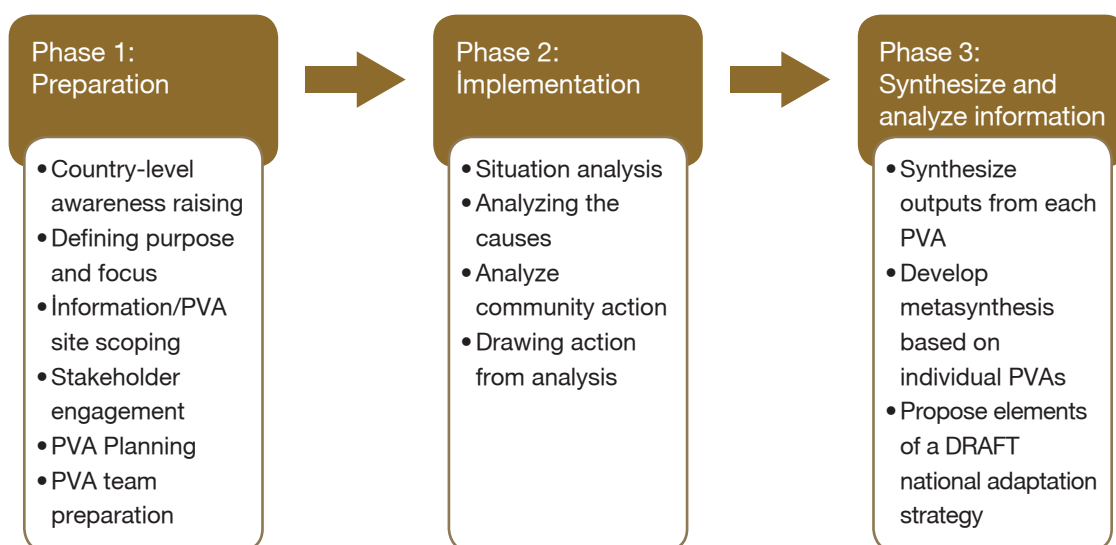
PVA process has contributed to the development of an adaptation action plan on the basis of the PVA itself in conjunction with additional baseline documents, discussion papers, and technical reports. This action plan has integrated into the national adaptation strategy.

2.4 Overall Approach

The overall approach for the PVA undertaken in Turkey consisted of three major phases as illustrated in Figure 2 and briefly described in the bullets below:

- **Preparation:** This phase was addressed directly through targeted training on PVA methods and tools to equip the project team undertaking the assessment. It was also addressed indirectly through a series of preparatory workshops that were held throughout 2009 in order to sensitize project staff to the link between vulnerability and adaptation to climate change.
- **Implementation:** The implementation phase involved the actual execution of the PVA itself by a 3 to 6 person team in a total of 11 provinces around Turkey. Activities involved the identifying/ recruiting stakeholders, conducting stakeholder workshops/consultations over a 2-day period, and documenting risks, strategies, and opportunities in each location.
- **Synthesis:** This synthesis phase involved the systematic review of the outputs from all 11 PVA workshops to identify major insights, overlapping concerns, and potential lessons for the development of a national adaptation strategy.

Figure 2: Major Phases of the PVA Undertaken in Turkey



2.5 Assessment Framework

The assessment framework for the PVA consisted of four key elements designed to elicit highly targeted information about vulnerability through facilitated stakeholder group discussions. These elements are briefly outlined in the bullets below.

- **Vulnerable situation assessment:** This involved an assessment of the prevalence, extent, frequency of vulnerability based on a review of site-specific studies, reports, and governmental information. This analysis was carried out prior to arrival at the PVA site and was intended to inform initial project team perspectives on current climatic threats and potential vulnerability. As such, it represented an initial basis for exploration regarding how well current programmes/policies are implemented, whether they reduce vulnerability or are in fact maladapted to a changing climate, whether certain sectors or areas of the province are more vulnerable than others and why, whether hazard preparedness is sufficient and if not, what's missing, etc.
- **Vulnerability cause assessment:** This involved an assessment of the range of internal and/or external pressures faced by the communities that contributed to overall vulnerability. The scope of these pressures was climatic in nature, as well as socioeconomic, ecological, demographic, as appropriate. For each major type of pressure identified, the project team sought to identify, understand and prioritize the root causes of the pressure and how it was being perceived as a contributor to increasing vulnerability to climatic risks.
- **Coping strategy assessment:** This involved an assessment of community/provincial action to cope with current climatic hazards (i.e., coping strategies). It also involved an assessment of household/community level ability to react to evolving climatic hazards so as to reduce the likelihood of the magnitude of their harmful outcomes (i.e., adaptive capacity). Baseline information was also collected on the sources, assets, entitlements external assistance (if any), etc that are used to reduce local vulnerability.
- **Future action assessment:** This involved an identification of potential adaptation actions favored by local stakeholders, together with a first-cut effort at prioritizing such interventions and the identification of the responsible parties - both local and federal authorities - that would be implicated for implementation, as well as the potential barriers/challenges for implementation.

2.6 Site Selection

Turkey is divided into seven geographical regions. These are called Marmara, Aegean, Mediterranean, Black Sea, Central Anatolia, Eastern Anatolia, and Southeast Anatolia. These regions were designated in 1941 according to their climate, location, flora and fauna, human settlements, agricultural diversities, transportation facilities, and topography. Moreover, Turkey is also divided into four major terrestrial ecosystems. It is characterized by ample arid and semi-arid areas having mostly a dry and semi-dry climate. About 25% of Turkey's surface area is forested (i.e., conifer, temperate broadleaf, mixed forests) around half of this area is extremely fire-sensitive (i.e., woodlands and scrub) due to the degraded forest areas and climatic characteristics. Maps of geographical regions and major ecosystems are provided in Figure 3.

Figure 3 A: Geographical Regions of Turkey



Figure 3 B: Terrestrial Ecosystems of Turkey



these geographical regions and terrestrial ecosystems, Turkey is administered into a total of 81 provinces. Given time and budget resource constraints of the PVA process, it was impossible to conduct participatory vulnerability analysis in each of these provinces. Therefore, specific site selection criteria - three in all - were developed and applied to select the most potentially representative locations. A summary of these site selection criteria is outlined below.

- **Vulnerability to climate change:** This corresponded to broad regional vulnerability indicators that were developed by the Eurasia Institute of Earth Sciences of Istanbul Technical University-İTÜ, as part of UN Joint Programme on Enhancing the Capacity of Turkey to Adapt to Climate Change activities, and considering regions/provinces that are well known to be vulnerable to the effects of climate change (e.g., coastal areas).
- **Strategic value:** This corresponded to the potential advantage of certain provinces due to the presence of technology and business development centers with joint service areas with universities, availability of research organizations/institutes directly/indirectly concerned with climate change, presence of TURKSTAT (Turkish Statistical Institute) Regional Directorates, status as an economic Free Zone or Specially Protected Area, and operational nature of Environmental Management Plans.
- **Logistical support availability:** This corresponded to the presence of regional Directorates associated with key government agencies (i.e., Regional Directorate of State Hydraulic Works, Regional Directorate of Forestry, Regional Directorate of Transport, Regional Directorate of Meteorology, and Regional Directorate of Food, Agriculture and Livestock), as well as the presence of regional Development Agencies. Such institutional infrastructure was a proxy for reasonable confidence in the potential convenience of workshop arrangements and accessibility to key stakeholders.

Each of Turkey 81 provinces was evaluated relative to the above criteria. It is important to note that the evaluation process was consultative in nature, relying on the iterative perspectives of the project team members and the wider UNDP and UNEP experts in Ankara, rather than relying on a strict multi-criteria assessment process with discrete weighting and scoring which would typically be used in evaluations of this kind.

This consultative evaluation process offered the advantages of streamlining the process and making the process amenable to iteration. After extensive deliberations and review over a 2-week period, a total of 11 provinces, with at least one location per region, were selected for the PVA process. These locations and the actual dates the project team undertook the PVA process are illustrated in Figure 4 and Table1.

Figure 4: PVA Workshop Locations in Turkey



Table 1: Locations, Dates and Properties of PVA Process in Turkey

PVA Location	Province	Region	Dominant Sector	Representing Characteristics	Dates
1	Tekirdağ	Marmara	Agriculture	Representing Thrace Region; coastal zone; inland sea; flood experienced (2008); intensive urbanization (pressure on water resources).	17-18 November 2009
2	Trabzon	Black Sea	Fisheries, Forestry, Energy	Representing Thrace Region; coastal zone; inland sea; flood experienced (2008); intensive urbanization (pressure on water resources).	24-25 November 2009
3	Kastamonu	Black Sea	Forestry	Representing Western Black Sea Region; protected areas; biodiversity; ecosystem services; migration.	24-25 November 2009
4	Kars	Eastern Anatolia	Animal Husbandry, Agriculture	Representing Northeastern Anatolia; one-way economic activity.	2-3 December 2009
5	Sivas	Central Anatolia	Agriculture, Animal Husbandry	Representing Central Anatolia; intersection of seven river basins; large surface area.	7-8 December 2009
6	Şanlıurfa	Southeastern Anatolia	Agriculture	Representing Southeastern Anatolia; flood experienced lately; drought	15-16 December 2009
7	Van	East Anatolia	Agriculture, Animal Husbandry, Fisheries	Representing Eastern Anatolia Region; Turkey's largest inland water ecosystem; strong link of economic activities and natural resources.	28-29 December 2009
8	Antalya	Mediterranean	Tourism, Forestry,	Representing Mediterranean Region; coastal zone; changing summer/winter population; expected to be affected by rising temperatures most.	5-6 January 2010
9	Eskişehir	Central Anatolia	Agriculture	Representing Central Anatolia; pressure on water resources; urbanization; high young population; strong NGO background	5-6 January 2010
10	Samsun	Black Sea	Industry, Fisheries	Representing Central Black Sea Region; coastal zone; hosting two important delta.	11-12 January 2010
11	İzmir	Aegean	Tourism, Industry, Agriculture, Fisheries	Representing Aegean Region; metropolitan; fast urbanization; migration.	14-15 January 2010

2.7 Stakeholder Identification and Engagement

The PVA process was premised on the need for active involvement of local stakeholders to address a topic - climate change adaptation - that was fairly new to them. This was considered an essential component of the PVA methodology since consensus priority areas for adaptation action can emerge as stakeholders share their understanding of climate and development issues through facilitated consultations.

A wide spectrum of relevant stakeholders was identified and invited to participate in the PVA workshops. Primarily, this consisted of regional policy makers, scientists, administrators, grass roots community representatives, and project/programme managers in the economic sectors most at risk (see Box 1 for an overview of stakeholder composition).

The host regional stakeholder institution was the Provincial Directorate of the Ministry of Environment and Forestry with its former name in all provinces except Tekirdağ where the PVA workshop was hosted by the Tekirdağ Municipality.

There was relatively good stakeholder diversity in each of the 11 PVA workshops. The representation of local communities in each PVA workshop was ensured through two indirect means.

1. Government stakeholders had longstanding contact with local farmers, people dealing with animal husbandry, and businesses through their extension and development activities and hence provided a reasonably good proxy of information about local livelihoods, coping strategies, major climatic hazards, problems, etc.
2. To compensate for the lack of direct access to the grassroots context, the PVA project team availed itself of as much local information as possible (e.g., statistical bulletins, project reports, socioeconomic studies, etc) in advance of the process and during the period over which the PVAs were conducted. Reported vulnerabilities through stakeholder consultations were cross-checked against these local technical sources and showed, for the most part, a good correlation. Participant-identified hazards were similarly cross-checked for consistency and accuracy against local government reports.

Box 1: Stakeholder composition

The following major stakeholder groups were represented in the PVA process.

- Provincial Directorates (with their former names Provincial Directorates of Environment and Forestry, Agriculture and Rural Affairs, Industry and Trade, Health, Culture and Tourism)
- Regional Directorates (Hydraulic Works, Meteorology, Forestry, Transport)
- Provincial Chambers (Agriculture, Trade and Industry)
- Directorates of Free Zone
- Governorates
- Technology development centers and research institutes (Soil and Water, Pest Control, Agricultural Research, Vine Cultivation, Statistics)
- Regional service and development organizations
- Municipalities (water/sewerage administrations)
- Non-governmental organizations
- Academic institutions (state-owned, private)

The dialogue between the project team and local participants was participatory, designed to explore and illuminate local conditions and issues. Stakeholder engagement was high as stakeholders were readily forthcoming in their perspectives and the quality of information was consistently insightful regarding local vulnerabilities and adaptation-related concerns.





3 Implementation

The actual implementation of the PVA process required a good understanding of the regional context for each location, as well as planning for the meeting logistics and a structured agenda for undertaking the stakeholder consultations. Each of these elements is briefly described below.

3.1 Context for Site Visits

Prior to arrival at the meeting locations, advance preparatory work had been undertaken to acquaint team members with the major characteristics of the regions. Relevant information is summarized for each location in the subsections below. The sources for this information are readily available background reports on culture, geography, history, and natural resources.

3.1.1 Tekirdağ

Tekirdağ is located in the Marmara Region including the Ergene and the Istranca areas with a total area of 6,200 km². It is located along the Marmara coast where the Örneklidere River flows into the sea, positioning the province both at the base of the valley and on the hillside. Tekirdağ neighbors Istanbul province to the east, the Marmara Sea to the southeast, Gelibolu district of Çanakkale province to the south, Edirne province to the west, and Kırklareli province to the north.

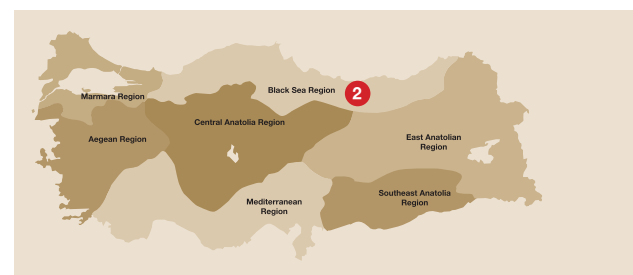
The most important mountains in the province are the Tekir Mountains, which are partly forested. These mountains start from the town of Kumbağ to the Gelibolu land bridge and lies 60 kilometer parallel along the Marmara Sea. North from Çerkezköy District are the Istranca Mountains and the Ganos Mountain with an altitude of 945 meters-- the highest point of Tekirdağ. With the exception of these two mountain ranges, the province is mostly plains. There are eight districts in the Tekirdağ province located in the Thrace: Çerkezköy, Çorlu, Hayrabolu, Malkara, Marmara Ereğlisi, Muratlı, Saray and Şarköy.



3.1.2 Trabzon

Trabzon province is located in the Eastern Black Sea Region. It is surrounded by the Eynesil district of Giresun province to the West, the Torul district and central districts of Gümüşhane province and Bayburt province to the South and the İkizdere and Kalkandere districts of Rize province to the East. Trabzon has a coastline of approximately 135 km along the Black Sea to its north. Including its central districts, Trabzon province has a total of eighteen districts.

Trabzon has a surface area of 4,700 km², representing 6% of Turkey's area. The elevation of the province starts at sea level and reaches 3,000 meters at its southern border. Except for the littoral zone, the province is mostly mountainous with hills and plateaus in the midlands. Parallel to the coastline, between the Çoruh Valley and the Melet Creek, Trabzon province has 325 kilometer plateau that is cut by the Çoruh-Kelkit Valley in the south. Within these natural topographic boundaries, the famous Zigana Passage at 2,000 meters above sea level links Eastern Anatolia to the Black Sea. Following the Zigana Passage, the Harşit and Çoruh Valleys and the Kop Passage links the region to Erzurum province.



3.1.3 Kastamonu

Kastamonu province is situated in Western Black Sea Region and is surrounded by Sinop province in the east, Çankırı province in the south, Çorum province in southeast, the Black Sea to the north, Bartın province in northwest and Karabük province in the west. Kastamonu has 20 districts including its Centre district, one town (Ortalıca) and 1,071 villages—the second most in the country. Within these villages are 2,558 settlements. Kastamonu is fairly mountainous with the Küre Mountains (İsfendiyar Mountains) to the north along the coast, and the İlgaz Mountains to the south towards Çankırı and Ankara. Kastamonu has a 170 kilometer coast line along the Black Sea, elevated at 780 meters above it.

Kastamonu covers 1.7% of Turkey's land with a surface area of 13,100 km². Of this area, 74.6% of is mountainous and forested, 21.6% is plateaus and 3.8% is plains. The İlgaz and Küre Mountains are well known for their natural beauty. The Yaralıgöz Hill (1,985 meters) and the Dikmen Hill (1,675 meters) are the highest hills in the Küre Mountains range. Büyük Hacet (2,587 meters) and Küçük Hacet (2,313 meters) are the highest hills on İlgaz Mountains. Apart from these mountains Hasan Mountain, Kar Yatağı Mountain, Ballıdağ Mountain (1,698 meters), Bacak Mountain (1,736 meters), Aylı Mountain (1,500 meters), Köklüce Mountain, and Dikmen Mountain are also important mountains.

Given the ratio of mountains and plateaus to plains, there is not a lot of arable land. A few important plains do, however, support agriculture. The Gökırmak and Tosya which include the Daday and Taşköprü plains and the Devrez valleys include agricultural areas and the areas suitable for plantation around the creek beds of Araç, Cide and Devrekâni. Important rivers include the Araç Creek that is formed by stream flow from the İlgaz Mountains; the Devrekâni Creek from the Küre Mountains and Gökırmak Creek that joins with Kızılırmak River after passing Taşköprü.



3.1.4 Kars

Kars province is located in the north eastern section of the Eastern Anatolia Region. In Kars, there are eight districts including the Centre district, six sub-districts, ten municipalities and 384 villages. Kars has a surface area of 9,400 km² covering 1.2% of the country's total area; of the province's total area, 51% is plateaus, 19% is plains, and 30% is mountainous areas and hills. The province has an elevation of 1,768 meters. Kars neighbors Armenia to the East, Ağrı and Iğdır provinces to the South, Erzurum province to the West, and Ardahan province to the North of the region.



3.1.5 Sivas

Sivas is located in the centre of the Anatolian Peninsula in Central Anatolia Region in the Upper Kızılırmak River area. Sivas neighbors Erzincan province in the east, Malatya and Kahramanmaraş provinces in the south, Kayseri province in southwest, Yozgat province in the west, Tokat and Ordu provinces in the north and Giresun province in northeast. Several key mountain ranges can be found in Sivas province, including the Köse Mountains, Tecer Mountains, Akdağ Mountains, İncebel Mountains and Yama Mountain. Several rivers are also within Sivas, including Kızılırmak River, Yeşilırmak River, Kelkit Creek, Tozanlı Creek, Çaltı Creek, and Tohma Creek.



Sivas has a surface area of 28,500 km²; the second largest in the country. According to the 2000 population census, the total population of the province is 794,881. Sivas has 17 districts: Akıncılar, Altınyayla, Divriği, Doğanşar, Gemerek, Gölova, Gürün, Hafik, İmranlı, Kangal, Koyulhisar, Suşehri, Şarkışla, Ulaş, Yıldızeli, Zara and Centre District; 46 municipalities, and 1,237 villages. The economy has traditionally been based on cereal production and other agriculture; it has been expanding to include a manufacturing industry of rugs, bricks, cement, and cotton and woolen textiles outside the capital city.

3.1.6 Şanlıurfa

Şanlıurfa that is located in the Central Fırat Section of South Eastern Anatolia, surrounded by Mardin province to the east, Diyarbakır province to the northeast, Adıyaman province to northwest, Gaziantep province to the west and Syria and Toros Mountains to the south. The mountains and high hills that lie in the northern areas of the province have an average elevation of 518 meters. Apart from these mountainous areas in the northeast, the province's highest point is Karacadağ, a passive volcano in the northeast at 1,919 meters.

The city of Şanlıurfa is in South Eastern Anatolia Region in the centre of the South Eastern Anatolia Project (known as GAP). Şanlıurfa, one of the oldest settlements of Mesopotamia has had a strategic importance throughout history due to its proximity to rivers and location at the intersection point of trade routes. Moreover, Şanlıurfa is situated on the historic Silk Road and is one of the most important cities where the South Eastern Anatolia Project has been implemented. All indication point to this city remains important in the future given the rapid increase in industrial and agricultural investments and high rates of productivity. The districts of Şanlıurfa are Akçakale, Ceylanpınar, Hilvan, Viranşehir, Birecik, Halfeti, Siverek, Bozova, Harran and Suruç.



3.1.7 Van

Van province is in the most eastern part of Turkey. Van is surrounded by Iran to the east, Hakkâri and Şırnak provinces in the south, Siirt and Bitlis provinces in the southwest, Van Lake and Bitlis province in the west and Ağrı province in the north. Van includes the Van Lake, Anatolia's largest closed basin with productive lands, many rivers and suitable climatic conditions. The primary livelihoods include animal husbandry, beekeeping, carpet sales and fisheries. Van province has a surface area of 19,069 km² which constitutes 2.5% of Turkey's area. The districts of Van are Bahçesaray, Edremit, Muradiye, Başkale, Erciş, Özalp, Çaldıran, Gevaş, Saray, Çatak and Gürpınar.



3.1.8 Antalya

Antalya is surrounded by the Mediterranean Sea to the south and is a neighbor to Muğla, Burdur, Isparta, Konya and İçel provinces from west to the east respectively. The Antalya Region provides us with a lot Turkish history and has been named as the Turkish Riviera due to its archaeological heritage. Antalya maintains its importance of today as an economic and tourism hub for the country.

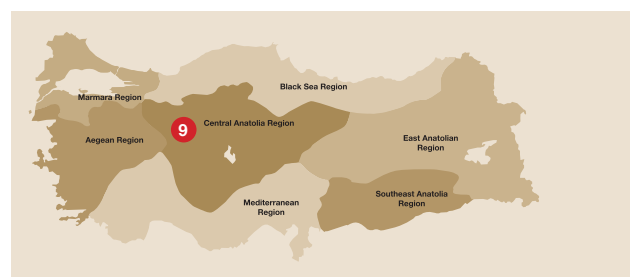
Antalya has a beautiful, 640 kilometer long coastline along the Mediterranean coast, embellished with antique cities, mausoleums, ports, beaches, forests, tropical plants, rivers and waterfalls. Behind these coasts lie the snowy Toros Mountains. With its 20,591 km² surface area, it constitutes 2.6% of the country. The districts of Antalya are Akseki, Alanya, Elmalı, Finike, Gazipaşa, Gündoğmuş, İbradı, Kale, Kaş, Kemer, Korkuteli, Kumluca, Manavgat and Serik. The population density of Antalya is higher in coastal areas compared to inner sections except for the Elmalı and Korkuteli plains, which are areas with a high population density.

The Antalya Plain and the West Toros Mountains form the geomorphological structure of the province. The mountains are covered with shrubs, and forests in coastal and inland areas. As the plains are narrow and mountainous areas are wide, more than half of the rural settlements in the Province are at the base of the mountains. The forests play an important role in this settlement arrangement: approximately 80% of the villages are located either in the forests or by the forests. In Antalya, the Mediterranean climate and the plateau climate converge allowing plants of both a Mediterranean climate and plateau climate to grow.



3.1.9 Eskişehir

The history of the city of Eskişehir dates back to the Hittite Empire, which founded the first political block in Anatolia. Eskişehir province is geographically situated in the northwest of Central Anatolia Region, and neighbors Bolu province to the north, Ankara province to its east, Konya and Afyonkarahisar provinces to its south and Kütahya and Bilecik provinces to its west. The districts of Eskişehir are: Central District, Alpu, Beylikova, Çifteler, Günyüzü, Han, İnönü, Mahmudiye, Mihalgazi, Mihaliççık, Sarıcakaya, Seyitgazi and Sivrihisar.



3.1.10 Samsun

Samsun province is located between the Yeşilirmak and Kızılırmak Rivers deltas at the Black Sea. Its neighbors are the Black Sea to its north, Ordu province to its east, Sinop province to its west, Tokat and Amasya provinces to its south and Çorum province to its southwest. It has a surface area of 9,579 km² with three different land cover characteristics in terms of its landforms. The first is the mountainous section to its south, the second is the plateaus that fall between the mountainous area and the coastal strip and the third is the coastal plains between the plateaus and the Black Sea. The Bafra and the Çarşamba Plains that have the highest agricultural potential of Turkey exist in the coastal plains formed in the deltas of Kızılırmak and Yeşilirmak Rivers.



Its surface area is 13,652 km², with terrain dominated by plains in the Sakarya and Porsuk basins and the mountains that surround these basins. The basin plains are surrounded by the Bozdağ and Sündiken mountains to the north and the Türkmen Mountain located in the east of Central Western Anatolia Threshold. The mountains make up 22% of Eskişehir provincial area. Among the most important are Bozdağ, Sündiken, Sivrihisar and Türkmen Mountains. The highest point within the province is the summit of the Türkmen Mountain at 1,825 meters. The province's longest river is the 460 km long Porsuk Creek that is a bayou of the Sakarya River.

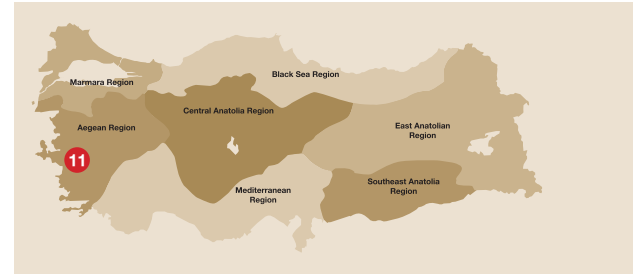
3.1.11 İzmir

Izmir is to the west of the Anatolian Peninsula, surrounded by the Aegean Sea to its west, neighbors Balıkesir province to its north, Manisa province to its east and Aydın province to its south. İzmir has 28 districts with a total population of 3,739,353 according to the 2007 census.

The province is affected by the Mediterranean climate with hot and arid summers and mild and rainy winters. Hot and arid summers result in shrubs that have spread to the hillsides at low elevations. İzmir has a long coast at the Aegean Sea. With the climate being suitable, İzmir has a long sea season. Average water temperature is above 20°C during eight months of the year.

Izmir has a surface area of 11,973 km² and is surrounded by the Madran Mountains to the north, Kuşadası Gulf to the south, the Tekne Ness of the Çeşme Peninsula to the west and the Aydın-Manisa province borders to the east and joining the Gulf of İzmir to the west. The highest point of İzmir (Karatepe) is the Yamanlar Mountain reaching 1,075 meters and the range of the mountain's hills. The Yamanlar mountain range continues with the Dumanlı and Kara Hasan Mountains to the north. The productive plains and valleys between the mountains ensure that the mild coastal climate is effective in the inner sections as well.

The geographical location of İzmir and its coastline, in particular, make it quite suitable for tourism activities and settlements. The numerous bays, shores and beaches also are well suited for fisher-settlements and yacht docks.



3.2 Meeting Logistics and Operations

Each PVA workshop was organized over a 2-day period and divided into a total of four information-sharing or discussion sessions that took place during the hours 08:30 and 16:30. These sessions are briefly described in the bullets below.

- **Session 1 - Introduction (2 hours):** This session consisted of a seminar conducted by the members of the project team, representatives of the host institution, and stakeholder participants in which the goals and objectives of the PVA were explained, general background information on climate change was offered, and Turkey's national climate change-related policies to date were outlined.
- **Sessions 2, 3, and 4 - Stakeholder Discussions (3 hours each):** The following three sessions of the workshop consisted of open reporting and discussions by the participants with the aid of the discussion facilitator (and a recording device). Project team members aimed to take careful for later synthesis. As the recorder captured the discussion, it was simultaneously projected to a large screen enabling a seamless and common ground for discussion.

In soliciting information from workshop participants, two key rules were applied in order to ensure accuracy.

First, only factual/verifiable information was considered valid. Reported vulnerabilities had to either be a) based on direct experience of the participant or b) witnessed as the experience of stakeholders unable to participate. Hearsay, presumptions, assumptions, logical inductions, etc. were not accepted as forms of factual information. This first rule intended to capture facts and real life experiences in the Provinces, which, to date had been sparsely documented.

Second, to the degree possible, consensus was required regarding the veracity of shared information or the desirability of priority adaptation actions. If consensus could not be reached, even after moderated discussions, the information was discarded. This second rule sought to strengthen the reliability of the reported event or permanent change through consensus building.

It is important to note that the experiences of groups not represented in the PVA workshop were understood through factual information provided by proxy witnesses. Even so, it is believed that there are inherent gaps in the information collected. Of course, this outcome is not uncommon rapid rural appraisals.

3.3 Data Solicitation/Synthesis Framework

A systemic approach was followed in soliciting and synthesizing vulnerability information from stakeholders. This approach consisted of a structured question/answer process that sought to elicit information outlined in the following bullets:

- *What: That is, what climate related changes / occurrences / disasters / unusual climatic phenomena have been observed / experienced over the course of last 5 to 10 years?*
- *Where: That is, where in the region / province have these occurrences been observed and/or experienced?*
- *Who: That is, who has been affected in a negative or positive way?*
- *How: That is, how have affected stakeholder been affected by the stated climatic event or change?*
- *Why: That is, what were the reasons for being affected? What were the particular conditions for those people that they (and possibly not others) were exposed to the effects of the climatic phenomena?*
- *When: That is, when have affected stakeholder experienced the effects (it should be noted that the question relates to the time of experienced impact and not to the date of the initial phenomenon) and at what frequency?*
- *What coping actions: That is what has been the immediate reaction by stakeholders? Moreover, what countermeasures or preventive actions have been taken by the authorities?*
- *What adaption actions: That is, what else could be done to reduce the risks associated with climatic variability? What structural adaptations can be proposed or are demanded?*





4 Key Findings

There was a copious amount of data and information generated from the stakeholder consultations at the 11 provinces. Therefore, for ease of communicating the major findings and lessons from the overall effort, this information has been synthesized as much as possible. In the sections below, a summary is provided that focuses on a “birds-eye” view of the key findings for the country as a whole, a graphical summary of hazards/impacts at each of the locations, and a broad review of the coping strategies that emerged from the effort.

4.1 Overall Climatic Hazards and Impacts

On the basis of stakeholder feedback, an overview of the major findings regarding climate hazards/changes is summarized in Figure 5. As can be seen in the map in this Figure, at least five climatic hazards (i.e., yellow, orange, and red regions) that they experienced in their region, have been reported in most of the PVA provinces. Also, as can be seen in the tabular portion of this Figure, stakeholder responses that generated the highest number of common climatic hazard observations throughout the country are as follows.

- Warmer winters with less snow;
- Greater drought frequency;
- Greater occurrence of sudden and heavy rainfall causing floods;
- Increasing irregularity in rainfall patterns, and
- Gradual shifting of the seasons.

Figure 5: Synthesis of Observed/Experienced Climatic Changes

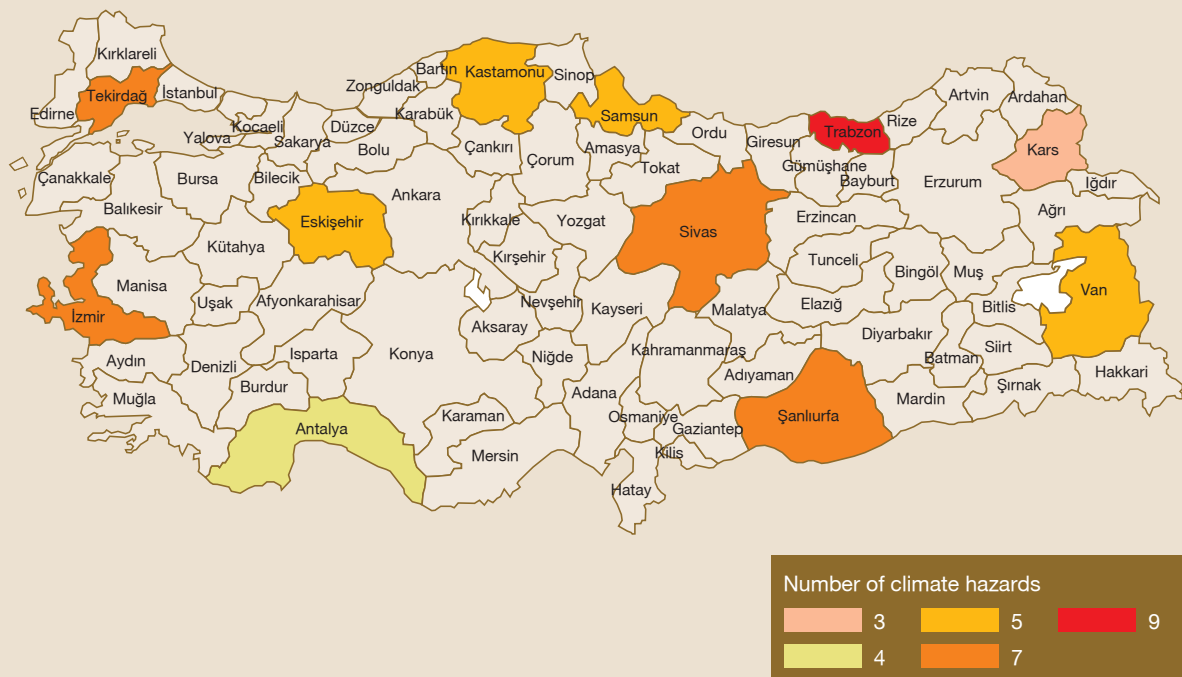


Table 2: Synthesis of Observed/Experienced Climatic Changes

Climatic Change:	Tekirdağ	Trabzon	Kastamonu	Kars	Sivas	Şurfa	Van	Antalya	Eskişehir	Samsun	Izmir
Drought	•	•	•			•	•	•			•
Sudden and extreme rainfalls	•	•		•	•	•	•				
Floods	•	•		•	•	•	•				
Rising in temperatures	•	•						•	•	•	•
Erratic precipitation	•	•	•			•		•	•	•	•
Warmer winter/Decreased snow	•	•		•	•	•	•		•	•	•
Shift in seasons		•	•		•	•	•		•		•

An overview of findings regarding the adverse impacts associated with the above climate hazards/changes is summarized in Table 3. As can be seen, across the 11 provinces it was consistently reported that there were a number of significant impacts being experienced from a changing climate. As can be deduced from the table, stakeholder responses that generated the highest number of common adverse impact observations throughout the country are summarized in the bullets below:

- Reduction in surface and fresh water resources;
- Lowering of the groundwater table in almost all regions;
- Increase in the number of forest fires, and
- Decline in fauna population.

Table 3: Adverse Impacts Associated with Climate Hazards/Climatic Changes

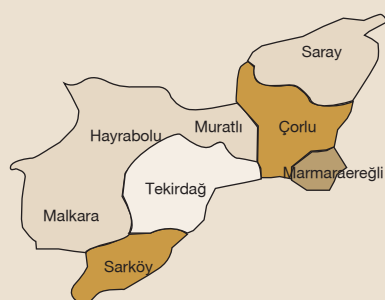
Climatic Change:	Tekirdağ	Trabzon	Kastamonu	Kars	Sivas	Ş. urfa	Van	Antalya	Eskişehir	Sam-sun	Izmir
Regress in water resources (rivers, dams, groundwater)		•	•		•				•		•
Decline in Number of Birds And Wild Animals	•				•					•	
Occurrence of Muddy Rains / Desert Sand		•			•	•				•	
Increase in Forest Fires			•					•			•

4.2 Provincial Climatic Hazards and Impacts

On the basis of stakeholder feedback, graphical representations of climatic hazards and major adverse impacts have been prepared for each of the PVA locations. These results are summarized in the maps that follow. The color coding used in the maps are unique to each map (e.g., the color green may signify drought in one map and flooding in another map). The color coding has been painstakingly developed on the basis of a review of the stakeholder feedback that was provided for each PVA location. As the maps are largely self-explanatory, no accompanying descriptions are provided.

Figure 6: Climate Hazards and Impacts Maps for Tekirdağ and Trabzon Provinces

Tekirdağ



Trabzon

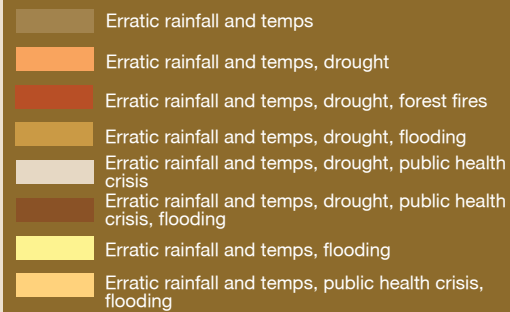
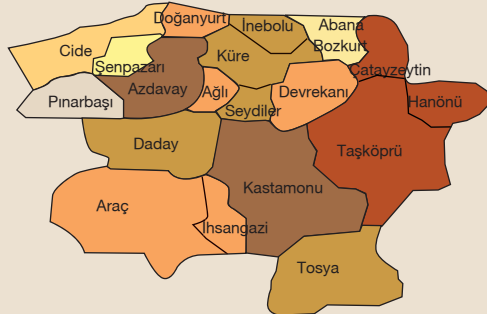


- Drought, coastal pollution, flooding
- Flooding
- Flooding, hail storms, increase winter air poll
- Sea level rise, coastal pollution, flooding

- Higher temps, droughts, erratic rainfall and mud rains, flooding, warmer winters
- Higher temps, droughts, erratic rainfall and mud rains, warmer winters
- Higher temps, droughts, erratic rainfall and mud rains, warmer winters, increased avalanche risk
- Higher temps, droughts, erratic rainfall and mud rains, warmer winters

Figure 7: Climate Hazards and Impacts Maps for Kastamonu and Kars Provinces

Kastamonu



Kars

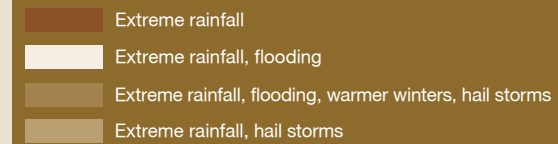
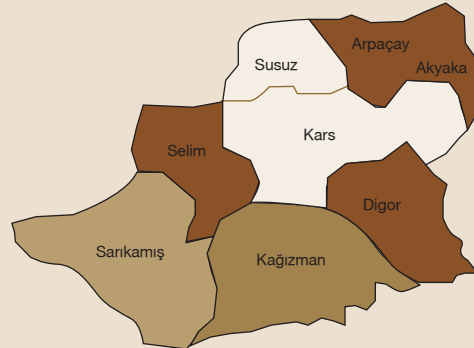
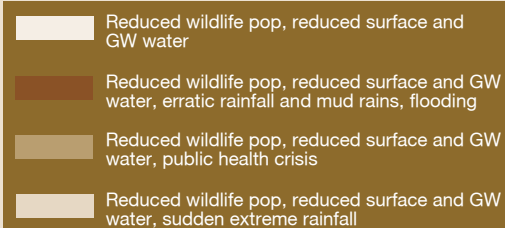


Figure 8: Climate Hazards and Impacts Maps for Sivas and Şanlıurfa Provinces

Sivas



Şanlıurfa

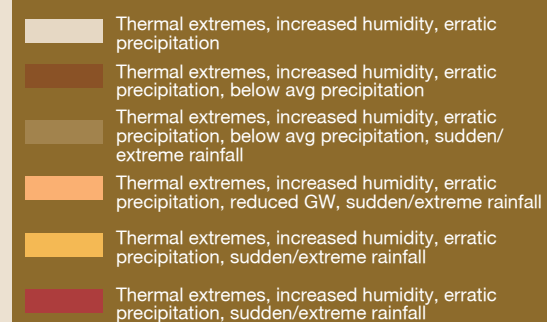
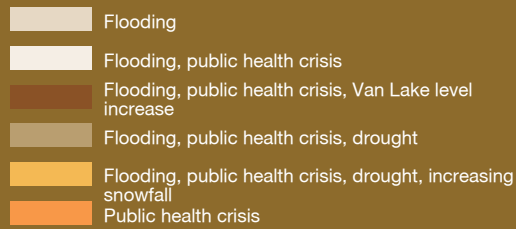


Figure 9: Climate Hazards and Impacts Maps for Van and Antalya Provinces

Van



Antalya

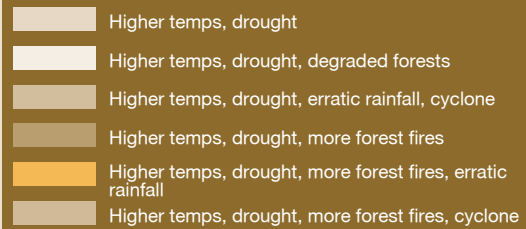
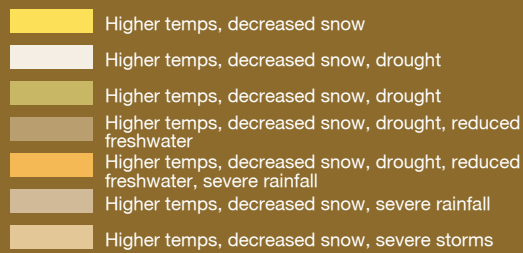


Figure 10: Climate Hazards and Impact Maps for Eskişehir and Samsun Provinces

Eskişehir



Samsun

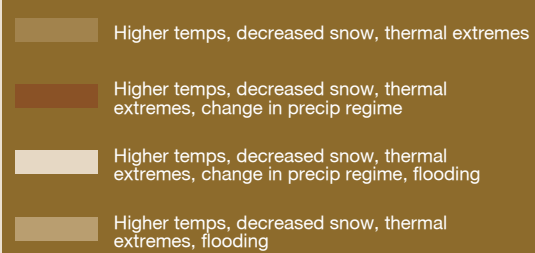
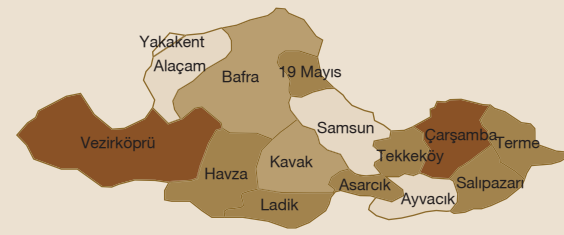
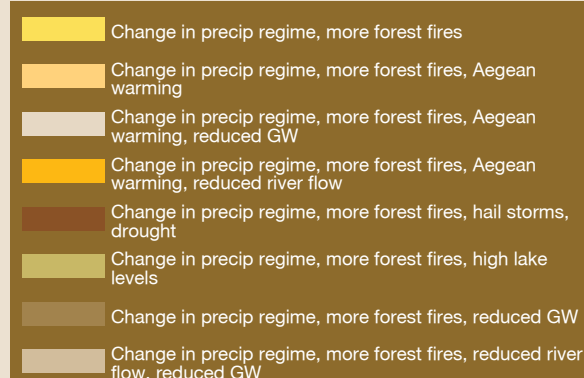


Figure 11: Climate Hazards and Impacts Maps for İzmir Province

İzmir



4.3 Vulnerabilities and Vulnerable Groups

Underscoring the results is a general confusion regarding climate change among stakeholders. While there was a reasonable level of awareness regarding climate change issues, there was not enough specific knowledge about climate change impacts or an understanding of how people will be affected by these impacts. Among those individuals that had a better understanding of climate change, the issue of “mitigation vs. development” tended to supersede a concern for tackling adaptation issues. Therefore, preliminary awareness building was needed at each location.

The vulnerabilities expressed in the regions were predominantly associated with reduced household income, except in those circumstances where a life-threatening sudden disaster had recently occurred. During the workshops, socio-cultural dimensions of possible changes in climate, vulnerabilities related to traditions, lifestyles or values were not discussed. This was due to time and budget constraints, as well as the need to prioritize on physical hazards and impacts, the underlying basis for developing potential adaptation strategies.

There were several key vulnerable groups, systems, and livelihoods – 11 in all - that emerged from the stakeholder consultations. These are summarized in the bullets below.

- Vulnerable livelihoods (5): These include farmers, pastoralists, bee keepers, fishermen, shop keepers/traders;
- Vulnerable groups (3): These include forest villagers, urban dwellers, and industrialists;
- Vulnerable systems (3): These include tourism (including tourists), public administration, wildlife and habitats (both marine and terrestrial ecosystems).

Table 4 provides a summary of vulnerabilities by province. A discussion of some of the nuances of these results is provided in the paragraphs that follow.

As expected, farmers were overwhelmingly reported to be the most vulnerable and most exposed group to current climatic variability and future climate change. Any significant fluctuations in temperature or rainfall were said to have adverse effects on farmers’ crop yields and hence incomes. Those households and communities practicing animal husbandry and fishing for their livelihoods were also found to be vulnerable.

In fact, it was generally agreed that adverse impacts on those relying on animal husbandry would likely be more severe than on farmers, rendering them less resilient in the face of future change. This is due to the fact that farmers tend to be more flexible and are able to adapt themselves to new conditions for the next harvest, either by changing crop patterns or adjusting the planting cycle. Hence, they have a range of options at their disposal. In contrast, after a severe climatic event or disaster, pastoralists tend to actually leave the sector or take up an alternate type of employment. Some even migrate to urban areas if circumstances remain persistently unfavorable to generating income.

Urban areas and populations face different challenges from the same climate events than rural populations. Urban areas are particularly vulnerable to erratic precipitation regimes as sudden and heavy rains often overload a city's infrastructure and lead to flash flooding in the streets, destroy sewer and water infrastructure, and inundate low-lying houses and businesses. On the other extreme, in times of drought, the lack of rain over extended periods results in the over-exploitation of water resources and induces chronic water shortages. This further aggravates an existing problem of inefficient water distribution systems in Turkish cities (water losses in urban distribution system currently average around %48).

On the other hand, warmer winters and less snowfall were regarded as a positive condition for urban life. Urban dwellers and infrastructure service providers (i.e., municipalities, province administrations, highway authorities) mentioned the positive effects of lower heating costs and reduced demand for municipal winter services. Farmers, in contrast are uncomfortable with reduced snowfall because they rely on snow accumulation and melt as part of their cultivation cycle. Less snow means exposure to frost and increased need for irrigation and pest control in the spring.

Sivas, which is a large and centrally located province, is the only province to report vulnerabilities for all of the 11 identified vulnerable livelihoods, groups, or systems (see Table 4). Tekirdağ, Kars, Şanlıurfa, and Eskişehir each identified 6, Van identified 7, Trabzon, Kastamonu and Samsun all identified 8, and both İzmir and Antalya reported 9.

Farmers were mentioned everywhere, whereas animal husbandry do not seem to be as vulnerable as farmers working on fields or with orchards despite being less resilient to change. Beekeepers' vulnerability was mentioned in only in two provinces. Vulnerabilities of shop keepers are mostly related to the floods following heavy rains where water entering shops and basements cause damage. Wildlife and changes in natural environment were reported by the participants in 9 provinces and are associated with changes in varieties of fauna and flora as a result of exposure to sudden climatic occurrences. It is known that tourism in Turkey is very dependent on climatic conditions; but according to the outcomes of the workshops winter tourism is more vulnerable because it requires snow, and warmer winters will negatively impact this sector.

Although the impacts of climate change in Turkey seem to pose a serious threat in the future, it is also envisaged that these impacts will bring with them some opportunities if planned carefully. It is crucial that this situation is addressed in terms of the pressures on natural resources and water resources in particular and in terms of the bottlenecks or opportunities in the development of climate-dependant sectors such as the agriculture sector (food security, plant production and animal husbandry, fishery, rural development etc.), energy, tourism, fishery, health, transport and industry sectors.

Table 4: Prioritized List of Vulnerable Livelihoods, Groups, and Systems by Province

İzmir	Farmers	Animal husbandry	Forest villagers	Fisherman	Citizens	Tourism	Industry	Public authorities	Wildlife and flora		
Samsun	Farmers	Fisherman	Citizens	Shop keepers	Tourism	Industry	Public auth.	Wildlife and flora			
Eskişehir	Farmers	Animal husbandry	Citizens	Industry	Public auth.	Wildlife and flora					
Antalya	Farmers	Animal husbandry	Forest villagers	Citizens	Shop keepers	Tourism	Industry	Public authorities	Wildlife and flora		
Van	Farmers	Fisherman	Citizens	Tourism	Industry	Public auth.	Wildlife and flora				
Şanlıurfa	Farmers	Animal husbandry	Citizens	Shop keepers	Industry	Public auth.					
Sivas	Farmers	Animal keepers	Bee keepers	Forest villagers	Fisherman	Citizens	Shop keepers	Tourism	Industry	Public authorities	Wildlife and flora
Kars	Farmers	Animal husbandry	Citizens	Tourism	Public auth.	Wildlife and flora					
Kastamonu	Farmers	Animal husbandry	Forest villagers	Citizens	Shop keepers	Industry	Public authorities	Wildlife and flora			
Trabzon	Farmers	Bee keepers	Fisherman	Citizens	Shop keepers	Tourism	Public auth.	Wildlife and flora			
Tekirdağ	Farmers	Fishers	Citizens	Shop keepers	Tourism	Public auth.					

4.4 Coping Strategies

Coping strategies are short-term and recent/current actions to avoid the immediate impacts of an experienced climatic hazard or to avoid the adverse effects of an expected climatic event and hence reduce vulnerability. The aim of such activities is to overcome the adverse situation at hand, not to systematically adjust to a new or long-term circumstance, the latter being the domain of adaptation strategies. There are limits to coping, which imply that in going beyond these limits, a system will break down. In this way, coping strategies can be understood as the first responses in a process of planned adaptation.

Coping strategies identified by stakeholders and focusing on positive/negative changes faced in the last 5-10 years due to climate change are summarized below.

- *Alteration of current practices:* This involved marginal changes in traditional agricultural and animal husbandry practices to accommodate increased variability in temperature and rainfall;
- *Monitoring programs:* This involved a tracking of damages associated with extreme events as well as monitoring of illegal practices that may contribute to increased vulnerability to extreme events;
- *Infrastructure modifications:* This involved modification of existing infrastructure (e.g., walls, roads, drainage systems) to cope with flash flooding events;
- *Shifts to alternative technology:* This involved the introduction of alternative types of technology to cope with changing circumstances (e.g., high efficient irrigation systems, drip and spring irrigation);
- *Awareness raising:* This involved the development of public awareness campaigns to inform residents of measures that should be taken, particularly public health related;
- *Early warning systems:* This involved information strategies to support farmers in light of temperature and rainfall fluctuations;
- *Insurance schemes:* This involved the development of contingency plans to meet productivity targets in the face of climatic extremes leading to local impacts;
- *Switch to alternative livelihoods:* This involved the abandonment of livelihoods that unable to cope with climatic changes, relative to household resource constraints; and
- *Provision of disaster relief:* This involved the provision of direct aid by regional governmental authorities to cope with the increased frequency of natural disasters.

Coping with known climatic variation typically depended on traditional responses to risks that have proven in reducing impacts. However, with climate change risks, many traditional coping strategies are no longer proving viable. In fact, some coping strategies could potentially deplete assets such that recurring hazards can increase vulnerability. For example, if a coping strategy leads to an unsustainable use of natural resources, impaired ecosystem function results. Such ecosystem functions could have otherwise helped absorb the shocks posed by extreme climate events.

4.5 Adaptation Strategies

The above coping strategies are actions taken when faced with unfavorable conditions, and not part of an ideal long-term livelihood strategy. For this reason, many of the coping strategies would not necessarily be anticipated to be part of a successful long-term adaptation strategy. This is due to the fact that if people constantly have to modify their practices to cope, it is a sign that they are not well adapted to their living conditions.

It is therefore important to distinguish between coping and adapting, although in a short time horizon, it can be difficult to do so. While defining the distinction between adaptation and coping seems straightforward, it is not so in practice. The above coping strategies included various kinds of mechanisms that people currently use to overcome short periods of difficulty whether it is a one-off strategy, a portfolio of possible response to temporary problems, or a recurring measure used as needed in times of crisis.

Adaptation strategies, based on detailed and bottom-up PVA matrices that were developed from the stakeholder consultations in each are summarized in the bullets below:

- *Introduction of enhanced planning practices:* This involved improved planning frameworks such as stronger integrated water basin management and integrated coastal zone management, expansion of rainfed agricultural areas to irrigation, use of enhanced plowing techniques for soil moisture retention, new plant rotation schemes, and water harvesting systems;
- *New research and data systems:* This involved the development of new areas of climate change impacts research (e.g., links between sea level rise and coastal erosion, thermal ocean characteristics and fisheries, efficacy of new vaccinations, impact of reduced snowfall), as well as new data/information systems (e.g., institutionalization of information for easy access);
- *New infrastructure and restrictions:* This involved construction of new infrastructure (e.g., forest belts, vegetating stream slopes, transportation routes, diversion of rivers), as well as new restrictions on infrastructural development in vulnerable areas (e.g., no construction in stream beds);
- *New technology:* This involved the need to develop and/or import new products capable of mitigating worst impacts of extreme weather events in fields, parks, and gardens (e.g., high drought/cold resistant crops) and introduction of higher efficiency technologies (e.g., thermal insulation in buildings).
- *Awareness raising and training:* This involved the development of public awareness campaigns to inform residents of measures that should be taken, particularly public health related. It also involved the strengthening capacity of vulnerable groups (poor, women, children, youth, elderly, handicapped) to take advantage of new adaptation strategies (e.g., insurance);
- *Early warning systems:* This involved meteorological modeling and implementation strategies to ensure that rainfall projections are accounted for in agricultural planning and programming in rural areas;
- *Insurance and contingency schemes:* This involved the development of mandatory insurance for certain types of productive activities (e.g., flood insurance for agricultural production in flood prone areas) and the development of contingency plans to offset new risks (e.g., water storage structures such as dams and ponds);

- *Emergency planning*: This involved the need for municipalities to develop and implement protocols and systems to deal with the increased frequency of climate change-related disasters (e.g., more first aid personnel, coordination among relevant rescue agencies), as well as the establishment of disaster funds.

When comparing the synthesized summaries of coping and adaptation strategies, some overlapping strategies are evident (e.g., insurance, early warning, new infrastructure). This suggests that current coping strategies can be built upon to meet adaptation needs. In addition, there are several new strategies proposed by stakeholders that should be effective in addressing the long-term nature of planned adaptation (e.g., new research and data systems, new infrastructure and restrictions, emergency planning).



5

Integration with National Adaptation Strategy Development Process

The results of the PVA represent an integral part of the national adaptation strategy development process. By synthesizing the insights, lessons, recommendations of the 11 PVA workshops, the national adaptation strategy development process have been supported and the local vulnerabilities - and ideas on how to overcome them – that were identified during the stakeholder process have been addressed.

Overall, there are five specific proposed stages for the development of Turkey's climate change adaptation strategy. These stages are illustrated in Figure 12. The rest of the section describes the overall approach in integrating the PVA results and other inputs into the overall process for developing Turkey's National Climate Change Adaptation Strategy.

Figure 12: Overall Framework for Turkey's Climate Change Adaptation Strategy Process



Stage 1: Synthesize Vulnerability Information

This stage focuses on the collection of pertinent Turkey-specific information that will be needed to be integrated into the national adaptation strategy. At the broadest level, this information consists

- *Climate risks at national level: This involves a detailed review of existing sectoral policies, institutions, legislation, programmes, and technical studies at the national level that may intersect with establishing a climate change adaptation strategy. This information is essential for ensuring that the strategy accounts for and builds off synergies with current practices that promote long-term adaptation. As of the time of this writing, a set of national reports have been prepared that provide a comprehensive summary of such practices.*
- *Climate risks at provincial level: This involves a detailed exploration of local vulnerabilities, coping strategies, and proposed adaptation measures as identified through stakeholder consultations in a field-oriented participatory vulnerability assessment. This information is essential for ensuring that the national adaptation strategy accounts for and builds off local realities and concerns. This current report represents a comprehensive and representative summary of local issues.*

Stage 2: Synthesize International Experience

This stage focuses on a systematic review of international experiences that could be useful in the development of Turkey's national climate change adaptation strategy. There have been several noteworthy examples on climate change adaptation strategy at the national, regional/state, and municipal level. A sampling of these initiatives at the national level (Spain, Australia, and the United Kingdom) and the regional/state level (Maryland, Florida, and Washington) have been summarized in lessons-learned report.

Stage 3: Establish a Stakeholder Process

This stage focuses on the nature of a stakeholder-driven process for the development Turkey's national climate change adaptation strategy. There are several key starting premises to the process for integrating the information prepared about national climate risks, provincial climate risks, and international experience as summarized below.

- Stakeholders are identified at the national level that represent a wide range of interests in Turkish society (i.e., government, civil society, private sector, etc)
- The process is information-based;
- The process is transparent;
- The process is inclusive and gender-sensitive;
- The process is iterative;
- The process seeks but does not mandate consensus;
- The process is comprehensive;
- The process is guided by clear decision criteria for the selection and design of recommended adaptation actions/strategies; and
- The process is implementation oriented and results in an actionable national adaptation strategy for Turkey.

Stage 4: Draft National Climate Change Adaptation Strategy

This stage focuses on the development of a multi-stage stakeholder-driven process for the integration of all inputs, discussion of potential strategies, and the development of an initial/final version of Turkey's climate change adaptation strategy. A broad overview of the steps in this process is outlined below.

- **Step 1 - Preparation of all science/information background documents.** This involves the development of all technical inputs (i.e., PVA results, national assessment, international assessment) for consideration during the climate change adaptation strategy development process;
- **Step 2 - Convene 1st/2nd stakeholder workshops to share results and solicit input:** This involves the presentation and discussion of the PVA results (especially the proposed adaptation measures which represent an important starting point), national assessment results, and international assessment results to the national stakeholders convened for the strategy development process. The purpose of these workshops is to ensure key vulnerabilities, proposed adaptation strategies, and mainstreaming challenges are reviewed, understood, and integrated into the stakeholder-driven strategy development process;
- **Step 3: Prepare draft National Climate Change Adaptation Strategy based on synthesis & stakeholder input received:** This involves the preparation of an initial version of the national strategy based on the inputs and feedback collected up to this step. The inputs refer to the PVA results, national assessment, and international assessment; the feedback refers to the reactions of stakeholders to these inputs and their recommendations regarding how they can be folded into a national strategy;
- **Step 4 - Convene 3rd stakeholder workshop to share draft National Climate Change Adaptation Strategy and solicit input:** This involves the advance distribution of the initial national climate change adaptation strategy to the assembled stakeholders for review, followed by a day-long workshop to present the initial strategy and solicit feedback regarding areas for revision and improvement.
- **Step 5 - Prepare revised National Climate Change Adaptation Strategy based on stakeholder input received:** This involves the preparation of a revised version of the national climate change adaptation strategy based on the feedback received in the previous step;
- **Step 6 - Share revised National Climate Change Adaptation Strategy and solicit final input:** This involves the preparation of a final draft of the national climate change adaptation strategy based on all feedback received thus far in the process; and
- **Step 7 - Revise the document on the basis of the input received and submit to Government:** This involves the preparation of a final version of the national climate change adaptation strategy based on all feedback received thus far in the process and submission to the Government.

Stage 5: Finalize National Climate Change Adaptation Strategy

This stage focuses on the finalization of Turkey's national Climate Change Adaptation Strategy. A broad overview of the key characteristics of the document is outlined below.

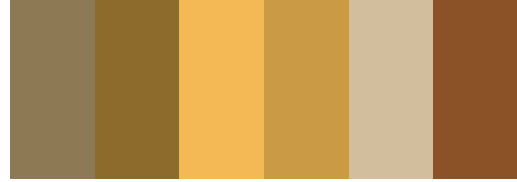
- Objectives are clearly identified;
- The strategy is precise and actionable;
- Links to international commitments are clearly noted, as appropriate;
- A clear description of implementation pathways is provided;
- Cross-cutting policy recommendations are identified;
- Indicators to measure effectiveness are proposed; and
- Institutional coordination and legal follow-up needs are clearly described

While developing “National Climate Change Adaptation Strategy and Action Plan” current activities and assessments in the PVA process were used as a base. Moreover, all other activities summarized above, specified needs and priorities served as a guide to preparing the National Climate change Adaptation Strategy and its actions. In this respect, basically 5 vulnerability fields were focused on. These are:

- 1- Water Resources Management
- 2- Agricultural Sector and Food Security
- 3- Ecosystem Services, Biodiversity and Forestry
- 4- Natural Disaster Risk Management
- 5- Public Health

The common/crossing points of these vulnerability themes are Capacity Building and Awareness; Technology, Research and Development; Financial Policies and Financial Mechanisms; Governance, Coordination, Monitoring and Evaluation, and Gender Mainstreaming.





6

Parting Thoughts

It is worth stating that the PVA workshops showed that adaptation to climate change is a very new topic in Turkey though one generated spirited stakeholder discussions. As a result, there are number of key general observations that can be concluded from the process. These are briefly outlined in the bullets below.

- *Urgency:* Since climate change is understood as a slow process, public institutions in the provinces do not necessarily yet see the urgency in taking adaptation measures. Prioritizing institutional cooperation and coordination at the outset of the national climate change adaptation development process will hopefully enhance the strategy itself. Not only is coordination needed in the development of the policy, but in the implementation as well.
- *Coordination:* The PVA workshops revealed that the Ministry of Food, Agriculture and Livestock (MoFAL) is a strategic partner for the Ministry of Environment and Urbanization (MoEU) for project and policy outreach at the provincial level. Ideally, these two ministries should work closely for taking the national climate change adaptation strategy further. The MoEU needs to involve, cooperate coordinate and convince other ministries and public institutions to contribute to the development of and ultimately the implementation of the National Climate Change Adaptation Strategy. The workshops showed, as expected, that public institutions are closely bound by and referred to their mandate so any national strategy needs to clearly define tasks and necessary competences for the implicated public institutions.
- *Cooperation:* The need for institutional coordination is not solely a government issue. Stakeholders urged improved cooperation between institutions e.g. public, private, NGOs, etc. because bureaucracy has been shown to be a road block to critical information sharing. One illustrative example from one province is that the early weather warning information from the Regional Meteorological Directorate must travel all the way to the governor's office in order to be distributed to other directorates, including the Provincial Directorate of Food, Agriculture and Livestock, who then call the leaders in the villages to warn the farmers. By the time the weather warning message arrives to the individuals who need it the most, it is usually too late due to all the red tape needing to be cleared before information is released.
- *Awareness:* The PVA process demonstrated a limited level of awareness on the impacts of climate change at the local level. In that sense, it is clear that the capacity of local stakeholders need to be enhanced countrywide with a view to managing the risks associated with future climate change. A higher level of enthusiasm on the part of local organizations, particularly local universities and research institutes, in terms of combating against the impacts of climate change could support the kinds of capacity building and awarenessraising that is needed to increase the participation and commitment of stakeholders in the process.
- *Representation:* The ongoing inclusion of the representatives of key public institutional actors from the PVA provinces (Provincial Directorates of Ministry of Environment and Urbanization, and Ministry of Food, Agriculture and Livestock) within the next steps of the National Climate Change Adaptation Strategy preparation process is important in terms of "local ownership/commitment." This inclusion would help to ensure that the local perspective and community-scale project requirements are taken into consideration in decisions to be made with regard to adaptation to climate change by the central level.
- *Implementation:* Proposed strategies to reduce vulnerabilities varied from workshop to workshop, concretizing the notion that different regions will need tailored solutions to similar climate events. Hence, in any national climate change adaptation strategy it will be important to incorporate regional geographic and cultural differences. Most of the solutions and adaptation options proposed in the PVA workshops will require local and/ or regional action. All regions proposed "hard" solutions like building or improving dams, irrigation schemes, sewer and rain networks or roads as well as "soft" solutions like training and educating target groups, extending emergency aid, providing financial and technical support for adaptation, or

regulatory and legislative action. Unless a national strategy for Turkey is able to be flexible and allow for variation depending on vulnerability and localized needs, it may prove counterproductive and insufficient for some regions.

- *Mandate:* The importance of a central mandate on adaptation in the form of national legislation and policies is a clear recommendation. The workshops relayed the positive effects of national legislative action through the introduction of agricultural insurance. While the legal framework for agricultural insurance is relatively new and not yet popular among farmers, in almost in all regions, the agricultural insurance was mentioned as a key tool for reducing the vulnerability of the farmers suggesting that the strategy is gaining traction among potential users. For a robust implementation of the National Climate Change Adaptation Strategy, the Ministry of Environment and Urbanization could form an implementation monitoring unit (or project implementation unit) that would monitor and reports on the achievements of the strategy.



Enhancing the Capacity of Turkey to Adapt to Climate Change

Participatory Vulnerability Analysis

