



Geen vrede zonder water

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Geen vrede zonder water

- De zes grote water uitdagingen van de 21ste eeuw
- Hoe kunnen dreigende **water conflicten** getransformeerd worden in **water samenwerking**
- Een concluderende opmerking

De zes grote water uitdagingen van de 21ste eeuw

- Water en sanitatie voor allen ➤ Mensenrecht
- Voeden van een groeiende bevolking ➤ Voedsel
- Duurzame energie voor economieën ➤ Energie
- Bescherming tegen water gerelateerde rampen, inclusief klimaat adaptatie ➤ Overstromingen, droogtes, zeespiegelstijging
- Handhaven en verbeteren van ecologische integriteit ➤ Milieu
- Transformeren van conflicten tot samenwerking ➤ Governance, Bestuur

1. Water and sanitation services for all



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Proportion of population using an improved water source,
1990 and 2008 (Percentage)

Developing regions



Developed regions



World



Improved drinking water

Source: UN, 2010

Improved sanitation

Source: UN, 2011

Proportion of population using an improved sanitation facility,
1990 and 2008 (Percentage)

Developing regions



World

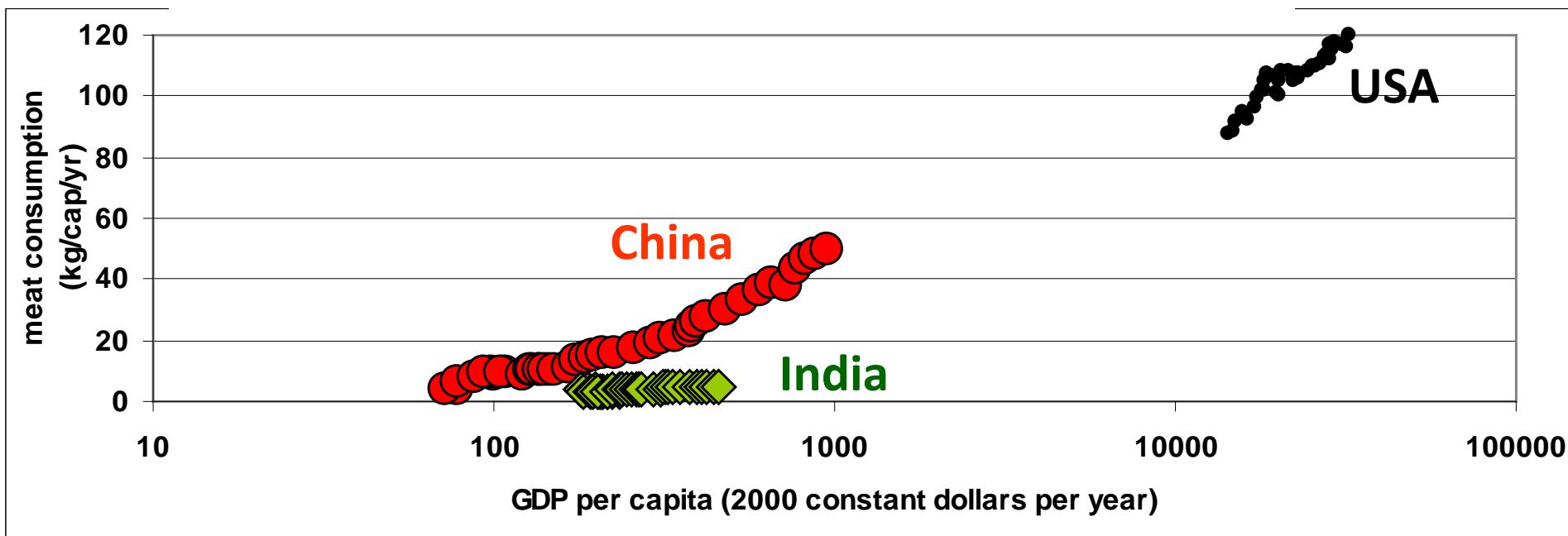


0 20 40 60 80 100

■ 1990 ■ 2008 ■ 2015

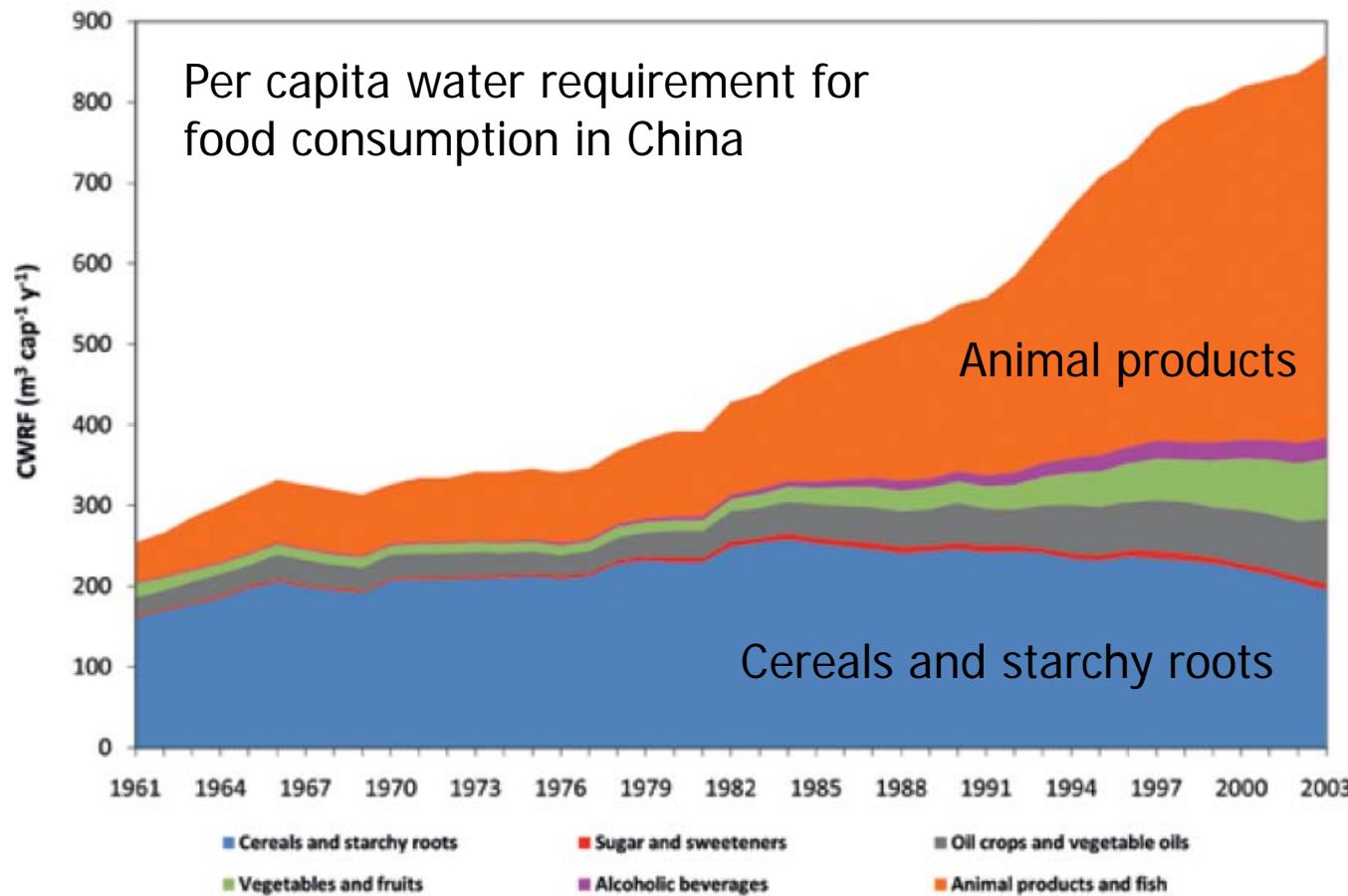
2. Feeding a growing population

Meat consumption and income 1961-2000



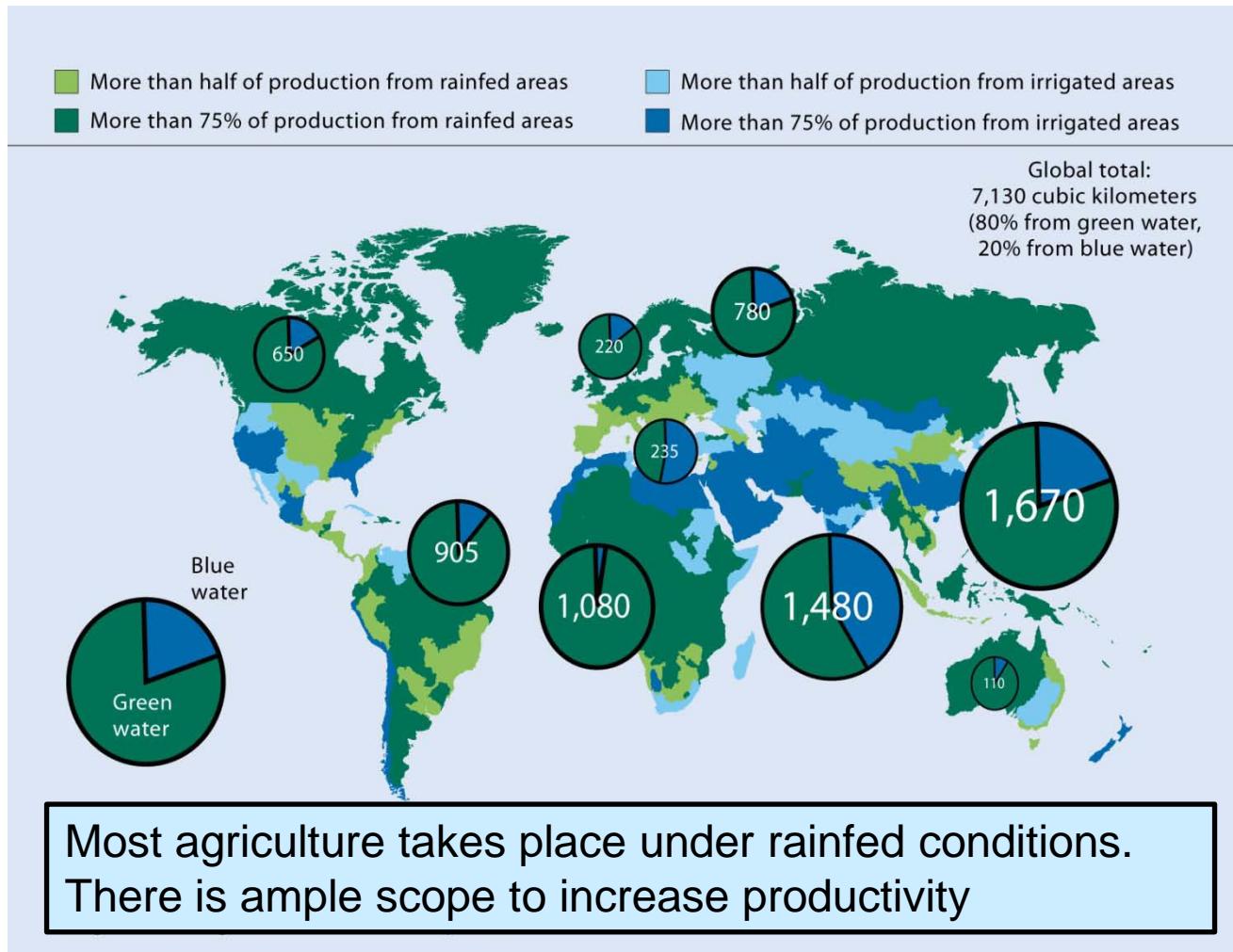
Source: De Fraiture and Clayton, 2009

2. Feeding a growing population



Source: Lundqvist (2010)

2. Feeding a growing population



3. Powering economies sustainably



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To produce energy requires water
(and, in case of biofuels, also land)



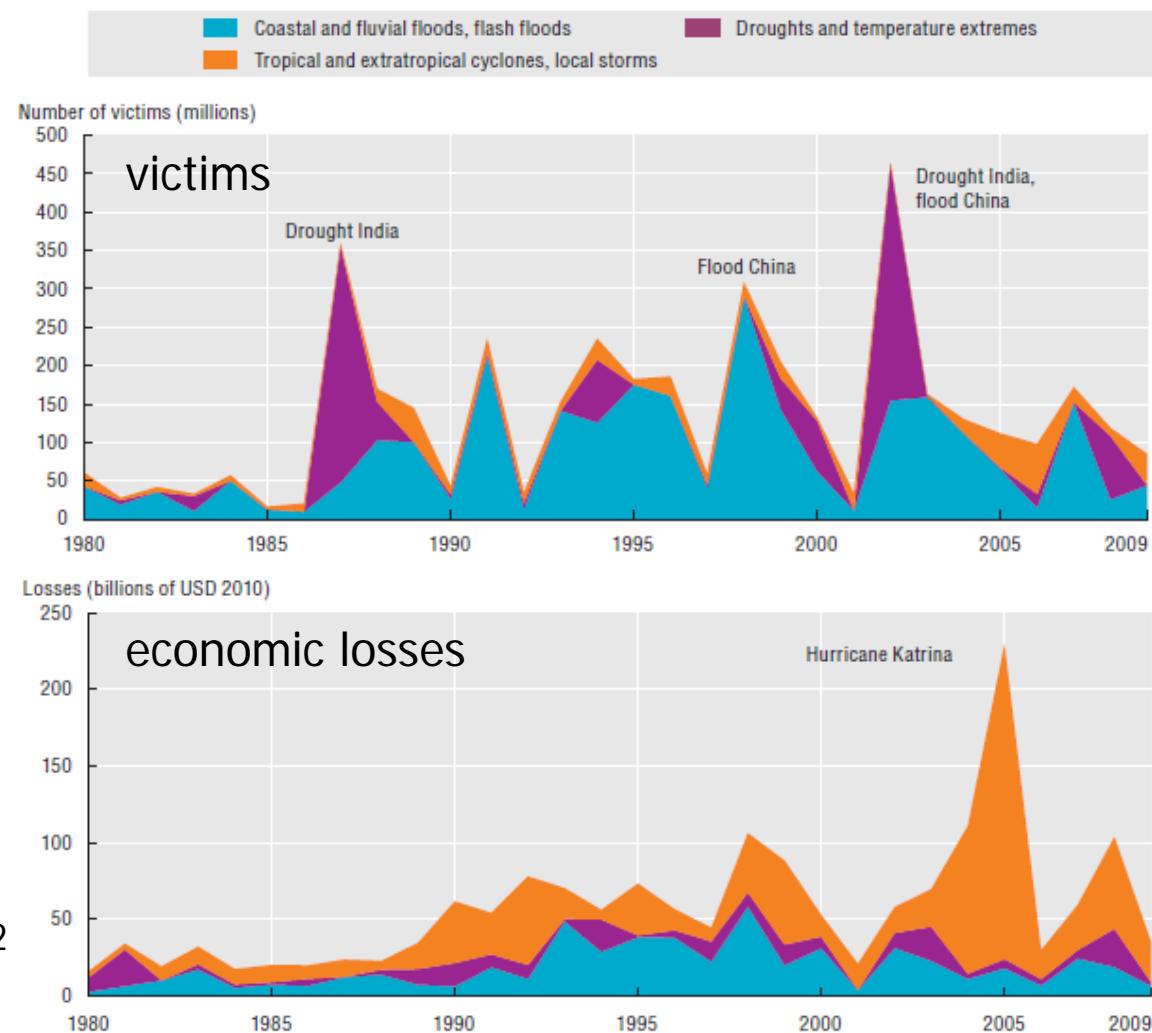
To produce drinking water requires energy



Treatment of wastewater produces energy

4. Protecting people from water related disasters

Figure 5.6. Global weather-related disasters, 1980-2009

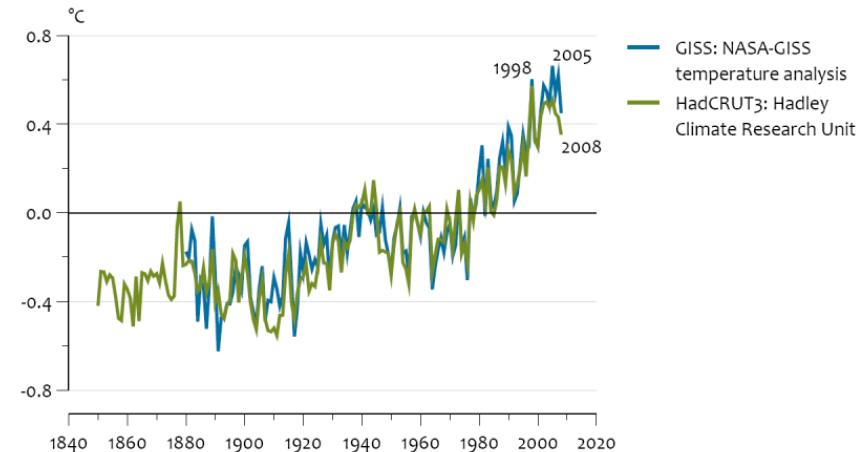


4. Protecting people from water related disasters

Climate change is here with us

Increase in temperature

- leads to sea level rise
- speeds up the hydrological cycle
- in most regions:
 - more droughts and floods
 - glacier melt
 - reduction of **usable** water
- **adaptation** to climate change is **>90%** water-related



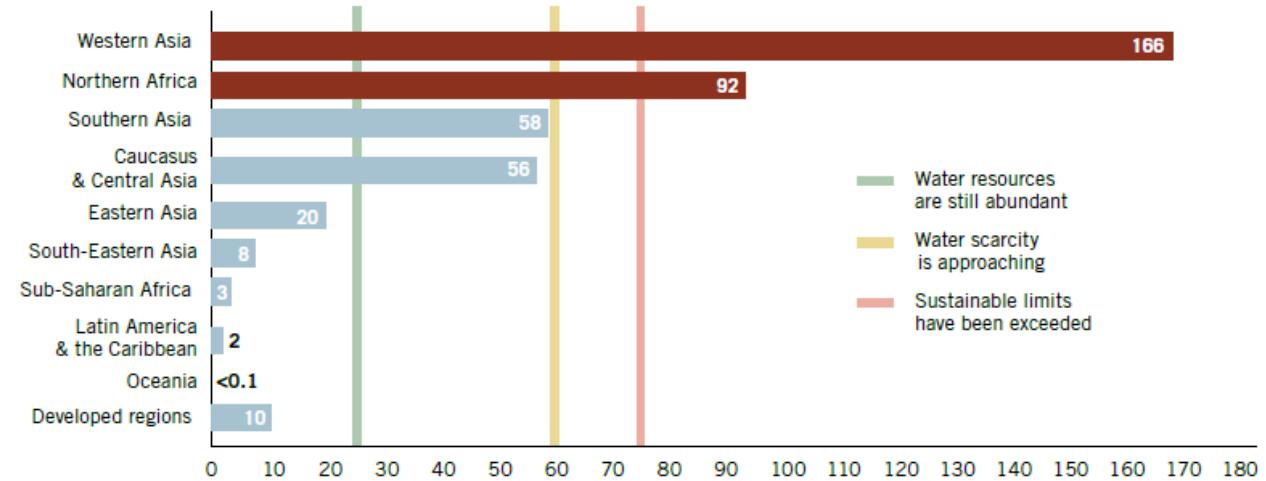
5. Maintaining and restoring ecological integrity

Ecological disasters due to unsustainable practices:

- **depletion** of water stocks (surface and groundwater)



Surface water and groundwater withdrawal as a percentage of internal renewable water resources, taking into consideration official treaties between countries, around 2005



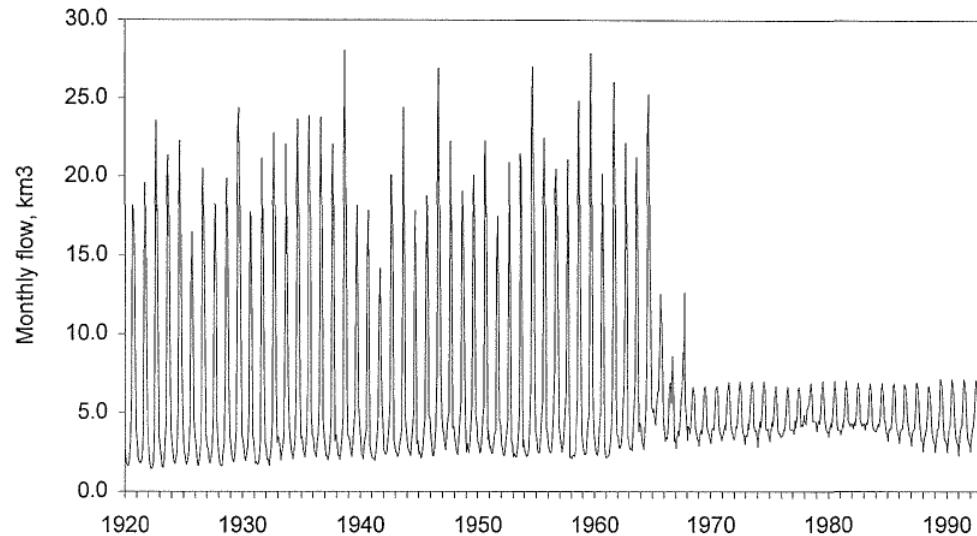
Source: UN, 2011

5. Maintaining and integrity

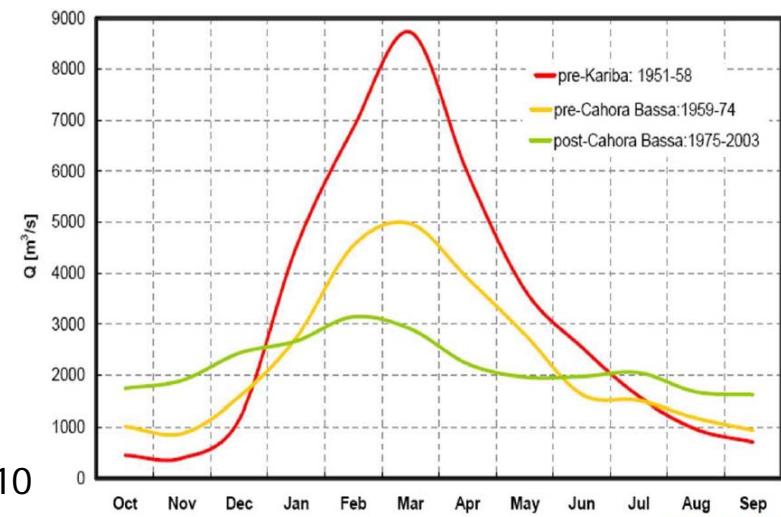
Ecological disasters due to unsustainable practices:

- **depletion** of water stocks (surface and groundwater)
- **accumulation** of pollutants
- **modification** of natural flow regimes

Source: Ronco et al., 2010



Source: Sutcliffe et al., 1999



6. Turning potential conflict into cooperation

photo: Eric Baran



Mekong



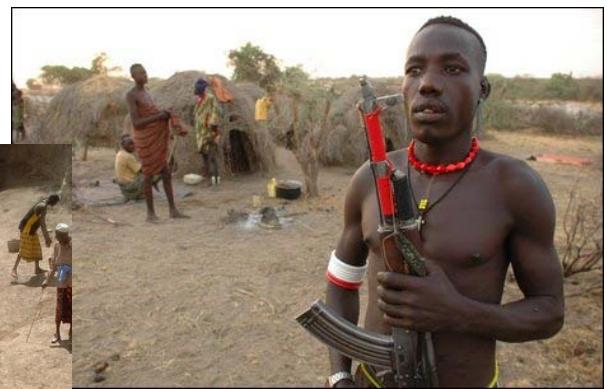
Scheldt estuary -
Netherlands/Belgium



Indus



Cochabamba - Bolivia



Omo river basin (Ethiopia)
and Lake Turkana (Kenya)

Water is special

- Water is special: *vital and finite and fugitive*
→ recognised as such in all major religions
- Different forms: blue, green, grey, virtual
- Multiple uses, involving different sectors
- Multiple scales: “from bucket to basin”; from communities to nations and regions
- Rising pressure on our water resources

Water is special

Rising pressure on water leads to tensions:

- between the haves and the have-nots
 - 0.9 billion without clean water
 - 2.6 billion without basic sanitation
- between water users within the same sector - e.g. irrigators
- between different sectors
 - urban water supply *vs.* irrigators
 - distant energy consumers *vs.* riparian communities
 - environmental *vs.* economic interests
- between different social/political entities
 - the transboundary dimension
- at the global scale - e.g. the current land & water grab in Africa



Water sharing

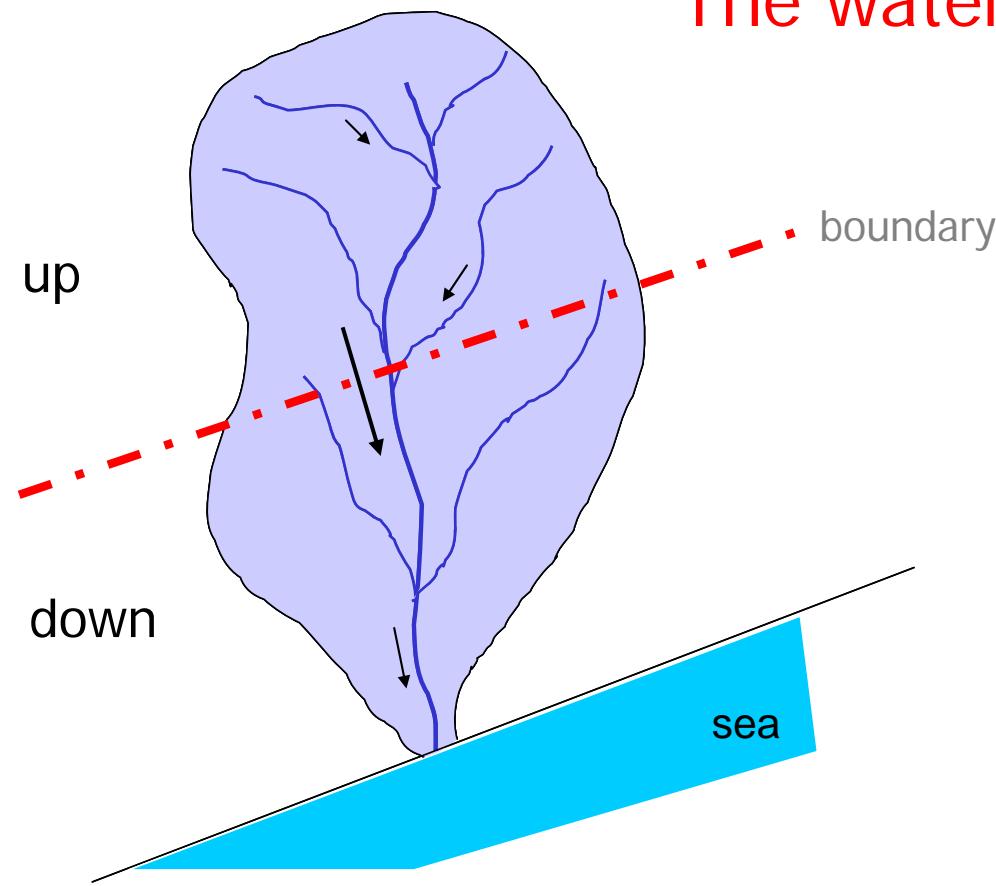
- Different regimes to reconcile competing interests:
 - customary *vs.* statute
 - moral (value-based), legal (rule-based), economic (market)

Principles of water sharing

1. The right of **equitable** and reasonable use
2. The duty not to cause significant **harm**
3. The duty to **cooperate**

Water sharing

The water asymmetry



Water sharing

Principles of equity and no harm imply that water users have to consider the needs of other users.

Thus, users may have to forgo some potential (and immediate) water benefits.

Why would water users voluntarily accept to forgo benefits?

Water sharing

If water users acknowledge that they depend on each other,

- not only in terms of water but also in other ways
- not only now but also in the future

it may be **rational** for them to cooperate and forgo some immediate benefits

- even for upstream users/countries
- even in cases where power-differences are large

Strategy:

1. make explicit the existing interdependencies between parties
2. actively seek to increase mutual dependencies

Water sharing

Creating interdependencies

- data sharing
- joint infrastructure development
- benefit sharing
- rewards for environmental services
- issue linking
- ..

Strategy:

1. make explicit the existing interdependencies between parties
2. actively seek to increase mutual dependencies

Conflict or cooperation?

search term in title, 1998-2007	research papers	citations
water AND conflict NOT cooperation	91	317
water AND cooperation NOT conflict	30	96
water AND cooperation AND conflict	11	28
	132	441

Web of Knowledge database
(isiwebofknowledge.com)

source: Gupta & Van der Zaag, 2009; Van der Zaag et al., 2009

(c)

Water Event Intensity Scale

(after Yoffe et al. 2003)

COOPERATION	7 Voluntary unification into one nation
	6 Major strategic alliance (treaty)
	5 Military, economic or strategic support
	4 Non-military ec'c, tech. or ind. agreement
	3 Cultural or scientific support (non-strategic)
	2 Official verbal support of goals, values, or regime
	1 Minor official exchanges or talks...
	0 Neutral or non-signific. acts
CONFLICT	-1 Mild verbal expressions - discord in interaction
	-2 Strong verbal expressions - hostility in interaction
	-3 Diplomatic-economic hostile actions
	-4 Political-military hostile actions
	-5 Small scale military acts
	-6 Extensive war acts
	-7 Formal declaration of war

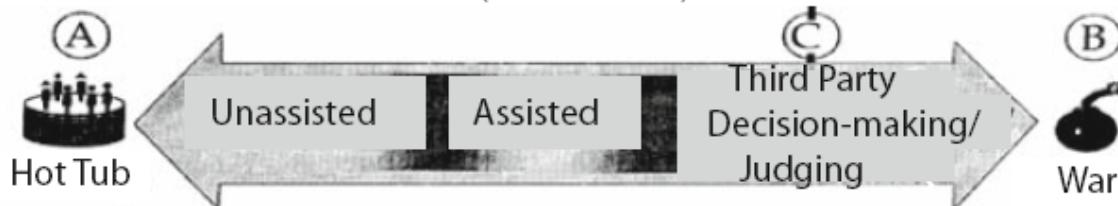
(a) *Stages of Conflict Development*
(NATO1999)



(b)

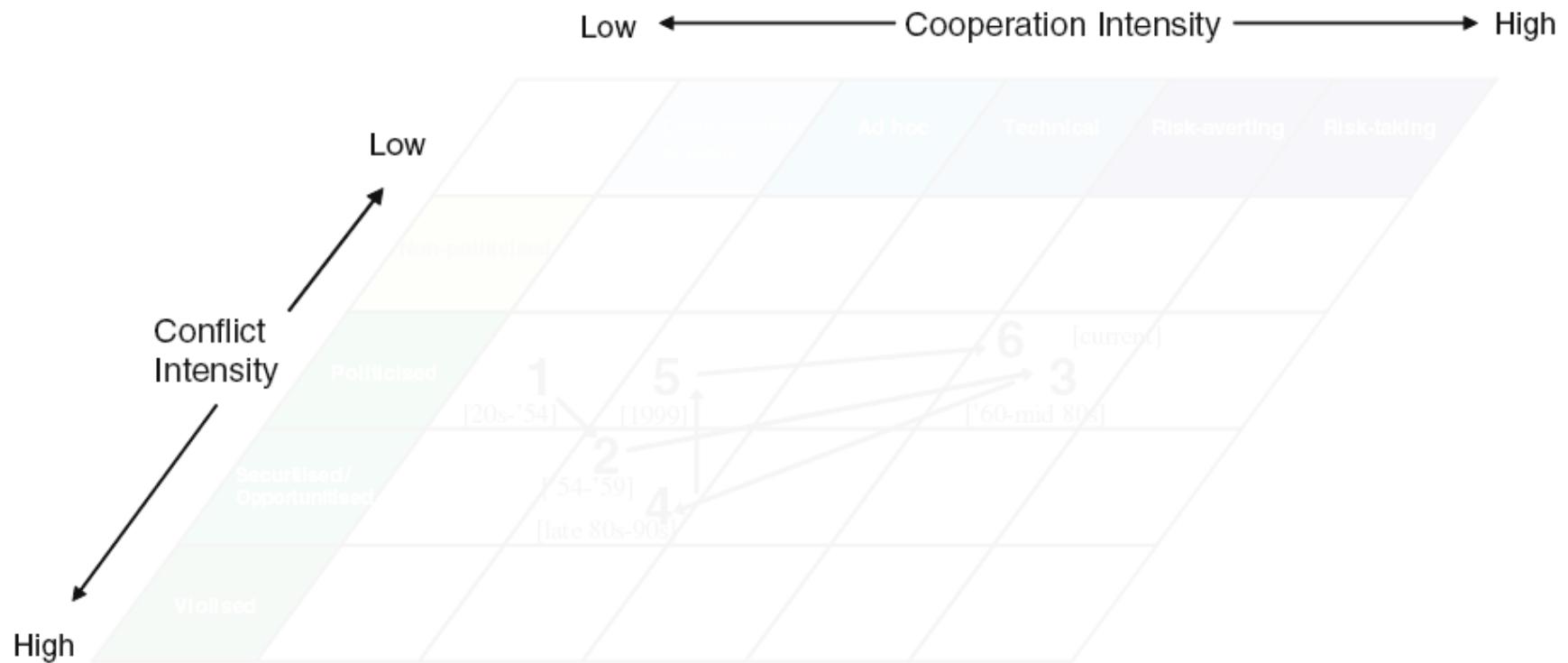
Continuum of Alternate Dispute Resolution Techniques

(Delli-Priscoli 1996)



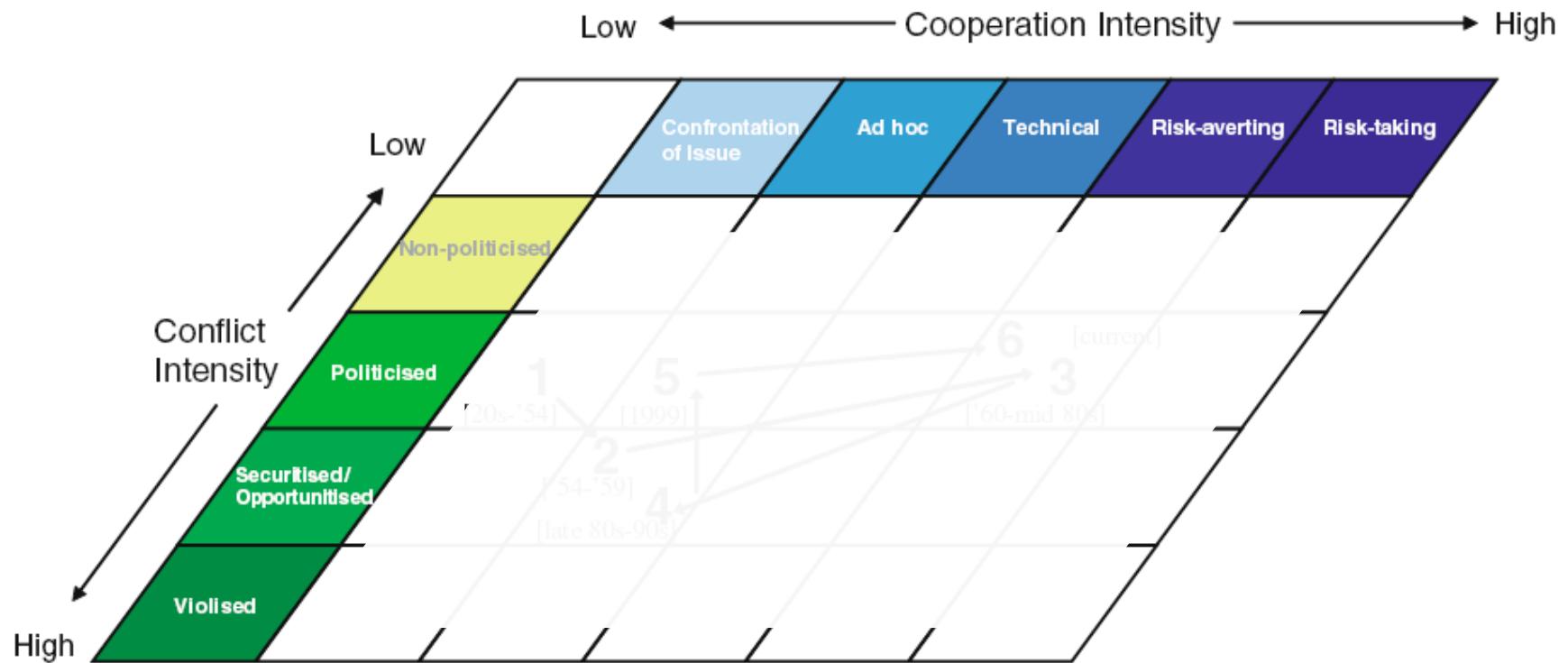
source: Zeitoun & Mirumachi, 2008

Conflict or cooperation?



source: Zeitoun & Mirumachi, 2008

Conflict or cooperation?



source: Zeitoun & Mirumachi, 2008

Conclusion

Water may be a cause of conflict

Water may also be a cause for cooperation

What can we, as engineers,
environmentalists, lawyers, mediators,
educators and philanthropists do?

We can promote the awareness of
the cooperation potential of water



United Nations
Educational, Scientific and
Cultural Organization



from Potential Conflict to Cooperation Potential

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Water may also be a cause for cooperation

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environmentalists, lawyers, mediators,
educators and philanthropists do?

We can promote the awareness of
the cooperation potential of water

“Since wars begin
in the minds of men,
it is in the minds of men
that the defences of peace
must be constructed”

UNESCO Constitution, November 1945





United Nations
Educational, Scientific and
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from Potential Conflict to Cooperation Potential

Thank you for your attention

www.unesco-ihe.org/users/pvanderzaag