

Blue Green Dream 's

Adaptation Support Toolbox

an effective planning support system

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1. “Develop a new paradigm for efficient planning and management of new urban developments and retrofitting of existing ones to maximize ecosystem services and increase resilience to climate change.”



2. “Develop an adaptation support tool (AST) to maximize efficiency, effectiveness and attractiveness of blue and green ecosystem services for urban climate adaptation, while dealing with constraints in budget, space and other resources.



- Support designers, developers, engineers and urban stakeholders in their efforts to make cities climate-proof in a sustainable way.
- Involve stakeholders in the planning process
- Support planning of new urban developments & urban reconstruction/ renewal
- Rank blue, green and grey adaptation measures for their applicability
- Show their effectiveness with a Performance Evaluation System



Blue Green Dream

Co-design



1. Many, many options:



Blue-green solutions preferred over grey ones

Hard solutions

Soft solutions

less space, dike

more space, no dike

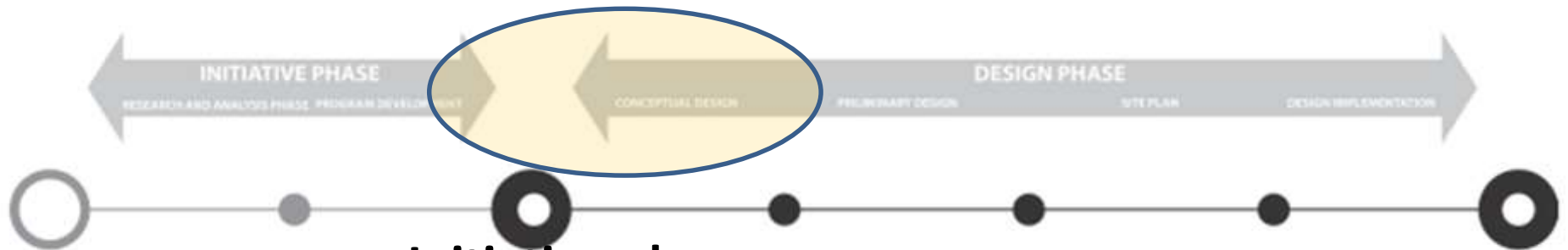
less flexible, extra investment

flexible and cost-effective





The planning process



Initiative phase

- research and analysis
- programme development

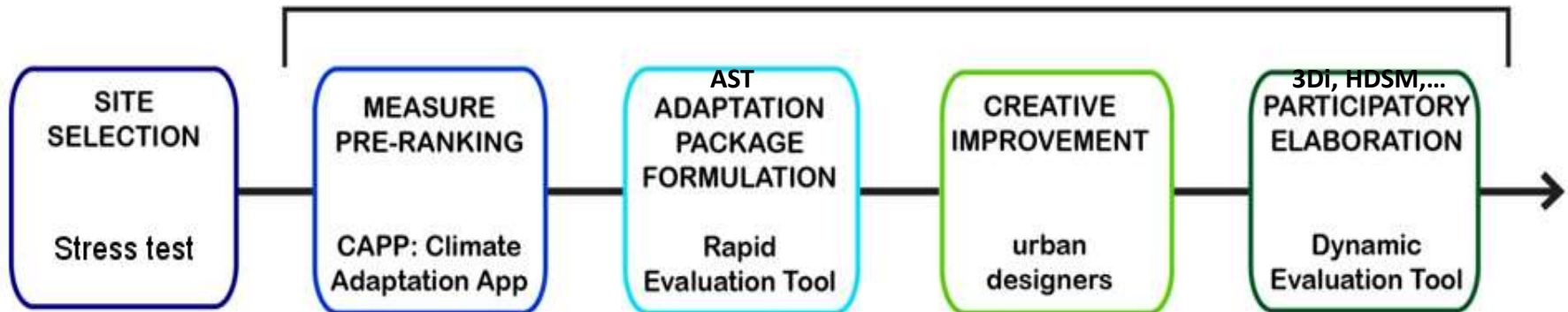
Design phase

- conceptual design
- preliminary design
- site plan
- implementation plan

Supported by

Adaptation Support Toolbox

ADAPTATION SUPPORT TOOLBOX



Output:

ranked list of
measures

2 - 3 alternative
adaptation
packages

strengthened
design &
innovation

design ready for
decision making

Climate Adaptation App

The screenshot displays the 'ADAPTATION SOLUTIONS' section of the app. On the left is a filter menu with categories: FILTER, Project type (Redevelopment), Scale (Neighborhood), Adaptation threat (Groundwater flooding), Land use (City Centre), Dominant soil type (Peat), and Surface level and slope (Sloping area, Flat area on high ground, Flat area on low ground). A 'Reset' button is at the bottom of the filter menu. Below the filter menu are sections for 'CLIMATE INFORMATION' and 'ABOUT Deltares'. The main area shows a grid of adaptation solution tiles, each with an icon and a title. A blue callout box points to the filter menu with the text 'Filters to rank measures'. Another blue callout box points to a tile with the text 'Click tile to get more images and info'. The URL 'www.climateapp.org' is visible in the top right of the app interface.

ADAPTATION SOLUTIONS

ADAPTATION SOLUTIONS

www.climateapp.org

Filters to rank measures

Click tile to get more images and info

ADAPTATION SOLUTIONS

- ADAPTATION SOLUTIONS
- FILTER
- Project type
 - Redevelopment
- Scale
 - Neighborhood
- Adaptation threat
 - Groundwater flooding
- Land use
 - City Centre
- Dominant soil type
 - Peat
- Surface level and slope
 - Sloping area
 - Flat area on high ground
 - Flat area on low ground
- 28 Adaptation solutions
- Reset

CLIMATE INFORMATION

ABOUT

Deltares
Enabling Delta Life

Raising land

Emergency supplies and utilities

Constructions on piles

Amphibious (floatable) constructions

Smart-drain (groundwater)



Blue Green Dream Adaptation Support Tool



Blue Green Dream

Setup: Resources | Layers

Snapshots

- Increase height difference between street level and ground floor level
- Infiltration of roads
- Raised paths / hollow roads
- Urban agriculture
- Intensive green roof
- Extensive green roof
- Cooling with water elements
- Green shores and riverbanks
- Private green garden
- Park or urban forest

Legend:

- Project Area
- Infiltration field
- Porous pavement
- Bioswales

Contribution

Climate	
Storage cap.	811.68 m³
Heat red.	-2.00 °C
Normative runoff	12.00 %
Drought red.	0.00 %
Water quality	
Nutrient red.	100.00 %
Abx. pollutants	100.00 %
Pathogens red.	100.00 %
Economy	
Construction	€ 293290
Annual Maint.	€ 29980.5

Active measures

Porous pavement

Storage cap.	145.26 m³
Heat red.	0.00 °C
Normative runoff	6.57 %
Construction	€ 73190
Annual Maint.	€ 3655.5
Nutrient red.	100 %
Abx. pollutants	100 %
Pathogens red.	100 %
Stress red.	-
Disease red.	-
Disease recovery	-
Air Quality	-
Social Cohesion	-

Infiltration field

Storage cap.	299.3 m³
Heat red.	-0.00 °C
Normative runoff	9.90 %
Construction	€ 173000
Annual Maint.	€ 25950
Nutrient red.	100 %
Abx. pollutants	100 %
Pathogens red.	100 %
Stress red.	-
Disease red.	-
Disease recovery	-
Air Quality	-
Social Cohesion	-

Bioswales

Storage cap.	263 m³
Heat red.	-0.00 °C
Normative runoff	3.42 %



Ranked list of 62 blue, green and grey adaptation measures

Contribution

Climate	
Storage red.:	100.00 %
Heat red.:	-0.00 °C
Normative runoff:	12.17
Runoff:	
Drought red.:	0.00
Water quality	
Nutrient red.:	100.00 %
Abn. pollutants:	100.00 %
Pathogens:	100.00 %
red.:	
Economy	
Construction:	€ 283290
Annual Maint.:	€ 21980.5

Active measures

Infiltration field <input checked="" type="checkbox"/>	
Storage:	100.0 m³
red.:	
Heat red.:	-0.00 °C
Normative runoff:	3.03
Runoff:	
Construction:	€ 173000
Annual Maint.:	€ 28850
Nutrient red.:	27.87 %
Abn. pollutants red.:	31.47 %
Pathogens red.:	31.47 %
Climate red.:	
Drought red.:	
Disposal:	



Dashboard with KPI's based on key figures, e.g.:

- Retention [m³]
- Peak flow reduction (T_{return} [yr])
- Seasonal storage [m³]
- Cooling effect [°C]
- Groundwater recharge [mm/yr]
- Water quality improvement:
 - Nutrients (%)
 - HMs, PAHs, min. oil (%)
 - Bacteriological quality
- Costs (implementation and maintenance)
- Benefits and 'co-benefits'





Pilot applications

First applications of the toolbox:

1. in the Netherlands

Utrecht, Dordrecht, ...

2. abroad

Beira, London, Oaxaca, ...



Blue Green Dream

Closing



Thank you for your attention

