



Sustainable Water
Integrated Management (SWIM) -
Support Mechanism



Project funded by
the European Union

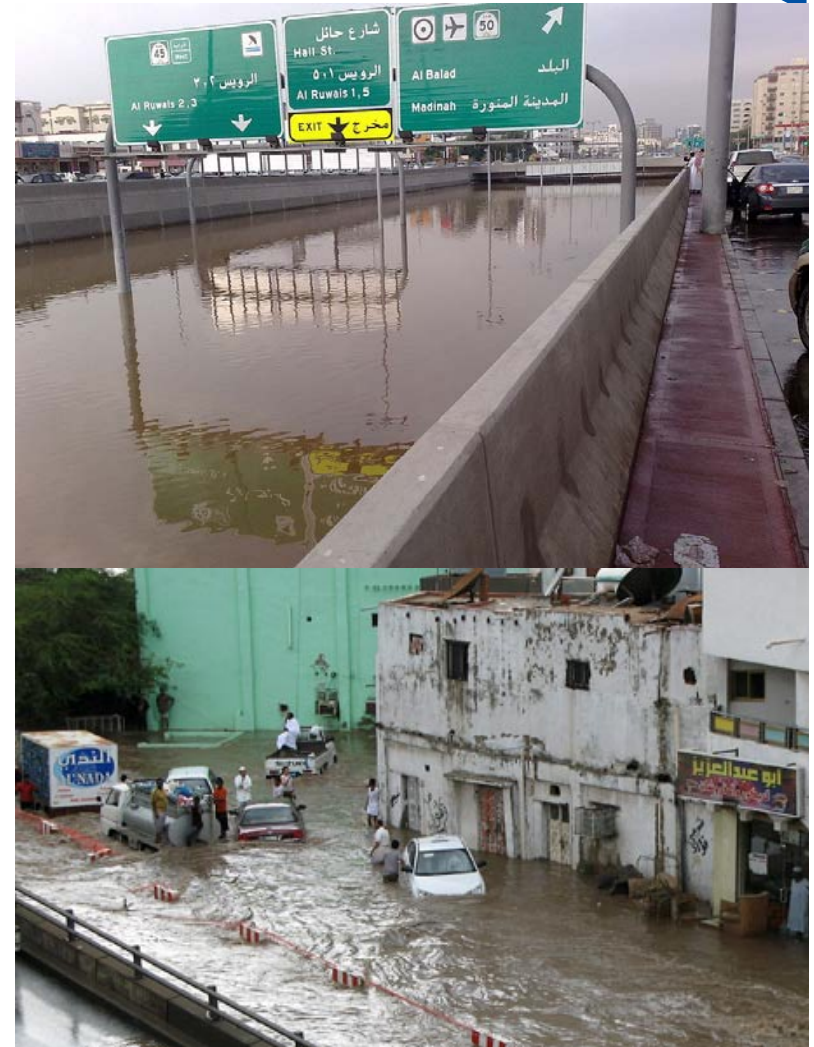
Water is too precious to waste

GROUP EXERCISE n°1: Case study on floods

Training workshop on the identification and development of climate change no-regret actions in the water sector, 3-5 October 2012, Amman

Case study: The Jeddah Flooding Event (1)

- Jeddah is the second largest city in Saudi Arabia
- On November 26, 2009, a major storm dropped over 90 millimeters of rain within 4 hours, equivalent to twice the yearly average
 - By midday the rain accumulated into massive torrents that ripped through the poor southern neighborhoods of the city and swamped thousands of vehicles caught in a heavy traffic jam exacerbated by the earlier light flooding of highways
 - The flood wave razed hundreds of buildings and swept thousands of cars and buses loaded with passengers
 - The death toll was over 150 (Usher, 2009), with damages to over 8,000 homes and over 7,000 vehicles (Alsharif, 2009)



Country example to illustrate an experience in dealing with climate variability

Source: Arab Environment Water - 2010 Report of the Arab Forum for Environment and Development (AFED) – Chapter 2
- Water Resources and Climate Change, Hamed Assaf, 2010

Case study : The Jeddah Flooding Event (2)

Jeddah came also under eminent risk of a major public health disaster as sewage water levels rose high in the upstream “Musk” lake (Abumansour, 2009)

- Originally planned for flood control and water supply, the lake was later turned into a dumping reservoir for sewage tankers since the city virtually lacks a sewage network
- At the peak of the storm the lake was estimated to contain around 50 million m³ of sewage water

Although the Jeddah flooding event is not necessarily tied to climate change, it nevertheless highlights vulnerabilities that are relevant to projected climatic change stimuli (increase in precipitation intensity)

- From a hydrologic perspective, the event is not very significant
- However **it has manifested into a catastrophe due to several vulnerabilities at the individual, societal, and institutional levels**



Case study : The Jeddah Flooding Event ⁽³⁾

- The most severely hit parts of the town were built on a “wadi” bed with virtually no drainage system
 - Poor planning and alleged corruption opened the way to haphazard development of poorly constructed buildings and densely populated shanty houses occupied mostly by migrant workers
 - The devastated area is crossed by several highway junctions kept busy by inadequate traffic planning and control
 - Many of the commuters were not aware of the danger nor at first alarmed by the floods, which added to the later chaos and death toll
 - Many survivors reported lack of response from the police and civil defense and could not reach authorities as emergency lines were reported mostly busy during the event
 - Many people were trapped and could not get help
 - The situation was further exacerbated by electric outages as the ravaging floods knocked down power lines
- The high mortality is tied to several key generic and hazard-specific vulnerabilities
 - The generic vulnerabilities include those of poverty, social status, governance (corruption, accountability), and infrastructure
 - Those linked to hazard specific vulnerabilities include the lack of adequate public drainage and sewage disposal and treatment, improper building structure, poor traffic management, improper urban planning, and the inexistence of emergency preparedness planning ⁴

Case study : The Jeddah Flooding Event ⁽⁴⁾

- This event has exposed several vulnerabilities to climatic hazards that could intensify under projected climatic change
- It therefore provides an important lesson for decision makers, homeowners, and society at large to work on reducing these vulnerabilities

Jeddah's recent flood is a testimony of the failure of planners in addressing intrinsic vulnerabilities that relate to the inadequacy of the drainage system, poor urban planning, and lack of emergency preparedness

How to reduce vulnerability to floods?

Step 1: Identify/Develop adaptation measures

Column B
Identify 2-3 climate change impacts based on the case study

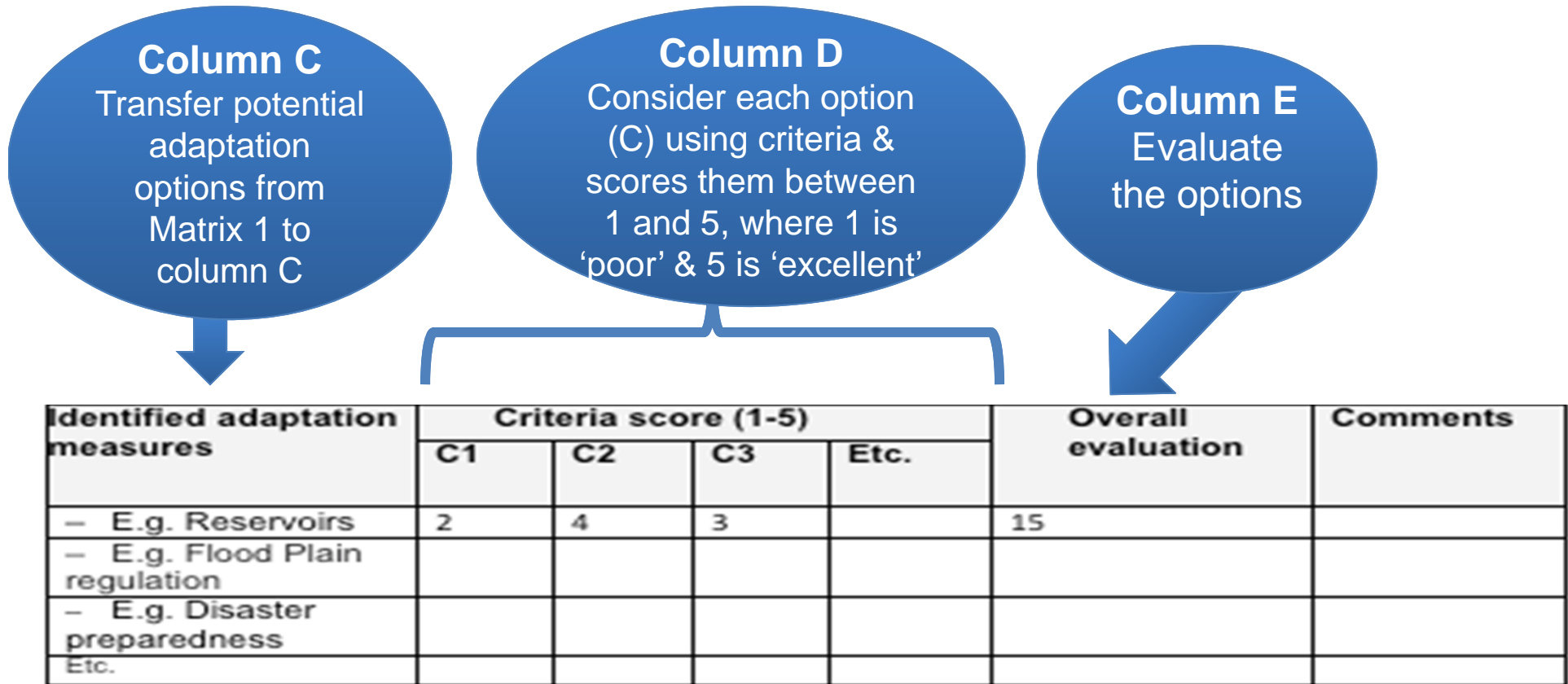
Column C
Devise adaptation options to prevent, reduce or avoid the adverse biophysical and socio-economic impacts

– System of interest	– Selected climate change impacts with need for actions	– Identified adaptation measures
Domestic water supply	Quality problems due to floods	
Agriculture	Damages to production due to floods	
Ecosystems		
Etc.		

- Use list of adaptation options in **Annex 1** to help you identify proper measures
- Think through all categories of adaptation options
- Think of adaptation options enhancing opportunities from climate change.
- Think of adaptation options enhancing the adaptive capacity of relevant actors

How to reduce vulnerability to floods?

Step 2: Assess and select no/low regrets adaptation measures



- Choose and discuss the selection criteria and add other criteria if desired (see Annex 2).
- Do the results make sense? Do they address the range of key risks? Would they be effective together? Do they overlap or complement each other?