

# Ricardo NAP toolkit and Palestinian National Adaptation Plan to Climate Change (NAP)

ورشة العمل الخاصة باستعراض الخطة الوطنية للتكيف مع تغير المناخ



*Empowered lives.  
Resilient nations.*

THE BELGIAN  
DEVELOPMENT COOPERATION **.be**



Environment Quality Authority

# Who are 'we'?

'We' are:

- Staff from UNDP and EQA
- Ricardo Energy & Environment
- An international climate expert from Climate Change Risk Management
- Our team of national experts from Birzeit University, Hebron University and the Islamic University of Gaza
- **The many stakeholders from West Bank and Gaza who contributed.**



*Empowered lives.  
Resilient nations.*

THE BELGIAN  
DEVELOPMENT COOPERATION **.be**



Environment Quality Authority

# Developing the NAP: what have we done?

- Assessed historic trends in climate relevant to the State of Palestine
- Identified and prioritized climate vulnerabilities
- Provided future climate-scenarios for the State of Palestine
- Identified and prioritized adaptation options, including costings
- Identified future developments required to be able to participate in climate-modelling research
- Outlined the process for future monitoring and evaluation
- Identified next steps



*Empowered lives.  
Resilient nations.*

THE BELGIAN  
DEVELOPMENT COOPERATION **.be**

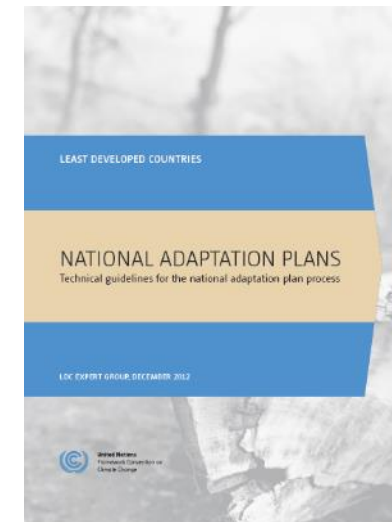


Environment Quality Authority



## Element B. Preparatory Elements

1. Analysing current climate and future climate change scenarios
2. Assessing climate vulnerabilities and identifying adaptation options at the sector, subnational, national and other appropriate levels
3. Reviewing and appraising adaptation options
4. Compiling and communicating national adaptation plans
5. Integrating climate change adaptation into national and subnational development and sectoral planning.



*Empowered lives.  
Resilient nations.*

THE BELGIAN  
DEVELOPMENT COOPERATION **.be**



Environment Quality Authority

# What issues helped to define the process?

- LEG Technical guidelines for the national adaptation plan process
- Water and food security previously identified as the most vulnerable issues with knock-on implications for all other sectors
- Climatic vulnerability being dwarfed by existing non-climatic vulnerabilities
- West Bank and Gaza Strip facing similar and differing vulnerabilities
- A lack of quantitative data relevant to vulnerabilities and adaptation
- Need to ensure common understanding and commitment
- A need to embrace climatic uncertainties aided by IPCC AR5 definitions.



*Empowered lives.  
Resilient nations.*

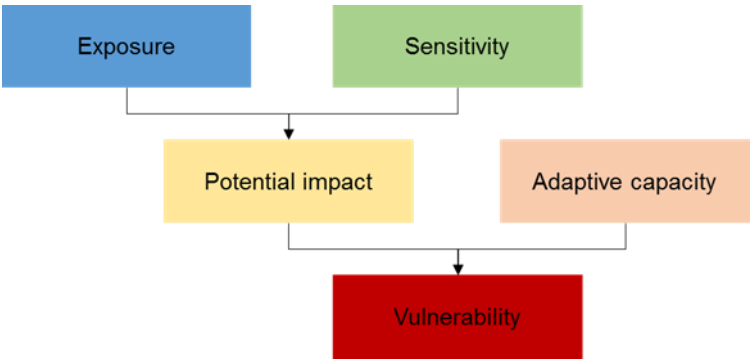
THE BELGIAN  
DEVELOPMENT COOPERATION **.be**



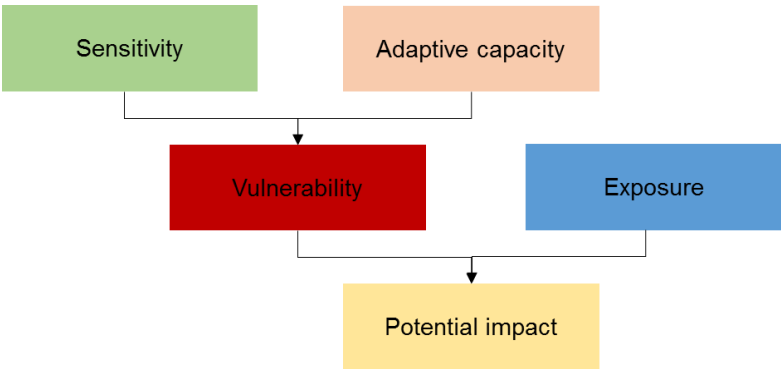
Environment Quality Authority

**Vulnerability – ‘The propensity or predisposition to be adversely affected’.**

- Impact chain (IPCC AR4 definitions)



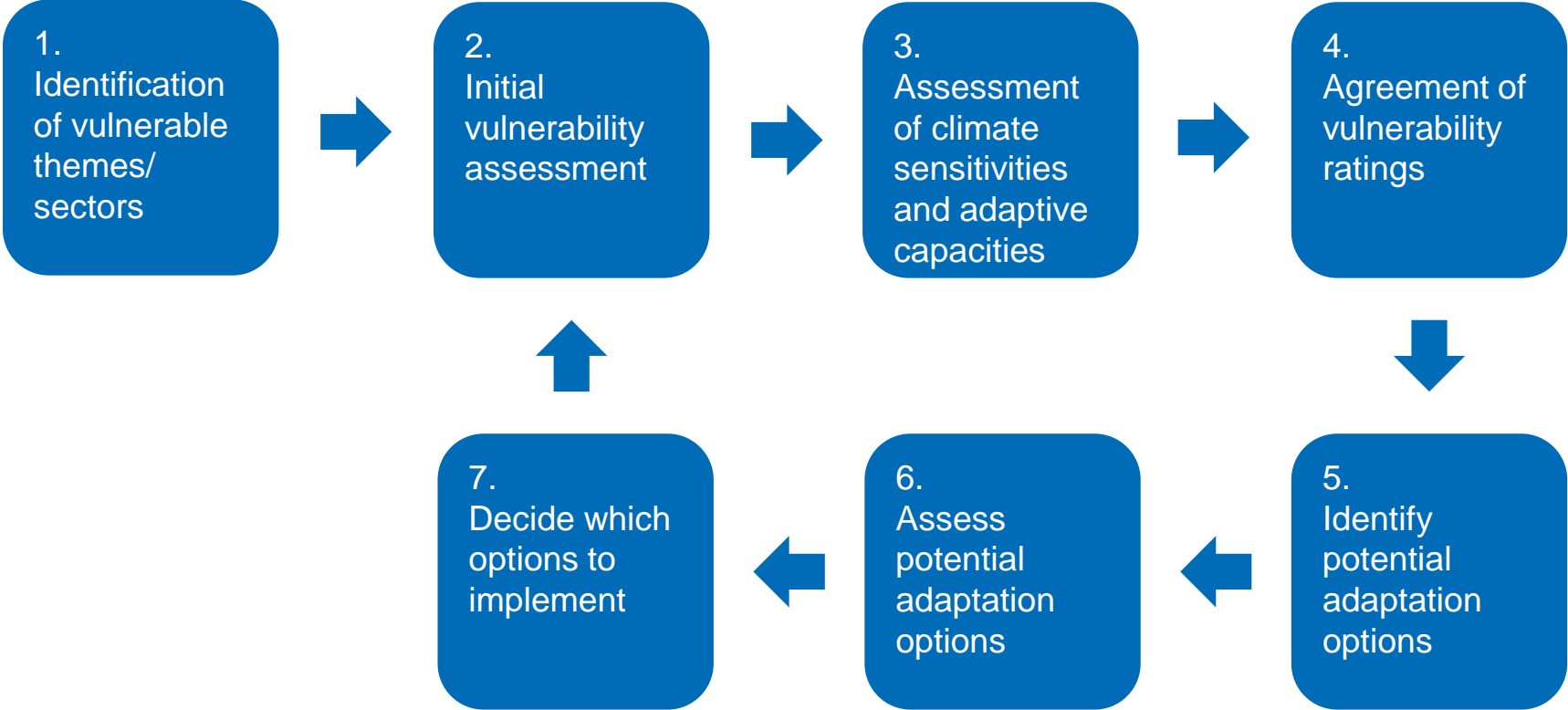
- Impact chain (IPCC AR5 definitions)



Empowered lives.  
Resilient nations.



# Process for identifying and prioritising vulnerabilities and adaptation options



Empowered lives.  
Resilient nations.

THE BELGIAN  
DEVELOPMENT COOPERATION **.be**



Environment Quality Authority

# Assessment of historic trends

## Why?

- To provide a context for considering the climate sensitivity of potential vulnerabilities
- Not as a baseline for future climate projections

## How? (Palestine)

- Interpreted global analyses (IPCC AR5, 2013) of observed trends in relation to the country
- Reviewed national climate trends assessed in relevant documents submitted to the UNFCCC
- Reviewed peer-reviewed papers that considered regional climate trends.



*Empowered lives.  
Resilient nations.*

THE BELGIAN  
DEVELOPMENT COOPERATION **.be**



Environment Quality Authority



# Palestine – potentially vulnerable themes/sectors agreed for assessment

- Agriculture
- Coastal and marine
- Energy
- Food
- Gender
- Health
- Industry
- Terrestrial ecosystems
- Tourism
- Urban and infrastructure
- Waste and wastewater
- Water



*Empowered lives.  
Resilient nations.*

THE BELGIAN  
DEVELOPMENT COOPERATION **.be**



Environment Quality Authority



# Rating vulnerabilities



**Climate sensitivity (S)** – ‘The degree to which a system or species is affected, either adversely or beneficially, by climate variability or change. The effect may be direct or indirect’.

S rating	Definition of ratings
1	Insensitive to climate
2	May be sensitive to climate
3	Climate sensitive
4	Very climate sensitive
5	Extremely climate sensitive

**Adaptive capacity (AC)** – ‘The ability of systems, institutions, humans, and other organisms to adjust to potential damage, to take advantage of opportunities, or to respond to consequences’.

AC rating	Definition of ratings
1	Major challenges to adjust or respond within existing climate limits
2	Minor challenges to adjust or respond within existing climate limits
3	Able to adjust or respond within existing climate limits but major challenges beyond them
4	Able to adjust or respond within existing climate limits but minor challenges beyond them
5	Able to adjust or respond regardless of climate



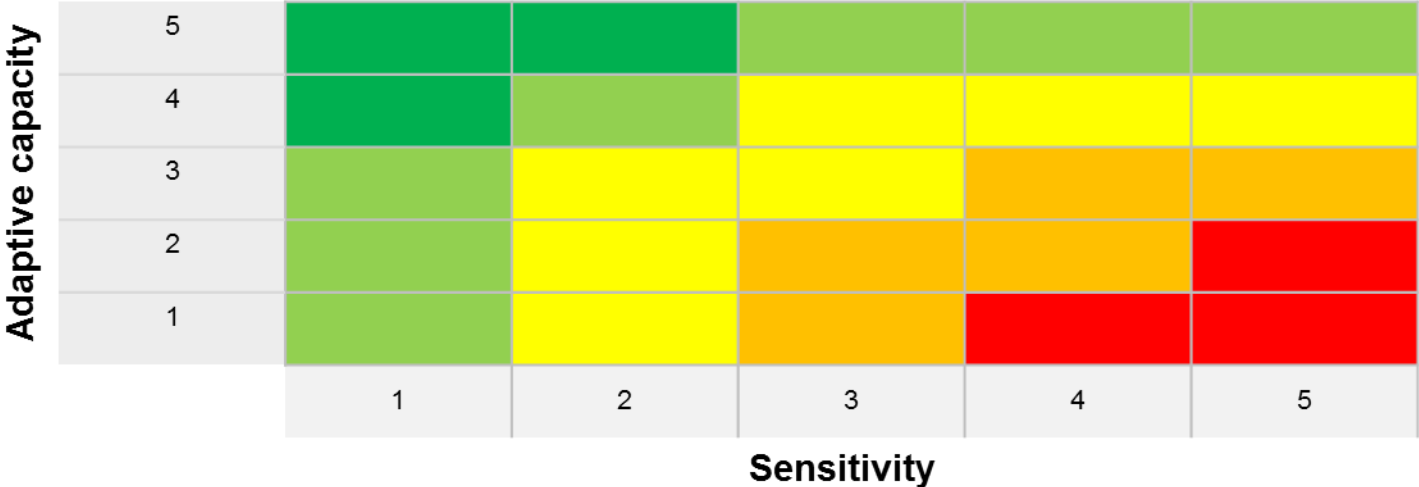
Empowered lives.  
Resilient nations.



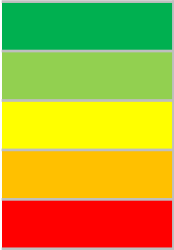
Environment Quality Authority

## Vulnerability

‘The propensity or predisposition to be adversely affected’.



Highly resilient  
Resilient  
Potentially vulnerable  
Vulnerable  
Highly vulnerable



Empowered lives.  
Resilient nations.

THE BELGIAN  
DEVELOPMENT COOPERATION .be



Environment Quality Authority

# Vulnerability assessment



FILEHOMEINSERTPAGE LAYOUTFORMULASDATA REVIEWVIEW

NormalPage Break PreviewPage Layout Custom Views

☒ Ruler☒ Formula Bar☐ Gridlines☒ Headings

Zoom100%Zoom to Selection

New WindowArrange AllFreeze PanesUnhide

SplitHideView Side by SideSynchronous ScrollingReset Window Position

Switch WindowsMacros

Workbook ViewsShowZoomWindow

CU19

	A	B	D	E	F	G	H	I	J
1									
2	Agriculture								
3									
4	Potentially vulnerable sub-sectors (biophysical and/or socioeconomic)	Detail (e.g. crop type, specific disease)	Location	Climate sensitivity (including links to water and/or food): biophysical and/or socioeconomic	Climate sensitivity rating	Adaptive capacity: biophysical and/or socioeconomic	Adaptive capacity rating	Vulnerability rating	References
13	Choose a potentially vulnerable sub-sector								
14	Choose a potentially vulnerable sub-sector								
15	Choose a potentially vulnerable sub-sector								
16	Choose a potentially vulnerable sub-sector								
17	Choose a potentially vulnerable sub-sector								
18	Choose a potentially vulnerable sub-sector								
19	Choose a potentially vulnerable sub-sector								

Vulnerability Assessment ToolDefinitions > VulnerabilityDefinitions > SectorsAgricultureBuilt InfrastructureBusinessEcosystemsEn ...

READY

08:5212/07/2016



Empowered lives.  
Resilient nations.

THE BELGIAN  
DEVELOPMENT COOPERATION .be



Environment Quality Authority



# Palestine – highly vulnerable issues

Theme or sector	Highly vulnerable – West Bank	Highly vulnerable – Gaza Strip
<b>Agriculture</b>	Olive production; Grape production; Stone fruits; Field crops; Irrigated vegetables; Rain-fed vegetables; Grazing area and soil erosion; Irrigation water; Livestock production	Livestock production; Fishing/fisheries; Cost of agricultural production; Employment; Vegetable production; Livestock production; Olive production, Citrus; Irrigation water
<b>Coastal and marine</b>		Fish catch; Coastal agriculture; Condition of beaches
<b>Energy</b>	Domestic/local energy production; Energy imports; Condition of infrastructure	Domestic energy production; Energy imports; Condition of infrastructure
<b>Food</b>	Domestic food prices; Imported food prices	Domestic food prices; Imported food prices
<b>Gender</b>	Major diseases related to water and sanitation	Employment and gender; Major diseases related to water and sanitation; Food security and gender
<b>Health</b>	Major diseases related to water, sanitation, and food	Major diseases related to water, sanitation, and food
<b>Industry</b>	Value of raw materials imported; Infrastructure; Energy supply; Energy demand	Value of industrial products exported; Value of raw materials exported; Employment; Energy supply; Energy demand
<b>Terrestrial ecosystems</b>	Habitat connectivity	Wadi Gaza – Habitat connectivity
<b>Tourism</b>	Condition of cultural heritage	
<b>Urban and infrastructure</b>	Urbanization	Building conditions; Urban drainage
<b>Waste and wastewater</b>	Waste management	Waste management
<b>Water</b>	Ground water supply; Flood management; Condition of infrastructure	Groundwater supply; Groundwater quality; Flood management



Empowered lives.  
Resilient nations.

THE BELGIAN  
DEVELOPMENT COOPERATION **.be**



Environment Quality Authority

# Production of future-climate scenarios

Needed to aid identification and prioritization of adaptation options

Two main steps undertaken by an international expert:

- Background assessment of ensemble means for models used in IPCC AR4 and AR5 (repeated using CORDEX projections covering the Levant)
- Detailed assessment of projections using the AR5-set based on self-organising maps (SOMs), grouping similar projections

Three scenarios selected to represent the full range of likely futures to aid identification and prioritization of adaptation options.



*Empowered lives.  
Resilient nations.*

THE BELGIAN  
DEVELOPMENT COOPERATION **.be**



Environment Quality Authority

# Identification and prioritization of adaptation options

- Stakeholders advised that adaptation options addressing vulnerabilities:
  - Should reduce climate sensitivity or increase adaptive capacity
  - May include management and operational strategies, infrastructural changes, policy adjustments or capacity-building
  - May involve adjusting (climate-proofing) current activities
  - May be new, or require major transformations in operations
  - May be ecosystem-based
  - Should seek to embrace all likely future-climate scenarios.



*Empowered lives.  
Resilient nations.*

THE BELGIAN  
DEVELOPMENT COOPERATION **.be**



Environment Quality Authority

## Scoring adaptation options?

Each adaptation option appraised and scored in relation to:

- Suitability:

- Impact
- Efficacy
- Timing/urgency for action
- Social acceptance

- Needs:

- Technology
- Knowledge and skills
- Costs

- Co-benefits for:

- Adaptation in other sectors
- Mitigation



*Empowered lives.  
Resilient nations.*

THE BELGIAN  
DEVELOPMENT COOPERATION **.be**





# Adaptation options – ‘Suitability’



Combined Vulnerability Tool V7.xls [Compatibility Mode] - Excel

FILE HOME INSERT PAGE LAYOUT FORMULAS DATA REVIEW VIEW

Normal Page Break Preview Page Custom Workbook Views

Ruler Formula Bar Gridlines Headings Show

Zoom 100% Zoom to Selection

New Window Arrange All Freeze Panes Split Hide View Side by Side Synchronous Scrolling Reset Window Position Switch Windows Macros

A1

Sector	Potentially vulnerable sub-sectors	Adaptation option	Impact	Appraisal	Score	Efficacy	Appraisal	Score	Timing/urg action
Please choose a sector			Short description	Neutral	0	Short description	Neutral	0	Short description
Please choose a sector			Short description	Neutral	0	Short description	Neutral	0	Short description
Please choose a sector			Short description	Neutral	0	Short description	Neutral	0	Short description
Please choose a sector			Short description	Neutral	0	Short description	Neutral	0	Short description
Please choose a sector			Short description	Neutral	0	Short description	Neutral	0	Short description
Please choose a sector			Short description	Neutral	0	Short description	Neutral	0	Short description
Please choose a sector			Short description	Neutral	0	Short description	Neutral	0	Short description
Please choose a sector			Short description	Neutral	0	Short description	Neutral	0	Short description
Please choose a sector			Short description	Neutral	0	Short description	Neutral	0	Short description
Please choose a sector			Short description	Neutral	0	Short description	Neutral	0	Short description
Please choose a sector			Short description	Neutral	0	Short description	Neutral	0	Short description
Please choose a sector			Short description	Neutral	0	Short description	Neutral	0	Short description
Please choose a sector			Short description	Neutral	0	Short description	Neutral	0	Short description
Please choose a sector			Short description	Neutral	0	Short description	Neutral	0	Short description
Please choose a sector			Short description	Neutral	0	Short description	Neutral	0	Short description
Please choose a sector			Short description	Neutral	0	Short description	Neutral	0	Short description
Please choose a sector			Short description	Neutral	0	Short description	Neutral	0	Short description
Please choose a sector			Short description	Neutral	0	Short description	Neutral	0	Short description

Health Manufacturing Mining and quarrying Transport Water Adaptation Options Tool Suitability Needs Co-benefits Results

READY

08:55 12/07/2016



Empowered lives.  
Resilient nations.

THE BELGIAN  
DEVELOPMENT COOPERATION .be



Environment Quality Authority

# Adaptation options – ranking



Microsoft Excel interface showing the 'Combined Vulnerability Tool V7.xls' in Compatibility Mode. The 'VIEW' tab is active, displaying options like Ruler, Formula Bar, Gridlines, Headings, Zoom, and Window management.

The spreadsheet displays a table for ranking adaptation options. The table has four columns: Rank, Adaptation option, Potentially vulnerable sub-sectors, and Score. The table is currently empty, with a prompt 'Please choose a sector' above it.

Rank	Adaptation option	Potentially vulnerable sub-sectors	Score
-	-	-	-
-	-	-	-
-	-	-	-
-	-	-	-
-	-	-	-
-	-	-	-
-	-	-	-
-	-	-	-
-	-	-	-
-	-	-	-
-	-	-	-
-	-	-	-
-	-	-	-
-	-	-	-
-	-	-	-

The bottom of the screen shows the Windows taskbar with various application icons and the system clock indicating 08:58 on 12/07/2016.



Empowered lives.  
Resilient nations.



Environment Quality Authority

# Ranking adaptation options

- Stakeholders were advised to check the total scores and ranking for inconsistencies
- Where rankings did not meet expectations, stakeholders were advised first to review their short specific description in relation to each criteria and only then revise scores, if appropriate.
- Where it was not possible to justify changing scores, stakeholders were advised that it suggested their existing strategies or plans needed to be updated to be aligned with the NAP rather than the other way around



*Empowered lives.  
Resilient nations.*

THE BELGIAN  
DEVELOPMENT COOPERATION **.be**



Environment Quality Authority

## What did we conclude? Vulnerabilities

- Water and food security have previously been identified as the most vulnerable issues in the State of Palestine
- This assessment also identified many 'Highly vulnerable' issues in relation to water, agriculture and food that affect other themes/sectors
- Importantly, it also revealed many other 'Highly vulnerable' issues have inter-connections across themes/sectors, e.g. in relation to energy
- All adaptation options identified in relation to 'Highly vulnerable' issues should be included in the NAP, irrespective of their ranking
- Notably, a substantial number of issues were also identified as 'Vulnerable' but were not prioritized for further consideration in terms of adaptation.



*Empowered lives.  
Resilient nations.*

THE BELGIAN  
DEVELOPMENT COOPERATION **.be**



Environment Quality Authority



## What did we conclude? Adaptation

- All adaptation options identified in relation to 'Highly vulnerable' issues should be included in the NAP, irrespective of their ranking
- The priority of adaptation options between the West Bank and the Gaza Strip or between themes/sectors should not be compared, as relative scores have been used to rank options within each theme or sector
- Detailed capacity and financial needs (Years 1-5 and 6-10) were identified in relation to each adaptation option.



*Empowered lives.  
Resilient nations.*

THE BELGIAN  
DEVELOPMENT COOPERATION **.be**

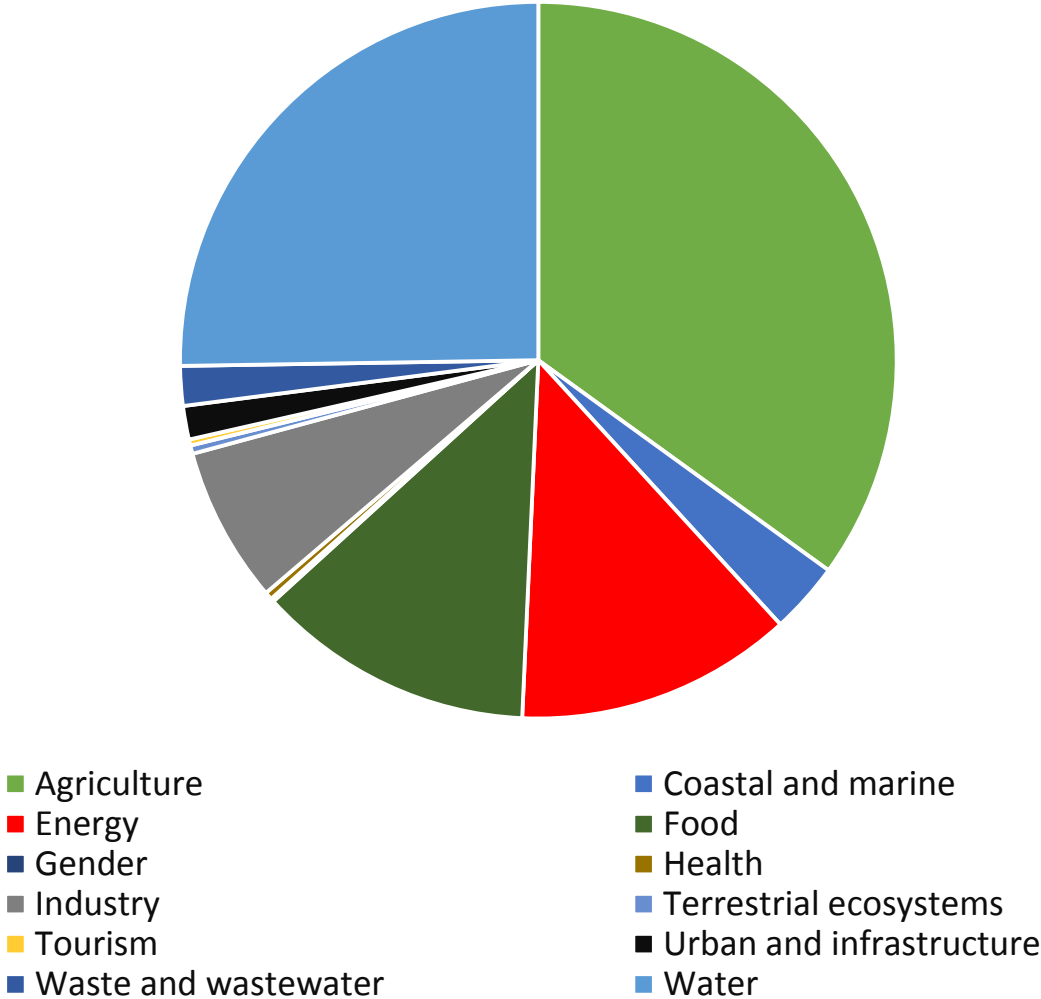


Environment Quality Authority

# What did we find? Adaptation options



Total cost of adaptation options (Years 1-10) – \$3.5 billion



Empowered lives.  
Resilient nations.

THE BELGIAN  
DEVELOPMENT COOPERATION .be



Environment Quality Authority

# Monitoring and evaluation

- Development of M&E will consider options relevant to each 'Highly vulnerable' issue regarding changes in:
  - Their climate sensitivity and/or
  - Related adaptive capacity and/or
  - Their vulnerability and/or
  - Related direct/indirect impacts attributable to climate change and/or
  - Progress with implementation of related adaptation options.
- Steps could be taken to address current lack of quantitative national datasets
- But simplest would be to repeat the same process at each NAP update.

# Important aspects of the process

- Facilitates systematic application of available published evidence and stakeholders' provision of expert input (particularly important where quantitative data are lacking)
- Uses IPCC AR5 definitions, which allow greater freedom to embrace uncertainties in identifying climate vulnerabilities
- Encourages stakeholders to focus on key vulnerabilities
- Secures consensus among stakeholders to ranking of adaptation options within and across sectors
- Develops stakeholders' common understanding of adaptation concepts, definitions of terms and the factors that need to be considered
- Ensures mutual commitment to adaptation options, and detailed technical, capacity and financial needs included in the NAP.





# State of Palestine's NAP

*Ricardo Energy & Environment's toolkit was incredibly helpful in enabling a wide range of stakeholders to provide systematic input to the development of our NAP. It was vital in securing agreement to thematic and sectoral priorities, and provides the country with the capacity to maintain the NAP as a living document. The toolkit's use should ensure the NAP's credibility and is expected to help us to secure from international donors the substantial financial support needed for implementation."*

Nedal Katbeh-Bader, Minister's Advisor for Climate Change, Environment Quality Authority, State of Palestine



*Empowered lives.  
Resilient nations.*

