



## CLICC Phase 2 Pilots – State of Palestine

DRAFT outputs for cross-pilot QA

07/06/2019



This document presents the Country Level Impacts of Climate Change (CLICC) templates completed for the State of Palestine in accordance with the CLICC technical guidelines for:

- Observed climate impacts (Table 1)
- Projected climate impacts (Table 2)
- Data quality (Table 3)
- Metadata (Table 4).

The CLICC templates have been completed by reference to information in the State of Palestine’s National Adaptation Plan (NAP) and supporting spreadsheets that were developed in association with stakeholders from across 12 themes/sectors. From the common sectors presented in the CLICC guidelines, Palestine has not documented information on business, forestry, transport, nor mining and quarrying. Therefore, the State of Palestine is presenting information here on the eight remaining sectors. The names of the CLICC sectors are slightly different than those addressed by the NAP. The list below clarifies differences in nomenclature, where needed:

- Agriculture (also includes “Food Security” from the NAP)
- Built infrastructure (is synonymous with “Urban and Infrastructure” from the NAP)
- Ecosystems (includes relevant elements of “Terrestrial Ecosystems” and “Coastal and Marine” from the NAP)
- Fisheries (includes relevant elements of “Coastal and Marine” from the NAP)
- Manufacturing (is synonymous with “Industry” in the NAP).

The NAP also assessed additional themes (gender and waste) that are not identified by CLICC as sectors or sub-sectors, so these are not included here.

Observed and projected impacts are presented for the West Bank (including East Jerusalem) and for the Gaza Strip, as they were each assessed separately for the NAP, taking into consideration their different prevailing conditions. However, the ratings of each sector encompass both the West Bank and the Gaza Strip.

**Table 1: Observed climate impacts**

Sector	Observed climate impacts	Global impact rating	National impact rating	Confidence rating	Data quality rating	Time period	Metadata identifier(s)
Agriculture	<p><b>West Bank</b></p> <p>Olive production: In 2010, heat waves during the flowering season</p>	Low	TBC	Low	Low	2010-2015	1.1

Sector	Observed climate impacts	Global impact rating	National impact rating	Confidence rating	Data quality rating	Time period	Metadata identifier(s)
	<p>reduced production by 20%.</p> <p>Grapes: In 2015, frost destroyed 170 hectares (3,825 tons), and partially destroyed 300 hectares (3,750 tons) in Hebron and Bethlehem Governorates.</p> <p>Irrigated vegetables: Frost has destroyed crops.</p> <p>Grazing area and soil erosion: The grazing area on eastern slopes is reduced, as floods increase gully erosion, and droughts increase wind erosion.</p> <p>Prices of fresh vegetables, poultry, and dairy products reached historical highs in 2013, due to frost and heat waves.</p> <p><b>Gaza Strip</b></p> <p>Livestock production: In May 2015, 15% of chickens in Gaza died because of a heat wave (12 °C above the annual average).</p> <p>Olive production: In 2010, heat waves during the flowering season reduced production by 20%.</p> <p>Prices of fresh vegetables, poultry, and dairy products reached historical highs in 2013, due to frost and heat waves.</p>						

Sector	Observed climate impacts	Global impact rating	National impact rating	Confidence rating	Data quality rating	Time period	Metadata identifier(s)
<b>Built Infrastructure</b>	<b>None captured in the NAP</b>						
<b>Ecosystems</b>	<p><b>West Bank</b></p> <p>In 2014 and 2015, 80km per hour winds uprooted trees in Umm Al Rihan, Al-bathan and Arraba forest.</p> <p>The last unseasonal sandstorm (08/09/2015) delayed migration of some species, e.g. Cranes and Stork, and increased insect and rodent infestations.</p> <p>Substantial decline in the number of birds caught for ringing (down from 50 to 5 birds per day), which may be attributed to climate change.</p> <p>Significant decline in vertebrate biodiversity in the Eastern slopes of the Bethlehem district.</p> <p><b>Gaza Strip</b></p> <p>None captured in the NAP</p>	<b>Low</b>	<b>TBC</b>	<b>Low</b>	<b>Low</b>	<b>2005-2015</b>	<b>1.1</b>
<b>Energy</b>	<b>None captured in the NAP</b>						
<b>Fisheries</b>	<b>None captured in the NAP</b>						
<b>Health</b>	<p><b>West Bank</b></p> <p>Climate in recent years has affected food availability leading to</p>	<b>Low</b>	<b>TBC</b>	<b>Low</b>	<b>Low</b>	<b>N/A</b>	<b>1.1</b>

Sector	Observed climate impacts	Global impact rating	National impact rating	Confidence rating	Data quality rating	Time period	Metadata identifier(s)
	malnutrition. <b>Gaza Strip</b> None captured in the NAP						
<b>Manufacturing</b>	<b>None captured in the NAP</b>						
<b>Water</b>	<b>None captured in the NAP</b>						

**Table 2: Projected climate impacts**

Sector	Projected climate impacts	Impact rating	Confidence rating	Data quality rating	Time period	Metadata identifier(s)
<b>Agriculture</b>	<p><b>West Bank</b></p> <p>Projected increases in temperature, increased drought risk and decrease in rainfall.</p> <p>Irrigation water: shortage of irrigation water means productivity will decrease.</p> <p>Grazing area and soil erosion: increased rate of livestock and wildlife mortality, increase in fires, increase in wind and water erosion.</p> <p>Irrigated vegetables: shortage of irrigation water will lead to a decrease in productivity, leading to a reduced income for farmers.</p>	<b>High</b>	<b>Low</b>	<b>Low</b>	<b>2025, 2055, 2090</b>	<b>1.1</b>

Sector	Projected climate impacts	Impact rating	Confidence rating	Data quality rating	Time period	Metadata identifier(s)
Built Infrastructure	<p>Livestock: fluctuations in production of animal feeds may lead to foreclosures on bank loans to farmers and businesses and increases in prices.</p> <p>Crops: increased incidence of plant diseases and exacerbation of water scarcity.</p> <p>Impacts on domestic agricultural production and food storage may lead to market instability and unaffordable food prices for at least 50% of people.</p> <p><b>Gaza Strip</b></p> <p>Same as West Bank</p> <p>Coastal agriculture: saltwater intrusion into coastal agricultural land will become an increasing challenge to agricultural production.</p>	<b>Medium</b>	<b>Low</b>	<b>Low</b>	<b>2025, 2055, 2090</b>	<b>1.1</b>
	<p><b>West Bank</b></p> <p><b>Projected increase in urban heat-island effect.</b></p> <p>Road infrastructure is in poor condition, making it vulnerable to heavy rainfall that could lead to erosion, collapse and closure.</p> <p><b>Gaza Strip</b></p>	High (bold text)				

Sector	Projected climate impacts	Impact rating	Confidence rating	Data quality rating	Time period	Metadata identifier(s)
Ecosystems	Same as the West Bank					
	<p><b>West Bank</b></p> <p>Increases in temperature and decreases in rainfall are projected to lead to:</p> <ul style="list-style-type: none"> <li>• Changes to timing of life cycles, species abundance and distribution, composition of species communities.</li> <li>• Changes to socio-economic drivers, cultural values, policies and land/resource use that lead to habitat loss, fragmentation, and change.</li> <li>• Changes in ecosystem services, e.g. water shortage, soil erosion, reduced C storage, less fuelwood, loss of food-species, and reduced ecotourism.</li> </ul> <p><b>Gaza Strip</b></p> <p>Same as the West Bank.</p>	High	Low	Low	2025, 2055, 2090	1.1

Sector	Projected climate impacts	Impact rating	Confidence rating	Data quality rating	Time period	Metadata identifier(s)
Energy	<p><b>West Bank</b> Increased demand for energy, e.g. for air conditioning.</p> <p><b>Increased probability of accidents when transporting fuel in extreme weather conditions.</b></p> <p><b>Gaza Strip</b> Increased demand for energy, e.g. for air conditioning, leading to discontinuity in energy supply.</p>	High	Low	Low	2025, 2055, 2090	1.1
Fisheries	<p><b>West Bank</b> N/A</p> <p><b>Gaza Strip</b> Fishing: fish will move from warmer shallow coastal water into cooler deep water, which will affect the quantity and quality of the fish catch.</p>	High	Low	Low	2025, 2055, 2090	1.1
Health	<p><b>West Bank</b> Increased survival and abundance of microorganisms associated with water- and food-borne diseases.</p>	High	Low	Low	2025, 2055, 2090	1.1

Sector	Projected climate impacts	Impact rating	Confidence rating	Data quality rating	Time period	Metadata identifier(s)
Manufacturing	<p><b>Gaza Strip</b></p> <p>Same as the West Bank.</p>	High	Low	Low	2025, 2055, 2090	1.1
	<p><b>West Bank</b></p> <p>Volatility in international markets for raw materials will impact the reliable supply of a wide range of raw materials.</p> <p>Industrial production could be interrupted due to water being cut-off or unavailable.</p> <p>Electricity cut-offs (due to higher energy demands) may reduce production (and factory maintenance) leading to increased imports at higher cost.</p> <p>Increased demand by industry for energy, e.g. air conditioning increasing production costs and reducing competitiveness.</p> <p><b>Gaza Strip</b></p> <p>Reduced quality/value of products exported (e.g. food, textiles, furniture, cosmetics) due to lack of suitable storage facilities.</p> <p>Reduced quality/value of raw materials export due to inadequate handling, fumigation, packaging and storage</p>					

Sector	Projected climate impacts	Impact rating	Confidence rating	Data quality rating	Time period	Metadata identifier(s)
Water	techniques. Increased demand for energy (e.g. for cooling, heating, and air conditioning) compounded by outdated energy-inefficient facilities/equipment.					
	<b>West Bank</b> More intense pressure on groundwater, exacerbated by less cold periods and more warm periods suggested by all scenarios. Increased loss of water through evaporation from wells and canals, especially from those in poor condition. Unmeetable increase in water demand due to leakage from distribution systems.	<b>High</b>	<b>Low</b>	<b>Low</b>	<b>2025, 2055, 2090</b>	<b>1.1</b>
	<b>Slight risk of increased flooding</b>	Medium (bold text)				
	<b>Gaza Strip</b> More intense pressure on groundwater, exacerbated by less cold periods and more warm periods suggested by all scenarios. <b>Slight risk of increased flooding</b>	Medium (bold text)				

**Table 3: Data quality**

Dataset		
National Adaptation Plan (2016)		
Data quality criteria	Levels	Score
<b>1. Transparency and auditability</b>	1. Data unavailable to public	
	2. Limited summary data available	2
	3. Full raw/primary data set and metadata available	
<b>2. Verification</b>	1. Unverified data	1
	2. Limited verification checks in place	
	3. Detailed verification in place and documented	
<b>3. Frequency of updates</b>	1. Sporadic	1
	2. Every 3-5 years	
	3. Annual or biennial	
<b>4. Security</b>	1. Future data collection discontinued	
	2. Future data collection uncertain	2
	3. Future data collection secure	
<b>5. Spatial coverage</b>	1. Partial national coverage	1
	2. National coverage, some bias	
	3. Full national coverage, including adjacent marine areas, if and where appropriate	
<b>TOTAL SCORE</b>		<b>7</b>
<b>RATING</b>		<b>Low</b>

**Table 4: Metadata**

Metadata identifier	1.1
<b>Source(s)</b>	National Adaptation Plan (2016)
<b>Explanation for impact rating</b>	Qualitative ratings for observed and projected impacts were determined during development of Palestine’s National Adaptation Plan (NAP). The ratings were agreed by national stakeholders for each sector drawing upon their expert knowledge and the literature, where available. The ratings were also subject to a peer-to peer review process across sectors to ensure consistency. The ratings for observed impacts were transcribed from the modal ratings of climate sensitivities for each sector in the vulnerability assessment Excel workbook, which supports the NAP. The ratings for projected impacts were transcribed from the modal ratings of impacts in the ‘appraisal’ spreadsheets of the Excel workbook on adaptation options for each sector, which support the NAP. These Excel workbooks are available on request from the Palestinian Environment Quality Authority.
<b>Explanation for confidence</b>	Confidence rating was low due to varying amounts and/or

Metadata identifier	1.1
<b>rating</b>	quality of evidence, but still with little agreement between studies or experts.
<b>Climate projections, emissions scenarios, or models used</b>	<p>Three future-climate scenarios for the State of Palestine have been developed to be representative of all projections considered by the IPCC AR5. The methodology used to provide climate-change scenarios for the State of Palestine incorporated two main steps:</p> <p>A background assessment of climate change projections for the State of Palestine, calculating ensemble means for the atmosphere/ocean models used in the main IPCC AR4 and AR5 assessments, repeated for the AR5 using the projections from Coordinated Regional Downscaling Experiment (CORDEX; <a href="https://www.cordex.org/">https://www.cordex.org/</a>) covering the Levant</p> <p>A detailed assessment of projections using the AR5-set based on the technique of self-organizing maps (SOMs).</p> <p>Analyses have been prepared by year for 2016-2035 (summarised as 2025), 2046-2065 (2055) and 2081-2100 (2090) with changes calculated against simulations for each model for a historical period, 1986-2005.</p> <p>The assessment focused presentation of results on two of the four scenarios considered by IPCC AR5:</p> <ul style="list-style-type: none"> <li>• RCP2.6 is the only AR5 scenario that provides a high probability of achieving the UNFCCC target of a maximum average global temperature rise of 2.0°C, and</li> <li>• RCP6.0 is a realistic option should UNFCCC processes fail given reasonable expectations of international mitigation activities.</li> </ul>
<b>Dataset(s)</b>	<p>All atmosphere/ocean models used in the main IPCC AR4 and AR5 assessments</p> <p>Projections from the Coordinated Regional Downscaling Experiment (CORDEX; <a href="https://www.cordex.org/">https://www.cordex.org/</a>) covering the Levant</p>
<b>Additional assumptions</b>	None
<b>Additional limitations</b>	None

