Effective international knowledge exchange to rehabilitate rivers in urban delta's: case study Metropolitan Manilla

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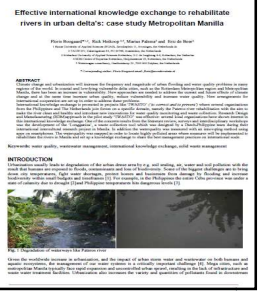

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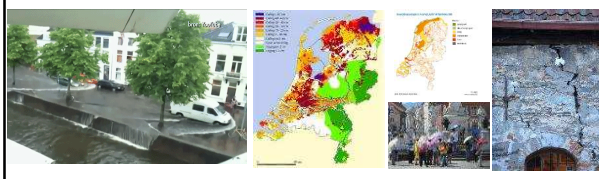
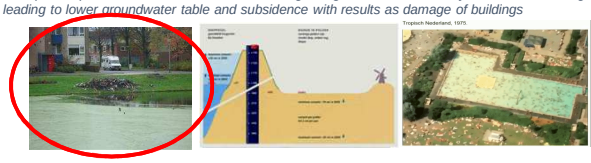
Challenges urban climate (change): Netherlands



examples of problems in the urban areas: floodings, degradation of waterways, heatstress, drought leading to lower groundwater table and subsidence with results as damage of buildings



Boogaard F.C. Climate adaptation from Groningen to Mae Phaem. Inaugural speech on Spatial Transformations – Water, ISBN 9789081935692 Kenniscentrum NoorderRuimte Hanzehogeschool, Groningen, February 2016.

Presentation
'Research Development Philippines' (RDP)

- Introduction
- Method
  - RDM approach
- Results
  - Practical applicable solutions
- Conclusions
- More info
- How to get involved

NWP: Water in a changing world

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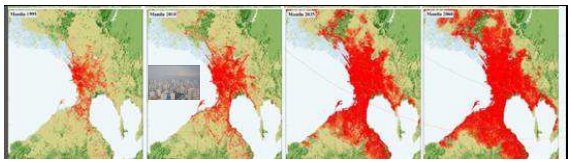
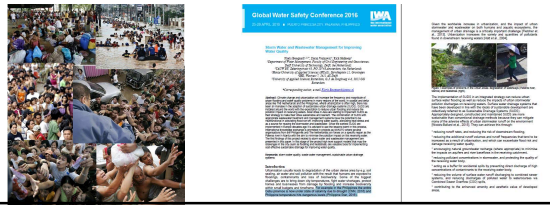
Why 'Research Development Philippines' (RDP)?



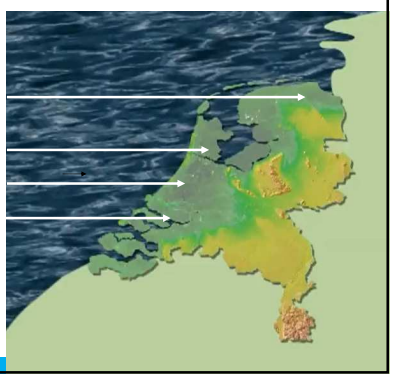
population growth Manila (1995, 2010 and prediction till 2035 and 2060)



Introduction: 'small RDM approach'

Hanzehogeschool Groningen University of Applied Sciences
Tauw
TUDelft Delft University of Technology
indyma

- Research
- Education
- Consultancy



inspiring change

Current situation: waterquality and risks

We share challenges

Amsterdam 1970

Amsterdam 2016

Dutch princess swims Amsterdam canals for charity

Action: concrete results RDF

- **Stakeholder analysis**
- **Assessment of the local situation**
- Identifications of ambitions
- **Cleaning up solid waste that floats in the river**
- Initiate behavioural changes to prevent river pollution
- Improving the drainage system
- **Education: public awareness (waste management, circular economy)**
- Implementing innovating nature based solutions
- **Monitoring of water quality by means of low-cost sensors in the river**
- Evaluation & governance

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Lessons learnt The Netherlands

how did we achieve this Waterquality?

- Determine situation & ambitions
- Regulations
- Education: public awareness
- Cleaning up emissions
  - Improving the sewer system
- Monitoring
- Waterquality improvement
- Evaluation& governance

- Lessons learnt: RDM approach

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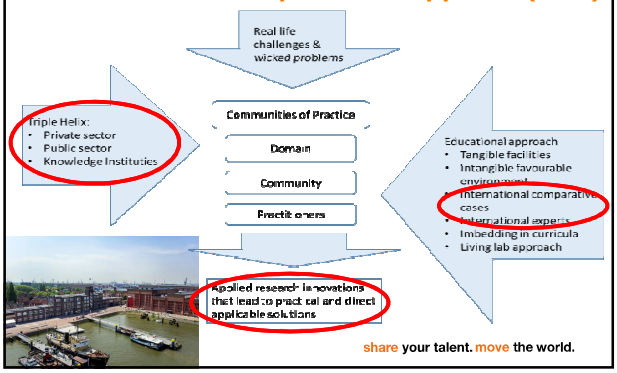
Stakeholder analyses&engagement Top down and Bottum up

The RDM-approach 'Research Development Philippines' (RDP)



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Stakeholder analyses, engagement and commitment

Top down: MoUs, agreements, contracts

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Design thinking Video impression:

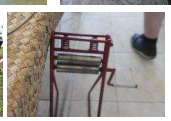



Waste: (inter-)national comparative cases











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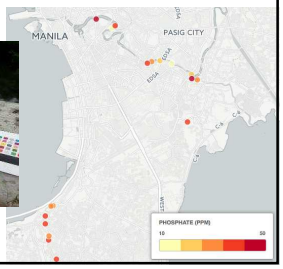
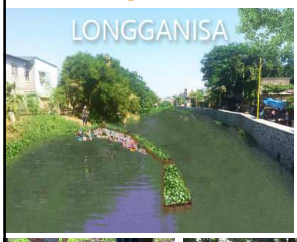
Micro pollutants: Innovation in mapping waterquality
RDM-approach: Research, training engagement





Waste management
'The Longanissa': design and implementation



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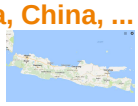
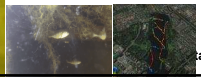
Upscaling to Indonesia, India, China, ...
New skills and technologies










CONCLUSIONS

- RDManila was effectively established
- The 'Meet in the middle' strategy resulted in engagement of all stakeholders
- Concrete results:
  - New monitoringmethods are developed and waterquality is mapped
  - Tailor made solutions designed and implemented
    - Longanisa to catch waste
    - Next step is micropolutants trap (treatment trains)
- RDManila implementation resulted in interest around the world.
- Upscaling and implementation in the upcoming years
- interested? Email: FCB@tauw.nl
- Video impression: https://youtu.be/VjkIRLD0hCg

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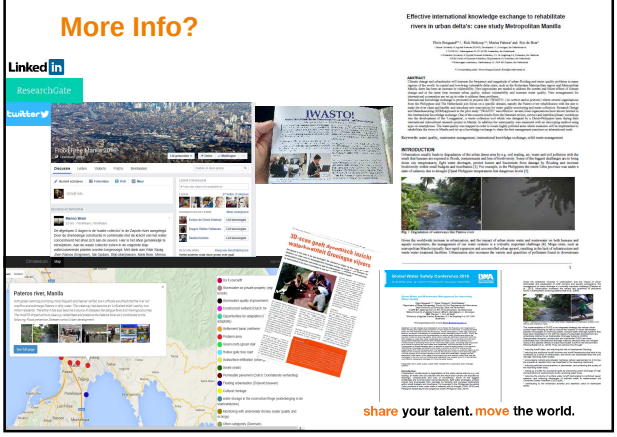
More Info?



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