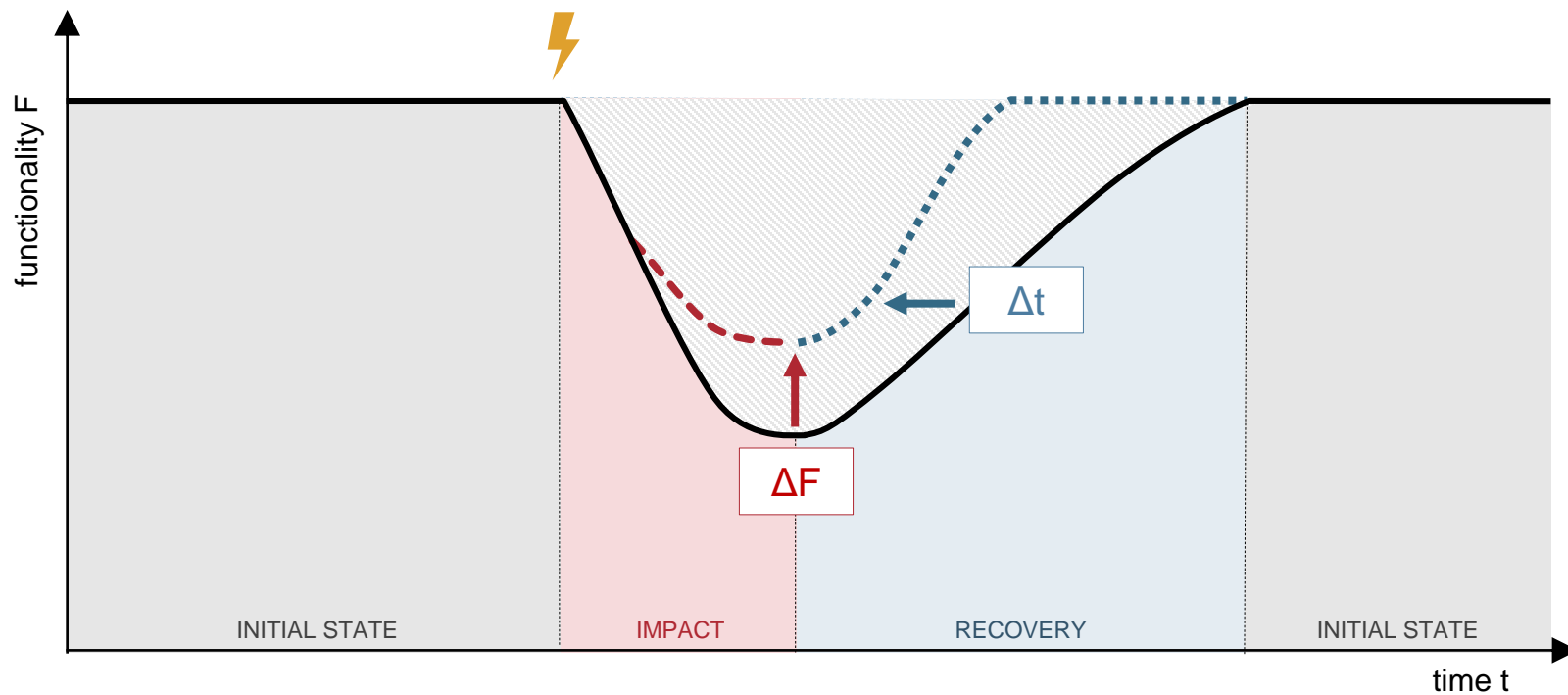


# Urban Resilience

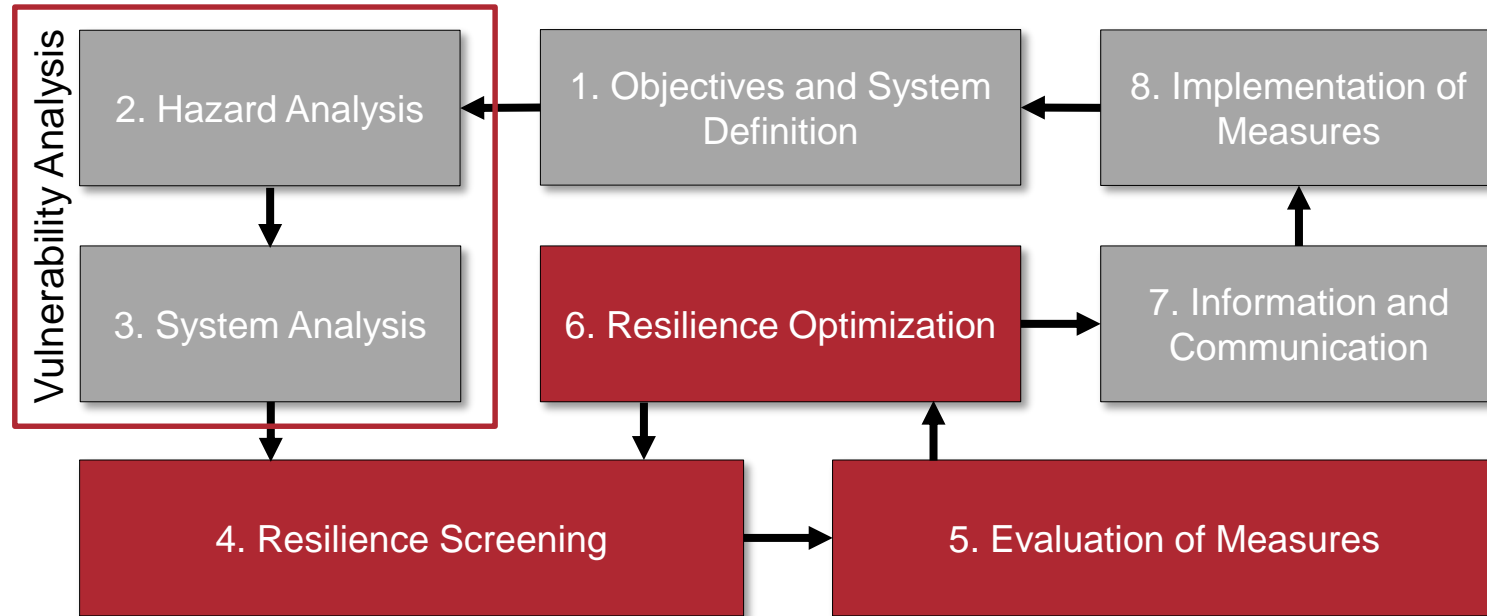
Our Understanding, Approach and Expertise



# Our Understanding



# Our Basic Concept



# Resilience Screening



## CATEGORY «environmental»

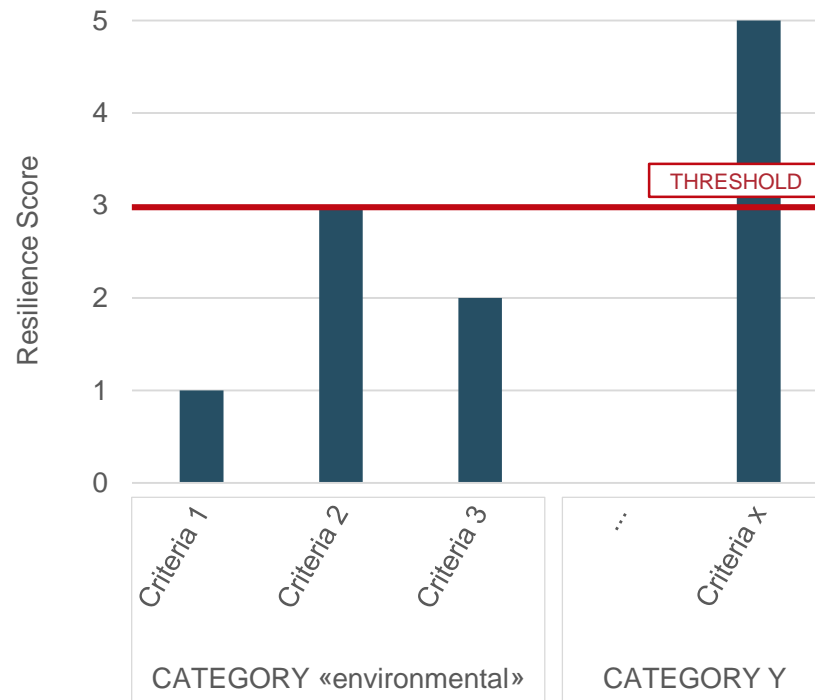
**CRITERIA 1:** How is the conservation of natural resources assessed (e.g. groundwater protection)?

5 Natural resources are sustainable used at long term.

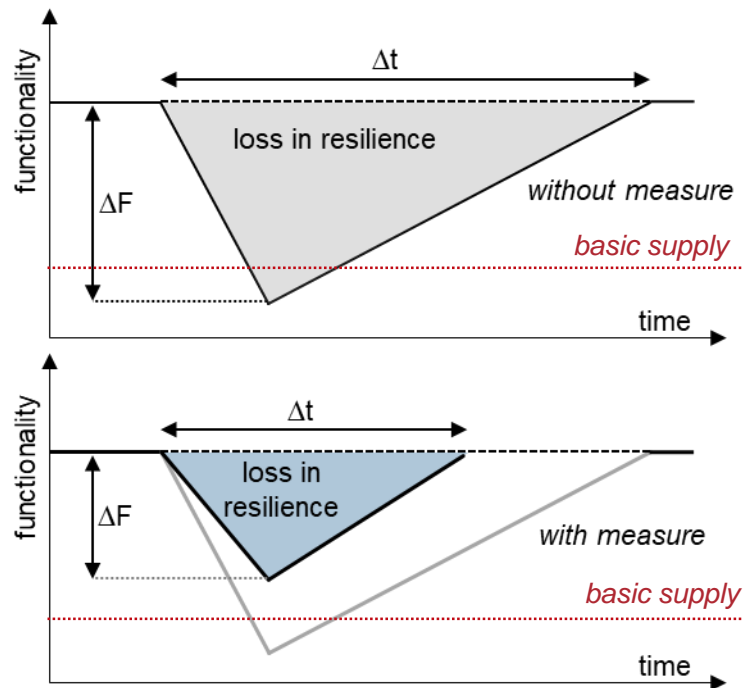
...

0 Natural resources are already heavily overused.

**OUTPUT:** Resilience Score for each criteria and category



# Evaluation of Measures



**OUTPUT:** Value which describes the impact of the measure on the system's resilience

# Project Exempels from Urban Context

# Potable Water Management Programme Upper Egypt (Aswan)



**Client**  
SDC



Schweizerische Eidgenossenschaft  
Confédération suisse  
Confederazione Svizzera  
Confederaziun svizra

**Swiss Agency for Development  
and Cooperation SDC**



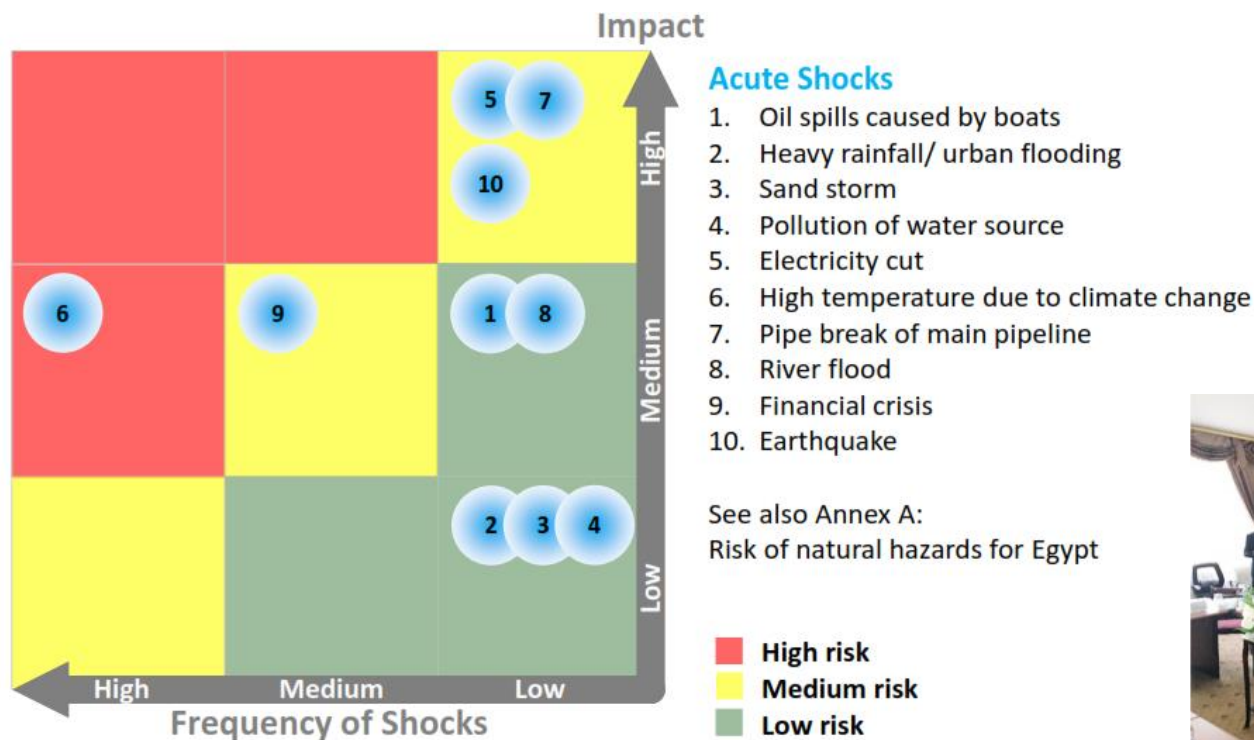
## Facts

Project country **Egypt**  
Period 2017 - 2021

## Topics

- Corporate development of Aswan Water Company
- Awareness raising regarding hygiene, water and environmental issues
- Rehabilitation of drinking water supply (and sanitation) in poor urban neighborhoods with about 70'000 inhabitants
- Resilient water supply (and sanitation) in context of climate change

# Water Management Upper Egypt: Hazard Analysis





# Dushanbe Water Supply Project



## Client

City Development Initiative Asia (CDIA)



Cities Development  
Initiative for Asia

## Facts

Project country

Tajikistan

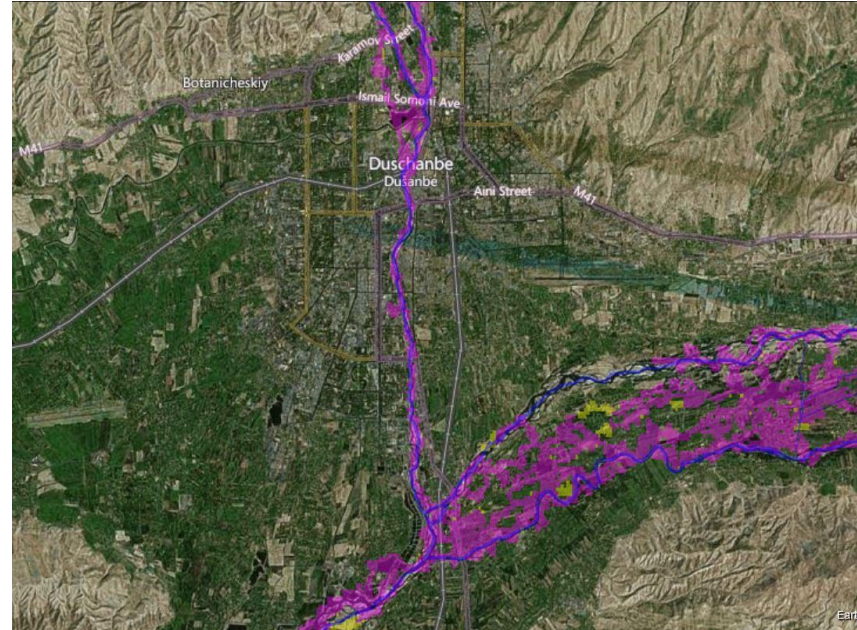
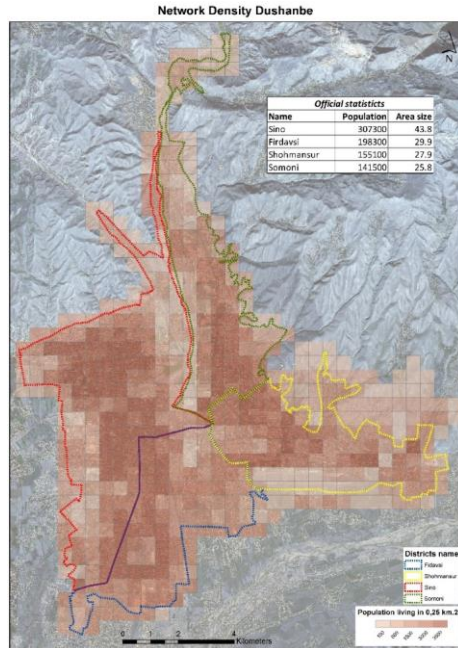
Period

2017 - 2018

## Topics

- Feasibility study for extension of water supply and sewerage infrastructure (technical, financial, institutional, socio-economic, environmental)
- Additional aspect of Terms of Reference: “increase urban resilience”

# Dushanbe Water Supply Project: Vulnerability Analysis



Population Density

Flood mapping: [www.fmglobal.com/research-and-resources/global-flood-map/flood-map](http://www.fmglobal.com/research-and-resources/global-flood-map/flood-map)

# Dushanbe Water Supply Project: Resilient Infrastructure

Intervention to the East Part of "KAF-1" Water Intake



## Rehabilitation of KAF-I Well Field

- Redundant supply from surface and groundwater
- rehabilitation of well field with 17 wells
- improvement of power supply system
- river protection
- implementation of sanitary protection zone

# Integrated Urban Water Management Morocco



**Client**  
World Bank



## Facts

Project country **Morocco**  
Period **2016 - 2017**

## Topics

- Rapid assessment of the water scarcity situation in 20 largest cities
- Compilation of suitable solutions to manage water scarcity in urban settings
- Integrated approach in context of climate change by considering the whole watershed and the urban/ rural interface
- Case study for Marrakech and cost benefit analysis for different technical measures to effectively address water scarcity

# Resilience as additional criteria in multi-criteria analysis

## Integrated Urban Water Management Case Study for Marrakech

	Poids	30%	20%	10%	20%	20%	100%
Critères	Durabilité	Demande	Qualité	Economie	Gestion	Total	
	Poids	30%	20%	10%	20%	20%	100%
Construction de nouveaux barrages: barrage Ait Ziat	SW4	3.0	4.0	4.0	4.0	2.7	<b>3.4</b>
Augmentation de capacité de barrages: barrage Sidi Driss	SW5	2.7	4.0	4.0	5.0	3.0	<b>3.6</b>
Recharge des nappes phréatiques par infiltration	GW3	3.4	4.0	5.0	5.0	3.4	<b>4.0</b>
Transferts inter-bassins: Adduction de Al Massira à Marrakech	WT1A	3.0	5.0	4.0	4.0	2.3	<b>3.5</b>
Transferts inter-bassins: Adduction de Kasba Tadla à Marrakech	WT1B	3.0	5.0	4.0	4.0	2.3	<b>3.5</b>
Collecte des eaux pluviales à petite-échelle/ au niveau rurale	RW1	2.2	2.0	3.0	4.0	3.4	<b>2.8</b>
Collecte eaux de pluies et réutilisation au niveau de la ville	RW3	1.8	1.0	3.0	2.0	3.4	<b>2.1</b>
Réutilisation des eaux usées traitées pour usage non-potable	WW1	3.9	4.0	3.0	4.0	3.7	<b>3.8</b>
Réutilisation des eaux grises dans les hôtels	WW3	3.3	2.0	3.0	3.0	2.7	<b>2.8</b>
Dessalement de l'eau de mer par osmose inverse	DS1	3.1	5.0	4.0	4.0	3.7	<b>3.9</b>
Réhabilitation du réseau et mesures d'accompagnement	NR1	3.0	2.0	5.0	4.0	5.0	<b>3.6</b>
Aménagement paysager urbain	DM4	2.5	1.0	3.0	3.0	4.7	<b>2.8</b>

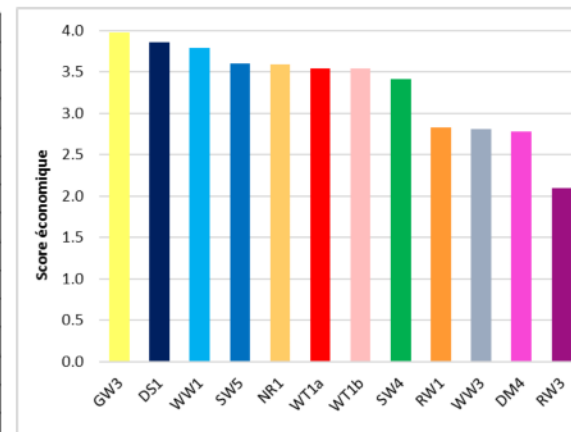


Tableau 4 Résumé de l'analyse économique des options (poids : 1 = évaluation la plus faible, 5 = évaluation la plus favorable)

## Concluding Remarks

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- Urban resilience shall preferably be addressed system-wise.
- Proposed resilience concept bases on the main steps resilience screening, evaluation of measures and resilience optimization. All steps require expert know-how.
- A resilience score can be incorporated as an additional criteria in a multi-criteria analysis.

### **Vision**

Like the Swiss risk methodology, the Swiss resilience methodology is defined as a standard and applied in Switzerland and abroad.

## Contact

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