CHINA EUROPE Water Platform
www.cewp.org

WORK AREA:
River Basin and Flood Risk Management

Coordinator: Peter JM Kerssens

CHINA EUROPE Water Platform
www.cewp.org

3 Co-Lead Partnerships:

1) Flood Risk Management (PRC + NL)

2) Dyke performance (PRC + NL)

3) River Basin Management (PRC + France)


Flood Fighting
Yangtze river

CHINA EUROPE Water Platform
www.cewp.org

Overall Key message (EU + No. 1 Doc PRC):

To increase flood security, integrated river basin management, accompanied by a revision of flood standards, and broadening the scope from hazard to risk management, will bring maximum benefit

CHINA EUROPE Water Platform
www.cewp.org

Needs:

- Vision
- Informed decision making
- Combination of infrastructural and non-infrastructural measures (NSM)
- Flood policies-standards
- Flood risk approach
- Informed Decision Making
- Information

CHINA EUROPE Water Platform
www.cewp.org

Chinese context:

Floods have plagued China for thousands of years

Yellow River: major floods, shifts of river course;

lower Yellow river: bed 10 to 20 m above terrain

Yangtze river: catastrophic floods

Many casualties, lots of damage

Last century: over 200 to 250,000 deaths

In 1998 still 3000 (Yangtze)

Damages Yangtze (2010) 375 B Rmb or 40 B Euro

CEWP Inception Workshops, March 5 – 6, 2014

Chinese context:

Just a few years ago…

CHINA EUROPE Water Platform
www.cewp.org

European context

Every year: regular floods cause damages:

Poland, UK, Germany, Spain…..

Not many casualties due to good flood early warning, but damages and hinder are high

Sometimes long periods of inundation

EU – Flood Directive

CHINA EUROPE Water Platform
www.cewp.org

European context:Floods from the rivers and the sea

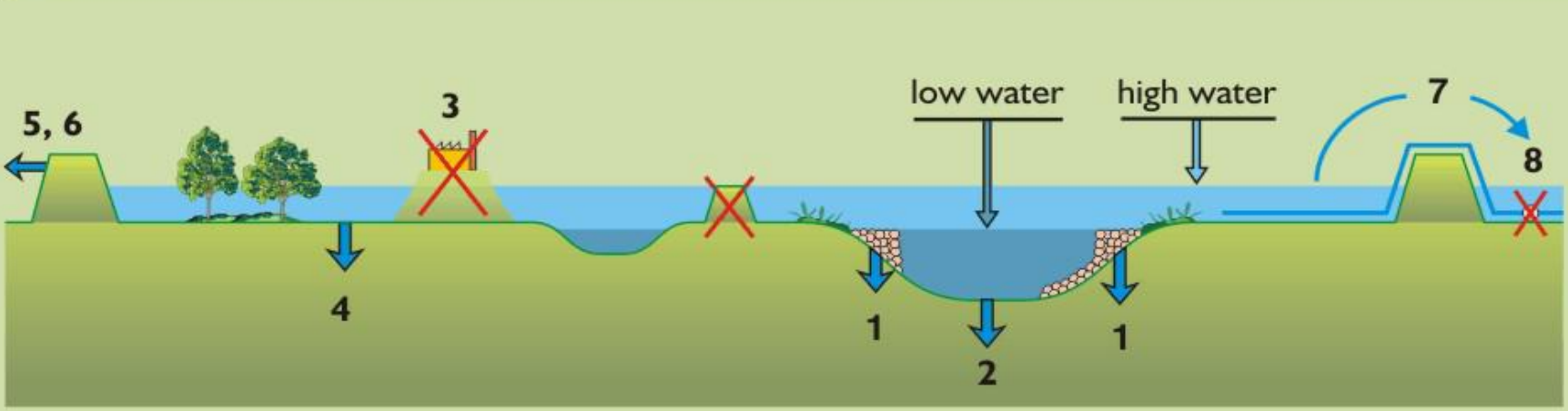
EU Flood Directive characterized by:

- Basin approach
- More attention for NSMs
- Paradigm shift: more space for water
- Living with water
- Coordination between riparian countries
- Cross-border cooperation
- Flood mapping/flood risks

CHINA EUROPE Water Platform
www.cewp.org

(Rural) Flood management:

- the Room for Rivers concept: stop fighting against the water, start 'Living with Water'
- Water as a threat, or as a friend, an opportunity??



1 – lowering groynes
2 – deepening low flow channel
3 – removing hydraulic obstacles
4 – lowering flood plains
5 – setting back dikes locally
6 – setting back dikes globally
7 – using detention reservoirs
8 – reducing lateral inflow

DongTing Lake change in Area:

		km2
Qin-Han Dynasty	BC	20000
1644 - 1825		6270
1937		4750
1954		3950
1962		3141
1998		2400
2010		2740

退 耕 还 林, 封 山 育 林
tui geng huan lin, feng shan yu lin,
Return plough land to forest,
close mountains for afforestation;

退 田 还 湖, 平 垸 行 洪
tui tian huan hu, ping yuan xing hong,
return fields to lakes,
allow seasonal floods of polders

以 工 代 赈, 移 民 建 镇
yi gong dai zhen, yi min jian zheng
labour in return for food , move
people and establish towns

加 固 干 堤, 疏 竣 河 道
jia gu gan di, shu jun he dao
reinforce dykes,
dredge river channels

CHINA EUROPE Water Platform
www.cewp.org

Urban and Rural Flood Risk Management:

- Triple layer safety approach (see Pic)
- Room for the River concept (rural)
- From Hazard to Risk
- Connection urban floods and urban drainage
- Application of Sustainable Urban Drainage Systems (SUDS, see pic)
- Analysis Pluvial – Fluvial causes

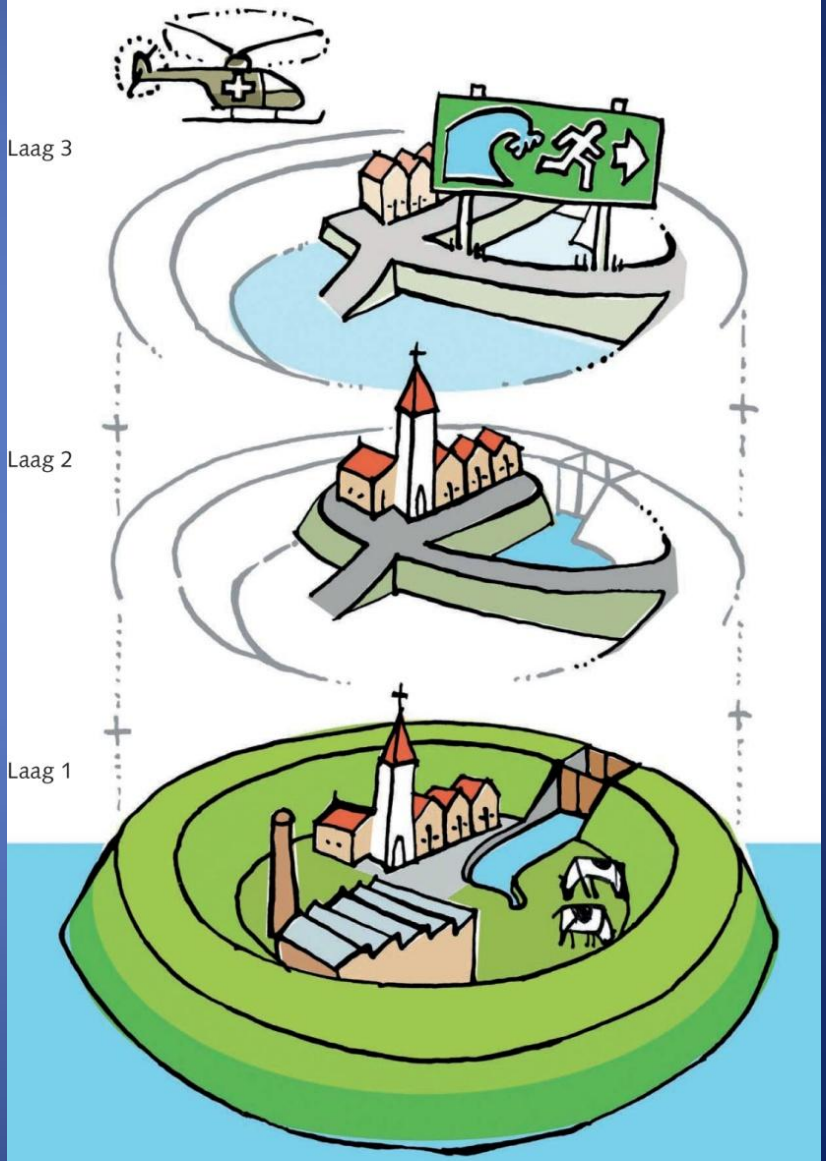
CHINA EUROPE

Triple Layer Flood Defence:

Layer 3: Preparedness

Layer 2: Protection

Layer 1: Prevention



CHINA EUROPE Water Platform
www.cewp.org

Preventive:

- River training
- Canal construction
- Dikes/bunds
- Polder systems/ pumping stations
- Hydraulic infrastructure
- (Flood proofing)

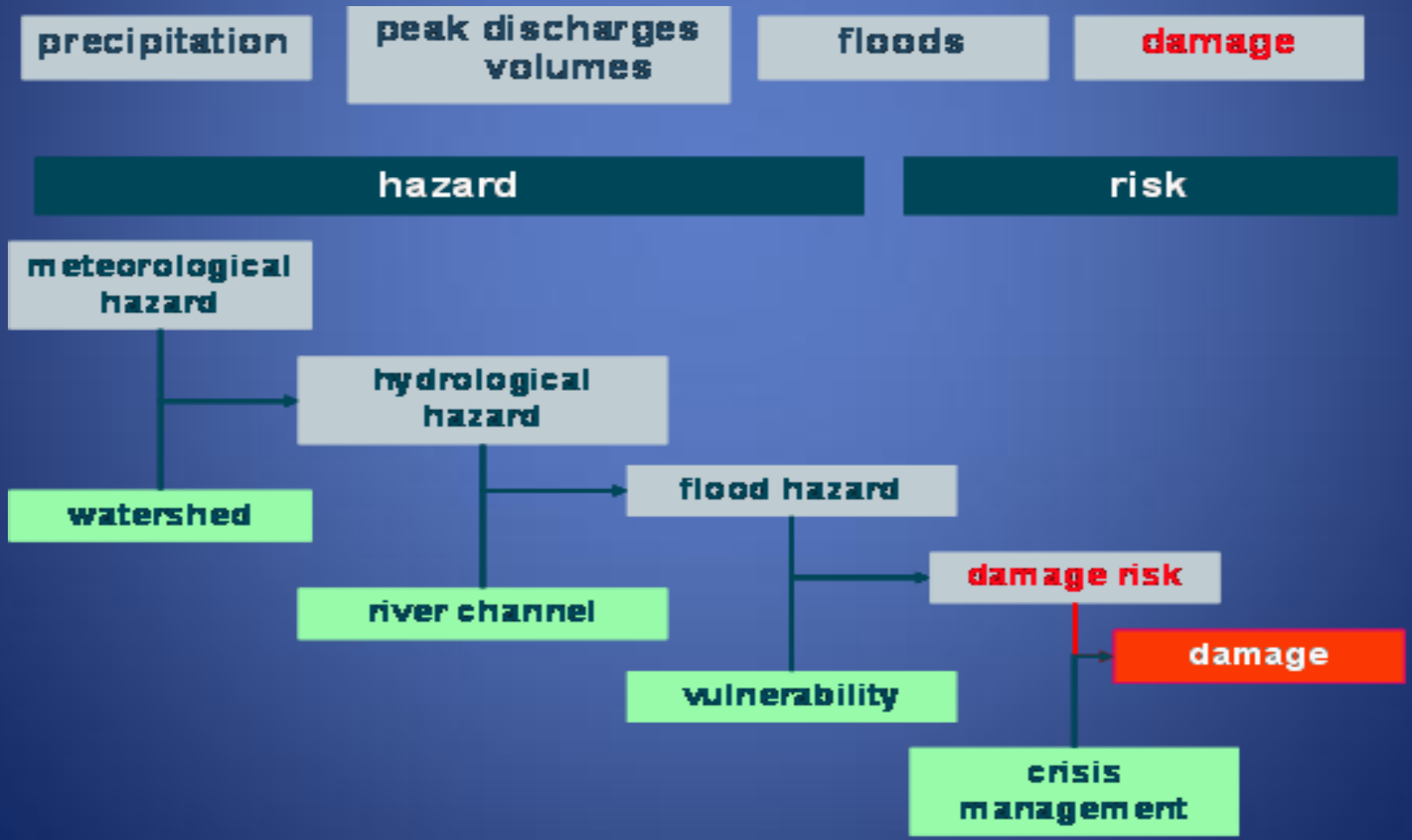
Reactive:

Flood warning
Evacuation
Emergency drainage
Retention/detention
Flood compensation (govt)
Flood Insurance
(Flood proofing)

CHINA EUROPE Water Platform
www.cewp.org

THE FLOOD RISK CONCEPT

*Flood risk = probability of flooding * potential damage*



CHINA EUROPE Water Platform
www.cewp.org

Example of SUDS: Infiltration Trench

Other options:

- Green roofs
- Wadis
- Filter strips
- Permeable surface
- Detention ponds
- Infiltration basins
- etc.

CHINA EUROPE Water Platform
www.cewp.org

Dyke Performance :

Key question: How to collect the right data (monitoring), that will give relevant information about the conditions of the dykes, to detect potential problems, and can trigger maintenance

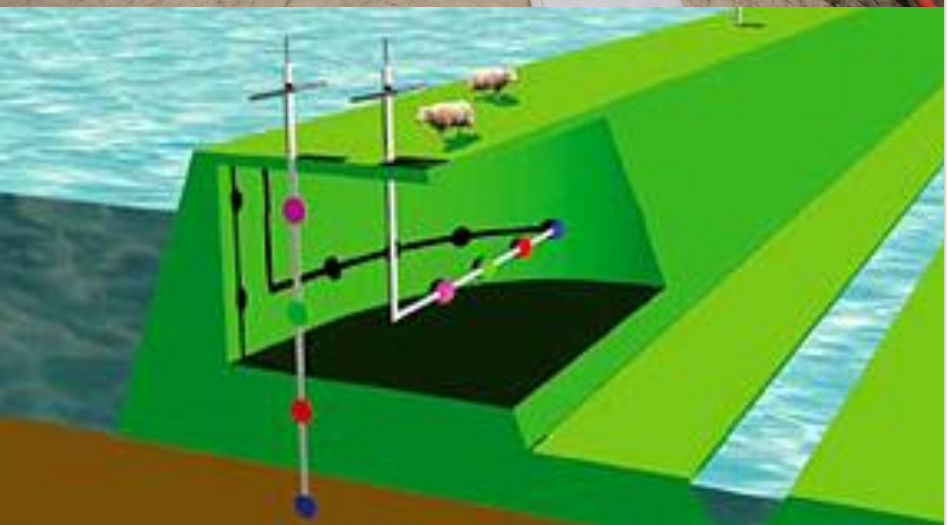
Overall: (dyke) asset management

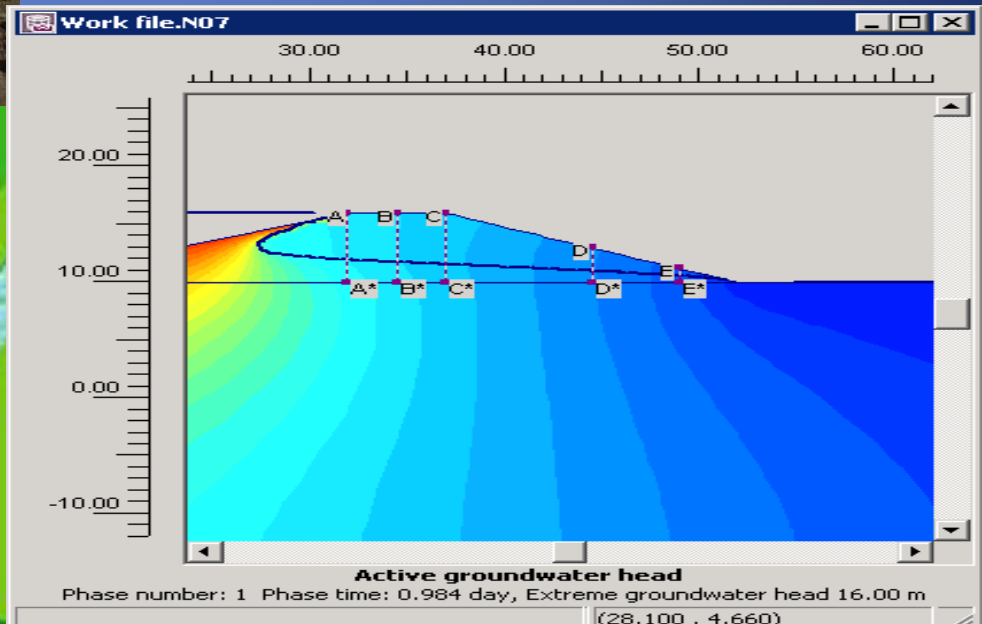
CEWP Inception Workshops, March 5 – 6, 2014

CHINA EUROPE Water Platform
www.cewp.org

Dyke monitoring sensor technology:

- In situ
- Real time





CHINA EUROPE Water Platform
www.cewp.org

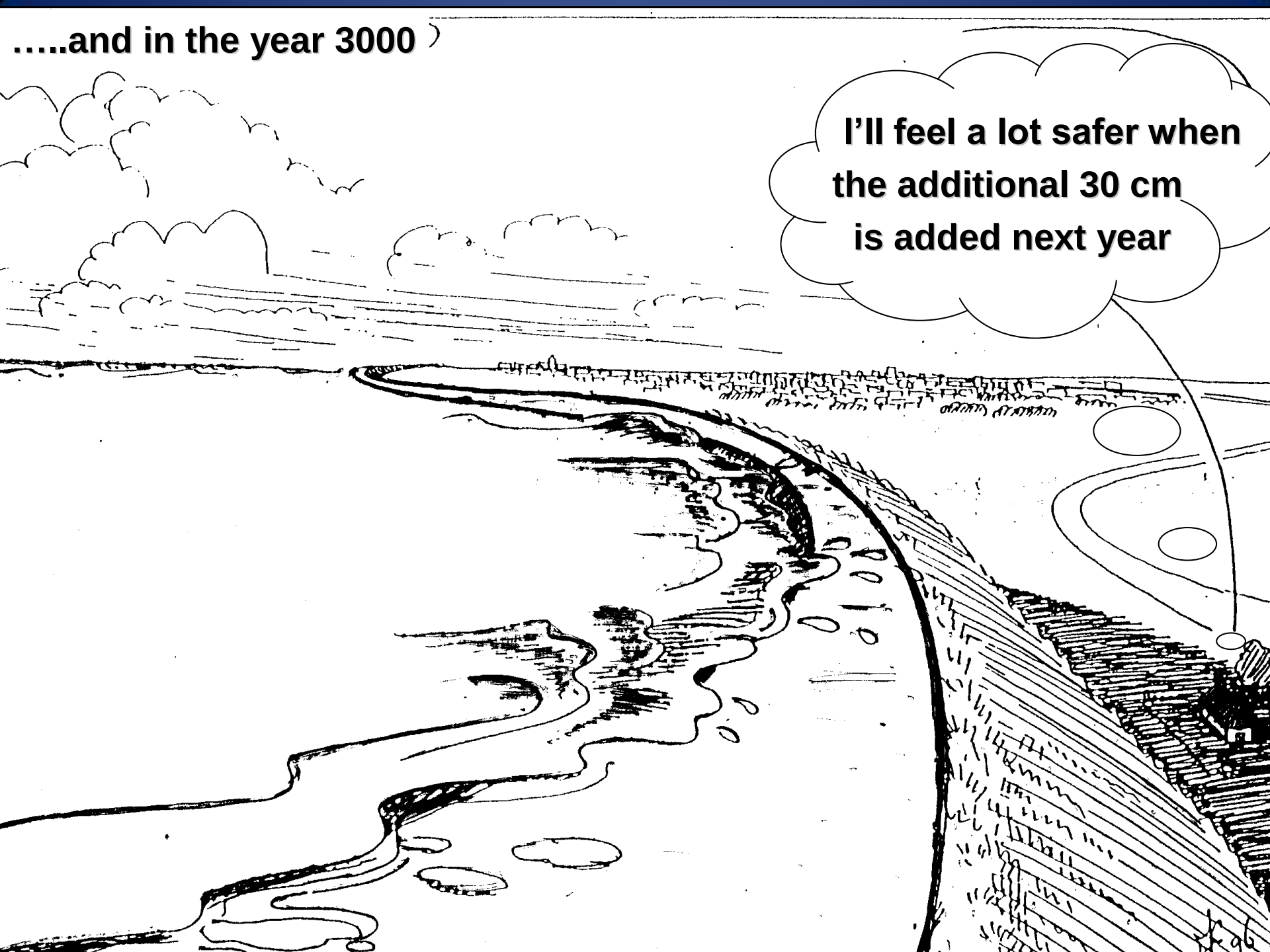
Dyke Failure testing (IJkdijk)

Increase loading till collapse

Dyke Profiling: FlyMap technology

More modern Techniques ??

- Drones..
- Mini-helicopter
- Kites


…..and in the year 3000
I'll feel a lot safer when the additional 30 cm is added next year

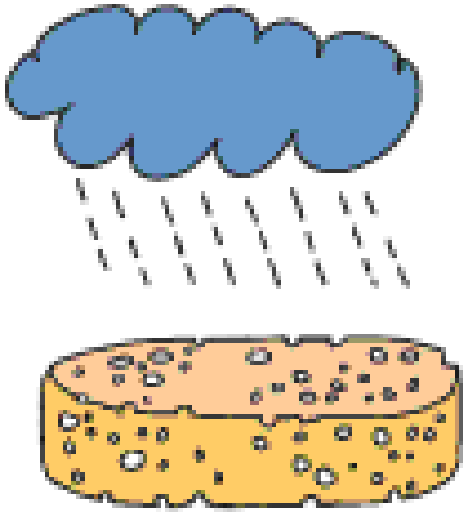
CHINA EUROPE Water Platform
www.cewp.org

River Basin Management:

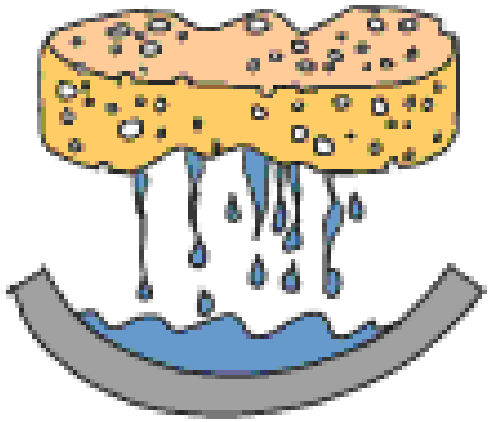
- Relation between RBM/IWRM & spatial planning (Land-use, urbanization, industrial compounds…)
- IWRM/RBM only based on hydrological boundaries? Relation with local administration?
- Dissemination of IWRM/RBM policies? From the large river basins (commissions) to smaller scale

CHINA EUROPE Water Platform
www.cewp.org

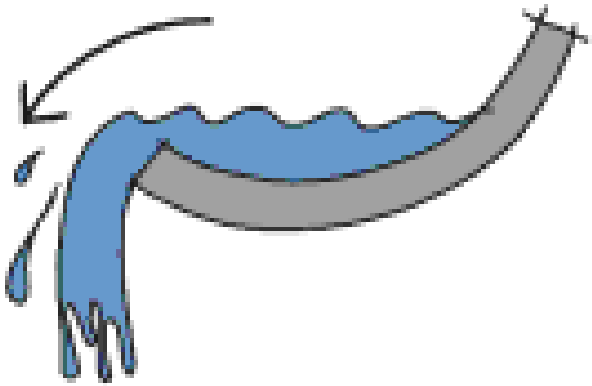
Promote natural processes in the river basin



Store Water



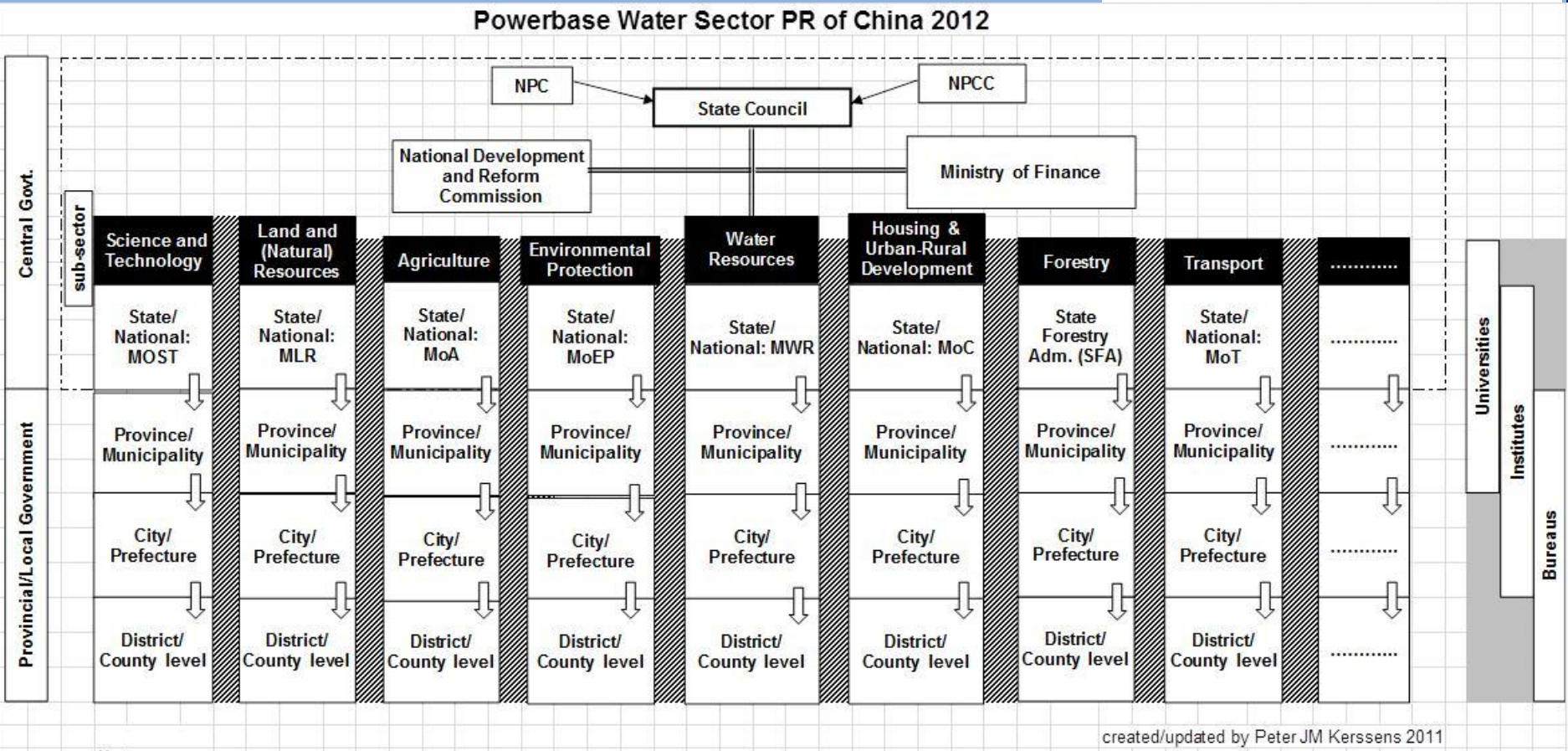
Delay Run-off



Drain surplus

CEWP Inception Workshops, March 5 – 6, 2014

CHINA EUROPE



Notes:

* Legislation by NPC, NPCC and State Council
* Policy guidelines for development by NDRC
* National budget by MoF
* Policies by the various ministries set at Central Govt. level and implemented by provincial/local government
* No or little horizontal coordination between columns/subsectors
* Universities at Central and Provincial level, sometimes connected to (Technical) Ministries
* Multiple Institutes at Central, Provincial and Regional level
* Bureaus at Provincial and Regional level

Institutional setting and conditions!

hops, March 5 – 6, 2014

CHINA EUROPE Water Platform
www.cewp.org

REWARD!

Emperor Da Yu or Yu the Great, an expert on flood control living 2200 - 2100 BC harnessed the Yellow River and was as reward crowned emperor of China

CHINA EUROPE Water Platform
www.cewp.org

And in the last 50 years several civil engineers have been president or prime minister of the PR of China… !!

CHINA EUROPE Water Platform
www.cewp.org

The End

Thanks for your attention