Research group at Unesco-IHE, Delft:

- **Research Driven:** Interdisciplinary, emerging topics;
- **Interdisciplinary:** Hydrology, Urban Development, Policy, etc.;
- **Network:** Hamburg, Melbourne, etc.;
- **International:** NL, Europe, World;
- **Self-Supporting:** Funding, Consultancy;
- **Agile:** Pro-Active;
- **Science Policy Interface:** Close collaboration with industry, local/regional/national government;
- **Impact Driven:** Uptake, Delivery;
THE DUTCH CONTEXT

NL: THE DRAIN OF EUROPE
• 66% below sea level
• 16 million inhabitants
• 2,000 billion Euro’s of assets protected against water
• 25 % is surface water
• 25 % man-made reclaimed land (polders)
• One of the most densely populated delta’s on the plane
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THE 1953 FLOOD: A MAJOR WAKE-UP CALL

STORM SURGE COMBINED WITH SPRING TIDE
- 5.6m (18') above mean sea level resulting in dike breaches
- 1835 casualties; 72,000 evacuated
- 47,300 buildings damaged; total damages 450m EUR(1953);
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- Predict and control regime (floods as a result of ‘neglect of man’);
- Top Down Flood Management;
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- Stringent safety standards based on fixed drivers;
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RIVER FLOODING FROM THE SOUTH-EAST
- Extreme river discharges on the Rhine and Meuse;
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- Changing drivers and deep uncertainty;
- Multi-level governance;
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- Climate change = opportunity for innovation;
- Long-term perspective and short term benefits.
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BEYOND THE DELTA COMMITTEE 2.0

CHANGES IN PERSPECTIVE: BOTTOM-UP CLIMATE ADAPTATION

- Cities, companies and knowledge institutes are taking the lead;
- Climate Adaptation as a Unique Selling Point (frontrunners);
- Climate Adaptation as a vehicle to speed up other processes;
- New partnerships and roles;
- Policy (e.g. unembanked areas) developed from local knowledge;

E.G. ROTTERDAM GREEN ROOF INITIATIVE

- Green roofs increase the stormwater drainage network capacity;
- Mitigate UHI, drought;
- Implemented as sewer tax reduction;
- Public buildings taking the lead.
ROTTERDAM/DORDRECHT: USING CC AS AN ASSET
MAINSTREAMING CLIMATE ADAPTATION

‘ROOF PARK’: COMBINING DIKE, RETAIL, INFRASTRUCTURE & PARK

- Part of the main dike-ring;
- Financed by a PPS construction;
- Synergy between urban quality, flood protection and building program.
AMPHIBIOUS HOUSING COMMUNITY MAASBOMMEL

• Resting on foundation during ‘normal’ conditions;
• Hollow concrete base for buoyancy;
• Floating during high water stages in Meuse;
• 2010: Successful operation during high waters.
ADOPT A LONG TERM HORIZON USING A LOCAL ADAPTATION STRATEGY

2 STEP APPROACH
- Use pilots to gain leadership;
- Mainstream climate adaptation into urban (re)development cycle.

DEVELOP AN ECONOMIC BENEFIT
- Make climate adaptation a Business Case (life cycle approach);
- Combine functions, goals;
- Assess benefits of flexibility (e.g. by real-options appraisal);

DEVELOP ACTIVE LEARNING
- Employ a project oriented ‘learning alliance’ including a broad set of stakeholders;
- Distribute risk: Develop a multi-level safety approach;

WE CANNOT BUILD OUR WAY OUT OF CLIMATE CHANGE!
DEVELOPED CITIES: LIFE CYCLE IS THE KEY TO ADAPTATION

‘CLIMATE PROOFING THE NETHERLANDS’:
• Assessment of exposure to drought, river flooding, waterlogging & heat stress;
• Assessment of lifespan of building stock & other assets;

MAINSTREAMING CLIMATE PROOFING MEASURES INTO URBAN RENEWAL:
Quick wins: Adaptation of post-war building stock;

Declining vulnerability based on lifespan & adaptation
LESSONS FROM THE NETHERLANDS

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