Climate Change Profile
Palestinian Territories
Table of contents

Introduction 3
Summary 3
Biophysical vulnerability 3
Socio-economic vulnerability 6
National government strategies and policies 8
Nationally Determined Contributions (NDC) 9
Climate finance 11
Climate change projects 12
Climate contribution of the Netherlands 12

Maps
Map 1 Map of (governorates of) the Palestinian Territories 14
Map 2 Climate classification of the West Bank 15
Map 3 Annual rainfall Palestinian Territories, 2015 16
Map 4 Mountain and coastal aquifers (2002), Palestinian Territories 17
Map 5 Mean temperature at the West Bank, at governorate level 18
Map 6 Total annual rainfall at the West Bank, governorate level 19

Annex
International and multilateral climate projects 20
Introduction

This climate change profile is designed to help integrate climate actions into development activities. It complements the publication ‘Climate-smart = Future-Proof! – Guidelines for Integrating climate-smart actions into development policies and activities’ and provides answers to some of the questions that are raised in the step-by-step approach in these guidelines.

The current and expected effects of climate change differ locally, nationally and regionally. The impacts of climate change effects on livelihoods, food and water security, ecosystems, infrastructure etc. differ per country and region as well as community and individual, with gender a particularly important vulnerability factor. This profile aims to give insight in the climate change effects and impacts in Palestinian Territories, with particular attention for food security and water. It also sheds light on the policies, priorities and commitments of the government in responding to climate change and important climate-relevant activities that are being implemented, including activities being internationally financed.

Summary

The Palestinian Territories refer to the West Bank (located at the West Bank of the river Jordan, bordering the Dead Sea) and the Gaza – strip (a coastal area bordering the Mediterranean Sea, see Map 1). In 2012, the UN adopted a resolution to provide the country a ‘non-member observer status’1. To date, the conflict with neighbouring state Israel persists.

Even though climate change is not the most pressing issue for the people in the Palestinian Territories, the climate risks are significant and will compound current and future development challenges. The Palestinian Territories are characterized by both a high bio-physical and socio-economic vulnerability to climate change, combined with limited capacity to respond to projected and current effects of climate change2. Inhabitants of the West Bank and Gaza are living in areas facing serious challenges in water availability. Recent and projected climate trends indicate that temperatures in the area will rise, precipitation will decrease, and high precipitation events (HPE) will occur. This will result in increased water shortages, flooding and subsequent challenges in food security. The capacity of the Palestinians to cope with and adapt to these challenges, is constrained due to its limited control over and access to its natural resources, especially land and water, as a result of the restrictions imposed by Israel.

Biophysical vulnerability

Current climate

The Palestinian Territories are located in a transitional zone, between the Mediterranean and arid, tropical zones. The climate in the Palestinian Territories is predominantly of the eastern Mediterranean type; warm to hot, dry summers and mild, rainy winters with rainfall between 100-700 mm3. During high summer (July – August), the average temperature is 27.3 °C; the coolest months are January and February with an average temperature of 12.9 °C. The various climate zones, combined with its geographic location close to Africa, Asia and Europe, have made it historically rich in biodiversity4.

The climatic conditions (rainfall, temperature) in the Palestinian Territories vary per location, per season and with altitude. Especially the West Bank is, despite its relatively small size, very climate diverse (see Map 2). There are five major climate zones within the Palestinian Territories5:

1. Jordan Valley region: about 75 to 90 metres above sea level with an average annual rainfall of only 100 to 200 mm. Soil salinization is a major problem.
2. Eastern slopes region: a transitional zone between the Mediterranean and desert, with an average annual rainfall of 150 to 300 mm.
3. Central highlands region: lies 400 to 1000 m above sea level, annual rainfall varies between 300 mm in the south to 600 mm in the north.
4. Semi-coastal region: 100 to 300 meters above sea level, rainfall 400 to 700 mm/year.
5. Coastal plain (Gaza Strip): rainfall of 200-400 mm/year.


http://sdwebx.worldbank.org/climateportal/index.cfm?/page=coun try_historical_climate6ThisRegion=Middle%20East&ThicCode=PSE
The West Bank is relatively arid, with 50% of the land having rainfall less than 500 mm/year, including a hyper-arid area with rainfall less than 100 mm/year. The remaining land has conditions with rainfall ranging between 500-800 mm/year. From the north to the south (of the West Bank), the annual amount of rainfall decreases (from 700 mm around Jenin to 80-100 mm in the south), while the annual temperature increases. The area that suffers from greatest aridity is located at the south-eastern side of the West Bank (see Map 3). The Gaza strip, a largely flat terrain, is characterized by a coastal climate and receives around 200 to 400 mm/year rainfall. In the north, the average seasonal rainfall is 522 mm (Beit Lahiya governorate) and in the south, 225 mm (Rafah governorate)9, see Map 3.

The Palestinian Central Bureau of Statistics (PCBS) reported the following amounts of rainfall on several monitoring locations on the West Bank for the year 201510:

<table>
<thead>
<tr>
<th>Location</th>
<th>Rainfall (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tubas</td>
<td>687</td>
</tr>
<tr>
<td>Ramallah</td>
<td>613</td>
</tr>
<tr>
<td>Nablus</td>
<td>705</td>
</tr>
<tr>
<td>Hebron</td>
<td>944</td>
</tr>
<tr>
<td>Jenin</td>
<td>528</td>
</tr>
<tr>
<td>Beith Haier</td>
<td>212</td>
</tr>
<tr>
<td>Jericho</td>
<td>201</td>
</tr>
</tbody>
</table>

Groundwater, one of the most important natural resources and the backbone of the agricultural sector and domestic needs, is affected by the amounts of rain falling in the region. Both the West Bank and the Gaza strip, depend on ground water aquifers as the major source of water (see Map 4). The volume of annual renewable ground water resources in the West Bank is 669 MCM and the yearly surface water is estimated at an average of 110 MCM, while the annual renewable ground water is estimated at 45 MCM in the Gaza Strip11. Winter rains replenish water resources from ground water aquifers16.

The Gaza strip lies above part of the Coastal Aquifer Basin, which runs from Haifa to northern Egypt through Gaza. Due primarily to its permeable sandy cover, the aquifer itself is vulnerable to pollution from the surface. The aquifer underneath Gaza has been overexploited for decades, at a rate three times its limit for sustainable use17. Overexploitation and decreasing precipitation has led to increased seawater intrusion and salinization of freshwater resources. Studies suggest that over 90% of the Gaza Strip’s water resources are already undrinkable and this figure is projected to rise14.

Current trends. Over the last 30 years, the mean temperature in the Middle Eastern region (Israel, Jordan, Lebanon, Palestinian Territories and Syria) significantly increased at a rate of 0.4 °C per decade (Map 5)18 20. At the same time rainfall has decreased (Map 6).

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The main problem related to the current climate trend of rising temperatures and declining precipitation, is the availability of water. In the last 15 years, the wider region (including Israel and Jordan) has seen reductions in the amount of rainfall. Average rainfall for the West Bank in the years 2008/9 was 425 mm – 22% below the long-term average of 538 mm. Subsequently, the 316 mm rainfall for the Gaza Strip was 12% below the long-term average. The Palestinian government reported negative impacts of rainfall reductions on agricultural production in the West Bank and problems of winter crops due to delayed rains in the Gaza strip. Besides experiencing region-wide reduced precipitation, access to water for the inhabitants of the Palestinian Territories is also impacted by security and military activities of Israel.

Climate change Projection models for the Middle East and eastern Mediterranean indicate a strong increase in temperature and a decrease in total annual precipitation. For the end of this century, a warming ranging from 1.8 to 5.1°C is likely. Annual precipitation rates are likely to decrease by 10% in 2020, by 20% by 2050, and may reach a decrease of 35% by 2100 with an increased risk of summer droughts.

Further, a strong increase in the duration of heat waves, as well as a strong reduction of cold spells length is projected. Also, the number of yearly days of high temperatures (daily maximum temperatures above 30°C) is expected to rise.

High Precipitation Events (HPEs) are likely to lead to flash floods. Sea level in the eastern Mediterranean is expected to rise by 10 cm every decade, which is consistent with global estimates of a 0.6-1.6 m increase by the end of this century.

Expected effects of climate changes on food security and water availability as well as energy, health and the environment, are:

Water:
- increased water shortages from lower rainfall and higher evaporation;
- increased flash floods from greater rainfall variability and HPEs;
- insufficient rain to recharge groundwater aquifers: lower precipitation affects groundwater aquifer replenishment and surface runoff, loss of storage in coastal aquifer. In 2020, it is estimated that the Palestinian Territories will experience a water deficit of 271 x 106 m³;
- reduced surface and groundwater quality: due to salinization of fresh water sources, availability of drinkable water is reduced. The situation in Gaza is particularly serious. Gaza has no surface water available and relies solely on groundwater aquifers. It is estimated that 95% of Gaza’s aquifer is not safe for drinking without treatment (due to salinization and contamination).

Further, the permeable soil is susceptible from leakage of surface contamination and pollution.

Agriculture:
- more frequent droughts and increased desertification;
- changes in economic viability of crops (e.g. shorter growing seasons);
- increased crop water requirements;
- decline in grazing ranges and stocks;
- higher food prices;
- soil degradation and desertification.

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Energy:
- increased energy demands to cope with more temperature extremes;
- rising fuel demands to cope with water shortages (fuel and transport associated costs);

Public health:
- pressure on public health and increased occurrence of diseases related to (the lack of) water such as diarrhea, cholera and dehydration;
- increased heat stress from high temperature extreme events;
- spatial and temporal alteration of diseases, such as malaria;

Coastal areas:
- saline intrusion into the Coastal Aquifer;
- land use impacts from sea-level rise and coastal erosion: the Mediterranean coast is expected to lose kilometers of beach area; cliff erosion will accelerate;
- soil degradation;
- loss of biodiversity: northwest migration of ecological systems, loss of sensitive ecosystems.

Socio-economic vulnerability

Key facts:
- GDP (PPP) per capita (2016): 2,943 (West Bank and Gaza)
- Population (July 2017): 4,920,724
- Registered refugees (2016): West Bank: 775,000; Gaza 1.3 million (of 1.9 million)
- Population growth rate (2016): 2.9%
- Projected population (2050): 9,704,000
- Population density per km²: 756
- Human Development Index (2016): 114 out of 188 countries

Corruption Perception Index (2015): no rank
Gender Inequality Index (2016): no rank
Adult literacy (2016): 97% (99% men; 95% women)
Unemployment rate (2016): 27% (West Bank 18%; Gaza 44%)
Youth unemployment rate (2016): 58% Gaza

The Palestinian territory is highly vulnerable and seriously affected by water scarcity and climate change. The socio-economic and political conditions deeply affect how the Palestinian population can cope with climate impacts (see below). Climate change further intensifies the existing food security and water related problems. A recent publication of the Palestine Red Crescent Society, states that 16 to 47% of the people in Gaza or on the West Bank experience food insecurity. Food security is to a large extent linked to poverty. Cash and food assistance have an impact on reducing poverty rates and increasing food security. Currently, approximately 88% of food consumption is imported, and this figure is expected to increase.

Agriculture is considered an important shock absorber in terms of food security. In 2015 it employed 11.5% of the country’s workforce and is however, the economic contribution of the sector to the country’s GDP is declining. In 1970, it was the dominant sector in the economy of the Palestinian Territories, providing employment for a large part of the population and contributing 36% to the GDP. The production shift in the 1990s towards export-oriented markets is now a major challenge as a consequence of the economic collapse combined with Israel’s closure policy. As a result, agriculture’s role in the economy has declined considerably: the contribution of agriculture to GDP

| 6 |
Climate Change Profile: Palestinian Territories

Highly Vulnerable West Bank

**Agriculture**
- Olive production; Grape production; Stone fruits; Rain-fed vegetables; Field crops; Irrigated vegetables; Grazing area and soil erosion; Irrigation water; Livestock production

**Food**
- Domestic food prices; imported food prices

**Water**
- Ground water supply; Flood management; Condition of infrastructure

High Vulnerability Gaza

**Agriculture**
- Livestock production; Cost of agricultural production; Employment; Vegetable production; Olive production, Citrus; Irrigation water

**Food**
- Domestic food prices; imported food prices

**Water**
- Ground water supply; Ground water quality; Flood management

### Climate Change Impact

<table>
<thead>
<tr>
<th>Impact</th>
<th>West Bank</th>
<th>Gaza</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agriculture</td>
<td>Olive production; Grape production; Stone fruits; Rain-fed vegetables; Field crops; Irrigated vegetables; Grazing area and soil erosion; Irrigation water; Livestock production</td>
<td>Livestock production; Cost of agricultural production; Employment; Vegetable production; Olive production, Citrus; Irrigation water</td>
</tr>
<tr>
<td>Food</td>
<td>Domestic food prices; imported food prices</td>
<td>Domestic food prices; imported food prices</td>
</tr>
<tr>
<td>Water</td>
<td>Ground water supply; Flood management; Condition of infrastructure</td>
<td>Ground water supply; Ground water quality; Flood management</td>
</tr>
</tbody>
</table>

Climate change effects are already being noticed. Reflecting their recognition of the increased likelihood of drought and HPEs, IUCN reported that residents of the West Bank consider floods and droughts as the main climate–related risks affecting their region. Continuing population growth and projections of regional climate change will intensify water stress for Palestinians. It has been estimated that the Palestinian Territories will experience a water deficit of 271X106 m³ by 2020. The challenge will be to increase food security (by domestic production and/or imports) in a context of increased water stress and with water allocation patterns determined by Israel.

Agricultural production in the Palestinian Territories has already been affected by recent droughts which are projected to become more pronounced over time. The National Adaptation Plan (2016) includes a vulnerability analysis for agriculture, food and water identifying highly vulnerable issues (see table above).

Socio-economic vulnerability to climate change in the Palestinian Territories must be seen in the political-economic context. Studies suggest that restrictions and limitations that inhabitants of the Palestinian Territories face (e.g. restrictions in importing goods into the Gaza strip, limitation to obtain work permits, limitations to mobility), impair their capability to take appropriate mitigation and adaptation measures. Water resources are almost under complete control by Israel; Palestine controls just 21% of its water resources. The NAP notes, for example, that in Gaza Israel has reduced the quantity available for irrigation, while it recognizes Palestine’s right to water. Since groundwater wells are the main source of water for irrigation in the Gaza Strip with only limited use made of treated wastewater, Israel’s refusal to allow Palestinians to import and install wastewater treatment or desalination plants results in insufficient freshwater for irrigation during dry periods. Food security is also affected Israeli restrictions, that contribute to the overuse of available resources, depleting soil nutrients and fresh water resources thus reducing current and future resilience.

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60 National Adaptation Plan (2016).
National government strategies and policies

On 1 February 2015, the state of Palestine acceded to the UN Convention of Biological Diversity (CBD) with the publication of its Fifth National Report** 64. The Palestinian Territories submitted its formal instrument of accession of the UN Framework Convention on Climate Change (UNFCCC) on 18 December 2015, and was granted a formal ‘party’ status on 17 March 2016**. Being a formal party enables active participation in international climate discussions and decisions and gives access to international climate finance, such as the Green Climate Fund. Since becoming a party to the UNFCCC Palestine has signed and ratified the Paris Agreement in April 2016 with it entering into force in November 2016. It also has submitted several documents: its Initial Communication Report to the UNFCCC and a National Adaptation Plan**. Furthermore, it has unofficially submitted its Nationally Determined Contributions (NDC, see below) which is awaiting formal approval by its government and an implementation road map for the NDC. In its NDC, it notes that ‘The period between joining the UNFCCC and submitting the INC and NAP is less than eight months, highlighting the importance of climate change within the Palestinian national agenda’.

This high degree of engagement in climate change is recent. Before 2008, climate change was not considered a policy priority by the Palestinian Authority (for example: climate change was not mentioned in the Palestinian Reform and Development Plan 2008-2010). Since 2008, the UNDP Programme of Assistance to the Palestinian People (UNDP/PAPP) funded capacity building for climate change adaptation and the preparation of the Climate Change Adaptation Strategy, the Programme of Action for the Palestinian Authority (PAPA) in 2010** and the NAP.

The PAPA focused on reducing water insecurity and food insecurity and recommends that priority should be given to no-regret and low-regret measures that are considered to have the highest levels of adaptive capacity and technical feasibility. No-regrets options are those that are justified under current climate conditions and are further justified when probable climate change is considered. Low-regrets options are those that require limited additional outlays to address the effects of climate change. No-regrets adaptation actions included actions, such as development of flood contingency plans; local increases in rainfall interception capacity; clear water use priorities; more efficient irrigation techniques; increased (sustainable) production of freshwater; equitable and reasonable utilization of trans-boundary water resources, between Israel and Palestine (implying a fairer allocation of groundwater and freshwater). Low regrets adaptation actions included prioritization of irrigation for high value crops; increased use of water harvesting; diversification of rural livelihoods, incorporation of climate adaptation in land use planning; selection of crop and ruminants for more tolerance to heat and drought.

The NAP builds on the PAPA and identifies key adaptation actions for agriculture, coast and marine, energy, food, gender, industry, terrestrial ecosystems, tourism, infrastructure, waste management, and water with a detailed implementation (for a ten-year period) cost estimate of USD 3.5 billion of which USD 1.02 billion is for agriculture activities and USD 894 million is for water activities.

Actions for agriculture include:

- Improve water use efficiency and using alternative water resources
- Land-use planning and management: greening, afforestation, and rangeland development
- Enhance sustainable community level irrigation schemes and infrastructure
- Increase the availability of animal feed (including plant and organic residues) at an affordable price
- Improve livestock production pens
- Climate-smart agriculture (West Bank: production of olives, grapes, stone fruits, rain-fed vegetables and field crops; Gaza Strip - citrus, olive production, vegetable production, and employment)
- Agricultural disaster risk reduction and management (DRR/M)
- Establishment of farmers’ support (subsidies, awareness training programs)

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64 See website UN CBD List of parties, accessed on 8 June 2016, via https://www.cbd.int/information/parties.shtml
68 http://newsroom.unfccc.int/unfccc-newsroom/state-of-palestine-joins-convention/
62 http://unfccc.int/home/items/6078.php?q=Palestine&searchbutton.x=0&searchbutton.y=0
Actions for water include:

• Enhance the use of additional and alternative water resources for non-domestic purposes
• Allocate transboundary water resources equitably and reasonably (Israel and Palestinian Territories)
• Rehabilitate water sources: wells, canals and springs
• Control of leakage from distribution systems
• Develop and improve storm water systems and drainage infrastructure
• Build a large desalination plant for Gaza
• Increase share of imported water

National plans and policies related to climate change supporting the PAPA and NAP include:

• The Agricultural Sector Strategy "Resilience and Development", 2014-2016. Strategic objectives related to climate change are:
  - efficient and sustainable management of natural resources;
  - enhanced agricultural production, productivity and competitiveness, as well as enhanced contribution of agriculture to food security.
• Water sector strategy and water sector reform plan: measures considered in this plan are (i) groundwater supply development (drilling wells and rehabilitation of existing springs and wells); (ii) impact assessment of climate change; (iii) demand management and strategic planning (physical water loss, water use reduction, changing crop patterns and water use restrictions); (iv) water harvesting (including storm water) and (v) mapping of alternative resources (purchased water, desalinization, reuse of waste water).
• Drought conditions and management strategies in Palestine (2014): measures to alleviate water scarcity

Nationally Determined Contributions (NDC)

Palestine’s First NDC notes that while its priority on climate change is adaptation, it is also committed to ensuring that its emissions pathway is in line with the objective of the UNFCCC to stabilise greenhouse gas emissions at a level that prevents dangerous anthropogenic interference with the climate system. Palestine intends to reduce its CO2 emissions conditional on receiving international support in the form of finance, technology transfer and capacity building; unconditional actions will also be undertaken that will contribute to mitigation. The cost of the conditional mitigation actions is USD 10.6 billion. The cost of the implementation of the NAP (which serves as the adaptation component of the NDC) is USD 3.5 billion (see above).

The reduction is also predicated on two scenarios, an independence scenario and a status quo scenario. In the independence scenario, the mitigation contribution is 24.4% by 2040 relative to business-as-usual; in the status quo scenario it is 12.8% by 2040 relative to business-as-usual.
Mitigation actions conditional on receiving international support include:

<table>
<thead>
<tr>
<th>Mitigation action</th>
<th>Brief description of action</th>
</tr>
</thead>
<tbody>
<tr>
<td>Solar photovoltaic</td>
<td>Generation of 20% - 33% of electricity using solar PV. Energy Service Companies (ESCOS) could be used to overcome financial barriers.</td>
</tr>
<tr>
<td>Energy efficiency in buildings</td>
<td>Buildings standards on thermal efficiency, developing on existing regulations.</td>
</tr>
<tr>
<td>Use of waste for cement production</td>
<td>Municipal solid waste used as a substitution of 20% of coal in cement production. Acquired through contract tender to private organisations.</td>
</tr>
<tr>
<td>Use of waste for electricity generation</td>
<td>Deployment of a 1 MW (50 tonnes per day of waste) waste incineration unit.</td>
</tr>
<tr>
<td>Reduction of methane from landfill</td>
<td>The capture of 14,000 tonnes of landfill gases per annum for use in power generation.</td>
</tr>
<tr>
<td>Energy efficient lighting</td>
<td>Annual increase as part of buildings standards. Increase of 1% per annum using energy efficient lightbulbs.</td>
</tr>
<tr>
<td>Hybrid electric vehicles</td>
<td>Promotional campaigns and maintenance/increases to tax credits for qualifying vehicles</td>
</tr>
<tr>
<td>Compressed natural gas-powered vehicles</td>
<td>Development of compressed natural gas refueling infrastructure and amendment to the Traffic Act regarding license fees. Assumes that 20% of trucks and buses could use compressed natural gas by 2040.</td>
</tr>
<tr>
<td>Modal shift programmes</td>
<td>Numerous measures including standard public service contracts, simplified fare systems, improved passenger information and better vehicles and maintenance. Envisions a 25% shift from private vehicle to public bus by 2030.</td>
</tr>
<tr>
<td>Afforestation</td>
<td>Annual increase of 200 hectares of forested land per annum, building on existing forested land.</td>
</tr>
</tbody>
</table>

Mitigation actions to be implemented unconditionally:

<table>
<thead>
<tr>
<th>Mitigation action</th>
<th>Brief description of action</th>
<th>Timescale for implementation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sustainable Urban Demonstration Projects1</td>
<td>Installation of six net-metering photovoltaic systems on 6 main public buildings in the Tubas Municipality: • Municipality Building • Public Information Centre • Cafeteria Building - Public Transportation • Dynamo-meter Building • Youth Centre Building • Storage Building.</td>
<td>2015-2017</td>
</tr>
<tr>
<td>Sustainable Urban Demonstration</td>
<td>Installation of a small-scale wastewater treatment plant powered by solar energy in Za’atara, Palestine, and evaluation of the feasibility of upscaling this technology</td>
<td>2015-2017</td>
</tr>
<tr>
<td>Afforestation Project</td>
<td>Afforestation through: • reclamation of approximately 1200 dunums of unused agricultural lands • development of approximately 1000 dunums of grazing lands. The introduction of new areas for planting new trees will provide increased carbon sequestration.</td>
<td>2015-2017</td>
</tr>
<tr>
<td>Greening Palestine</td>
<td>Increasing green cover to provide increased carbon sequestration.</td>
<td>Ongoing</td>
</tr>
<tr>
<td>Rangeland development, improvement and rehabilitation.</td>
<td>New forage plants (shrubs and trees) will provide increased carbon sequestration.</td>
<td>2014 – 2017</td>
</tr>
</tbody>
</table>
Climate finance

On 1 February 2015, the state of Palestine acceded to the UN Convention of Biological Diversity (CBD)\(^76\) and as noted above was granted formal ‘party’ status to the UNFCCC in March 2016\(^77\). The entry as formal party to the UNFCCC has opened access for the Palestinian Territories to climate funds that were previously unavailable when it had an observer status. Potential climate finance funds include\(^78\):

• The Adaptation Fund\(^79\);
• The Clean Development Mechanism (CDM)\(^80\);
• The Green Climate Fund\(^81\);
• Global Environmental Facility (GEF)\(^82\).

Currently, the World Bank and the United Nations provide climate funds for the Palestinian Territories. The World Bank portfolio in West Bank and Gaza includes 17 projects for a total of USD 161 million\(^83\). Climate related projects focus on water & sanitation and energy & electricity (see projects listed in Annex).

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\(^76\) See website UN CBD List of parties, accessed on 8 June 2016, via https://www.cbd.int/information/parties.shtml

\(^77\) See website UNFCCC, accessed on 8 June 2016, via http://newsroom.unfccc.int/unfccc-newsroom/state-of-palestine-joins-convention/

\(^78\) Climate Policy Observer (2016). In-depth: Palestine’s full membership to the UNFCCC. Available via http://climateobserver.org/in-depth-palestines-full-membership-unfccc/

\(^79\) https://www.adaptation-fund.org/projects-programmes/project-information/projects-map-view/

\(^80\) http://cdm.unfccc.int/index.html

\(^81\) http://www.greenclimate.fund/home

\(^82\) https://www.thegef.org/gef/home

Since 1993, the UN finances multiple projects in the Palestinian Territories through the Programme of Assistance to the Palestinian People (UNDP/PAPP)\(^6\). The current program has 57 projects primarily focusing on responsive institutions and inclusive and sustainable growth (71%).

### Climate change projects

Though the larger part of UNDP/PAPP projects focuses on poverty reduction, strengthening democratic governance, youth, education and healthcare, there are also projects focusing on climate change. These projects mostly focus on water supply (increasing availability and quality) and increasing food security (e.g. agricultural development). Examples of projects are:

- **Construction of Khan Younis Waste Water Treatment Plant (KYWWTP):** UNDP/PAPP, government of Japan and the Islamic Development Bank, funded a waste water treatment plan in governorate Khan Younis, located at the southern part of the Gaza strip. This plant helps protecting public health and environmental pollution by preventing sewage from leaking into the environment and water aquifers. The plant will have a capacity of 26,600 cubic metres per day. Project preparations started 2006, the project was launched in 2015 and is estimated to be fully functional in February 2020\(^9\).
- **Rehabilitation of water facilities in Area C of the West Bank:** the government of Japan funded this initiative aiming to provide quick tangible improvements in access to water for agricultural development and irrigated farming. The project will deliver: (i) 234 water cisterns with a total capacity of 22,400 cubic metres in the Jerusalem and Hebron governorates; (ii) 5 water storage reservoirs in the Jordan Valley and Qaliqilyah; (iii) 8 km of irrigation networks; (iv) upgrades of 10 underground water wells and (vi) 4 water user associations for capacity building in the Jordan Valley\(^8\).

Examples of World Bank funded projects are:

- **Gaza Emergency Response for Electricity Network Rehabilitation:** project finances scaling up and reconstructing the electricity infrastructure.
- **Water sector capacity building project (additional financing):** this project aims to strengthen the capacity of governmental institutes (PWA) to effectively plan, monitor and regulate water sector development.

A list of climate-related projects can be found in the [Annex](http://www.ps.undp.org/content/papp/en/home/operations/projects/environment_and_energy.html).

### Climate contribution of the Netherlands

The Netherlands supports climate-relevant projects in the Palestinian Territories through a variety of channels and in cooperation with range of actors with a focus on integrated water management, food security and energy:

- **Land and Water Resource Management programme:** helps farmers to adapt to climate change challenges by promoting sound water management techniques and assisting farmers to build water cisterns to catch rainfall. It also improves inclusive sustainable agricultural production through land resource management, enhancing Integrated Soil Fertility Management (ISFM), creating platform knowledge of climate change adaptation, efficient collective water resources management and inclusive access to water resources.
- **Reform and Development of Markets, Value Chains and Producers’ Organisations programme:** to enable Palestinian agribusinesses to generate better income, trade and welfare; minimize the environmental consequences of agricultural activities; and promote the adoption of climate-smart agriculture, including practices that improve adaptation to climate change by providing a buffer to drought and extreme temperatures. The programme presents opportunities for mitigation by the reduction in energy consumption and increased carbon sequestration.
- **Safe and Productive Use of Treated Wastewater project:** scientific research to promote safe and productive use of treated wastewater for agricultural purposes (and reduce water shortage).
- **Sustainable off-grid energy and water services programme:** develops sustainable water distribution systems powered by renewable energy in unserved communities in Area C. provides families with safe drinking water and improves living standards by securing a reliable energy source.
- **Academic Water Cooperation project:** tackles key challenges faced by the Palestinian water sector, both on policy and practical levels, enhancing the capacity of academic institutions throughout the activities and leading to new knowledge, practices and technologies contributing to the sustainable management of water and environmental resources and the sustainable delivery of water related services.

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Maps
Map 1  Map of (governorates of) the Palestinian Territories

Source: Fanack

Map 2  Climate classification of the West Bank

Source: UNDP (2010) 88

Map 3  Annual rainfall Palestinian Territories, 2015

Source: FANACK89 and ARJ90

89 https://water.fanack.com/palestine/climate-and-rainfall/
90 http://www.arij.org/maps-of-palestine.html
Map 4 Mountain and coastal aquifers (2002), Palestinian Territories

Source: UN Cartographic section (December 2002) [47]

http://www.arij.org/maps-of-palestine.html
Map 5 Mean temperature at the West Bank, at governorate level

Map 6  Total annual rainfall at the West Bank, governorate level

Annex

International and multilateral climate projects (since 2012)
<table>
<thead>
<tr>
<th>Name of Project</th>
<th>Name of fund/ donor</th>
<th>Implementing agency</th>
<th>Amount approved (USD million)</th>
<th>Disbursed (USD millions)</th>
<th>Time frame</th>
</tr>
</thead>
<tbody>
<tr>
<td>Construction of a waste water treatment plan in the Khan Younis governorate</td>
<td>Government of Japan, Islamic Development Bank, UNDP</td>
<td>UNDP/PAPP</td>
<td>57</td>
<td>2.8</td>
<td>2015-2020</td>
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<tr>
<td>Community resilience and development programme (CRDP)</td>
<td>Sida, Austrian Development Agency, Norway, UK (round 1)</td>
<td>UNDP/PAPP</td>
<td>17.9</td>
<td>2012-2017</td>
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<tr>
<td>Enhancing capacities of Palestinian institutions in mainstreaming environment and climate change</td>
<td>Government of Belgium</td>
<td>UNDP/PAPP</td>
<td>1.8</td>
<td>2013-2016</td>
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<tr>
<td>Restoring water facilities in Area C of the West Bank</td>
<td>Government of Japan</td>
<td>UNDP/PAPP</td>
<td>2014-2016</td>
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<tr>
<td>Development of high resolution hydro climate model, fostering cooperation on water management between Palestinian, Jordanian and Israeli water authorities</td>
<td>EU</td>
<td>UNDP/PAPP</td>
<td>.41</td>
<td>2013-2016</td>
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<tr>
<td>Water sector capacity building project, additional financing</td>
<td>World Bank</td>
<td>PWA, Water Regulatory Council</td>
<td>2</td>
<td>2015</td>
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<tr>
<td>Hebron regional wastewater management project, phase 1</td>
<td>World Bank</td>
<td>PWA</td>
<td>4.5</td>
<td>2015</td>
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<td>GZ Water sector capacity building</td>
<td>World Bank</td>
<td>PWA</td>
<td>3</td>
<td>2011</td>
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<tr>
<td>Gaza Sustainable Water Supply Program</td>
<td>World Bank</td>
<td></td>
<td>2.5</td>
<td></td>
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<tr>
<td>Adapting to climate change</td>
<td>Energy and climate fund (GIZ)</td>
<td>MoA</td>
<td>N/A</td>
<td>2014-2018</td>
<td></td>
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