



SID
Society for International Development
Berlin Chapter



Ministry of Infrastructure and the
Environment



Entwicklung, Konflikt und Kooperation entlang internationaler Flüsse; Beispiel Rhein

Koos Wieriks


Ringvorlesung Entwicklungspolitik
TU Berlin, 21. November 2013



IKSR
CIPR
ICBR



UNSGAB



INTRO

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Koos Wieriks

TU Delft, Civil Engineering / Spatial Planning (1980)

Ministry of Transport, Public work & Watermanagement (1981-1990)

North Sea Directorate Rijkswaterstaat (1990-1995)

Internationale Kommission zum Schutz des Rheins, Koblenz (1995-2000)

Advisor Minister of Public Works Indonesia, Jakarta (2000-2005)

Personal Advisor Watermanagement HRH. Prince of Orange (2005-2011)

Botschaftsrat für Infrastruktur und Umwelt, Berlin (2011- ...)

Board Member UN Secretary-General's Advisory Board Water & Sanitation

Member High Level Expert & Leaders Panel for Water & Disaster

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Experience

National water policy development and implementation Netherlands

North Sea and Rhine Ministerial Conferences

World Water Fora

International Year of Sanitation

World Toilet Day

Aceh and Tohoku Tsunami

New Orleans – Katrina, New York – Sandy - Jakarta Floods


Innovative Water Technologies

Hochwasser Rhein 1995, 1998), Elbe (2002, 2013)

UNSGAB, HELP

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Themen 21. November

Wasser und Konflikte


Wasser in der Welt

Flüsse weltweit, Zusammenarbeit am Rhein

Niederländisch - Deutsche Zusammenarbeit (Hochwasser, Technologie)


?????

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CONFLICT

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Water crisis

Violence and vigil in drought-hit areas

There are 100 reported deaths in the drought-hit region of the Horn of Africa, says UNICEF. The UN says that the crisis is spreading to other parts of the region. The water crisis is a global issue and will become a major concern in the future. The need for water is increasing and the world is facing a water crisis. The water crisis is a global issue and will become a major concern in the future. The need for water is increasing and the world is facing a water crisis.

water

war

Wars

International


conflict

river

countries

history increasing fresh grain new become much human resource risks may food World years increase disputes Barnaby future global israel trade sharing environmental go virtual access people sharing climate change shortages many reason nations change even International power percent far resources question answer institutional


A water crisis is looming.



Tension

"All are places where shortages of water contribute to poverty. They cause social hardship and impede development. They create tensions in conflict-prone regions. Too often, where we need water we find guns. [...] There is still enough water for all of us - but only so long as we keep it clean, use it more wisely, and share it fairly"

Ban Ki-moon, UN Secretary General



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Future water prospects ...

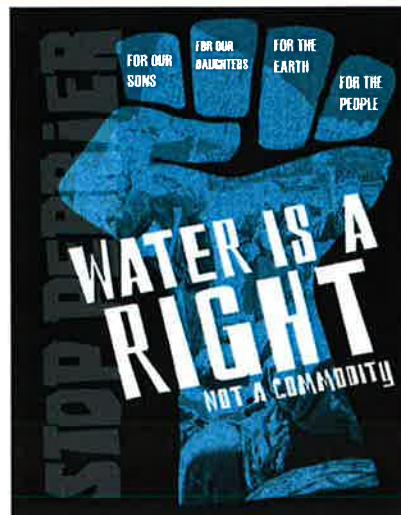
US Secretary of State Hillary Clinton:


Lack of water may lead to **terrorism, violence, political instability and conflict over competition failed states**



War and Water

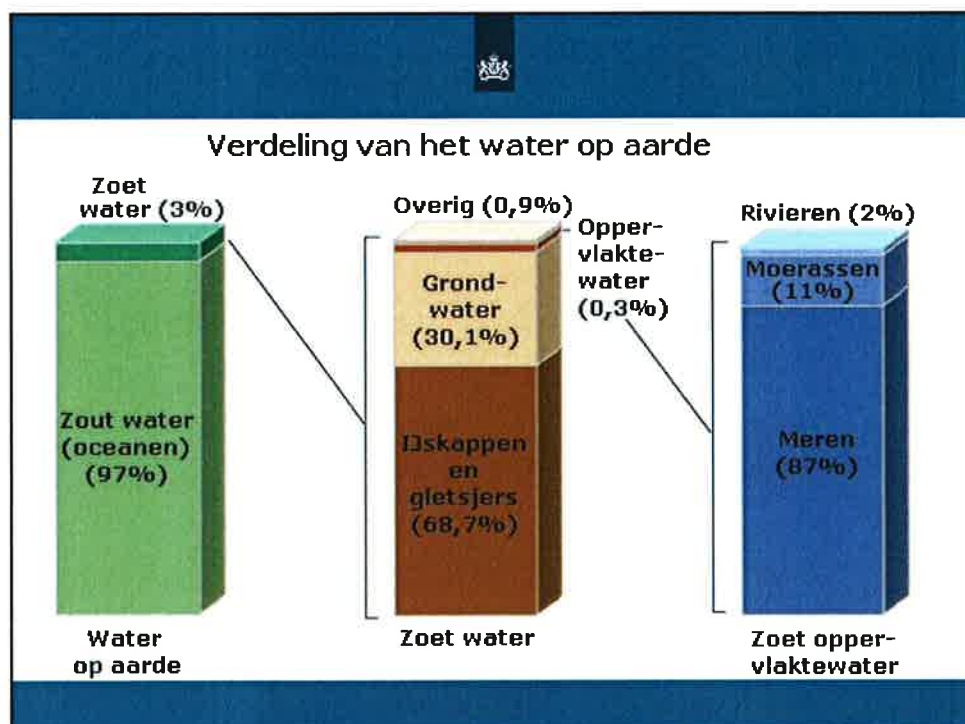
Drinking water and sanitation are huge problems in many conflict areas




**Water in the World
Problems**

Ministerie van
Infrastructuur en
Milieu

11 november 2013






Water beschikbaarheid neemt af

- Blue Planet?
- Meer dan 1 miljard mensen zonder safe drinking water
- Meer dan 2,5 miljard zonder goede sanitatie
- Trend: stijgende vraag, dalend aanbod




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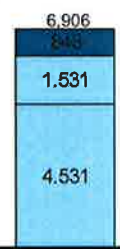


Watershortage: 40% global water gap 40% by 2030

2005 demand




2030 demand

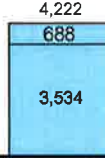


2.765

40%



Planned supply 2030



Demand trends

- Population/economic growth
- Water intensity of diets
- Water intensity of energy
- Sub-optimal allocation of demand due to low virtual water trade

Supply trends

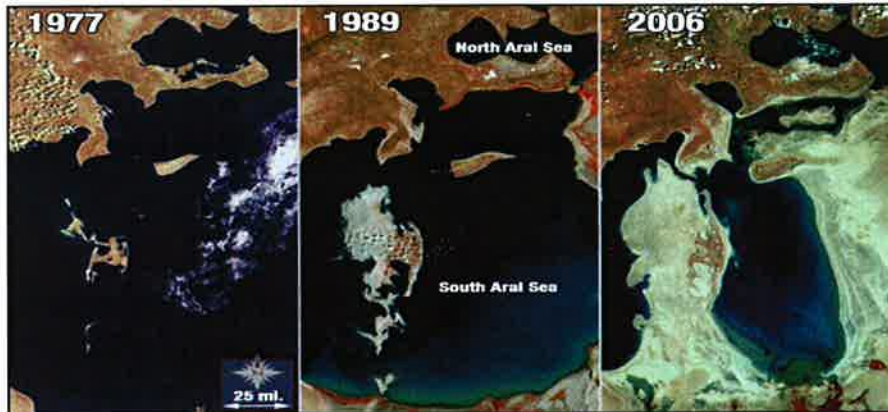
- Constrained capital and underinvestment
- Increased variability and potential decreased flows due to climate change

- Basins with deficits

- Basins with surplus



Transboundary problems



Large freshwater lakes, such as the Aral sea, are drying up



Flood



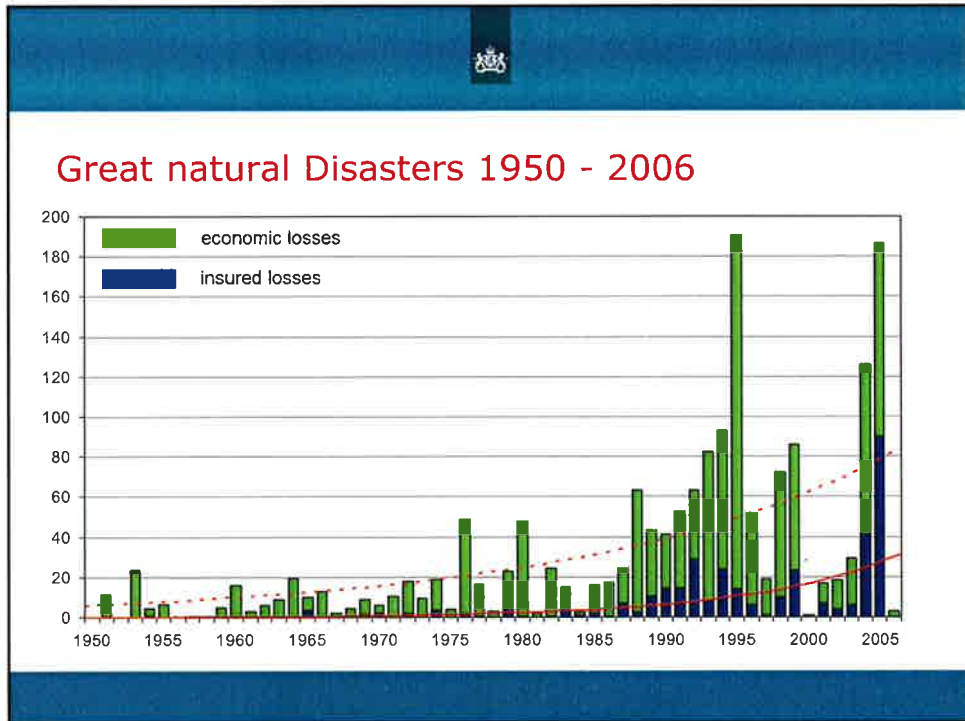


Drought




Pollution





**Water in the world
Causes**

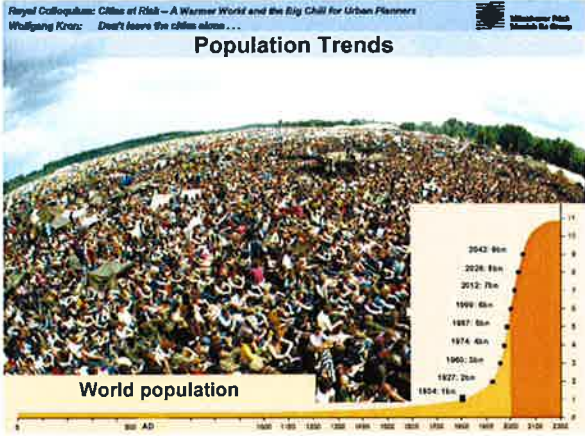
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Population growth

Royal Colloquium: Cities at Risk – A Warmer World and the Big Chill for Urban Planners
Wolfgang Kraus: *Don't leave the cities alone . . .*

Population Trends



World population

Year	Population (Bn)
2042	9bn
2026	8bn
2012	7bn
1999	6bn
1987	5bn
1974	4bn
1960	3bn
1927	2bn
1804	1bn

500 AD 1000 1500 1800 1900 2000 2050 2100 2200




Urbanization



© 2013 World Bank








Urbanization

Populair Colloquium: Cities at Risk - A Warmer World and the Big Challenge for Urban Planners
Wolfgang Krahl: Don't leave the cities alone

Population Trends

Megacities* 1950 (10)

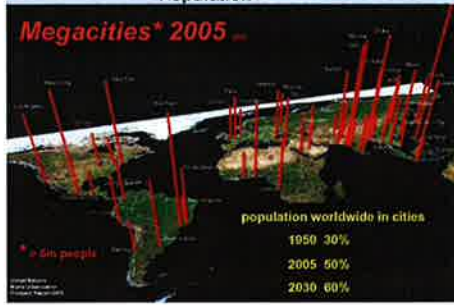


* > 5m people

Populair Colloquium: Cities at Risk - A Warmer World and the Big Challenge for Urban Planners
Wolfgang Krahl: Don't leave the cities alone

Population Trends

Megacities* 2005 (30)



population worldwide in cities

1950	30%
2005	50%
2030	60%

* > 5m people



Climate Change



Oct 6th 18, 2005 August 18, 2005

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Poor Management



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River Management



Rivers

Source of Development

Settlements, harbors, irrigation, transport, hydropower, fisheries, ecological corridor,

Source of Problems

Upstream-downstream, water allocation, pollution, floods

Cooperation or Conflict?

Connector or separator?

Water Wars?

Who owns the river?

Who can use the river?

260 major transboundary rivers

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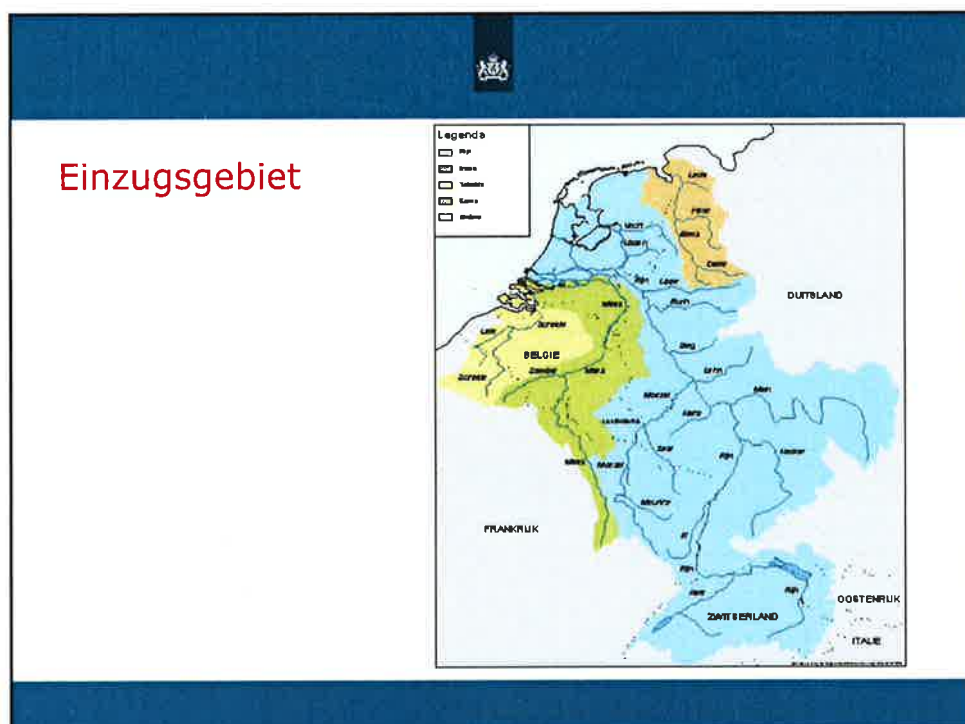
Cooperation


- Bilateral:
 - Cross border
 - International, on the river (CCR), in catchment (IKSR)
 - No global framework
- Legal framework
 - Bilateral agreement
 - River agreements
 - Basin treaties
 - Framework directive EU
 - Convention on the Law of the non navigational uses of international water courses
 - UNECE Waterconvention





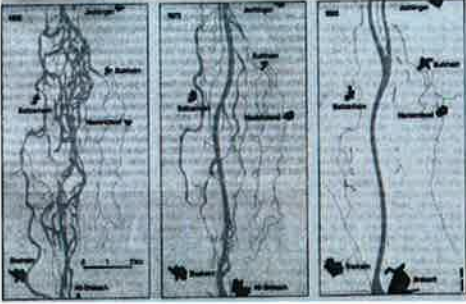


Der Rhein





Landbouw: normalisering

- Tulla
- Doel was "temmen" tbv landbouw, gezondheid
- Begin 19^e eeuw: ca 1600 eilanden tussen Basel en Strassburg

Tulla: Begradigung

- Tulla normaliseerde het Flussbett tot 200-250 m (ipv kilometers)
- Windungen und Schlingen wurden gestreckt. Zwischen Basel und der hessischen Grenze wurde der Rheinlauf um 81 km verkürzt
- Verbesserung Landwirtschaft und Schiffbarkeit



Verunreinigung, Fischerei

- Abwasser (Industrie, Landwirtschaft, Haushalt)
 - Kühlwasser
 - Überfischung
 - Chlorid
 - Dämme und Wehre
-
- Übereinkommen 1950
 - The seventies (Schlamm Rotterdam))
 - 1986 Sandoz
 - 1993-95 Hochwasser
 - 2000 Neues Übereinkommen



Salz, Kaliminen





Sandoz 1986



Erfolgsgeschichte Rhein

Internationale Vereinbarungen

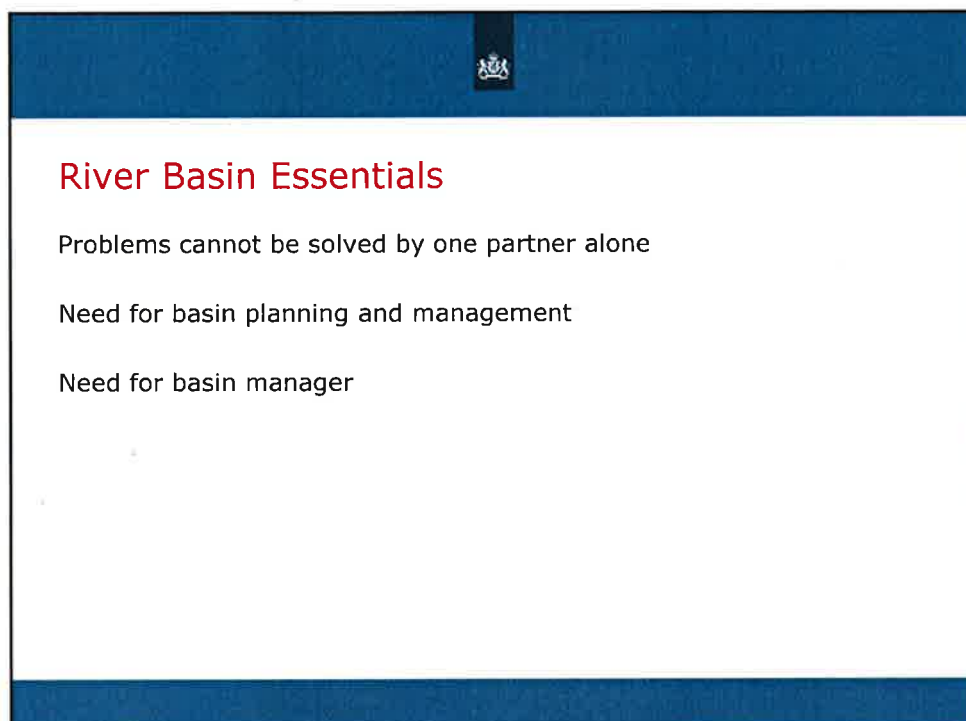
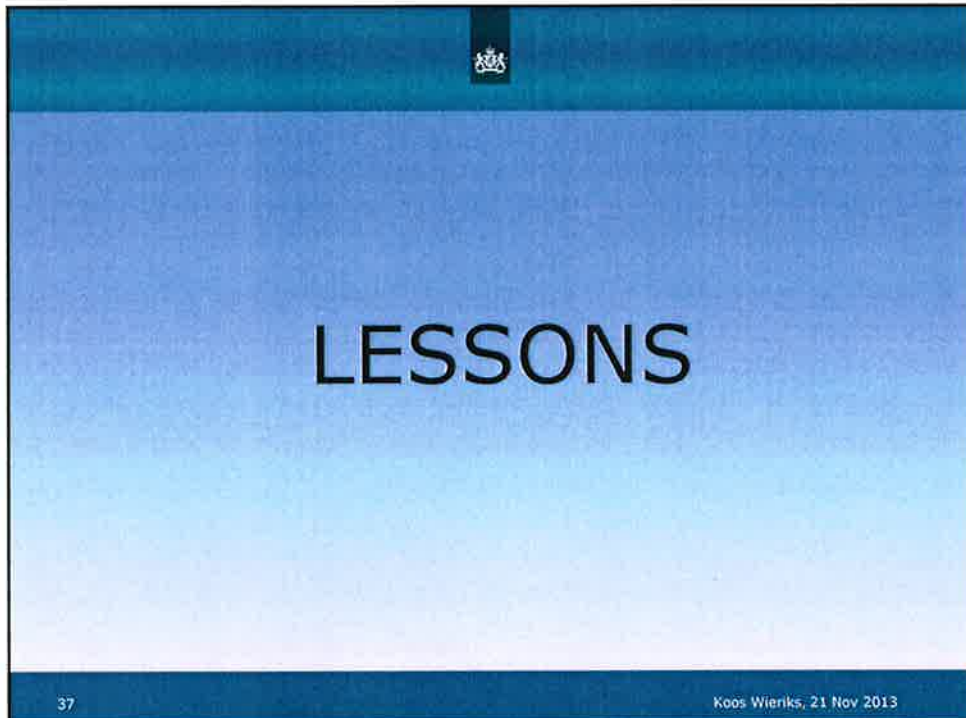
Rhein Aktion Plan

Reduzierung Einleitungen

Lachse zurück im Fluss

Hochwasserschutz

Beispiel für internationale Flusskooperation





Basic principles for river management

- For the people
- Integrated, holistic approach
- Community based
- Basin wide
- Stakeholder involvement
- Cooperation model, together
- Visible results
- Solidarity
- Preventive approach
- Role sharing, cost sharing



Basic requirements for river management

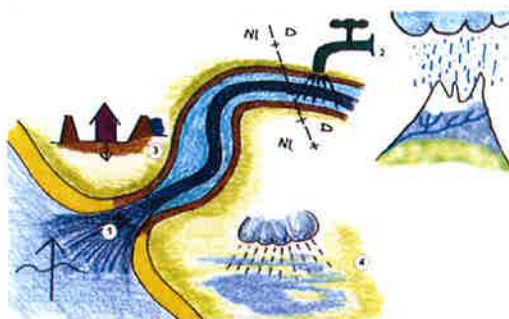
- Organizational structure
- Legal basis and law enforcement
- Financial basis, cost recovery
- Implementation
- Transparency
- Political will





Success factors world wide

- Learning by doing
- Cooperation model
- Coordination unit
- Mutual trust & understanding
- Public & political support
- Flexible implementation
- Basin wide approach
- Integrated approach
- Precaution & prevention
- Challenging goals
- Transparency
- Involvement of all actors
- Solidarity



Cooperation

Ban Ki-moon:
"keep it clean, use it more
wisely, and share it fairly"





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- Koos.wieriks@gmail.com



HOCHWASSER ELBE




of Infrastructure and the
ment


Floods in Germany (June 2013)

Post-flood field investigation, July 2& 3, 2013
Preliminary Findings

Bas Jonkman, Timo Schweckendiek, Guy Dupuits (TU Delft);
Torsten Heyer (TU Dresden); Joop de Bijl (STOWA); Astrid Labrujere (RWS)


in collaboration
with:

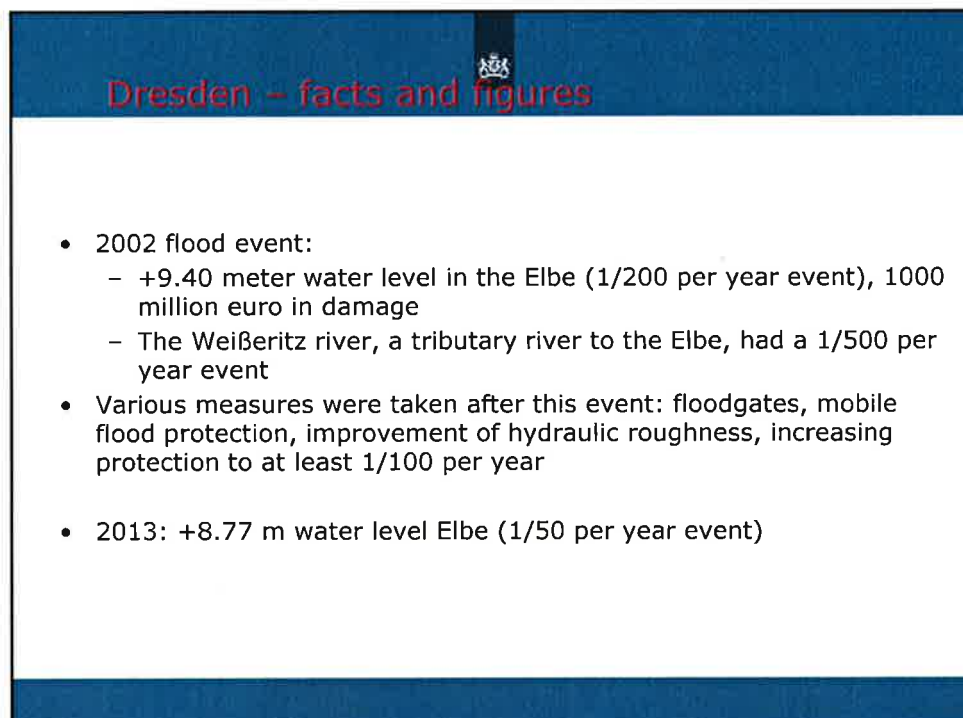
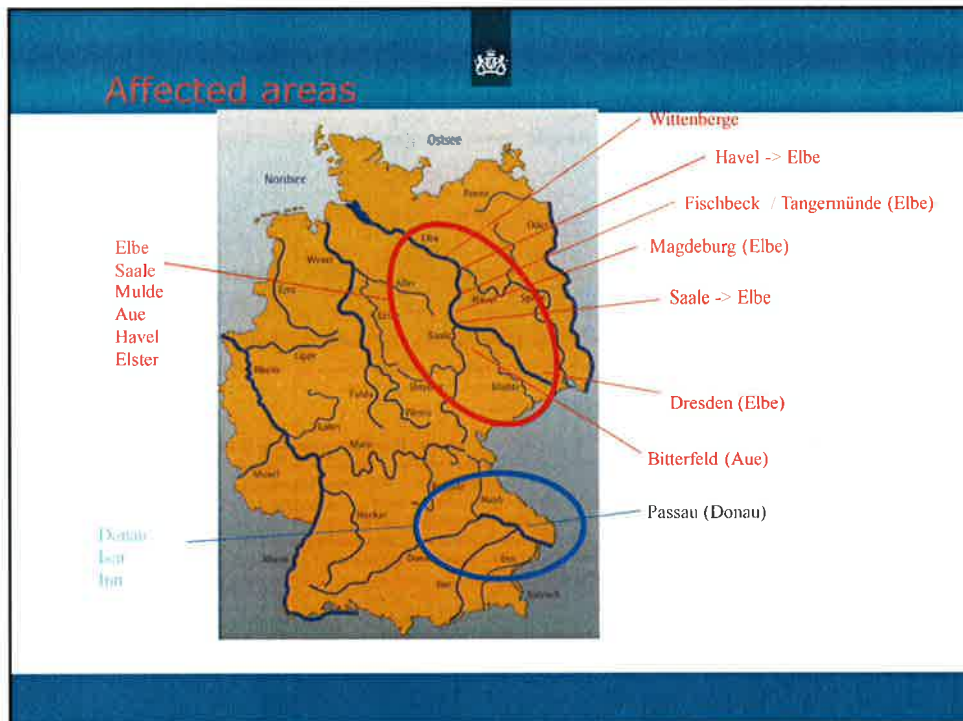


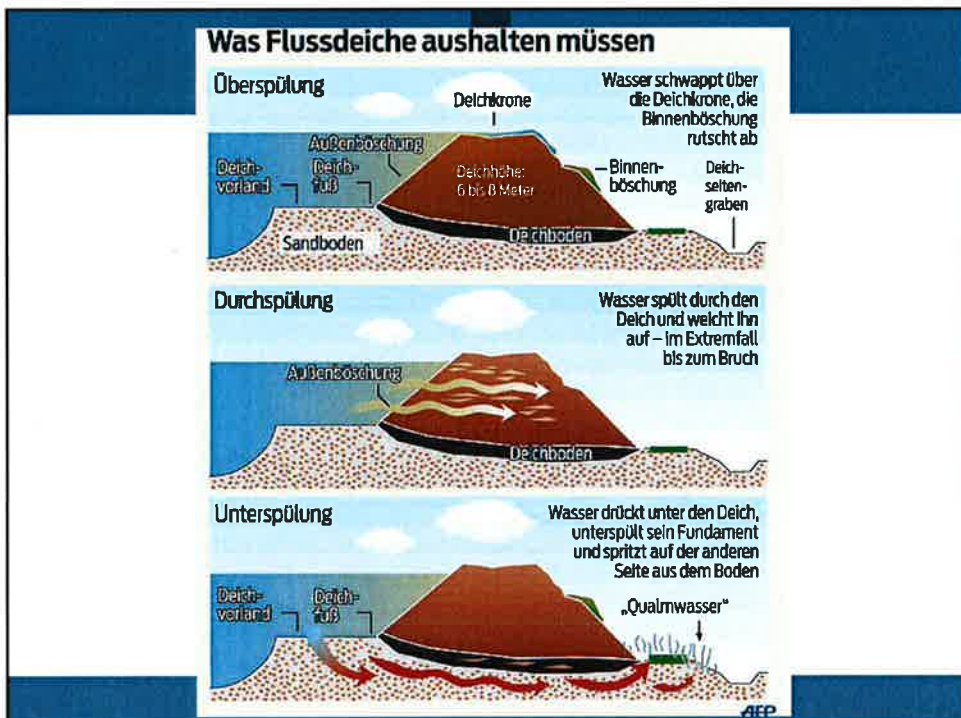



Objectives and scope

- Post-flood field investigation July 2 & 3
- Focus on dike breaches and flood fighting








Bitterfeld (pre-breach situation)

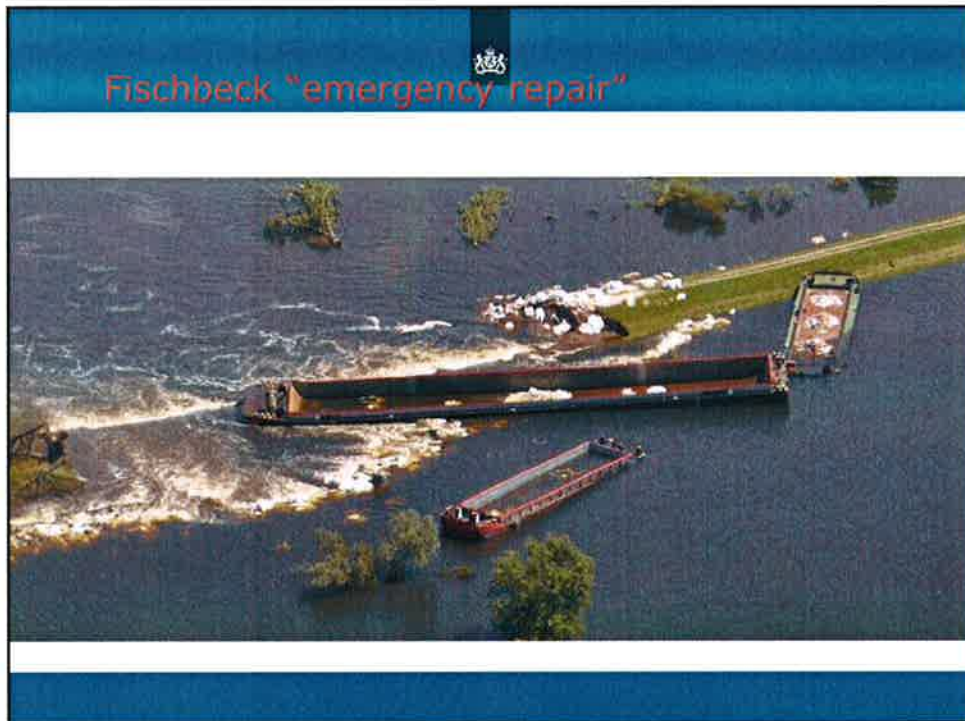


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Fischbeck - post-breach



modified after dpa photo



Concluding remarks

- Large flood event:
 - Return period 50 – 500 year depending on location / river
 - At some places larger than 2002 flood event
- Water levels mostly close to the crest of dikes (no overflow)
- Several dike failures
- Visited failures were due to geotechnical mechanisms at several sites
 - Instability at Fischbeck and Breitenhagen
 - Possibly piping at Bitterfeld river dike breach, and overflow for canal and road breaches
- Complex system / cascading effects at Bitterfeld
 - Dike failure -> road breaching -> lake fills -> canal dikes fail -> Second lake fills up, threatens town of Bitterfeld

Recommendations



- Analyze and hindcast dike failures (data collection, stability and piping analysis)
- Large reliance on emergency measures
 - Implemented almost everywhere in the system
 - During inflow breaches could not be closed by bigbags or barges
 - ⇒ Recommended to evaluate performance of emergency measures
- Evaluate evacuations and emergency response
- Further analysis of other topics:
 - Hydrological system performance (incl. cascades and retention)
 - Damage
 - Risk management / multi-layered safety

Multilayer Safety






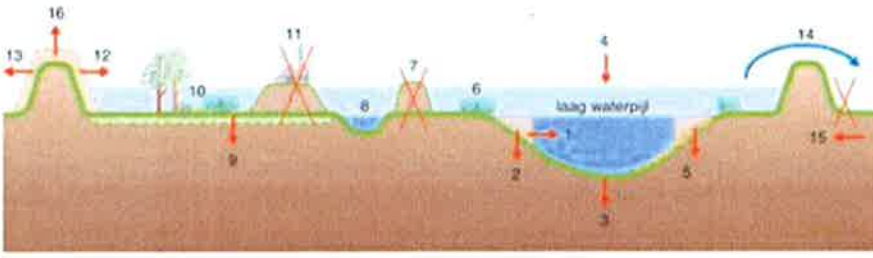
Raum für den Fluss



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Aanpak na 1995: ruimte voor de rivier op nationaal niveau



1 = versmalling van zomerbed	7 = verwijderen zomerbed	13 = dijk verplaatsing
2 = knibverlaging	8 = aanleg nevengeulen	14 = binnendijkse referentie
3 = baggeren	9 = uitenwaard verlaging	15 = stoppen laterale toestroming
4 = storten sediment	10 = natuurontwikkeling	16 = dijkverhoging
5 = vaste laag	11 = verwijderen hoogwaterrijke terreinen	
6 = natuurlijke oever	12 = dijkversterking	

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