



Building Water Security for Resilient Economies



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Water security attracts attention because it is linked to a growing consensus that we are facing an emerging **water crisis**



Two emerging dangers: **First**, national competition amongst users of water intensifies. **Second**, water is the ultimate fugitive resource, traversing borders.

Conflicts over water use will result in security issues, at the local (security-of-access) and regional scales (international peace and national security).

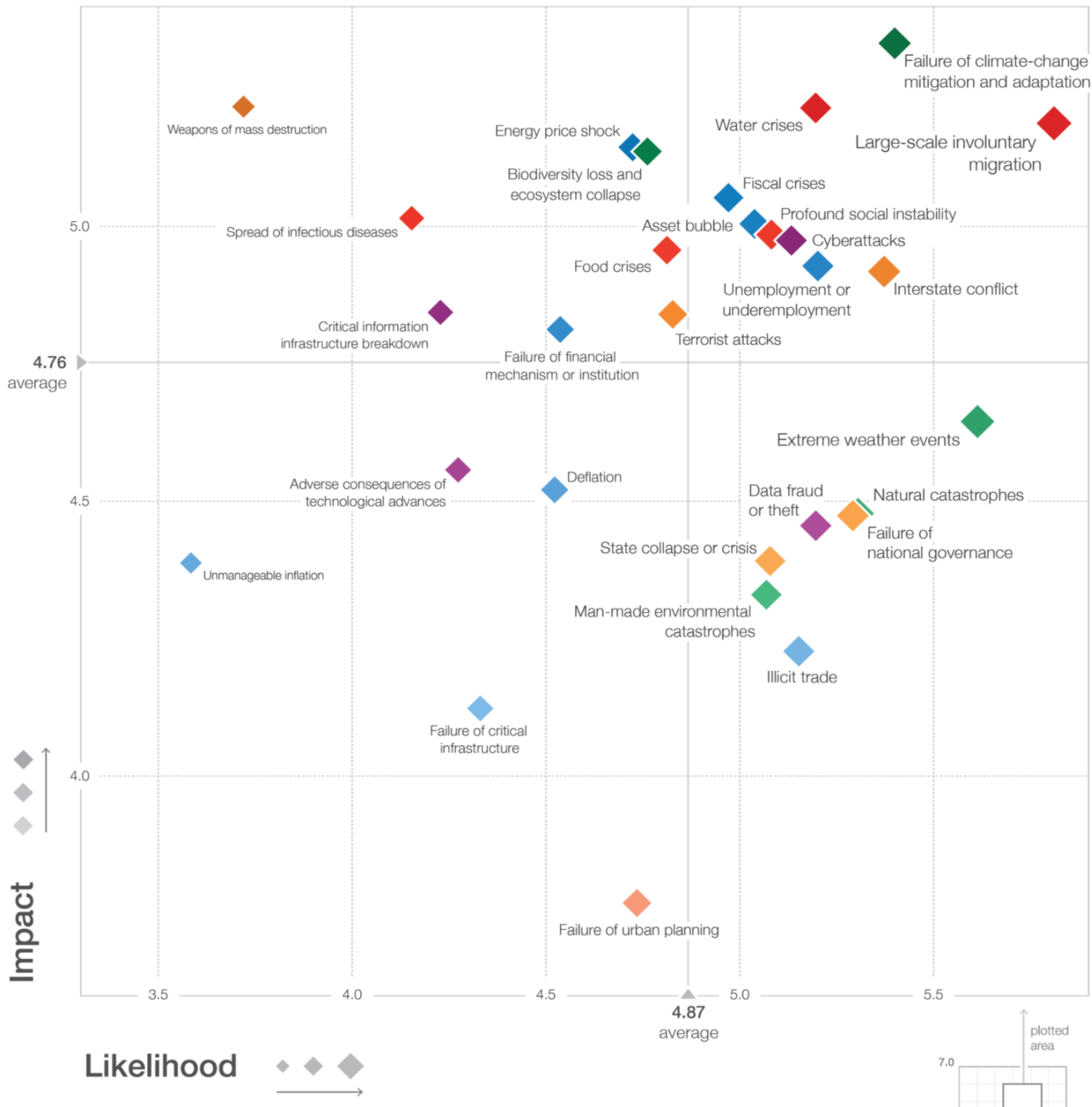
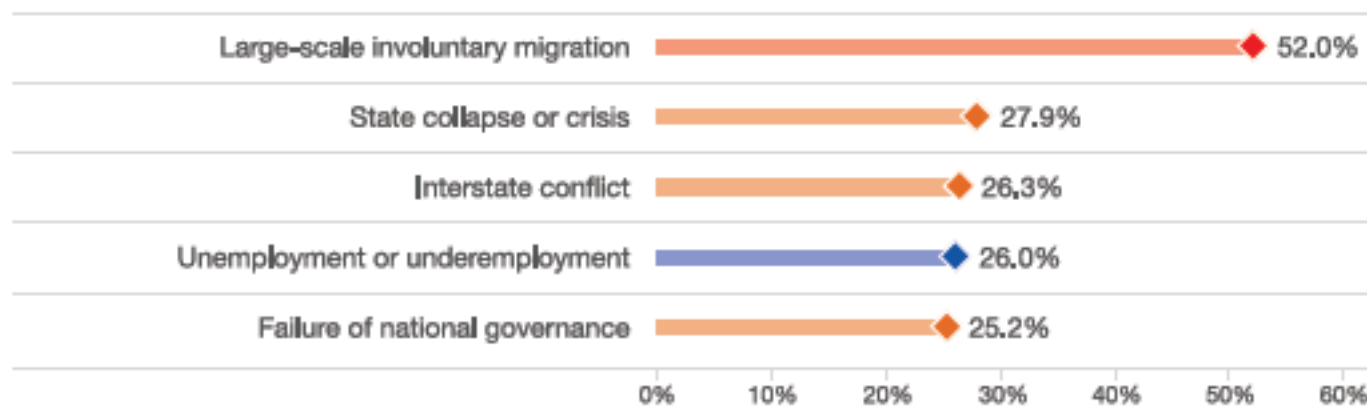
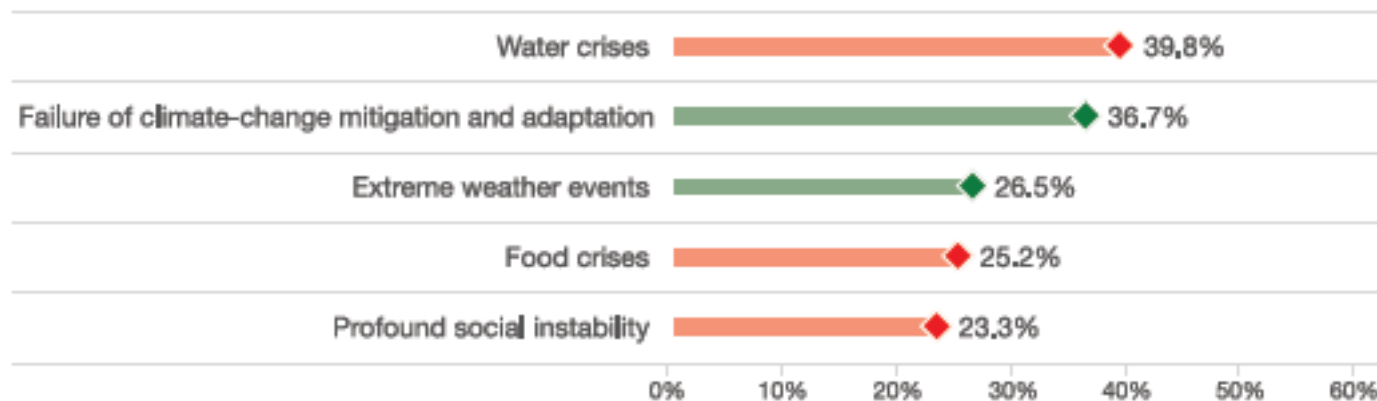


Figure 1.2: The Top Five Global Risks of Highest Concern for the Next 18 Months and 10 Years

For the next 18 months



For the next 10 years



Source: Global Risks Perception Survey 2015, World Economic Forum.



SUSTAINABLE DEVELOPMENT GOALS

1 NO POVERTY 	2 ZERO HUNGER 	3 GOOD HEALTH AND WELL-BEING 	4 QUALITY EDUCATION 	5 GENDER EQUALITY 	6 CLEAN WATER AND SANITATION
7 AFFORDABLE AND CLEAN ENERGY 	8 DECENT WORK AND ECONOMIC GROWTH 	9 INDUSTRY, INNOVATION AND INFRASTRUCTURE 	10 REDUCED INEQUALITIES 	11 SUSTAINABLE CITIES AND COMMUNITIES 	12 RESPONSIBLE CONSUMPTION AND PRODUCTION
13 CLIMATE ACTION 	14 LIFE BELOW WATER 	15 LIFE ON LAND 	16 PEACE, JUSTICE AND STRONG INSTITUTIONS 	17 PARTNERSHIPS FOR THE GOALS 	 SUSTAINABLE DEVELOPMENT GOALS



Table 1: Overall Summary of Damage and Losses

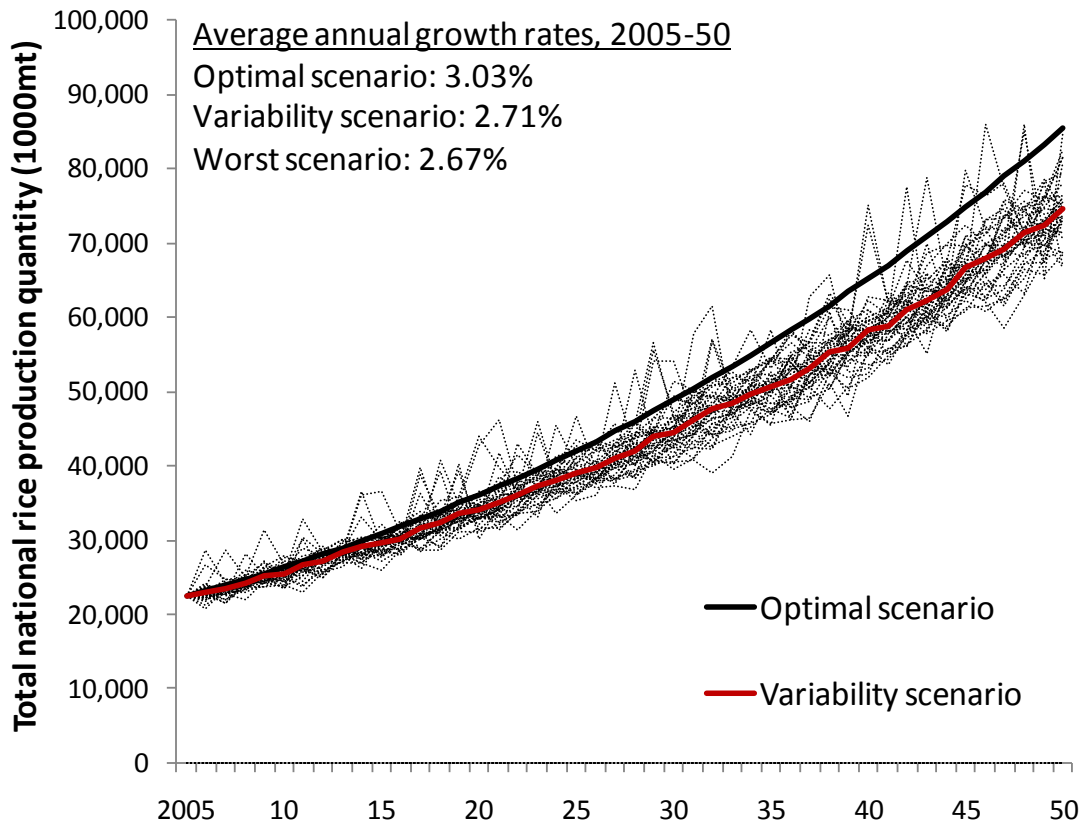
Sector	Sub-Sector	Disaster Effects (BDT Million)			Disaster Effects (US\$ Million)		
		Damage	Losses	Total	Damage	Losses	Total
Infrastructure		71,064	2,130	73,194	1,029.9	30.9	1,060.8
	Housing	57,915	—	57,915	839.3	—	839.3
	Transport	8,006	1,725	9,731	116.0	25.0	141.0
	Electricity	576	359	935	8.3	5.2	13.6
	Water and Sanitation	157	46	203	2.3	0.7	2.9
	Urban and Municipal	1,696	—	1,696	24.6	—	24.6
	Water Resource Control	4,918	—	4,918	71.3	—	71.3
Social Sectors		4,482	1,453	5,934	65.0	21.1	86.0
	Health and Nutrition	169	1,038	1,206	2.4	15.0	17.5
	Education	4,313	415	4,728	62.5	6.0	68.5
Productive Sectors		1,734	32,083	33,817	25.1	465.0	490.1
	Agriculture	1,472	28,725	30,197	21.3	416.3	437.6
	Industry	262	2,035	2,297	3.8	29.5	33.3
	Commerce	—	1,258	1,258	—	18.2	18.2
	Tourism	—	65	65	—	0.9	0.9
Cross-Cutting Issues		420	0	420	6.1	0.0	6.1
	Environment	420	—	420	6.1	—	6.1
Total		79,904	35,665	115,569	1,158.0	516.9	1,674.9

**November 15,
2007
Cyclone Sidr
(category 4)**

**Toll at 3,406
deaths, over
50,000 injured**

Impacts of existing climate variability on the economy of Bangladesh

National rice production, 2005-2050



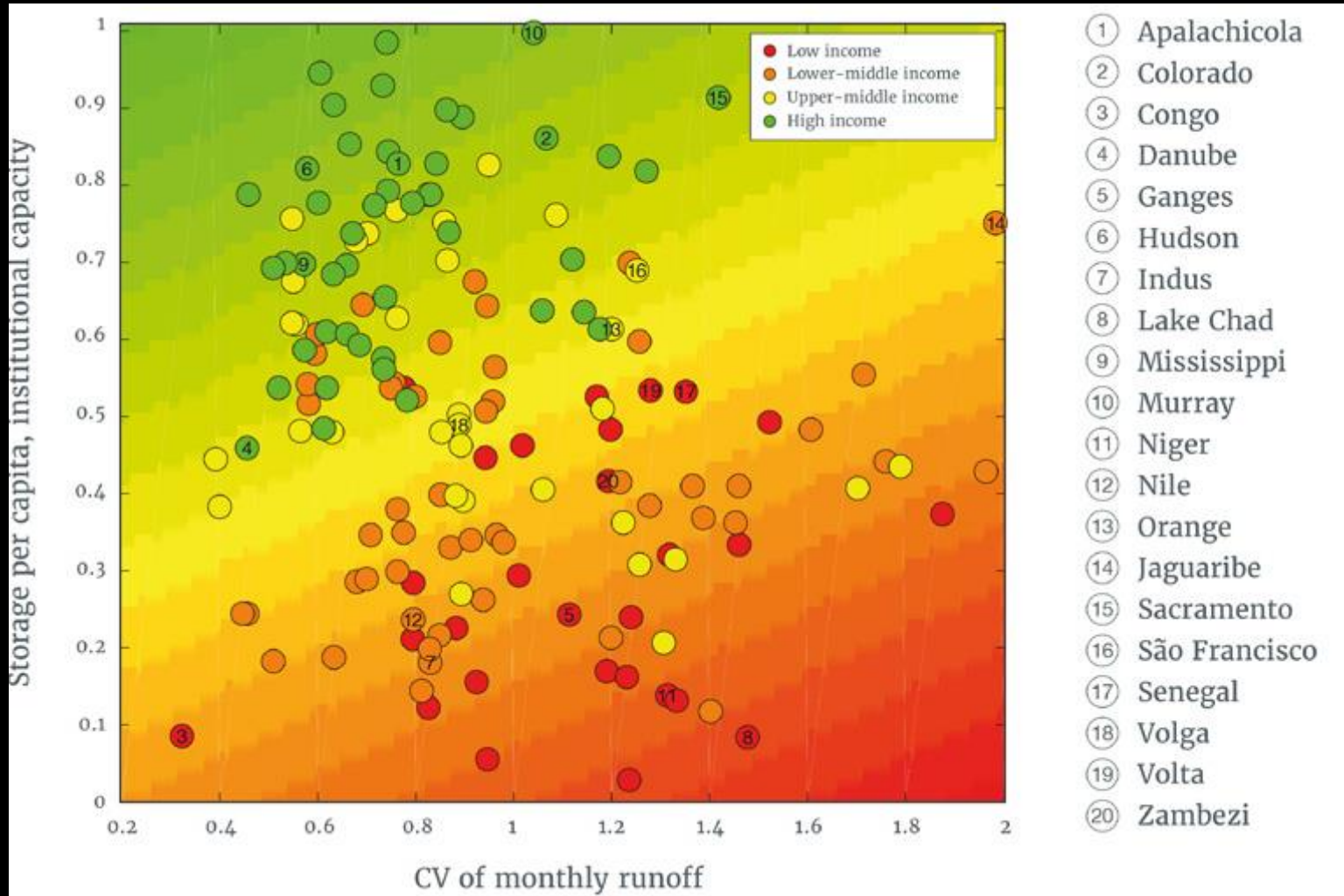
Existing variability reduces national GDP by a discounted US\$121 billion over 2005-2050 (5% of optimal GDP)

	2005-2050
	Total GDP
Average annual growth rate (%)	
Optimal scenario	4.65
Existing variability	4.44
Cumulative economic loss (2005 US\$ bil.)	594.06
Discounted cumulative loss (2005 US\$ bil.)*	120.66
Annual discounted loss (2005 US\$ bil.)	2.68
Discounted loss' share of optimal GDP (%)	5.14

* 5% annual discounted rate

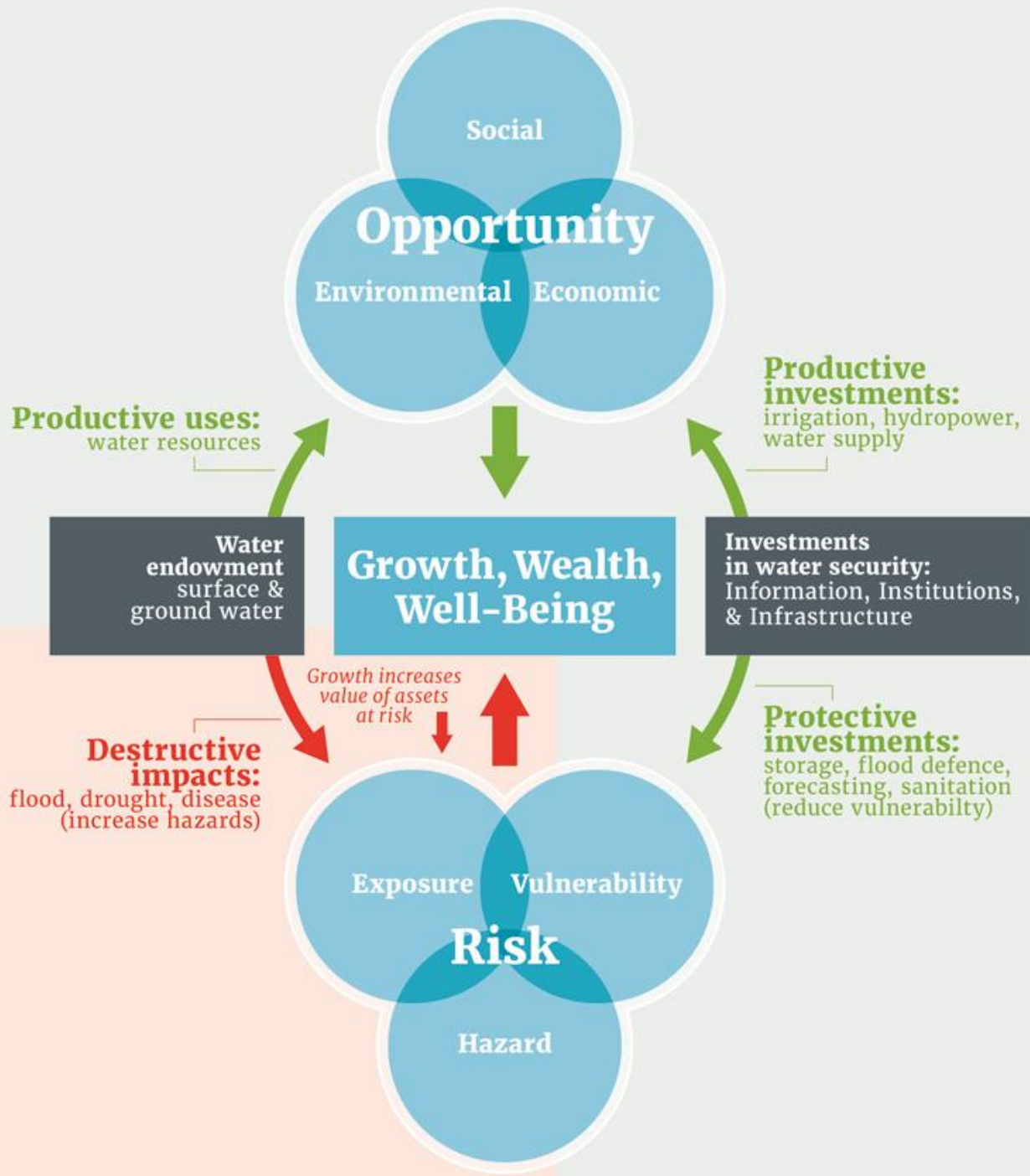
Water security as a determinant of economic performance?

More capacity and resilience →



Increasing variability →





Key Challenges in building Water Security

1. Sustainability of Investments

2. Suitability of Institutions

3. Scarcity of Information

Resilient cities are important !

Cities:

- generate **85%** of global GDP,
- consume **75%** of the world's natural resources and
- account for **80%** of global greenhouse gas emissions.

Today 7.3 billion people live and work in only 7.6% of the global land mass.



7.3 bn



7.6%

85%

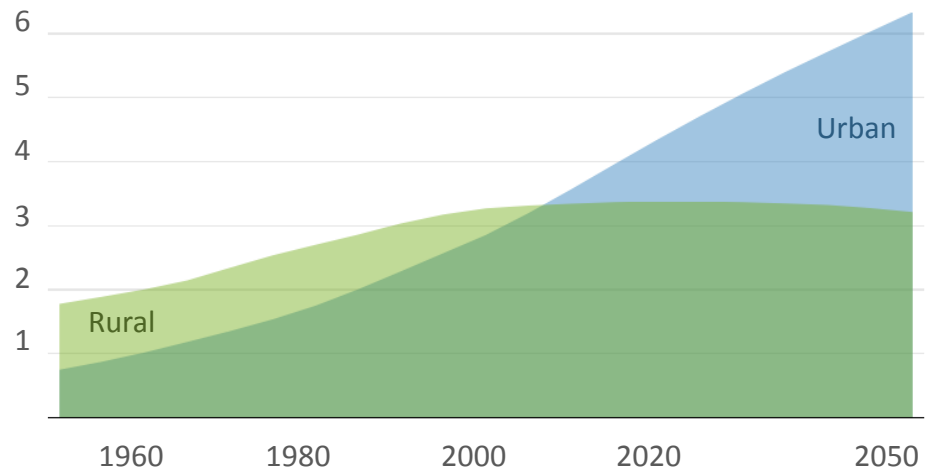
of the global population lives in urban areas

1.5m

people are added to the urban population every week

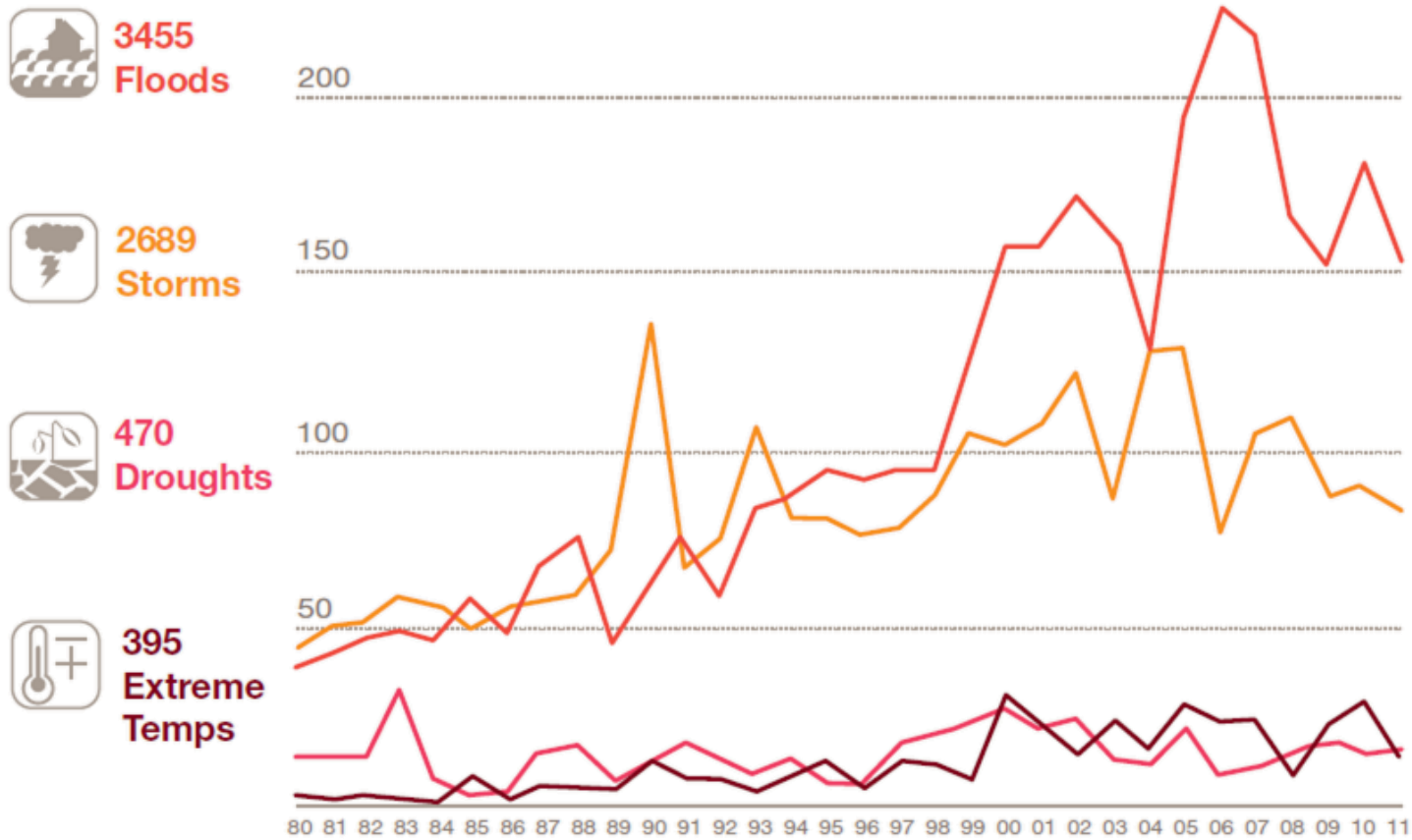
Accelerating urbanization is one of the 5 global megatrends shaping our world creating new challenges for urban development and resilience.

Worldwide urban and rural population (billions)



One of the key urban resilience challenges: FLOODS

Number of climate-related disasters worldwide (1980-2011)



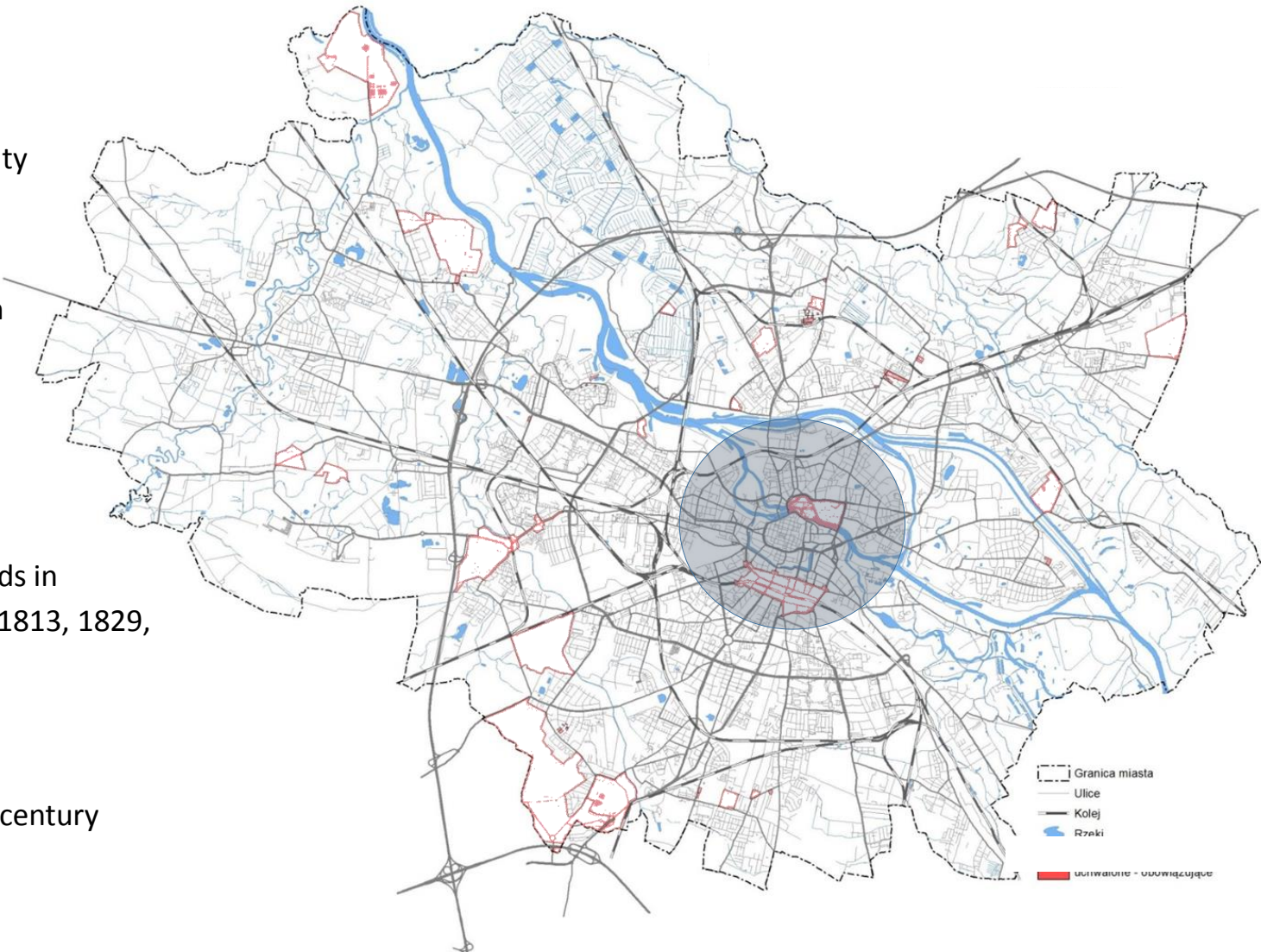
Flood risk is one of the key resilience challenges for Wroclaw

6
rivers going
through the city

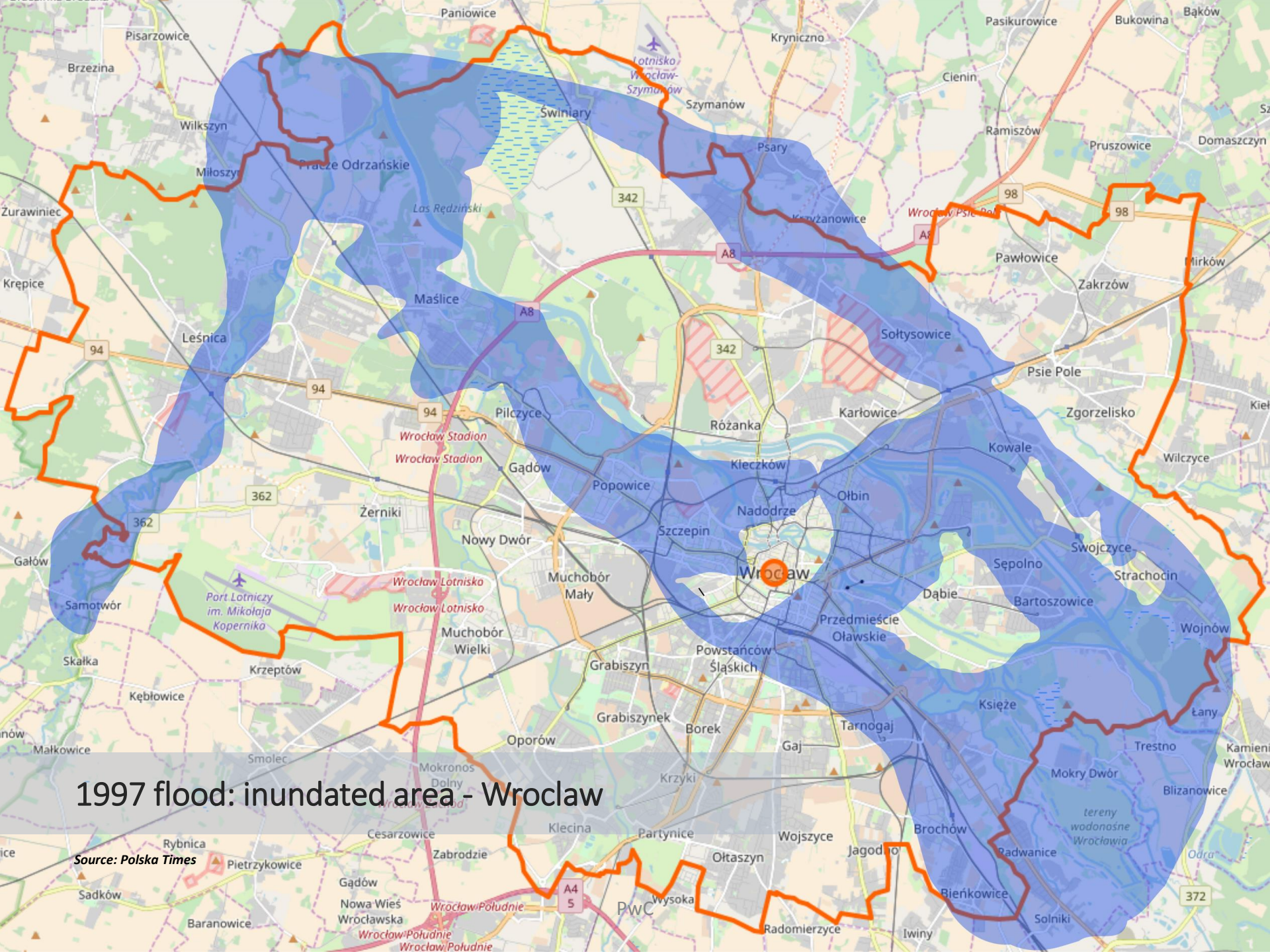
>100
bridges within
the city
borders

4 major floods in
19th century (1813, 1829,
1854, 1880)

12
floods in 20th century



Source: City of Wroclaw



1997 flood: inundated area - Wrocław

Source: Polska Times



Total damages from the 1997 flood

Poland

USD 2.3bn in losses (3.7bn in current prices)

Loss of 54 lives

37,000 buildings, 866 bridges, 2,000 km of roads

Wroclaw

USD 192m (304m in current prices, **99.2% of the city budget at the time**)

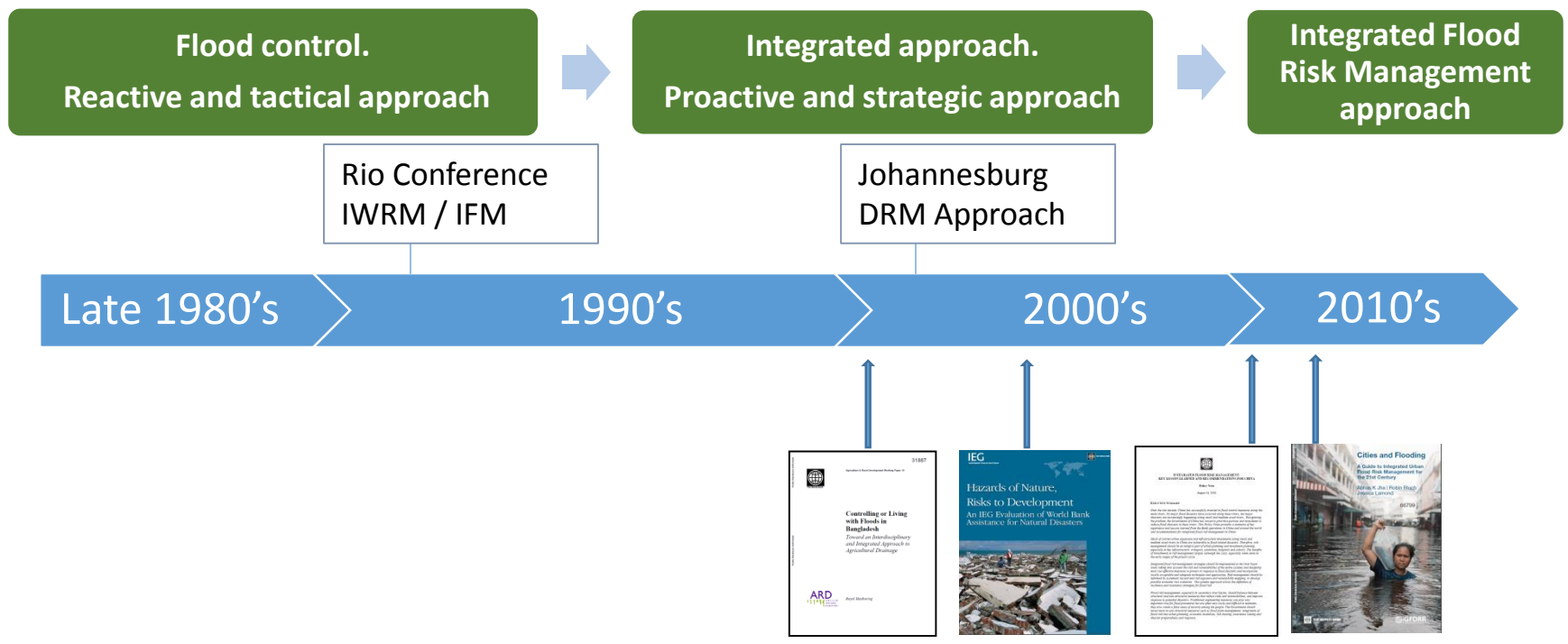
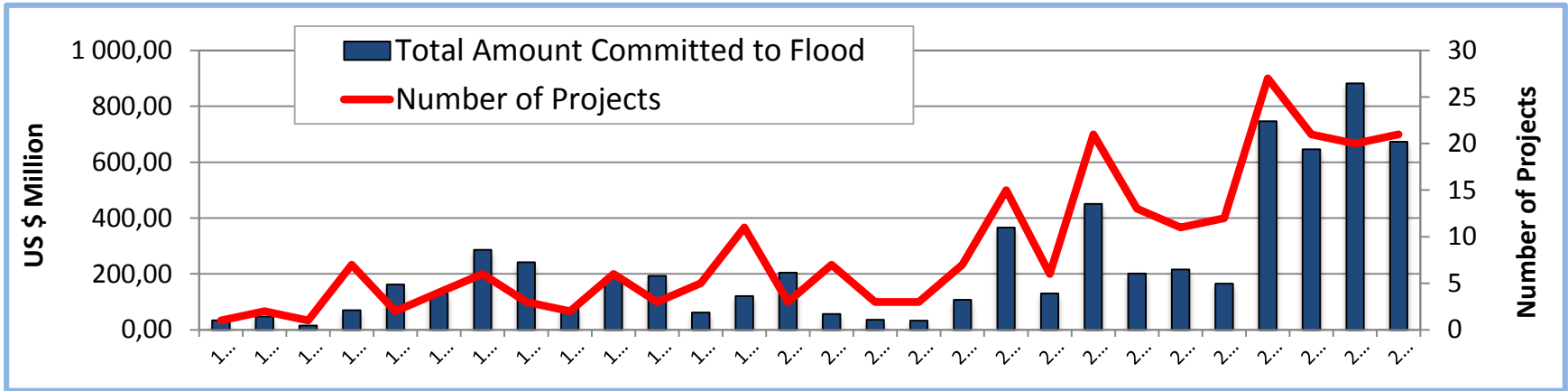
31% of city area inundated

WB/CEB/EU engagement in Poland

- 1. Emergency Flood Recovery Project:** 1997-2005, USD 498 mln including USD 200 mln from WB
- 2. Odra River Flood Protection Project:** 2007-2017, EUR 760 mln, including EUR 140 mln - WB, EUR 205 mln – CEB, the rest EU grant funds, Gov. own funds, NFOS
- 3. Odra-Vistula Flood Management Project:** 2015-2022, EUR 1.2 billion, including EUR mln – WB, EUR 300 mln – CEB, the rest EU grant funds and Gov. own funds, NFOS

Bank involvement for almost **20 years**, since 1997

Evolution of approach in the World Bank Portfolio





Before and After



nabojaszowa

nabojaszowa

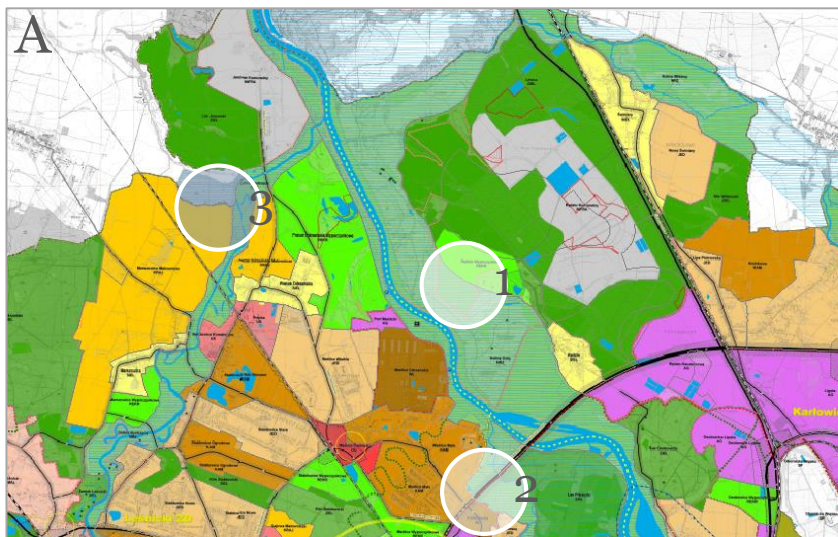


Before and After

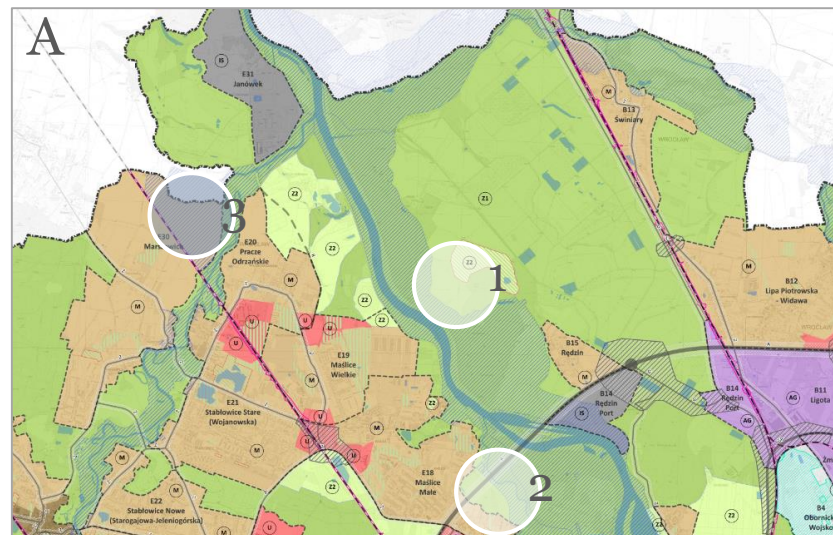


In the northern part of the city, in the surroundings of the Rędziński Forest and the Maślice estate, there are areas that are no longer under flood risk

Part of SUIKZP Wroclaw from 2006



Part of SUIKZP Wroclaw from 2018



● New areas classified as threatened by flood in 2018

○ Areas, which were classified as areas threatened by flood in 2006/2010, that are currently free from flood risk

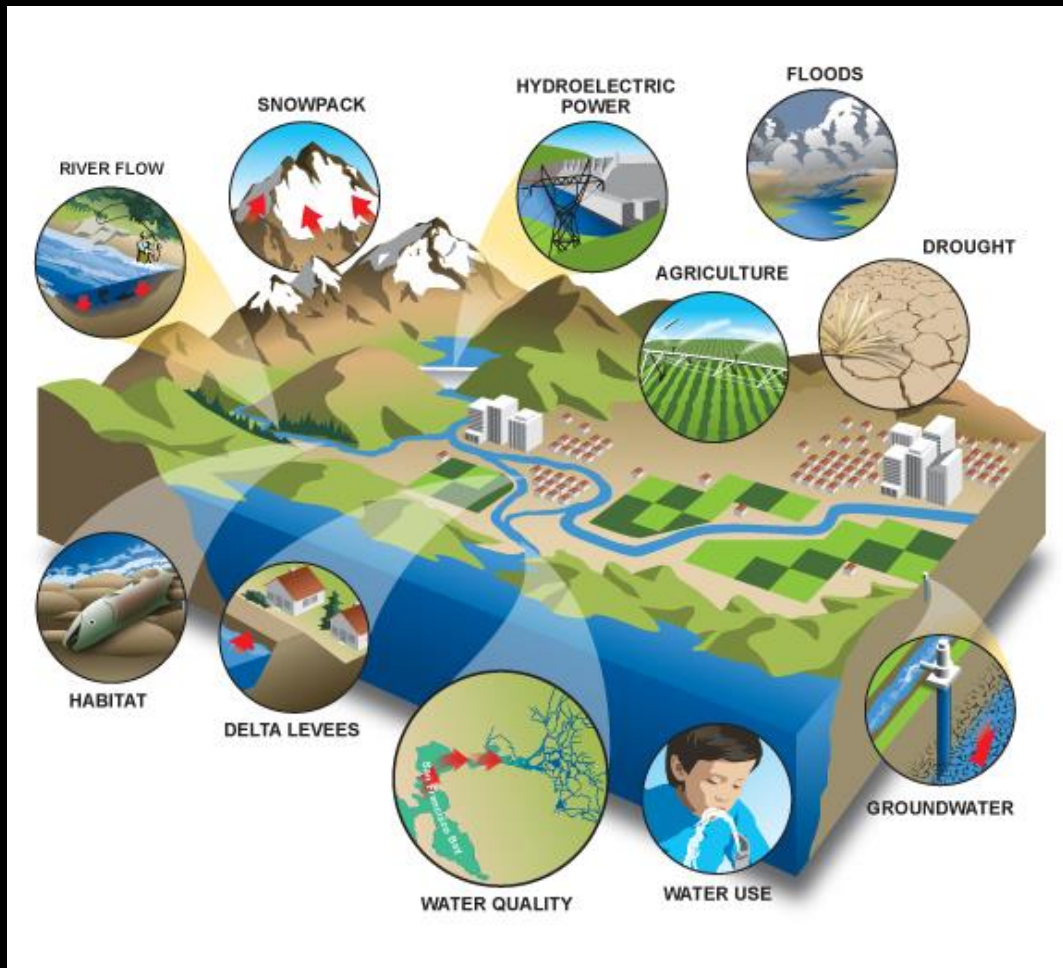
Key Challenges in building Water Security

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2. Suitability of Institutions

3. Scarcity of Information

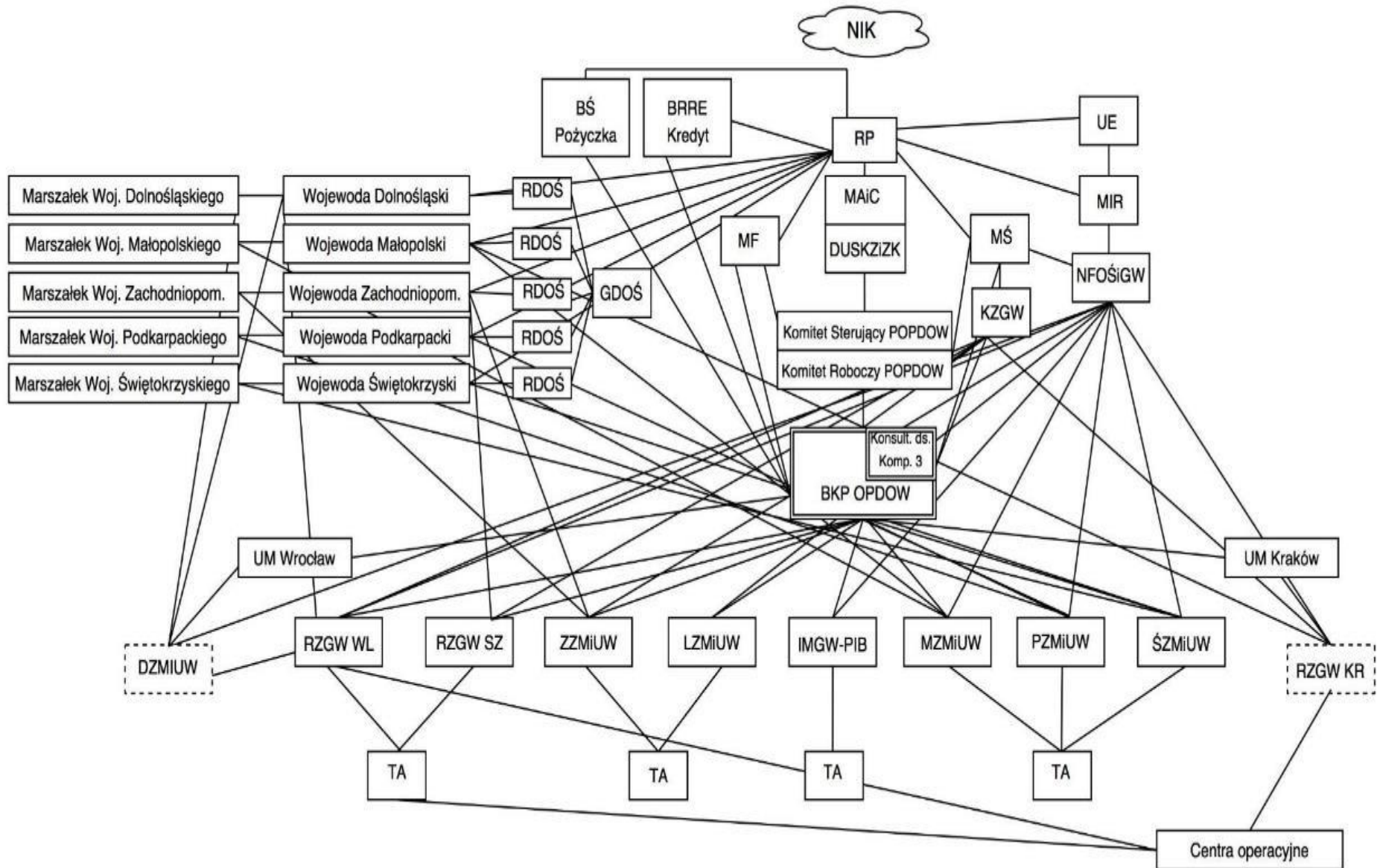
Managing Water: Who are the Players?



Agriculture Department
Livestock Department
Forest Department
Rural Water Supply Department
Irrigation Department
Urban Water Supply Department
Power Department
Industry Department
Fisheries Department
Environment Department
Transport Department
Tourism Department
Groundwater Department
Surface Water Department
Public
Farmers
Private Sector
Academics and Universities

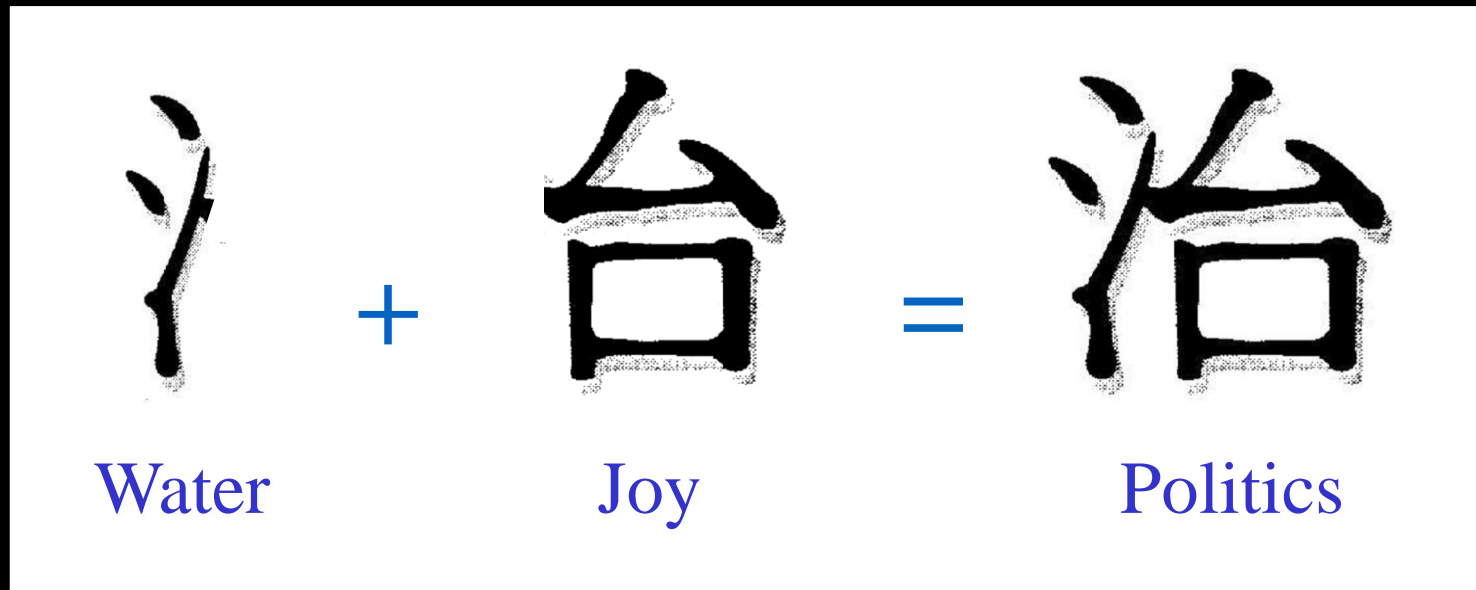
Managing water is complex from the technical, economic, social, environmental, cultural, and historical perspectives

Easy Institutional Framework for implementation of the project when working at the basin scale – almost full picture!



Rivers are political systems....

- Management of rivers is always political
- Rival: Latin *rivalis*, one using the same stream as another
- The Chinese got it right long long ago:



Shared waters and interdependence



July - September, 1989



August 12, 2003

No such thing as managing water for a single purpose – all water management is multi-objective and as such is by definition based on conflicting interests.

Key Challenges in building Water Security

1. Sustainability of Investments

2. Suitability of Institutions

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It goes without say that

YOU CAN NOT MANAGE WHAT YOU CAN NOT MEASURE AND MONITOR

YOU CAN NOT PLAN WHAT YOU CAN NOT MEASURE AND MONITOR

YOU CAN NOT OPERATE WITHOUT DATA

YOU CAN NOT CREATE KNOWLEDGE WITHOUT DATA

RELIABLE, TIMELY, QUALITY, CONSISTENT, PUBLIC DATA

This is unfortunately a major challenge!

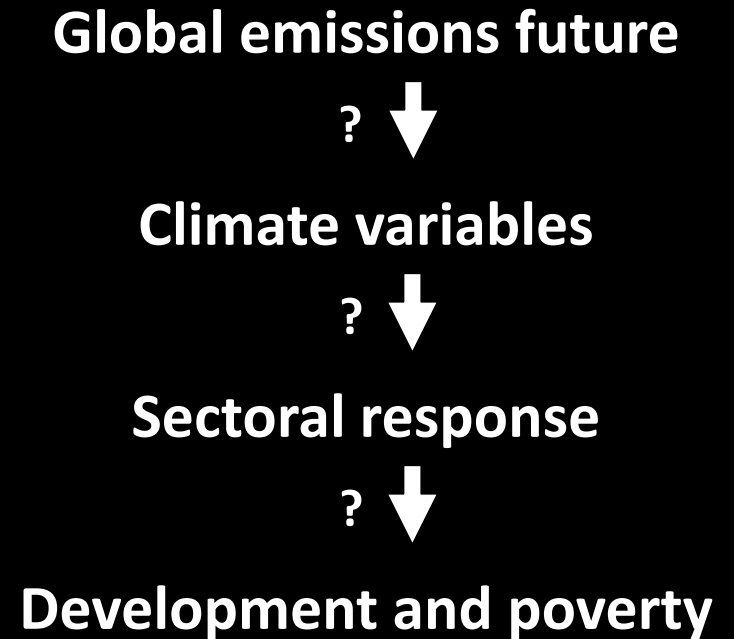








What matters in predicting a waters future?



The key is decision-making under uncertainty

Thoughts on building water security

- Acknowledge that the water sector is extremely *diverse* in its physical features, users composition, institutional responses ... and they keep changing over time;
- Initiate change only when there is a powerful, articulated need for reform;
- Have a clear strategy for involving all interested parties in the discussions of reform, and for addressing fears seriously, with effective, understandable information;
- Its not about money - implementation is challenging ; We spend more time and effort on resolving problems of a institutional nature than on problems of a technical nature ...
- Building water security is so often about changing minds, attitudes, and a mosaic of values

Thank you



Source of the photograph: City of Wrocław

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