



UNIVERSITY OF GOTHENBURG
SCHOOL OF BUSINESS, ECONOMICS AND LAW

Turkey Environmental and Climate Change Policy Brief

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This Environmental and Climate Change Policy Brief¹ aims to summarise the key environmental problems and opportunities for Turkey, related to poverty reduction and economic development and the Swedish government's thematic priority Environment and Climate change which includes four focus areas; (i) climate change adaptation, (ii) energy, (iii) environment and security, and (iv) water.

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1. Introduction

Turkey's climate varies from rainy winters in the western coastal areas and hot, moderately dry summers to cold winters with heavy snowfall and hot dry summers in the eastern highlands. Water resources are greater than in the Middle East but generally less than in other European countries. Known oil and natural gas deposits are small, but the country has relatively large

¹ This Environmental and Climate Change Policy Brief was written, at the request of Sida (Att: Thomas Nyström) by *Emelie Dahlberg* at the Environmental Economics Unit (EEU), Department of Economics, University of Gothenburg, as part of Sida-EEU's institutional collaboration on environmental economics and strategic environmental assessment, with contributions from SEI Oxford (Tahia Devisscher and Ben Smith). Comments can be sent to emelie.dahlberg@economics.gu.se. The views expressed in this Environmental and Climate Change Policy Brief are those of the authors and do not necessarily represent the views of Sida.

amounts of coal. There is great potential for renewable energy e.g. solar and wind and the long coastlines with a temperate climate support commerce, tourism, and fishing.²

Turkey is the world's 19th largest economy³, a key member both in G20 and the OECD and the second most populated nation in Europe with 73 million inhabitants. Turkey is challenged with ensuring economic growth together with environmental and social progress to achieve sustainable development. The country faces increasing environmental pressure which can partly be explained by growing sectors such as energy, industry, transport and tourism.⁴ High level of rural poverty leads to pressure on the surrounding environment e.g. forest, land, nature and wildlife. The current accelerated migration from rural to urban cities creates pressure on the urban environment due to insufficient infrastructure resulting in inadequate water and energy supply, solid waste and waste water treatment, which threatens public health.

The EU accession and cooperation with the EU has had a significant impact for Turkey to strengthen its environmental commitments and responsibilities. Turkish environmental legislation is slowly moving towards an alignment with EU. Although there has been some progress in alignment transposition⁵ is still waiting for several pieces of legislation concerning air, water and natural protection and environmental standards that are not consistent with EU's. To accomplish an alignment there is a need for large amounts of investment.

2. Key Environmental Problems and Opportunities and their Causes

Turkey is a mountainous country endowed with relatively few mineral resources such as coal, iron and copper. The country can be divided into 7 regions; 4 coastal and 3 mountainous with regional climatic differences and varying precipitations. The country possesses a rich flora and fauna. The key environmental problems (not in order of priority and described further below) in Turkey include air and water pollution, land and forest degradation and loss of biodiversity and ecosystem services.⁶

2.1 Key Environmental Problems and their Causes

Land degradation: The most widespread form of land degradation in Turkey is erosion; 73% of the total agricultural land is prone to erosion, mainly water erosion. Overall, 86% of Turkey's land area is affected by medium to serious soil erosion. Land degradation and erosion are increasing. The high erosion rates are a result of both natural and human activities; climate and steep topography (natural), unsustainable agricultural and irrigation practices (human), and overgrazing and burning of stubble (human). Over 54% of Turkey's land area consists of vulnerable ecosystems of semi-arid to arid landscapes threatened by desertification⁷. Moreover, projected climate change and increased aridity together with expansion of agriculture, forestry, and livestock rising in arid regions are growing areas of concern.

² Federal Research Division, 2006

³ The Economist, 2008

⁴ OECD, 2008b

⁵ Transposition is the process of giving EC laws legal effect within each Member State. Every Directive includes a deadline ahead of which Member States need to pass laws to give the Directive effect in their territory.

⁶ If nothing else is stated the reference for this section is OECD, 2008b

⁷ In Italy this number is 2.6% and in Greece 36.6%.

Forest Degradation: In Turkey, forest and woodland areas have increased during the last few years and constitute today over 27% of the national territory, and the total forest area is increasing by 0.3% per year.⁸ However, forest in strict land cover sense is only around 13%. The rest (over half of total forest cover) is considered to be degraded forest or rangelands. Forest degradation is due to human activities and unsustainable practices e.g. illegal cutting and clearing, illegal settlements and grazing in the past and the dependence of rural communities on wood for heating and cooking. Degradation as an effect of forest fires is also common, with about 2 000 forest fires annually.

Loss of biodiversity and ecosystem services: Turkey is richly endowed with a diverse flora and fauna. It supports around 9000 animals and plants.⁹ However, these numbers are declining due to pressure from rapid urbanisation, industrialisation, tourism, and environmental degradation. The steppe ecosystems are particularly threatened by road and dam constructions.¹⁰ Uncontrolled development and large scale water infrastructure projects such as hydropower dams are significant threats to Turkish ecosystems and biodiversity. More than 20% of mammals are threatened and many bird species are in danger of extinction. Furthermore, biodiversity loss is high in coastal areas. Turkey's Mediterranean and Aegean coastline is under severe pressure from extensive industrial and domestic waste water discharges and pollution from tanker traffic and refineries. The coastal environments are also vulnerable to more and more intense tourism.

Air pollution: Air pollution is a major issue in Turkey. SO_x emission intensity is over three times higher than the OECD average and intensity of NO_x is estimated to be over 50% higher than OECD average. In many urban and industrial centers, ambient air pollution by SO_x, NO_x and particulates exceeds national air quality standards¹¹. Major contributors to SO_x emissions continue to be power plants (66%) and industrial combustion (26%). The major contributor to NO_x is the mobile sources e.g. vehicles (44%) but also industrial combustion and power stations are large contributors.

Water availability and quality: Water abstraction is high in Turkey and surface water quality is low in many water bodies. Over half of all waste water from industry is discharged into rivers and coastal waters without any treatment. The waste water often contains heavy metals e.g. mercury, lead, chromium and zinc. Groundwater, which accounts for 38% of all withdrawals, is also affected by waste water and waste dumps from industry and increasingly from households and agricultural activities. Nitrate and pesticide pollution from agriculture is continuing. Levels of groundwater are of concern as abstraction from aquifers in several areas is higher than regeneration. Thousands of municipalities do not have proper waste water treatments. Further, household sewages are often in poor condition which contributes to contamination of water bodies. Annually 30 million tonnes of solid waste and over 2 million tonnes of hazardous waste are produced in Turkey. The only facility that treats hazardous waste has capacity for around 50 000 tonnes.¹²

⁸ World Bank, 2008

⁹ World Bank, 2008. If all species were to be added to this number, including invertebrates (animals without a backbone e.g. corals and insects), it is much higher, around 90 000 species. (OECD, 2008)

¹⁰ EEA, 2007

¹¹ The national standards allow somewhat higher concentrations in industrial regions and considerably exceed the recommended air quality standards advocated by the World Health Organization (WHO), (Kaygusuz, 2007)

¹² UK Trade & Investments, 2008

Natural disaster risks: Turkey is vulnerable to natural disasters such as earthquakes, floods, landslides, avalanches and forest fires. Earthquakes are the most serious threat¹³. Over the last two decades more than 25.000 people have died and nearly 100.000 buildings have been destroyed as a result of earthquakes. Landslides and floods account for 25% and 10% respectively of Turkey's annual total of natural disasters. The number of such events will most likely rise as a result of climate change.¹⁴

Climate change: Climate change will add to existing stresses in Turkey including the above mentioned issues, particularly water scarcity, land degradation and natural disasters. In terms of mitigation, Turkey's per capita emission level of greenhouse gases (GHG) is below the OECD, EU and world averages. However, the Turkish GDP is expected to rise 6% per year over the next 15 years and as a result growth in the coal-dominated energy sector is projected to increase rapidly. If Turkey continues during these 15 years in a business-as-usual scenario, the energy consumption per capita will be doubled by 2020, and CO₂ emissions will be more than doubled. More on climate projections, adaptation and mitigation challenges will be described in section 4. (Note: section 4 is to be developed)

2.2 Opportunities:

Turkey is richly endowed with solar, hydropower, wind and geothermal resources. It is estimated that Turkey has the potential to out of wind power capacity generate about 25Twh¹⁵ of electricity per year. Further, there are also large potentials for geothermal and solar energy as well as energy from waste incineration¹⁶.

Turkey is a country with extraordinary natural and cultural assets. These assets provide an opportunity to develop business based on eco-tourism and nature-based activities contributing to national growth and poverty alleviation. The government is today encouraging ecological and cultural tourism.

The accession to EU and alignment to EU environmental legislation creates incentives and opportunities for more environmental technology. Many countries see Turkey as an area of opportunity where they have the possibility to sell their technology. There are large opportunities in waste management and water supply, treatment and management as well as in air and marine pollution control.¹⁷

3. Effects of the Environmental Problems

3.1 Impacts on Poverty

Vulnerability: Turkey experiences significant regional disparities. Poverty is highest in the eastern and south-eastern rural areas and suburbs of city areas. GDP per capita in the richer western regions (e.g. Marmara) is about three times higher than in the eastern regions (e.g. East Anatolia).¹⁸ Of the rural population and urban population nearly 35% and 22%, respectively, live below the relative poverty level.

¹³ About 92% of the land area and population are at risk of medium to high level earthquakes. (OECD, 2008)

¹⁴ OECD, 2008b

¹⁵ This is approximately 17% of total annual consumption of electricity in Turkey. (IEA, 2006)

¹⁶ OECD, 2008b

¹⁷ UK Trade & Investments

¹⁸ OECD, 2008b

The high level of poverty in rural areas leads to pressure on the surrounding environment e.g. forest, land, nature and wildlife. Therefore, one of the main issues within the forest sector is poverty alleviation as about 15% of Turkey's population live in villages next to forests where forest resources make a vital contribution to livelihoods.¹⁹ Fuel wood and non-wood forest products (such as animal fodder, berries, mushrooms, nuts, seeds, cork, meat and skins) remain important for the rural population. These livelihood opportunities are decreasing due to environmental and natural resources degradation e.g. loss of biodiversity and the degradation of ecosystem. Indicators of welfare (health, income, education etc) in rural villages are lower than the country average.

An estimated 67% of Turkey's population live in urban areas and the rate of urbanisation is high, about 1.4 million people per year (mainly rural to urban migration). As a consequence, the number of low income families in big cities is rising. Further, urban areas with large migration flows face serious challenges in terms of insufficient infrastructure and services e.g. housing, water and energy supply, and solid waste, and waste water treatment.²⁰ The continuous migration to urban areas also poses a major public health challenge.

Opportunity: Training on best agricultural and forestry techniques, development of agro-industries, commercialization of products, and consolidation of farms are expected to reduce the environmental impacts of poverty as well as environmental effects on poverty. Providing rural areas with environmental services will not only bring the direct benefits of water supply and sanitation, but also the indirect benefits associated with improved health and education.²¹

3.2 Impacts on Economic development

After the severe economic crisis in year 2000, Turkey managed to recover impressively well with an average annual growth of 7.5% between 2002 and 2005. During the recent years Turkey has had among the strongest economic growth compared to other OECD countries. However, the economic crisis and global economic slowdown have had an effect on the Turkish economy. Growth was estimated at 1% for 2008 and is expected to remain low throughout 2009.²² Of the Turkish economy industrial and service sector accounts for 29% and 60% respectively. Agriculture accounts for 11% of the GDP but employs over one-third of the labour force. Industrial production increased between 2000 and 2006 by 33%. Further, the tourism sector is rising rapidly and accounts directly for 5% of the GDP and indirectly for over 10%.²³

Turkey is facing a number of environmental challenges due to unsustainable production and consumption patterns. The overall material intensity of its economy is still among the highest in the OECD area, as is the pollution intensity.²⁴ This can be explained to some extent by the structure of the Turkish economy and growth. For example, Turkey imports large quantities of metals which are converted into metal products exported to the middle-east. It also imports cotton to produce cotton products to export to Europe. Environmental priorities are not high in this context, resulting in more pollution and environmental degradation. Furthermore, continued economic growth increases motor vehicles ownership and traffic, as well as

¹⁹ MoEF, 2003

²⁰ OECD, 2008b

²¹ OECD, 2008b

²² Embassy of Canada, 2009

²³ OECD, 2008b

²⁴ OECD, 2008b

municipal and industrial waste generation. Turkey's economic growth and high production and consumption together with little environmental concern pose a threat to the country's possibilities to attain sustainable development.

Economic growth and energy consumption have gone hand-in-hand, and the effect has been increasing air pollution in cities that are already suffering from high pollution levels. Although low compared to advanced European economies, Turkey's per capita carbon emissions are increasing.²⁵ In terms of air pollution Turkey has achieved decoupling²⁶ of SO_x, NO_x and CO₂ emissions; still the emissions are far higher than the OECD average. Benefits from reducing air pollution (through achieving EU Air Directives) are estimated to be EUR 3-9 billion.²⁷

Environmentally related taxes in Turkey include taxes on fuels and on vehicles (among the highest in OECD). Large revenues come from taxes that can be related to environmental issues. However, these taxes were not designed for environmental purposes.²⁸ Given this, taxes have to some degree decreased e.g. pollution but have also created areas with disincentives and more degradation. For example, the taxes do not have significant impact on air quality as the tax rate for fuel with low sulphur content is higher than fuel with high sulphur content which creates a disincentive from an environmental perspective. Furthermore, environmentally harmful subsidies, especially in the energy sector, continue to promote polluting activities. One example is the subsidies on hard coal.²⁹

3.3 Impacts on Public Health

Studies of the relations between public health and environmental services in Turkey are few and links between health and environmental policies should be developed. Large health related benefits could be enhanced by improving environmental conditions, including increased labour productivity, reduced health expenditure, and increased well being of the population. Motor vehicles, industry and power stations are main sources of air pollution and also potential health threats. A study comparing provinces using natural gas instead of heavier fossil fuels shows that the incidence of respiratory disease due to low air quality decreased by 5-8%.³⁰ Safe drinking water and sanitation is vital for good health. Population with access to improved drinking water in urban and rural areas is 98% respectively 93%. Population with sustainable access to improved sanitation in urban and rural areas is 96% respectively 72%.³¹ According to WHO estimates more than 27 000 annual deaths occur due to diarrhoea caused by polluted water/bad hygiene, indoor air pollution and outdoor air pollution (see table below).

²⁵ EIA, 2006

²⁶ Decoupling is a measurement on growth-environmental links; "emissions diminish while GDP increases". Decoupling occurs when the growth rate of an environmental pressure is less than that of its economic driving force (e.g. GDP) over a given period. (OECD, 2002)

²⁷ OECD, 2008b

²⁸ 4.8% of GDP and 25% of total tax revenues which compared to other OECD countries is the largest revenues

²⁹ OECD, 2008b

³⁰ OECD, 2008b

³¹ WB, 2008

WHO estimates	Water Sanitation & Hygiene		Indoor air pollution		Outdoor air pollution	
Country	Diarrhoea deaths/year	Diarrhoea DALYs/1000 capita per year	Deaths/year	DALYs/1000 capita per year	Deaths/year	DALYs/1000 capita per year
Armenia	<100	1	100	0.8	1 600	4
Azerbaijan	800	3.9	1 800	7.2	1 400	1.4
Georgia	--	0.3	100	0.6	2 200	3
Turkey	6 000	3	2 500	0.9	18 800	2

Source: WHO, 2007(data from 2002)

4. Turkey and Climate Change

4.1 Changes in Precipitation and Temperature

Two Regional Climate Models (AGCM³² and RegCM3³³) run for Turkey for the period 2071-2100 show similar precipitation changes for winter: a large decrease in precipitation around the southern coastal region of Turkey, particularly along the Mediterranean and Aegean coasts, and an area of large precipitation decrease extended into the lower Seyhan River Basin, blocked by the Toros Mountains to the north. Both also show increase in precipitation over the northern coastal region in Turkey facing the Black Sea for the summer season.³⁴ Results project that precipitation in Turkey will decrease almost throughout the year, with the greatest decrease in winter. Intensity of rainfall is likely to increase, which may increase the number of flash-floods and landslides experienced.

The annual mean temperature is estimated to increase 2-3°C by 2070³⁵. In winter, projected temperature increase is higher in the eastern part of the country. In the summer, this is reversed and the western part of the country, especially the Aegean region, is predicted to experience temperature increase up to 6°C. Extreme summer temperatures are likely to increase.

4.2 Impacts

So far, there has only been limited assessment of potential impacts for Turkey based on future sea-level rise scenarios³⁶. However, significant impacts are expected on high-populated coastal cities, particularly in the Black Sea and Istanbul coasts, as well as on tourism and agriculture along the Aegean and Mediterranean coasts³⁷. Water availability is expected to decrease, leading to increased competition for resources amongst users, and increased demand for irrigation; for instance a study carried out in the Gediz and the Buyuk Menderes river basins along the Aegean coast has projected a loss of nearly 20% of the surface water in the studied basins by the year 2030³⁸. Sea-level rise will exacerbate salt-water intrusion into ground water resources, increasing the vulnerability of freshwater supply for Istanbul³⁹. So

³² Kitoh, 2007

³³ MoEF, 2007

³⁴ MoEF, 2007

³⁵ MoEF, 2007

³⁶ Karaca, 2000a

³⁷ MoEF, 2007

³⁸ Modeling studies carried out by Dokuz Eylul University, Water Resources Management and Application Center in 2006, Harmancioglu et al. 2007.

³⁹ Karaca, 2000b.

far, there has been only very limited results indicating potential impacts for man-made and natural ecosystems in Turkey. According to Thuiller et al. (2005), a 3.6°C rise in global temperature could lead to a loss of over 50% of plant species in the Mediterranean mountainous region shared by Turkey. All in all, it is expected that further decreasing in precipitation may seriously damage agriculture and ecosystems in the country⁴⁰.

Uncertainty in attributing expansion or resurgence of diseases to climate change remains high, due to the many factors that influence disease epidemiology⁴¹. Analysis of temperature records shows a correlation between higher temperatures and the number of malaria cases in Turkey, however it may be that although climatic conditions become more favourable, cases of malaria drop due to preventative public health efforts⁴². A recent study carried out in Istanbul indicates that temperature rise and an increase in rainfall correlate to an increase in the number of leptospirosis patients⁴³. Finally, changes in climatic conditions could facilitate the reproduction of ticks in Turkey and increase the incidence of tick-borne infectious diseases⁴⁴. One of the infectious diseases that needs further research is the fatal viral infection Crimean Congo Hemorrhagic Fever (CCHF), first recognized in Turkey in 2002. It is also expected that increased extreme temperatures in summer will increase heat-related mortality.

4.3 Energy, Emissions and Mitigation

Turkey's greenhouse gas (GHG) emissions rose by 75% between 1990 and 2004⁴⁵ due to steady population growth and industrialization after the mid-1990s, however Turkey's per capita emissions are still below the world and OECD⁴⁶ and in 2004, Turkey accounted for 0.8% of the global emissions⁴⁷. However, with GDP projected to grow at over 6% per year over the next 15 years⁴⁸ emissions are expected to rise significantly, increasing at 6.3% annually and reaching over 600 million tons/year by 2020.

Although most of the primary energy supply in the country comes from coal⁴⁹ and natural gas, by 2004 Turkey managed to produce 12% from renewable energy sources (5.6% from hydro, solar, wind and geothermal, 6.3% from biomass and waste). Nevertheless, since domestic resources are not able to meet the demand, the country remains a net energy importer, with a ratio of import dependency reaching 72% in 2004⁵⁰.

An effective policy for the reduction of GHG will have to rely on the application of a mix of options. With this in mind, Turkey plans to minimize GHG emissions through a combination of measures that aim at: improving energy efficiency and encouraging conservation measures (demand side management (DSM)); allowing for fuel switching from high carbon to low carbon fuels; and increasing the share of renewable energy sources in its energy supply. A

⁴⁰ Kimura et al. 2008.

⁴¹ Patz, et al. 2005.

⁴² Ernogul, 2007

⁴³ Polat et al. 2007, UNDP, 2007a

⁴⁴ MoEF, 2007

⁴⁵ from 170 teragrams to 300 teragrams of carbon dioxide equivalents

⁴⁶ IEA Statistics, 2008

⁴⁷ UNDP, 2007b

⁴⁸ MoEF, 2007

⁴⁹ 33% of Turkey's electricity generation is coal-fired. 95% of coal is local lignite. Lignite is one of Turkey's main indigenous energy resources.

⁵⁰ MoEF, 2007

possible measure to encourage switching to a less carbon intensive fuel is a carbon tax; although there are associated disadvantages (e.g. increase in economic cost of energy supply and import dependency). At the national level, mitigation measures with large estimated contributions by 2010 are: wide use of natural gas (4.5%), cogeneration (2.2%), and DSM (5.5%)⁵¹.

The Energy Efficiency Strategy was developed and adopted in 2004, and the Ministry of Industry and Trade has recently issued a number of regulations on energy efficiency labelling standards. In addition, the exploitation of renewable sources is among Turkey's energy policy priorities. It is hoped that the 2005 Renewable Energy Program will bring the share of wind energy and mini-hydro to nearly 13% of total power system capacity by 2025, generating 7% of total electricity. The overall share of renewable energy sources, including large hydropower and geothermal would then be over 35% by 2025 and it would account for 23% of total electricity generated in the country⁵².

4.4 Adaptation Measures

Recognizing the potential risks related to climate change, several governmental agencies in Turkey have taken precautions. For example, to prevent/manage potential problems arising in coastal areas, the Ministry of Environment is planning to establish a Coastal Zone Department and the Authority for the Protection of Special Areas has declared new protection areas to reduce stresses on coastal zones, while developing special environmental programmes⁵³.

To offset increasing water scarcity problems and desertification, several measures have been included in the First NC: developing techniques for non-traditional use of water resources; improving and developing new plant species resistant to drought and salinity; and developing plant species that may yield quality products with low-quality water. Emphasis has also been put on research, systemic observation, and technology transfer as key measures for climate adaptation. Research will be strengthened in the following fields: climate modelling, ecological, earth and ocean system changes; tools and technologies for monitoring, preventing and mitigating environmental pressures and risks including health, conservation and sustainable management of the natural and man-made ecosystems⁵⁴. Training and capacity building are also critical measures to build adaptive capacity within the country. In this regard, measures to strengthen the capacity of institutions⁵⁵ responsible for making observations on weather, climate and hydrology, monitoring climate systems, measuring air pollution and conducting climate-related research, need to be implemented.

4.5 Institutional Framework for Climate Change in Turkey

Turkey became Party to the United Nations Framework Convention on Climate Change (UNFCCC) on May 2004 and the government passed a law in Feb 2009 to accede to the

⁵¹ UNDP and WB, 2003

⁵² UNDP and WB, 2003

⁵³ MoEF, 2007

⁵⁴ MoEF, 2007

⁵⁵ The Turkish State Meteorological Service), The General Directorate of State Hydraulic Works and the General Directorate of Electrical Power Resources Survey and Development Administration are the state organizations responsible for making observations on weather, climate and hydrology and monitoring climate systems. Some military organizations are involved in oceanographic observations. Research studies on climate change are conducted in universities, public institutions and research centres.

Kyoto Protocol, a move which although late is welcomed as a positive step⁵⁶. Decision 26 of the 7th Conference of the Parties in 2001 moved Turkey to being an Annex I country of the Convention, but recognizes the special circumstances of the country. Turkey submitted its first National Communication to the UNFCCC in 2007, and the process for the second NC will begin in 2009. Building on this process a National Climate Action Plan (NCCAP) is under preparation, containing new policy goals over specific time frames, concrete climate change policies, and multi-sectoral adaptation and mitigation measures. The National Development Plan (NDP) for 2007–2013 does not explicitly refer to climate change, but does show increasing integration of environmental concerns in several sectors⁵⁷.

4.6 The Role of Environment and Climate in Turkey's Preparation for EU Accession

Turkey is in the process adapting legislation and regulations for accession to the EU. Not only the public sector, but also the private sector has started a series of investments that will allow Turkey to match EU and international environmental standards. For instance, the energy sector has undergone a major restructuring with liberalization of the electricity market and planned liberalization of the gas market in conformity with the EU's Gas and Electricity Directives⁵⁸. Additionally, refineries are investing heavily to upgrade petroleum product standards, and energy companies are undertaking major investments in energy efficiency⁵⁹.

The approximation process also demands an increasing integration of climate change policy into policies governing energy, transport and water, infrastructure, land use planning, and development co-operation⁶⁰. The Kyoto Protocol is part of the EU's *acquis communautaire*; therefore its adoption is part of the joining process. The bill to ratify the Kyoto Protocol was submitted to the Turkish parliament on June 5, 2008, with parliament due to debate the bill early 2009. Despite the progress achieved, Turkey's growing economy and energy demand and increasing levels of GHG emissions pose particular problems in relation to emission targets, for example it will be difficult to meet emissions reduction targets for SO₂ and NO_x⁶¹. It is unclear what effect Turkey becoming a member of the EU would have on the EU's targets for a 20% reduction in emissions by 2020, to be achieved by country specific reductions. If included in this target it is unlikely Turkey would be obliged to make the full 20% reduction, so other EU countries would probably have to compensate by making deeper cuts.

5. What are key actors doing to manage the environmental problems?

5.1 Key Actors:

The *Ministry of Environment and Forest* of Turkey is responsible for coordination of all national and international activities concerning the environment and forest. Other ministries that have authority over certain elements of environmental policy include; the Ministry of Agriculture and Rural Affairs which is responsible for plant and animal protection in rural areas and for aquatic products, the Ministry of Energy and Natural Resources responsible for energy efficiency policies, the Ministry of Industry and Trade has authority to improve the environmental performance of enterprises and innovation technologies, the Ministry of Public

⁵⁶ REC press release Feb 2009

⁵⁷ OECD, 2008b

⁵⁸ MoEF, 2007

⁵⁹ UNDP and WB, 2003

⁶⁰ OECD, 2008a

⁶¹ UNDP and WB, 2003

Works and Settlement prepares land use plans for coastal zones, the Ministry of Health has functions and responsibilities regarding protection of environmental health and the Ministry of Tourism protects cultural values and use of coastal zones.

5.2 Capacity:

Improvements within the area of administrative capacity have been achieved by recruitment of a substantial number of skilled staff to the Ministry of Environment and Forestry (MoEF) and a new department for implementation of the environmental programmes under the IPA (Instrument for Pre-Accession Assistance) has been established under the MoEF. The merger of the Ministry of Environment with the Ministry of Forestry has reduced the influence of environmental officials in policy making, and enforcement procedures are considered weak.⁶² Administrative capacity needs further strengthening, including coordination between the relevant authorities at all level.

Historically air pollution monitoring in urban areas have been performed by the Ministry of Health but these responsibilities have now shifted to the MoEF.⁶³ There has been no progress made on establishment of national environmental agency. Further, responsibilities such as inspection activities and nature protection are not clearly defined.

Turkey is not party to the Espoo or the Aarhus convention, respectively and has not ratified the Bonn Convention on the Conservation of Migratory Species of Wild Animals.

Access to public environmental information and public environmental awareness has been strengthened. There has also been an increase of public participation in the management of protected areas, in rural development and in Environmental Impact Assessments (EIAs) procedures. Further, there has been significant progress and improvements of environmental education at all levels of the formal education system.⁶⁴

6. Implementation and Follow-up of Responses to Environmental Problems and Opportunities and the Accession to EU-membership

For Turkey, the EU harmonisation process is the main driving force in major national environmental reforms. The EU accession process was for example a key driving force behind the EU Integrated Environmental Approximation Strategy (2007-2023) prepared by the Ministry of Environment and Forest (MoEF). The strategy identifies measures to ensure harmonisation and compliance with a large part of the EU environmental acquis communautaire. During the last decade several new environmental regulations and legislations have been issued. The negotiation of EU membership incited an update of several environmental legislations; 44 new pieces of legislations or amendments were adopted on e.g. access to information, environmental impact assessment and environmental inspections and also on air pollution, waste, water and chemicals. Although there has been some progress in aligning with the EU environmental legislation, transposition is still waiting for several pieces of legislation concerning air, water and natural protection. Furthermore, several environmental standards are not consistent with EU's.⁶⁵

⁶² Federal Research Division, 2008

⁶³ OECD, 2008b

⁶⁴ OECD, 2008b

⁶⁵ OECD, 2008b

Air quality: In line with the EU acquis, Turkey has made progress in alignment with the air quality framework. A clean air centre has been established in Marmara which is a sign of improvement of regional administrative capacity.⁶⁶ No progress has been made on air quality legislation related to the acquis on emissions of volatile organic compounds, on the sulphur content of certain liquid fuels or on national emission ceilings.⁶⁷

Water quality: In the area of water quality progress is slow and alignment to the acquis remains low. Institutional framework for water management is not organised on a river basin basis and trans-boundary consultation on water issues are at an early stage.⁶⁸ The emission standards for large power plants remain significantly less strict than those within the EU.

Waste management: There has been some progress on alignment with the waste management acquis. Although alignment in the area of waste management is advanced Turkey does not have a national waste management plan. The continuing loss of habitats is a cause of concern and the protection and implementing legislation has not yet been adopted. A national biodiversity strategy has been prepared but has not yet been adopted by the government.⁶⁹

Chemicals: There is no progress within the areas of industrial pollution and risk management and limited progress in the field of chemicals. Legislation on dangerous chemicals has been amended although capacity for effective implementation is inadequate.

Nature protection: Continuing loss of nature habitats, loss of biodiversity as well as ecosystem services is a cause of concern. A national biodiversity strategy and an action plan have been prepared but not yet adopted by the government.

Environmental monitoring: Several steps have been taken to increase the coverage and policy relevance of the environmental monitoring and reporting system (for e.g. air and water quality). However, overall the system is fragmented and needs to be upgraded, especially regarding support to policy decisions concerning industrial zone and coastal tourism.

The Environmental Impact Assessment (EIA) regulations are being harmonised with the EU regulations. The EIA directive has been transposed to a large degree.⁷⁰ However, mining projects are still not included for EIA consideration.⁷¹ Further, transposition of the Strategic Environmental Assessment (SEA) directive is at an early stage.⁷²

While the Turkish environmental legislation is moving towards an alignment with EU, there is still a huge need for physical investments to implement the EU Environmental Directives. Total expenditure to accomplish alignment is expected to be EUR 58 billion⁷³. In addition, the impact of modern environmental legislation in Turkey is often held back by problems of enforcement and insufficient capacities of municipal administrations in the adaptation to EU

⁶⁶ EC, 2008

⁶⁷ EC, 2008

⁶⁸ EC, 2008

⁶⁹ EC, 2008

⁷⁰ EC, 2008

⁷¹ OECD, 2008b

⁷² EC, 2008

⁷³ OECD, 2008b

procedures. It is estimated that a complete implementation of the environmental regulations to meet EU legislation will take approximately 15 years.⁷⁴

7. Implications for Swedish Development Cooperation

7.1 Conclusions

Turkey is challenged by ensuring economic growth together with environmental and social progress to achieve sustainable development. The country faces increasing environmental pressure which can partly be explained by growing sectors such as energy, industry, transport and tourism. The key environmental problems include air and water pollution, land and forest degradation and loss of biodiversity and ecosystem services.

Turkey is dependent on its natural and cultural resource for economic growth and poverty alleviation. Agriculture employs over one-third of the Turkish labour force and in many rural areas forest resources make a vital contribution to livelihoods. Further, the large natural and cultural assets provide an opportunity to develop business based on eco-tourism and nature-based activities contributing to national growth and poverty alleviation. Energy consumption has increased as a result of economic growth in recent years and the effect has been increasing air pollution in urban areas and increasing levels of CO₂ emissions. The high rural to urban migration is another area of concern. Urban areas are facing basic services and infrastructure challenges such as water and energy supply, and solid waste, and waste water treatment.

As a suggested “road map” for sustainable management of the natural resources of Turkey the findings and recommendations of the Millennium Ecosystem Assessment (MA) can be put to good use. The overall aims of the MA were to contribute to improved decision-making concerning ecosystem management and human well-being, and to build capacity for scientific assessments of this kind. A substantial adoption of the MA conceptual framework, approaches, and methods in donors’ ongoing initiatives and programs to support natural resources management could “fast-track” the process for a sustainable economic growth in Turkey. For additional information on the MA, see annex 1

Accession to the EU is the main driving force to major national environmental reforms. There has been some progress in aligning with the EU environmental legislation but transposition is still waiting for several pieces of legislation concerning air, water and natural protection. Furthermore, several environmental standards are not consistent with EU’s. The alignment to EU environmental legislation creates market incentives and opportunities for e.g. environmental technology. Many companies around the world see Turkey as an area of opportunity for environmental technology export.

7.2 Issues for Sida to consider:

Against this background the following issues could be relevant for Sida to consider in the development of a new cooperation strategy with Turkey:

- How can Sida together with other development agencies support and strengthen, efforts to improve energy efficiency in the energy, transport, industry, sectors promoting climate change mitigation and reducing air pollution.

⁷⁴ Clean Environment, 2008

- There is a need to strengthen monitoring, regulatory and control functions of water and air quality. Sida could consider supporting projects for implementing improved monitoring and pollution control.
- How can Sida together with other development agencies further support the integration of environment and climate change in key national and sector strategies (for instance within the energy and tourism) and the implementation of the same?
- Endangered and vulnerable species is high and destruction or transformation of biotopes is continuing due to rapid development of tourism, urbanisation, industrialisation, and environmental degradation. Nature conservation programme planning is needed as well as inventory of endangered species and a Red List. There is also a need to ensure that EIAs are carried out for activities that put pressure on biodiversity. Sida could consider strengthening the network of specialists and research within this area.

Finally, this policy brief is by no means all-encompassing. Needless to say, there are many aspects that deserve a much more detailed level of analysis. We hope, however, that this Environmental and Climate Change Policy Brief fulfils its aim of being a point of departure for a discussion on how environmental and natural resources aspects can be integrated into Swedish development cooperation with Turkey.

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Annex 1: The Millennium Ecosystem Assessment

The Millennium Ecosystem Assessment in brief

The Millennium Ecosystem Assessment (MA) was called for by the United Nations Secretary-General Kofi Annan in 2000. Initiated in 2001, the objective of the MA was to assess the consequences of ecosystem change for human well-being and the scientific basis for action needed to enhance the conservation and sustainable use of those systems and their contribution to human well-being. The MA has involved the work of more than 1,360 experts worldwide. Their findings, contained in five technical volumes and six synthesis reports, provide a state-of-the-art scientific appraisal of the condition and trends in the world's ecosystems and the services they provide (such as clean water, food, forest products, flood control, and natural resources) and the options to restore, conserve or enhance the sustainable use of ecosystems.

There is a growing understanding of the fundamental role ecosystems and the services they provide play for human welfare, see Fig 1. describing the linkages between biodiversity, ecosystem services and human well-being.

Key findings of the Millennium Ecosystem Assessment⁷⁵, finalised in 2005 and the so far most comprehensive survey of the ecological state of the planet, include:

- 60% of world ecosystem services have been degraded
- Of 24 evaluated ecosystems, 15 are being damaged, see Table 1.
- About a quarter of the Earth's land surface is now cultivated.
- People now use between 40 percent and 50 percent of all available freshwater running off the land. Water withdrawals have doubled over the past 40 years.
- Over a quarter of all fish stocks are overharvested.
- Since 1980, about 35 percent of mangroves have been lost
- Nutrient pollution has led to eutrophication of waters and coastal dead zones
- Species extinction rates are now 100-1,000 times above the background rate

The degradation of ecosystem services is hence already a significant barrier to achieving the Millennium Development Goals, contributes to growing inequities and disparities across groups of people, and is sometimes the principal factor causing poverty and social conflicts.

Figure 1. Links between biodiversity, ecosystem services and human well-being

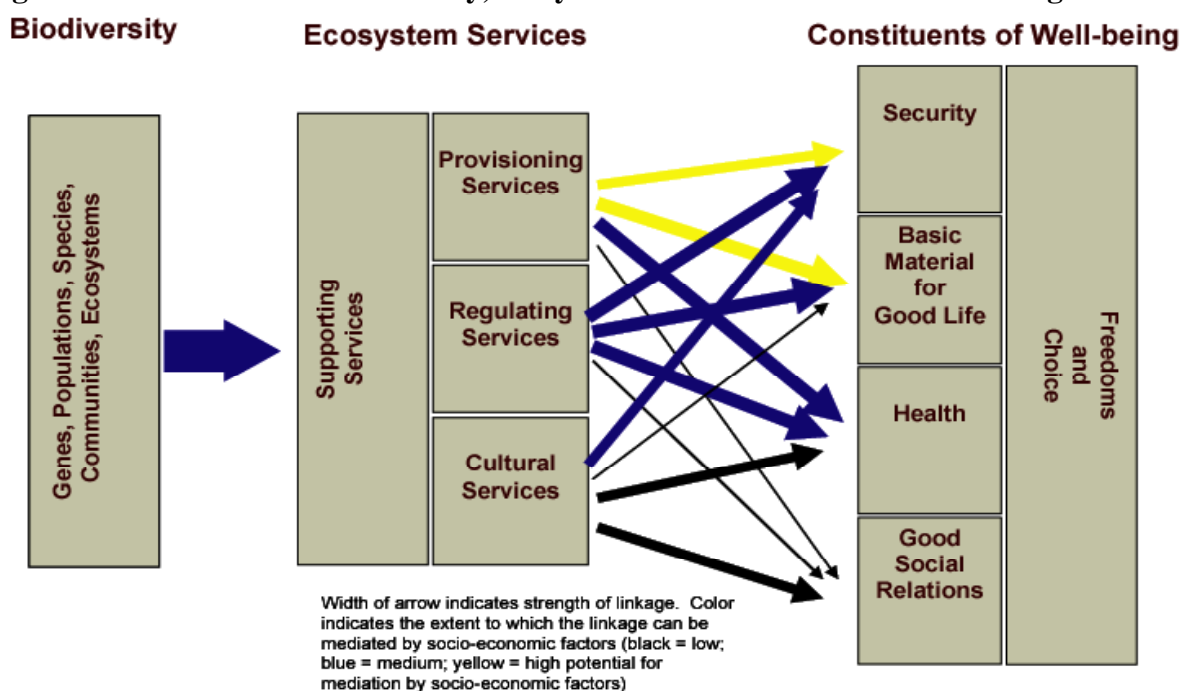


Table 1: Global condition of Ecosystem Services Examined by the Millennium Ecosystem Assessment

Ecosystem Services	Enhanced	Mixed	Degraded
Provisioning	Crops Livestock Aquaculture Carbon	Timber Fiber	Capture fisheries Wild foods Wood fuel Genetic resources Biochemicals Fresh Water
Regulating	Carbon sequestration	Water regulation Disease regulation	Air quality regulation Regional & local climate regulation Erosion regulation Water purification Pest regulation Pollination Natural Hazard regulation
Cultural		Recreation & ecotourism	Spiritual & religious Aesthetic values

For additional information on the MA including presentation materials etc, go to

<http://www.maweb.org>