Eindrapportering Denkersprogramma

WATER & KLIMAAT

Koninklijke Vlaamse Academie van België voor Wetenschappen en Kunsten
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Eindrapportering Denkersprogramma

Water & Klimaat

Inhoud

Activiteitenverslag

Situering

Klimaat leeft, maar de indruk heerst dat niemand iets doet en dat het steeds slechter gaat met klimaat, natuur en milieu. Vertrekkende vanuit die optiek nam de Klasse van de Technische Wetenschappen in 2016 het initiatief een Denkersprogramma te organiseren om het debat aan te gaan met alle mogelijke stakeholders maar vooral om een onderscheidende 'positive narrative' te brengen. Het doel was de wisselwerking tussen water en klimaat in kaart te brengen (technologie, milieubeleid) en perspectieven te bieden voor een toekomstig beleid in Vlaanderen. Heel concreet wilde dit programma een aantal acties op touw zetten die kunnen in werking worden gesteld ter adaptatie aan deze klimaatveranderingen.

Dat het klimaat verandert is een feit en de berichtgeving in de media beklemtoont haast dagelijks de negatieve effecten van de opwarming van de aarde. Enkele facts:
- de watervoetafdruk van de wereld is al 3 maal overschreden;
- conventionele landbouw verbruikt 70% van alle zoet water;
- één op drie mensen heeft nog geen sanitatie;
- zwaar vervuilende stoffen van water zijn: meststoffen, pesticiden, farmaceutica, menselijke fecaliën.

De grote uitdaging is om vanaf nu met zijn allen een strategie uit te werken die perspectieven brengt door nieuwe denkpaden te betreden, ook als die risico's inhouden. Men wenst dus in te zetten op het zogenaamde 'veerkrachtdenken'.

Het doel van dit programma was om samen met het brede publiek een positieve insteek te bedenken waarbij constructief wordt omgegaan met de combinatie klimaat/water/nieuwe duurzaamheid en daarnaast het beleid aan te sturen en aan te moedigen tot nieuwe technologieën en regelgeving in een context van zelfredzaamheid ten aanzien van klimaatverandering.

Centraal stond de suggestie 'Een waterwijs Vlaanderen dat is voorbereid op de Klimaatsverandering'; een regio die ten volle is voorbereid op 'te veel' en tegelijkertijd op 'te weinig' water en die haar kennis over het slim omgaan met water in een peri-urbane omgeving wereldwijd uitdraagt.

Denkers

Twee vooraanstaande internationale Denkers hebben hiervoor hun medewerking toegezegd: Margaret Catley-Carlson en Dr. Glen T. Daigger. Zij werden begeleid door Caroline Van Steendam, een jonge doctoranda, die hen bijstond bij het doorgronden van de lokale structuren en gebruiken.

Margaret Catley-Carlson is beleidsdeskundige op het gebied van duurzaam waterbeheer en landbouwtechnische ontwikkelingen. Ze is o.m. vicevoorzitter van de Canadian Water Network Board, lid van het adviesorgaan voor water van de Verenigde Naties en patron van het Global Water Partnership.

Dr. Glen T. Daigger is professor aan de University of Michigan en is oprichter en huidig voorzitter van One Water Solutions, LLC, een organisatie voor waterbouw en -innovatie. Hij is voormalig voorzitter van de International Water Asociation (IWA). Zijn expertise situeert zich in de watertechnologie, -gebruik en -management.

Caroline Van Steendam behaalde haar masterdiploma Chemische ingenieurstechnieken aan de KU Leuven. Als doctoraatsstudent aan de Universiteit van Michigan werd ze in dit Denkersprogramma betrokken.

V.l.n.r.: Erik Matthijs (Aquafin), Caroline Van Steendam, Glen Daigger, Margaret Catley-Carlson, Johan Verbauwhede (IWVA), Willy Verstraete (UGent), Stan Carlson.

Stuurgroep

De coördinatie en wetenschappelijke leiding van het programma berustte bij de Stuurgroep geleid door Prof. Willy Verstraete, UGent en lid van de Klasse Technische Wetenschappen. De samenstelling van de Stuurgroep was als volgt:

- Willy Verstraete (KTW, UGent)
- Joos Vandewalle (KTW, KU Leuven)
- Erik Mathijs (KU Leuven)
- Willy Bauwens (VUB)
- Patrick Meire (UAntwerpen)
- Jeroen Buysse (UGent)
- Frederik De Laender (JA, UNamur)
- Erik Matthijs (ex-senator, adviseur landbouw en milieu)
- Marnik Vanclooster (UCL)
- Jacques Willems (KTW, UGent)
- Paul Verstraeten (KTW)

Expertengroep

Om het programma te ondersteunen en de nodige actoren in het veld actief te betrekken werd een expertengroep samengesteld bestaande uit leden van de Academie en tal van externe experten. Het is deze groep die ook mede instond voor de uitwerking en invulling van de diverse activiteiten. De samenstelling van de expertengroep was als volgt:

De leden van de Stuurgroep (zie 1.3)
Leden van de KVAB:

- Ludo Gelders
- Jan Delcour
- Jean Berlamont
- Ivo Van Vaerenbergh
- Dirk Fransaer
- Stan Beernaert
- Luc Bossyns
- Ronny Verhoeven
- Nicole van Lipzig

Externe experten:

- Philippe Quevauviller (EC, DG Environment)
- Luuk Boelens (UGent)
- Renaat de Sutter (UGent)
- Raf De Vis (Agrolink)
- Els Berckmoes (Agrolink)
- Patrick Willems (KU Leuven)
- Ilse Smets (KU Leuven)
- Stijn Speelman (UGent)

- Ronald Waterman (Building With Nature, buitenlands lid KTW)
- Hans Bruyninckx (European Environmental Agency)

Naar aanleiding van de Pro Action Cafés die werden gehouden op het slotcongres werd een vervolgtraject uitgestippeld met als doel de publicatie van een Standpunt van de Academie en werd de Expertengroep aangevuld met volgende personen:

- Ingmar Nopens (UGent)
- Victor Dries (Kabinet minister Homans)
- Frank Verschraegen (DEME)
- Thomas Sterckx (DEME)
- Didier D'hont (VMM)
- Wim Van Gils (Natuurpunt)
- Arne Verliefde (UGent)
- Charlotte Boeckaert (VLAKWA)

Activiteiten

1.5.1 **Overzicht**

Hieronder vindt u een overzicht van de activiteiten die werden ontwikkeld in het kader van dit Denkersprogramma. Daarnaast hadden de Denkers onderling ook geregeld overleg via mail en skype.

- 03/02/2015 Vergadering Willy Verstraete en Joos Vandewalle: invulling programma
- 23/04/2015 Vergadering Joos Vandewalle, vast secretaris Freddy Dumortier en Inez Dua: modaliteiten Denkers
- 08/06/2015 Startvergadering Stuurgroep
- 02/09/2015 Overleg Willy Verstraete met Joke Schauvliege, Vlaams minister van Omgeving, Natuur en Landbouw
- 02/09/2015 Vergadering Stuur- en Expertengroep: voorbereiding eerste Fact Finding
- 26-30/10/2015 Fact Finding Week I
- 21/12/2015 Vergadering Stuur- en Expertengroep: evaluatie en voorbereiding tweede Fact Finding
- 05/01/2016 Vergadering beperkte Stuurgroep met Willy Verstraete, Joos Vandewalle en Erik Matthijs
- 15/02/2016 Vergadering Stuur- en Expertengroep
- 25/02/2016 Overleg met Tinne Rombouts, voorzitter van de commissie Leefmilieu, Natuur, Ruimtelijke Ordening, Energie en Dierenwelzijn in het Vlaams Parlement
- 7-11/03/2016 Fact Finding Week II
- 15/04/2016 Vergadering beperkte Stuurgroep met Willy Verstraete, Joos Vandewalle en Erik Matthijs
- 20/04/2016 Vergadering Stuur- en Expertengroep: organisatie slotsymposium en persmoment
- 25/04/2016 Overleg Willy Verstraete en Inez Dua met Karel Debeuf, Raadgever Klimaat, Lucht en Hinder op kabinet Schauvliege @Gent
- 06/06/2016 Vergadering Stuur- en Expertengroep

- 16/06/2016 Persconferentie met Joke Schauvliege en beide Denkers
- 17/06/2016 Slotsymposium: Flanders Wise With Water

1.5.2 **Bespreking**

De klimaatverandering is een feit. Dit programma bood een opportuniteit om onafhankelijk en vrij te reflecteren, bestaande procedures te herdenken en ter discussie te stellen. Enige focus was echter wel vereist. Uiteindelijk werden drie grote pistes geïdentificeerd waarin Vlaanderen met al haar karakteristieken een voorbeeldfunctie kan spelen voor andere landen m.n. kustverdediging, landbouw en voedingsindustrie, urbanisatie en ruimtelijke ordening. Het zijn deze denklijnen die werden voorgelegd in de gesprekken die volgden.

Tijdens de Fact Finding Week van 26 tot 30 oktober 2015 kwamen beide Denkers reeds poolshoogte nemen van de situatie in Vlaanderen en hebben zij een 150-tal stakeholders gesproken die betrokken zijn bij deze thematiek. Gesprekken werden gemodereerd en geleid door de Denkers.
Op het programma van de eerste Fact Finding Week stonden:

- 4 rondetafelgesprekken elk toegespitst op een specifiek doelpubliek: de agentschappen, de bedrijven, de universiteiten en onderzoeksinstellingen, de NGO's. Bij de deelnemers van de rondetafelgesprekken werd gestreefd naar een optimale representativiteit van alle actoren.
- veldbezoeken aan IWVA Oostduinkerke, melkvee- en varkensbedrijf in Oudekapelle, Sigmaplan Rupelmonde.
- overleg met het beleid op de kabinetten Schauvliege, Muyters, Homans en Weyts.

In opvolging hiervan hebben leden van de Stuurgroep op 25 februari 2016 eveneens overleg gehad met Tinne Rombouts, voorzitter van de Commissie Leefmilieu, Vlaams Parlement.

Na deze fact finding hebben de Denkers hun eerste indrukken en aandachtspunten geformuleerd in een draft report 'Transforming the role of water in Flemish Economy and Social Life and in Services to the Environment'. Op basis hiervan werd het programma van de tweede fact finding ingevuld.

De tweede Fact Finding Week van 7 tot 11 maart 2016 richtte zich op het invullen van enkele lacunes en nood aan specifieke contacten:

- internationale dimensie: gesprekken met Bruno Verbist (KLIMOS), Gert Verreet (FUST-projecten, UNESCO) en Jos Delbeke (Klimaatactie Europese Commissie).
- VMM en CIW: ontvangst met uitvoerige toelichting en presentaties.
- veldbezoeken: DEME, Aquafin, de Watergroep, enkele VMM-projecten: Waterinfo.be, Egenhoven en Vaartkom, projecten van het departement MOW Nieuwpoort.
- rondetafel met universiteitenclusters UGent-UAntwerpen en KULeuven-VUB: participatie van internationale PhD studenten.

- rondetafel rond 'Ecosystem services'.

Als afsluiter werd een netwerkevent georganiseerd met keynote van Thomas Van Waeyenberge (Aquafed).

Op vrijdag 17 juni 2016 vond het slotcongres plaats in het Paleis der Academiën onder de titel 'Flanders Wise With Water' en stelden de Denkers er hun actiepunten voor aan het grote publiek. Een heel ambitieus programma met keynotes van o.m. Hans Bruyninckx (European Environment Agency), Jacqueline Cramer (Utrecht University) en Philippe D'Hondt (VMM, CIW); twee paneldebatten waaronder een 'battle of talents' met Young water Professionals en een resem pitches van belangrijke stakeholders lokten tal van enthousiaste en geïnteresseerde deelnemers. In de namiddag werd het congres opengetrokken in vijf discussiegroepen, zogenaamde 'Pro Action Cafés', en werd het publiek interactief betrokken wat zorgde voor bruisende discussies. De resultaten van deze Pro Action Cafés werden meegenomen in de uitwerking van het Standpunt.

Het programmaboekje en de deelnemerslijst van het slotcongres vindt u in bijlage. De papers en presentaties kan u downloaden op onze website.

Resultaten en impact

Aanbevelingen van de Denkers

Op basis van een ruim overleg met de hele watersector en de beleidsstructuren hebben zij onafhankelijk hun oordeel gevormd en wijzen zij op de dringende uitdagingen waaraan Vlaanderen vandaag het hoofd zou moeten bieden. Daarnaast formuleren ze concrete richtlijnen voor een nieuw grondwaterbeleid voor een meer duurzame maatschappij en economie. Het extensieve verslag van de Denkers en hun conclusies vindt u in bijlage.

Standpunt

Het was van bij de start ook de bedoeling dat de Stuurgroep samen met de Expertengroep, onafhankelijk van de adviezen van de Denkers, een eigen Standpunt met actieplannen voor het Vlaams beleid in de reeks van de Academie zou uitgeven. Een aantal thema's werden ondertussen verder uitgediept, mede naar aanleiding van de Pro Action Cafés, en het resultaat van deze samenwerking werd in 2016 goedgekeurd in de Klasse van de Technische Wetenschappen onder de titel 'Vlaanderen Wijs met Water – Waterbeleid in transitie'.

Dit Standpunt vormt een aanvulling op de bevindingen en aanbevelingen van de Denkers en legt de focus op enerzijds bouwstenen voor een transitie naar een toekomstgericht waterbeheer met betrekking tot 'Te veel/te weinig water', 'Kustverdediging' en 'Ecosystemen in de landbouw' en anderzijds uitdagingen inzake good governance.

Communicatie en media

De activiteiten van het Denkersprogramma werden aangekondigd op de website van de KVAB, in de Academieberichten en op de websites van partnerorganisaties. De aankondiging en uitnodigingen voor het slotcongres werden elektronisch verstuurd naar meer dan 3000 geadresseerden, een persbericht werd uitgestuurd naar onze media-contacten. Alle programma's en bijhorende papers zijn eveneens terug te vinden op de website van KVAB.

Op donderdag 16 juni - daags voor het slotsymposium - werd een persconferentie gehouden aan de UGent, faculteit Bio-ingenieurswetenschappen en reageerde Joke Schauvliege, Vlaams minister van Omgeving, Natuur en Landbouw op het rapport van de Denkers. Beide Denkers stelden er de resultaten van hun intensieve fact findings voor en hadden een constructief gesprek met de minister. Een interview van VTM Nieuws met Margaret Catley-Carlson en Minister Schauvliege werd diezelfde dag uitgezonden om 19u00. Op de radio gaf Willy Verstraete een interview bij Q Music.

In de geschreven pers kreeg het programma heel wat aandacht. Op 16 juni verschenen o.m. artikels in Knack 'De Vlaming moet meer bewust worden van zijn kwetsbaarheid', De Standaard 'Experts dringen aan meer regenwater te gebruiken' en 'Vlaming moet meer regenwater opvangen', Het Laatste Nieuws 'Bewuster omspringen met water om extreme droogte en wateroverlast te vermijden', Het Belang van Limburg 'Burgers moeten bewuster worden van wateroverlast'.

Naar aanleiding van het congres werden tweets gepost via Twitter #flanderswaterwise.

Er is een interview verschenen met de Denkers in de Academieberichten nr. 63, 2016, p. 3-5 (in bijlage).

Opvolgacties

2.4.1 **Standpunt**

Het Standpunt 'Vlaanderen Wijs met Water – Waterbeleid in transitie' zal op 20 april 2017 worden voorgesteld aan het kabinet van Joke Schauvliege, Vlaams minister van Omgeving, Natuur en Landbouw.

Er is de intentie om het Standpunt voor te leggen aan minister-president van de Vlaamse Regering Geert Bourgeois, aan viceminister-president van de Vlaamse Regering Liesbeth Homans en aan de voorzitter van de Klimaatcommissie in het Vlaams Parlement Jan Peumans.

De voorstelling van het Standpunt zal worden voorgelegd als programma-item op de Internationale Waterweek in Amsterdam in oktober 2017.

Bijlagen

Programmabrochure slotcongres + deelnemerslijst

Persoverzicht

Interview met de Denkers - Academieberichten nr. 63

Rapport van de Denkers

Flanders Wise With Water

Symposium at the Palace of the Academies
Hertogsstraat 1, Brussels
Auditorium Albert II
Friday June 17th 2016

Climate change is a fact. The challenge arises to develop an adaptation strategy and deal with its consequences. Rather than focusing on the negative aspects, this symposium aims to provide an alternative perspective. Top speakers from Flanders and abroad present a positive narrative about climate change and resilience in the context of water.

Margaret Catley-Carlson (Patron Global Water Partnership Canada) and Glen T. Daigger (former chairman of the International Water Association) were the two Thinkers-in-Residence at the Royal Flemish Academy of Belgium for Science and the Arts (KVAB) for the 2016 Thinkers Programme on Water & Climate. They worked with stakeholders in Flanders in order to write a report formulating long term policy objectives for Flanders and beyond. Today, Friday June 17, they present their findings. National and international experts can respond and nurture the debate about climate and future water management.

Programme

9:00-9:30 ***Coffee and Registration***

9:30 ***Newsflash press conference***

Welcome by

Hubert Bocken, President of the Academy
Willy Verstraete, Coordinator Thinkers Programme Water & Climate

10:00-10:45 ***Presentations by the Thinker Team***

Chair: Erik Mathijs

Margaret Catley-Carlson
Glen Daigger
Caroline Van Steendam

Q & A

10:45-11:15 ***Tea/Coffee Break***

11:15-12:00 ***A selection of Governance Issues raised in the report***

Chair: Erik Mathijs

Hans Bruyninckx, European Environment Agency
Jacqueline Cramer, Utrecht University - Former Dutch Minister of Environment and Spatial Planning
Philippe D'Hondt, Flanders Environment Agency (VMM), Coordination Committee on Integrated Water Policy (CIW)

12:00-13:00 ***A selection of Science & Technical Issues raised in the report***

Chair: Joos Vandewalle

Iven Mareels, University of Melbourne
Frank Verschraegen, DEME
Erik Mathijs, KU Leuven
Ronald Waterman, Building with Nature

13:00-14:00 ***Break/Informal Lunch***

14:00-14:45 ***Young Water Professionals - Battle of Talents***

Topic: Water Awareness

Chair: Ilse Smets & Caroline Van Steendam

Bart De Vos, Goodplanet
Arne Verliefde, Paint, UGent
Maarten Desmet, For Good
Frederik De Laender, UNamur, UGent
Samuel Van de Vijver, UAntwerpen
Korneel Rabaey, UGent

Q & A

14:45-15:45 Pitches on Key Flanders Water Management Issues

Chair: Willy Verstraete

Tom Williams, IWA
Wim Van Gils, Natuurpunt
Dirk Van der Stede, VITO/VLAKWA
Willy Bauwens, VUB
Jos Boere, KWR
Marnik Vanclooster, UCL
Thomas Van Waeyenberghe, Aquafed
Ann Overmeire, POM West-Vlaanderen
Jan Seys, VLIZ Flanders Marine Institute
Marc Despiegelaere, Protos
Maaike Breugelmans, Stad Gent
Rudy Gotzen, Boerenbond
Jeroen Buysse, UGent

15:45-17:00 Pro Action Café

Discussion in small groups - participants may choose two tables of each 30'.

1. *Too much and too little: better preparation for flood and water shortages*

Coordinators: Ilse Smets and Ingmar Nopens

2. *Coastal defenses: standing up to nature or building with it: costs and issue*

Coordinators: Jean Berlamont and Frank Verschraegen

3. *Organizing Agriculture to enhance Ecosystem Services*

Coordinators: Patrick Meire and Jeroen Buysse

4. *Water & resilience*

Coordinators: Erik Mathijs and Luuk Boelens

5. *Out of the box!*

Coordinators: Frederik De Laender and Arne Verliefde

17:00 Report back to plenary

17:30 Closing lecture by Jan Peumans

17:45 Official closing by Willy Verstraete

Network Reception

#flanderswaterwise

Margaret Catley-Carlson, Thinker-in-residence

Margaret Catley-Carlson operates within Boards of Organizations focused on improved water resource management and agricultural productivity and rural development, serving with 20+ in the last decades. Now PAC Chair of the International Commission on Integrated Mountain Development (ICIMOD), Vice Chair Canadian Water Network Board, member Syngenta Foundation for Sustainable Development, International Fertilizer Development Council, International Food Policy Research Institute (IFPRI). She is a Patron/ past Chair Global Water Partnership, member of the Council of Advisors of the World Food Prize, Library of Alexandria in Egypt, and the Robert Daughterly Institute on Water for Food production. Jurist of the Tyler and Stockholm Water Prizes; President Canadian International Development Agency1983-89; Deputy Executive Director UNICEF New York 1981-1983; President Population Council New York 1993-98; Deputy Minister Health and Welfare Canada 1989-92. Ms. Catley-Carlson has ten honorary degrees and is an Officer of the Order of Canada.

Glen Daigger, Thinker-in-residence

Dr. Glen T. Daigger, Ph.D., P.E., BCEE, NAE is currently Professor of Engineering Practice at the University of Michigan and President and Founder of One Water Solutions, LLC, a water engineering and innovation firm. He previously served as Senior Vice President and Chief Technology Officer for CH2M HILL where he was employed for 35 years, as well as Professor and Chair of Environmental Systems Engineering at Clemson University. Actively engaged in the water profession through major projects, and as author or co-author of more than 100 technical papers, four books, and several technical manuals, he contributes to significantly advance practice within the water profession. Deeply involved in professional activities, he is currently Immediate Past President of the International Water Association (IWA). The recipient of numerous awards, including the Kappe, Freese, and Feng lectures and the Harrison Prescott Eddy, Morgan, and the Gascoigne Awards, he is a Distinguished Member of the American Society of Civil Engineers (ASCE), a Distinguished Fellow of IWA, and a Fellow of the Water Environment Federation (WEF). A member of a number of professional societies, Dr. Daigger is also a member of the U.S. National Academy of Engineers.

Caroline Van Steendam, Associate Thinker-in-Residence

Caroline Van Steendam is a PhD candidate, pursuing a degree in Environmental Engineering at the University of Michigan and in Chemical Engineering at the University of Leuven (KU Leuven, Belgium). Co-advised by Profs. Ilse Smets, Steven Skerlos, Lutgarde Raskin, she is spearheading a pilot-scale and bench-scale study to decrease impacts related to wastewater treatment by facilitating widespread implementation of anaerobic membrane bioreactors. To further support this endeavor, she is currently performing a life cycle assessment to identify the field in which this technology constitutes a more sustainable option than current alternatives. She was awarded with the *'TNAV prize: Best Thesis regarding Water and Sludge Technology'* for her Master's Thesis (Chemical Engineering, KU Leuven) and recently received the honor of becoming an ITiMS fellow (Integrated Training in Microbial Systems). As an officer for GrEENPEAS (a departmental organization aspiring to bring students and faculty closer together) and the outreach-officer for the Society of Women in Engineering (SWE) at the University of Michigan, she organizes many educational and engaging events for students of all ages.

Coordinator

Willy Verstraete, UGent

Willy Verstraete, professor and head of the Laboratory of Microbial Ecology and Technology (LabMET - Faculty of Bioscience Engineering) at Ghent university, since 2011 emeritus. He has field experience with respect to drinking water production plants (slow sand filtration), aerobic wastewater treatment (in particular with respect to nitrification-denitrification), anaerobic digestion of wastewaters and sludges, solid state fermentation of organic residues and bioremediation processes of soils and sediments. Current activities: Dutch KWR institute, Nanyang Technical University Singapore, Board of the FWO. Excellence in Science Prize (FWO-Belgium), Imhoff Award of the International Water Association, Einstein Professorship Chinese Academy of Applied Sciences, Highly Cited Researcher Web of Science. Willy Verstraete is a member of the Royal Flemish Academy of Belgium for Science and the Arts and is coordinator of the 2016 Thinkers Programme Water & Climate.

Hans Bruyninckx, Executive Director, European Environment Agency (EEA)

Dr. Hans Bruyninckx became the Executive Director of the European Environment Agency on 1 June 2013. In 1996 he completed a PhD in international environmental politics at Colorado State University and since 2010 headed the HIVA Research Institute in Leuven which specializes in policy research. Over the last 20 years, he has conducted research in more than a dozen countries, in areas including environmental politics, climate change, and sustainable development.

European perspectives on water management

The presentation will link the water aspects highlighted in the report as part of a broader transition to a green economy. The green economy concept has the potential to provide solutions for water management and governance.

Jacqueline Cramer, Professor of Sustainable Innovation, Utrecht University - Former Dutch Minister of Environment and Spatial Planning

Prof. dr. Jacqueline Cramer is professor in sustainable innovation at Utrecht University, strategic advisor of the Utrecht Sustainability Institute and member of the Amsterdam Economic Board, particularly in charge of the circular economy. Moreover, she is director of the consultancy firm 'Sustainable Entrepreneurship; strategy and innovation consulting'.

Before she was Minister of Housing, Spatial Planning and the Environment for the Labour Party (February 2007 – February 2010). Her background is primarily related to industry, working as a consultant for many years with more than 150 companies on the implementation of sustainable entrepreneurship and corporate social responsibility. Moreover she worked as part-time professor since 1990.

She was and still is member of various (inter)national advisory boards of the government, industry and non-profit organisations (e.g. previously crown member of the Dutch Social-Economic Council, member of the Advisory Board of the World Wide Fund for Nature (WWF)/Netherlands, member of the non-executive board of Shell Netherlands and FMO (Finance for Development Bank) and presently among others chairman of the Dutch Banking Sector Agreement on international responsible business conduct regarding human rights, the Plastic Soup Foundation, Nudge and the ESCo (Energy Service Companies) Netherlands network).

Water as key resource for cities

An increasing concentration of the world population lives in urban regions. In 2014 it was 54% and by 2050 it is expected to be ± 70%. This may threaten the quality of life in cities. One of the key resources at stake is water because of four reasons: 1. security of water provision, water quality, safe/healthy drinking water; 2. adaptation to climate change; 3. closing of

water cycles and 4. relation between water use and use of energy, nutrients and waste streams. The lecture of Jacqueline Cramer addresses the opportunities to deal with these four issues in a sustainable manner. It will be concluded that every part of the water chain has been optimized rather well, but not the chain as a whole. The ecological and economic performance of the water chain can be improved substantially by providing safe and clean drinking water, a climate resistant water management, closing of water cycles and adopting an integrated chain-oriented approach taking into account water, energy and raw materials.

Philippe D'Hondt, Director-general Flanders Environment Agency (VMM), Chairman Coordination Committee on Integrated Water Policy (CIW)

Philippe D'Hondt is MSc Chemistry and MSc Environmental Sanitation. He first worked as research assistant on air emissions at the University of Ghent. Later on, for more than 12 years, he was head of unit at the Management Unit of the North Sea Mathematical Models. Since 1993, he works at the Flanders Environment Agency (VMM), first as Head of Department Monitoring and Research, then as Head of Department Air, Environment and Communication. In 2014, he became the Director-General of VMM. He is currently also chairman of the Coordination Commission Integrated Water Policy (CIW), Water Director for the Flemish Region for the implementation of the EU WFD, and Head of the Flemish delegation in the Scheldt and Meuse Commissions.

How Wise is the Integrated Water Policy in Flanders

Since 2003, the Decree on Integrated Water Policy constitutes the framework for an integrated water policy in Flanders. The decree transposes the Water Framework Directive and the Floods Directive. The choice to implement those two directives through the same legal basis is quite unique in Europe, and guarantees an integrated approach of water management.

Also with regard to the content the decree aims at this integrated approach: it seeks for a maximum integration of all aspects (such as quality, quantity and spatial aspects) and all uses of the water system, and introduced coordination and consultative structures for an integrated water policy. It also provides specific instruments that strengthen the links between water policy and spatial planning.

The Coordination Committee on Integrated Water Policy (CIW) has a central role in the integrated water policy. The CIW brings the water managers and the managers of related policy areas such as nature, mobility, agriculture and spatial planning together. The CIW is a coordination and consultative structure that searches for sustainable and shared solutions through cooperation with respect for the identity, the interests and competences of the concerned organizations. It respects the competence of the individual members, but at the same time it encourages the authorities to take account of the water system in their policy decisions.

Over the last 10 years the work of the CIW has resulted in various legislative initiatives, plans, tools and other instruments towards a better integration of water policy. Significant progress has been made particularly in the area of integrating water policy and spatial policy. A closer look at the recent results and planned initiatives of the CIW in relation to climate adaptation will be presented. These good practices will demonstrate “how wise the integrated water policy in Flanders” is.

Iven Mareels, University of Melbourne

Iven Mareels is Redmond Barry Distinguished Professor and Dean of the School of Engineering at the University of Melbourne, Australia. He studied electro-mechanical engineering at Ghent University, and completed a PhD at the Australian National University. He is a Fellow of the IEEE and the Academy of Technological Sciences and Engineering (ATSE) in Australia, as well as a foreign member of the KVAB. In 2008 he received the Clunies Ross Medal from ATSE for his work on intelligent water systems.

Intelligent Water Systems

About 70% of the world’s water usage goes towards irrigation and ultimately food production. In most circumstances the technology behind irrigation is Sumerian in nature, and typical extraction efficiency (water reaching a plant vs water extracted from the environment) is below 50%. Using modern control and communication engineering ideas, one can implement a measure-model-manage approach changing the operations of large scale irrigation systems dramatically and achieve benefits such as better than 80% extraction efficiency and 100% gain in the production of dry matter per unit of water. In collaboration with Rubicon Water Pty Ltd, the University of Melbourne has developed this systems engineering approach to large scale irrigation systems and results from this 20 year collaboration, with more than a decade of commercial system results to draw from, will be (briefly) presented.

Frank Verschraegen, DEME

Frank Verschraegen has degrees in Electromechanical Engineering (University of Ghent, Belgium – 1987) and in Industrial Management (Catholic University of Louvain, Belgium – 1988).

After successful completion of innovative projects in several high tech environments (s.a. VITO and i2), he became General Manager of the European Operations for IMCORP, a US-based company specialised in state-of-the-art monitoring and diagnosing high voltage cables.

In 2011 he joined the company DEME as project leader, focusing on innovative offshore energy applications and blue growth.

The Blue Cluster - a project with guts

The Blue Cluster aims to tackle different welfare challenges at the same time in response to the urgent need of giving an adequate answer at the long term to the rising level of the North sea. By a multidisciplinary approach of innovation a new élan will be given to the Flemish economical structure to reinforce our competitive position and to create jobs.

The Blue cluster is based on a coastal protection by Nature by building a series of islands and atolls.Those infrastructural investments will give the opportunity to restore the ecosystem of the North sea and will guarantee a healthy and cheap fish production. Feed stocks will be created over 100 km² with important spin-offs for the food-industry, pharmaceutical industry, cosmetic, textile and energy.

The Blue cluster provides a multi-cash flow approach: coastal protection; healthy food, blue energy and innovative telecommunication.

Erik Mathijs, KU Leuven

Prof. Dr. Ir. Erik Mathijs is Full Professor of Agricultural and Resource Economics at the Department of Earth and Environmental Sciences of the KU Leuven, Belgium. He holds an M.Sc. in Bioscience Engineering (KU Leuven, 1991) and a Ph.D. in Agricultural Economics (KU Leuven, 1998). His research focuses on the transformation of the agricultural and food system towards sustainability and resilience and more specifically on the role of niche innovations, such as agro-ecology, organic farming, community-supported agriculture, insect rearing, biofuel crops, etc. He is coordinator of the FP7 project TRANSMANGO and the Horizon2020 project SUFISA—both on the transformation of the European agricultural and food system. He acted as rapporteur and chair of the expert group of the 3rd (2011) and 4th (2015) Foresight Exercise for the EU's Standing Committee on Agricultural Research (SCAR). He has been coordinator of the Flemish Policy Research Centre for Sustainable Development (TRADO) up to 2016.

The Agro-food system wise with water

Our agro-food system is an important user of water, both directly and indirectly, through the virtual water embodied in the products we import from abroad. It also has an important impact on water quality following the use of fertilizers and pesticides. However, the agro-food system can play a positive role in the management of both too much and too little water. This presentation discusses how this can be done by both technological advances – such as precision agriculture, nutrient recycling and novel food processing techniques – and land management approaches, enhancing the ecosystem services that soils can provide to society.

Ronald Waterman, Building with Nature

Dr. Ronald E. Waterman MSc is dedicated to finding answers to the question how can we – by creating added value – develop well-balanced and integrated solutions in the fields of space, economy and environment to existing and future problems in vulnerable densely populated areas.
Ronald Waterman is a specialist with 35 years of worldwide experience in the field of integrated multifunctional sustainable coastal & delta zone development based on the principle of Building with Nature®, using methods that at the same time strengthen the economy and improve the environment, while ensuring an optimal use of the available space. Specialist also in the fields of bio-based economy & infrastructure: roads, railways, pipelines and waterways, including Aquapuncture®, aiming at the sustainable use, adaptation and management of inland waterways and their waterfronts for safety, navigability & regional, socio-economic development, while improving environmental values & nature.

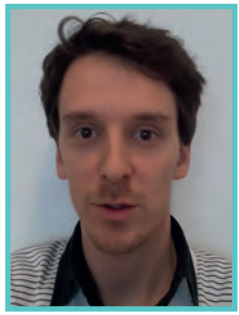
Flanders: Climate Proof - Water Safe - Water Prosperity through Building with Nature® & Aquapuncture

Applying the principle of Building with Nature® using more than before the materials present in nature and the forces and interactions to which they are exposed, and the characteristics of coast & seabed, it is possible to transform step by step the narrow coastal strip of Flanders into an attractive, safer dune-beach coast. With regard to the hinterland using the method of Aquapuncture® it is possible to create both Water Safety as well as Water Prosperity.

Ilse Smets, KU Leuven

Ilse Smets is professor at the Chemical Engineering Department of the KU Leuven. Her research concentrates on monitoring, modeling, optimization and control of biological wastewater treatment systems (i.e., classic activated sludge systems as well as membrane bioreactors) with a specific focus on the bioflocculation dynamics of activated sludge. Her passion for these topics is also reflected in several water related courses she teaches and workshops she provides.

Bart De Vos, Goodplanet



Arne Verliefde, UGent

Arne Verliefde is associate professor at Ghent University, Particle and Interfacial Technology group. He has a strong research focus on interfacial phenomena in separation processes, mainly membranes. The applications of his research are primarily within water treatment, mainly in the fields of process water/ultrapure water for industry and improved sanitation for developing countries. Arne has built a strong track record in this field and has good connections with several highly regarded international research partners and with the waste- and process water industry

Water fit-for-use in de chemische industrie: inzet van alternatieve waterbronnen

Maarten Desmet, For Good, TU Delft

Maarten is an architect by education. He did his internship at the Ministry of Works and Human Settlements in Bhutan where he started researching the integrative sustainability approach Gross National Happiness. Maarten published a book on GNH and is now pursuing his PhD at the Technical University of Delft on the same topic. Maarten is the co-founder of For Good, the digital platform that helps people to live more sustainable. He is also co-founder of the office NDVR which focuses on socio-spatial research and consultancy.

For Good - your guide towards a more sustainable lifestyle

Frederik De Laender, UNamur, UGent

Frederik De Laender, PhD, is a member of the Young Academy of the Royal Flemish Academy of Sciences and the Arts from Belgium and is actively collaborating with 15 different research teams across Europe and the United States. Currently, Frederik is supervising a team of 8 PhD students working on

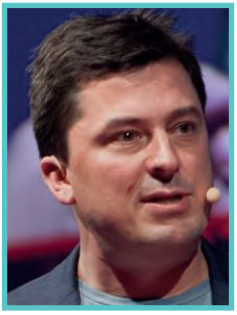
community and ecosystem ecotoxicology using models and microcosm approaches. Frederik has served as invited as an external expert for the European Commission for the Scientific Committee on Health and Environmental Risks (SCHER) and for the USEPA (US) as well. He is Professor of Ecology at UNamur and Guest Professor at UGent.

Predictive ecology makes you wise

Samuel Van de Vijver, UAntwerpen

Samuel Van de Vijver studeerde 4 jaar geleden af als ingenieur-architect aan de KU Leuven met een proefschrift over de kwetsbare waterinfrastructuur in Cochabamba, Bolivia. Sinds 2012 werkt hij als projectarchitect voor RE-ST in Antwerpen aan diverse architectuur, stedenbouwkundige en onderzoeks-projecten. In 2015 heeft hij met RE-ST het onderzoek 'De winst van het niet-bouwen' en 'Pleidooi voor het niet-bouwen' afgerond. Sinds 2015 is hij bovendien als stedenbouwkundig onderzoeker verbonden aan de Onderzoeksgroep voor Stadsontwikkeling binnen de Universiteit van Antwerpen. Hij is geboeid door klimaatverandering en de impact hiervan op onze steden en landschappen. In zijn onderzoek focust hij zich meer specifiek op waterschaarste en droogte op ruimtelijk vlak.

From water urbanism to drought urbanism. Designing a resilient urban landscape, addressing drought and water scarcity.



Korneel Rabaey, UGent

Korneel Rabaey is professor at the Center for Microbial Ecology and Technology (CMET), head of the department of Biochemical and Microbial Technology at Ghent University as well as honorary professor at The University of Queensland. He is a member of the Young Academy. His main research efforts are on resource recovery from wastewater, industrial liquid sidestreams and CO2 streams from industry. Typically a combination of electrochemical and/or bioelectrochemical approaches is used to achieve formation of added value products. He is currently leading several scale-up projects related to organics recovery, fermentation, CO2 conversion to organics and sanitation in Indian slums. He is the author or co-author of over 120 refereed articles attracting over 15,000 citations in the past ten years, listing him as an ISI Highly Cited Researcher. He is currently associate editor for mSystems and Editorial Advisory Board member for Environmental Science & Technology.

Electrify the water sector

Tom Williams, IWA

Tom Williams coordinates IWA's thematic programmes, which are agendas for change for basins, cities and water supply and sanitation service providers addressing and responding to some of the most significant challenges we face in managing the water cycle. Tom has a background in public health sciences and microbiology and is committed to contributing to social and environmental development. His motivation for joining IWA was to contribute to the effective communication of science, an interest first established whilst working in microbiology laboratories and extended since working at IWA to the role of science in informing practice and policy.

Principles for Water-Wise Cities

Wim Van Gils, Natuurpunt

Wim Van Gils (°1976) has a master degree in biology (KU Leuven, 1999). He worked two years as a researcher on freshwater fish at INBO (www.inbo.be) before joining Bond Beter Leefmilieu (Federation for a Better Environment – www.bblv.be) as water policy officer. From 2002 untill 2010, he worked on the implementation of the urban waste water directive, the nitrates directive, the water framework directive and flooding. Next to that, he was involved in large water-related integrated projects such as Seine-Schelde (a part of TEN) and the development of the Scheldt estuary.

Since 2010, he is policy director at Natuurpunt, the biggest nature conservation organization in Flanders. The policy work of Natuurpunt (www.natuurpunt.be/beleid) focuses on biodiversity, spatial planning, agriculture, fisheries, and water policy.

He is a member of the Minaraad (www.minaraad.be) – the multi-stakeholder council that advises the Flemish government on environmental issues.

Nature- based solutions for an urbanized region

Dirk Van der Stede, VITO/Flanders Knowledge Center Water (VLAKWA)

Dirk Van der Stede (1954, Oostende, Belgium) has, since the beginning of his career (1975), been involved in innovation and new technology, including European research and demonstration projects within different framework programmes.

As co-founder/Managing director of HEMMIS (1990), activities were focussed on environmental applications, including water quality modelling applications. A worldwide network has been set-up with university partners, authorities and water users from all over the world.

Dirk Van der Stede managed the start-up of Vlakwa (2010), since January 2016 an independent division of VITO. He is member of a large number of a socio-economic regional, national and international organisations.

To a robust water system with ambitious EU living-labs and inclusive multi-stakeholder governance

Willy Bauwens, VUB

Prof. dr. ir. Willy Bauwens is head of the Department of Hydrology and Hydraulic Engineering at the Faculty of Engineering of the Vrije Universiteit. He is specialized in surface water hydrology and in urban hydrology. He is a member of the Royal Academy of Overseas Sciences and chair of the steering committee of the inter-university international course programme on Water Resources Engineering.

Preparing students for the future water management in the South

Jos Boere, KWR, The Netherlands

Jos Boere leidt de kennisgroep Watersystemen en Technologie, waarin 75 specialisten verspreid over een vijftal onderzoeksteams werken: Geohydrologie, Ecohydrologie, Drinkwaterbehandeling, Waterinfrastructuur en Industrie/Afvalwater/Hergebruik. Verder is Jos plaatsvervangend directeur van KWR, en is hij binnen het MT onder meer verantwoordelijk voor nieuwe markten. Jos heeft een achtergrond in milieutechnologie en management. Eerdere werkervaring ligt op het gebied van advisering rondom waterbehandeling, industriële R&D, normalisatie, training/opleiding en financieel en internationaal business management. Sinds begin 2015 is Jos lid van het bestuur van ALLIED WATERS (www.alliedwaters.com), een publiek-private samenwerking tussen bedrijfsleven en kennisinstituten welke zich richt op het internationaal valoriseren van Nederlandse kennis op het gebied van water.

Water in the Circular Economy

Marnik Vanclooster, Earth and Life Institute, UCL

Prof. Dr. Marnik Vanclooster is professor and researcher at Université catholique de Louvain (www.uclouvain.be/marnik.vanclooster). He made his PhD in soil physics and develops research projects in the area of water resources engineering, agricultural water management and vadose zone hydrology. His major research focus is the study of transport processes of water and chemicals from agricultural origin in the soil-water continuum. He has 20 years of experience in executing and leading research projects at the national level, at the EU level and elsewhere (in particular the Maghreb and central Africa). He is head of the Environmental Sciences Department of the Earth and Life Institute of the UCL. He was elected chair of the Vadose Zone Division at the European Geophysical Union (2011-2013), is elected chair of the Belgian commission for the UNESCO – International Hydrologic Program (2013-2016), past member of the editorial board of the 'Journal of Hydrology' and the 'Vadose Zone Journal', and current member of the editorial board of 'Agricultural Water Management' and 'Hydrology and Earth Sciences Systems Journal (HESS)'.

The Belgian Committee of the International Hydrological Programme of UNESCO: a vehicle for promoting Belgian hydrological science in the Global Water Family.

Thomas Van Waeyenberghe, Aquafed

Thomas Van Waeyenberge is Head of the Brussels Office, AquaFed – The International Federation of Private Water Operators (the global 450+ members trade federation for public-private partnership operating companies). He has expertise in private sector provision of water and sanitation services, right to water and sanitation, gender and water governance issues, international development policy, multistakeholder partnerships and dialogues, relations with donors and multilaterals. Van Waeyenberge is credited lobbyist to the European Parliament and member of the Multistakeholder Coordination Group, European Union's Water Initiative (EUWI). He is also treasurer and member of the Board of Directors of Building Partnerships for Development in Water and Sanitation (BPDWS) – United Kingdom.

Ann Overmeire, POM West-Vlaanderen

Ann Overmeire is coordinator of Flanders' Maritime Cluster and responsible for maritime economy at the West-Flanders development agency in Belgium. Besides day-to-day management of the cluster organisation, she is responsible for planning and strategy development, co-ordination with various stakeholders and project development. Before this, Ann was 8 years innovation co-ordinator at the West-Flanders development agency. The main topics she worked on are energy efficiency, renewable energy, marine / maritime economy and care economy. She has a background in chemical engineering. Her previous experience is with sustainable business cooperation, environmental, health and safety auditing and soil and groundwater remediation.

Regional economic opportunities associated with climate adaptation

Jan Seys, VLIZ Flanders Marine Institute

Head of the Communications Department of VLIZ (Flanders Marine Institute - Belgium), chair of the European Marine Board Communications Panel since 2010 and member of the news & information group of POGO (Partnership on Observation of the Global Ocean). Trained as a marine biologist – with a PhD in seabird research - and initially active in marine and estuarine research in Belgium/Netherlands (10 years) and as a managing-director (2 years) of a bilateral Kenya-Belgium cooperation in marine sciences. Educational experience as a teacher, tourist guide and developer of learning platforms. As head of communications at VLIZ, he developed a wide-ranging expertise in communicating scientific information to policy-makers, researchers, schools and the public at large. One of the pioneers of the Ocean Literacy movement in Europe and co-organizer of the First Conference on Ocean Literacy in Europe (12 Oct 2012, Bruges).

Flanders Wise With Seawater?

Marc Despiegelaere, Protos

After a career of 30 years in the private sector, of which 24 very enjoying years in the water sector, Marc Despiegelaere made a long planned shift, and joined in 2005 the non profit landscape. Protos was the perfect match, since water is also the focus in the third world development programmes of Protos.

Marc is convinced that there must be more "cross-fertilising" between the profit and the non-profit sector. This is very enriching for both kind of societal players, and not at least for the private sector and civil society organisations.

Flanders way forward to climate adaptation support for Least Developed Countries

Maaike Breugelmans, City of Ghent

Master in Bioscience Engineering (Soil and Water Management).

Working for the City of Ghent since 2005 as policy maker on Climate Adaptation, Environment and Climate Service.

Policy maker, first for sustainable development (waste management, food consumption, water management), since 2012 for climate.

Towards a Climate Resilient City

The animation at https://klimaat.stad.gent/nl/gent-bereidt-zich-voor-op-onvermijdelijke-klimaatverandering shows the way to a climate resilient Ghent.

Rudy Gotzen, Boerenbond, KU Leuven

Rudy Gotzen Barrister at the Louvain Bar (1975-1979); Legal Counsel of various Belgian ministers (agriculture, environment, nature and forestry, urban planning) (1982-1999); Legal counsel of the Boerenbond (Belgian farmers association); Teaching "Land, nature and forestry policy" at the Department of Earth and Environmental Sciences, KU Leuven; Vice-President of the Vlaamse Landmaatschappij.

Farmers and sustainable water management

Jeroen Buysse, UGent

Jeroen Buysse has a master degree in bioscience engineering and made a PhD on economic modelling to assess agricultural policies.

His current research deals with agricultural and environmental policy analysis with a focus on the economics and regulatory frameworks of reactive nitrogen pollution.

This research uses economic models to compare the policy impact of mineral nitrogen taxes, fertilization standards and manure transport regulations and their impact on surface water quality.

Ilse Smets (see above)

Ingmar Nopens, UGent

Prof. Ingmar Nopens holds a MSc in Bio-science Engineering and a PhD in Applied Biological Sciences from Ghent University. He is associate Professor since 2008, leading the BIOMATH research group at Ghent University. His main interest lies in Mathematical modeling using different frameworks like biokinetics, computational fluid dynamics and population balance models and combinations thereof. These are applied to unit processes as well as plant- and system-wide with as goal building system understanding and eventually optimization. He is an IWA fellow since 2011 and is prominent in different IWA structures (Specialist Groups: Modelling and Integrated Assessment (MIA); Task Group Modelling of Greenhouse Gas Emissions from wastewater systems; Working Group: Computational Fluid Dynamics for wastewater system applications). He was the chair of the scientific committee of the Wastewater treatment Modelling seminar recently held in Spa, Belgium in spring 2014. He is the incoming chair of the UGent Center of Environmental Science & Technology as well as the Belgian IWA branch (B-IWA).

Jean Berlamont, KU Leuven

Jean Berlamont is emeritus professor of hydraulics and hydraulic engineering at KU Leuven. He is a past head of the department of civil engineering and past dean of the faculty of engineering.
J. Berlamont is chairman of VLARIO and member of the board of the Flemish Marine Institute (VLIZ). His research focused on hydraulic structures, cohesive sediments and urban drainage systems.

Frank Verschraegen (see above)

Patrick Meire, UGent

Patrick Meire studied biology at Ghent University where he also obtained his PhD. Since 1995 he holds the chair of Integrated Water Management at the Institute of Environmental Studies of the University of Antwerp. From 1999 onwards he is full professor and head of the Ecosystem Management Research group (ECOBE) at the University of Antwerp and visiting professor at the Warchau University of Life Sciences. His research interests are mainly integrated water management, estuarine and aquatic ecology and biogeochemistry.

Jeroen Buysse (see above)

Erik Mathijs (see above)

Luuk Boelens, UGent

Luuk Boelens worked several years for the Dutch Province of South Holland as project leader for large projects, and from 1998-2002 as a senior project-leader for large infrastructure projects (such as the High Speed Train lines) on behalf of the Dutch consultancy firm Holland Railconsult (at the moment Movares). From 2004-2012 he was extraordinary professor in Network planning, Governance and Space at the University of Utrecht on behalf of the ministry of VROM, and since 2012 full professor of Spatial Planning and director of the Centre for Mobility and Spatial Planning at the University of Ghent.

Luuk Boelens is opinion leader and author of various books and articles regarding the actor relational approach of (urban) planning, governance and design. He has been member of several major juries on spatial planning. He chairs academic review boards for VLIR/VLOHRA, the Think-tank Climate Adaptation for Belgium and the Network of sustainable mobility research. He is Belgian representative of the Association of European Planners, member of the Head of Schools, and has organised AESOP's year congress for 2014 in Utrecht. His recent research focuses on the institutional rearrangements, co-evolution in decision-making and adaptive governance in especially the Euro delta of Rhine, Meuse and Scheldt, based on actor-network theories, post structural geographies and common pool resource management.

Frederik De Laender (see above)

Arne Verliefde (see above)

Jan Peumans, President Vlaams Parlement, President Vlaamse Klimaatcommissie

Jan Peumans is Licentiaat in de politieke en sociale wetenschappen, KU Leuven en studeerde nadien aldaar aan het Instituut voor Ontwikkelingslanden.

Van 1976 tot 1988 was Peumans Coördinator preventie en voorlichting aan de RIAGG Westelijke Mijnstreek (Nl.). Hij was o.m. Adjunct-kabinetschef van de Vlaams minister van Openbare Werken van 1988 tot 1991, directeur marketing en strategie bij De Lijn van 1991 tot 2004 en was Fractieleider in de Limburgse Provincieraad (1985-1987 en 1991-2004). Sinds 2004 is hij Vlaams Volksvertegenwoordiger en sinds 13 juli 2009 Voorzitter van het Vlaams Parlement.

Daarnaast was hij Burgemeester van Riemst van 1995 tot 2006 en Schepen van Riemst (1983-1994 en opnieuw sinds 2007).

With special thanks to the Thinkers, all session Chairmen, speakers and coordinators and especially to the Experts Group of the Thinkers Programme, without whose commitment this initiative never could have been realized.

Tahmina	Akter	KU Leuven
Wim	Audenaert	Ghent University
Janis	Baeten	Ghent University
Willy	Bauwens	VUB
Stan	Beernaert	KVAB - lid KTW
Johan	Bellon	Pidpa
Elina	Bennetsen	Ghent University, Researc Group Aquatic Ecology
Adolphe	Benoot	
Yolande	Berbers	KU Leuven
Karla	Berckmoes	University College Ghent
Jean	Berlamont	KU Leuven
Murray	Biedler	Deep Blue Consultants
Micheline	Blanchart	
Hubert	Bocken	president KVAB, Ugent
Charlotte	Boeckaert	Flanders Knowledge Center Water (VLAKWA)
Nathalie	Boelens	KVAB
Luuk	Boelens	Ghent University
Jos	Boere	KWR
Nico	Boon	Ghent University - CMET
Michel	Boucneau	Environment Agency
Maaike	Breugelmans	Stad Gent
Harold	Brouwers	Nutreact Bio Solutions bv
Kris	Bruneel	bbouwadvies
Hans	Bruyninckx	European Environment Agency
Benjamin	Buysschaert	Ghent University - CMET
Marc	Buysse	AquaFlanders
Jeroen	Buysse	Ghent University
Cristina	Cagnetta	Ghent University - CMET
Nelly	Cans	civil society
Margaret	Catley-Carlson	Thinker-in-residence
Kris	Cauwenberghs	Vlaamse Milieumaatschappij
Marlies	Christiaens	Ghent University - CMET
Eric	Claeys	ABS vzw
Peter	Clauwaert	Ghent University
Guido	Compernolle	
Luis	Corbala Robles	Ghent University
Jacqueline	Cramer	Utrecht University
Glen	Daigger	University of Michigan, Thinker-in-residence
Wim	Dauwe	Waterwegen en Zeekanaal NV
Greet	De Gueldre	Aquafin
Frederik	De Laender	UNamur, Young Academy
Anja	De Meerleer	
Chaïm	De Mulder	Biomath, Ghent University
Lieve	De Roeck	Flanders Environment Agency (VMM)
Julien	De Rouck	Ghent University

Kristine	De Schamphelaere	University of Antwerp - Ecosystem Management Research Group
Lieven	De Schamphelaere	Natuurpunt
Robin	De Smedt	Spatial Development Department Flanders
Tom	De Vits	Vlaams Parlement
Bart	De Vos	Goodplanet
Anneleen	Demey	ACLVB
Bart	Deronde	VITO - Remote Sensing
Ivy	Desaever	Interest
Maarten	Desmet	For Good
Marc	Despiegelaere	Protos ngo
Orellana	Deycyc	Genta
Philippe	D'Hondt	VMM, CIW
Didier	D'hont	VMM
Giorgia	Donin	Randbee Consultants
Victor	Dries	Kabinet Minister Homans
Inez	Dua	KVAB
Claude	Dubus	EIC Europa
Ran	Feng	KU Leuven
Hendrik	Ferdinande	Ghent University - Fysica & HOPE
Pereira	Fernando	Waterbouwkundig Laboratorium
Wilfried	Franck	
Wendy	Francken	VLARIO
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Sylvia	Gildemyn	Ghent University - CMET
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Rudy	Gotzen	Boerenbond
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Jean Pierre	Henriet	Ghent University
Jozefien	Hermy	Departement Ruimte Vlaanderen
Dominique	Huits	Inagro
Marijke	Huysmans	Vrije Universiteit Brussel
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Peter	Kavuma	NaFIRRI
Ingrid	Keupers	KU Leuven - hydraulics
Luc	Keustermans	De Watergroep
Janik	Kukral	VUB
Josiane	Leroy	VUB
Geoffrey	Lipman	University Hasselt - SUN Program
Carlos	Maes	I.E.J.
Christiane	Malcorps	SOLVAY S.A.
Cedric	Malfroid	
Iven	Mareels	University of Melbourne
Edith	Maroy	Antea Group (Belgium)
Silvio	Matassa	Avecom NV

Erik	Mathijs	KU Leuven
Hannelore	Mees	University of Antwerp
Micheline	Meesen	BELGACOM
René	Meeuwis	Agentschap Natuur en Bos
Patrick	Meire	University of Antwerp
Joseph	Melotte	student KU Leuven
Matthias	Mertens	KU Leuven
Esther	Moens	Avecom
Janet	Molina	Ghent University - CMET
Bart	Nevens	Vlaams Volksvertegenwoordiger
Dongmo	Nguimatsia	Pan African University Life and Earth Science Institute
Elvire	Nijs	UNION ECONOMIQUE
Ingmar	Nopens	Ghent University
Jiri	Nossent	Flanders Hydraulics Research
Bastiaan	Notebaert	KU Leuven
Eleftheria	Ntagia	Ghent University - CMET
Joost	Ossevoort	Waterschap De Dommel
Ann	Overmeire	POM West-Vlaanderen
Resi	Pansaerts	Provincie Antwerpen
Anastasia	Papangelou	KU Leuven
Bob	Peeters	VMM
Jan	Peumans	Vlaams Parlement
Delphine	Prat	Ghent University - CMET
Korneel	Rabaey	Ghent University
Ludo	Rochette	FPS Foreign Affairs, Foreign Trade & Development Cooperation
Mark	Saeys	Ghent University
Dries	Seuntjens	Ghent University - CMET
Jan	Seys	VLIZ Flanders Marine Institute
Theocharis	Sideris	Avecom
Ilse	Smets	KU Leuven
Vincent	Smets	KU Leuven
Stijn	Speelman	Ghent University
Patrizia	Trivulzio	European Commission
Dirk	Uyttendaele	Milieu- en Natuurraad van Vlaanderen
Eleni	Vaiopoulou	Ghent University
Rebecca	Van Coppenolle	University of Antwerp
Samuel	Van de Vijver	University of Antwerp
Jeannine	Van De Voorde	
Christine	Van der Heyden	Hogeschool Gent
Dirk	Van der Stede	VITO, VLAKWA
Wim	Van Gils	Natuurpunt
Kor	Van Hoof	Kabinet minister Schauvliege
Edward	Van Keer	Vlaamse Overheid, departement MOW
Nicole	van Lipzig	KULeuven
Guido	Van Steendam	KU Leuven

Caroline	Van Steendam	Associate Thinker-in-residence
Els	Van Uytven	KU Leuven
Ivo	Van Vaerenbergh	KVAB, Actility Benelux
Thomas	Van Waeyemberghe	AquaFed
Marnic	Vanclooster	UCL
Thierry	Vancrombrugge	FOD Justitie
Hendrik	Vandamme	ABS vzw
Tom	Vandekerckhove	Ghent University - CMET
Joos	Vandewalle	KVAB, KU Leuven
Jan	Vanvelk	VMM
Jeet	Varia	Ghent University - CMET
Johan	Verbauwhede	IWVA
Irina	Veretenicoff	KVAB, VUB
Myrtle	Verhaeven	Ghent University - Department of Agricultural Economics
Ronny	Verhoeven	Ghent University
Arne	Verliefde	Ghent University - PAINT
Gert	Verreet	Flanders Dept. EWI Afdeling Onderzoek
Frank	Verschraegen	DEME
Willy	Verstraete	KVAB, Ugent
Walter	Vissers	Avecom
Eveline	Volcke	Ghent University - dept. Biosystems engineering
Liesbet	Vranken	KU Leuven
Ronald	Waterman	Building with Nature
Tjebbe	Will	TeamWork
Jacques	Willems	KVAB, UGent
Tom	Williams	IWA
Kim	Windey	Avecom
Charlotte	Wirion	VUB
Vincent	Wolfs	KU Leuven - Civil Engineering
Guido	Wyseure	KU Leuven - depart. Earth & Environmental Science

#flanderswaterwise

Vlaamse overheid

RICHTING MORGEN

VWK

3.2 Persoverzicht

KVAB-activiteit	Medium	Datum publicatie	Titel
DP Water & Klimaat	Radio - Q Music	16/06/2016	Interview met Willy Verstraete over Denkersprogramma
DP Water & Klimaat	Goed Gevoel	16/06/2016	Experten: "Bewuster omspringen met water om extreme droogte en wateroverlast te vermijden"
DP Water & Klimaat	Knack	16/06/2016	'De Vlaming moet meer bewust worden van zijn kwetsbaarheid'
DP Water & Klimaat	De Redactie	16/06/2016	Aanpakken regelmatige wateroverlast is zaak van iedereen
DP Water & Klimaat	Het Belang van Limburg	16/06/2016	"Burgers moeten bewuster worden van wateroverlast"
DP Water & Klimaat	De Standaard	16/06/2016	Experts dringen aan meer regenwater te gebruiken
DP Water & Klimaat	De Standaard	16/06/2016	Vlaming moet regenwater meer gebruiken
DP Water & Klimaat	Het Laatste Nieuws	16/06/2016	Experten: "Bewuster omspringen met water om extreme droogte en wateroverlast te vermijden"
DP Water & Klimaat	Regenwater Expert	16/06/2016	Vlaming moet meer regenwater opvangen
DP Water & Klimaat	VTM Nieuws	16/06/2016	Interview met Joke Schauvliege en Margaret Catley-Carlson over maatregelen ter preventie van waterovelast uitgezonden tijdens nieuws van 19u

Denkersprogramma “Water & Klimaat: Een adaptatiestrategie voor Vlaanderen”

Interview met de Denkers

Nathalie Boelens

Dat het klimaat verandert horen we welhaast elke dag in de berichtgeving over de opwarming van de aarde. De opdracht is om vanaf nu met zijn allen een strategie uit te werken om 'er het beste' van te maken. Met het Denkersprogramma “Water & Klimaat” wil de Klasse Technische wetenschappen vanuit een positieve insteek het beleid aansturen en aanmoedigen tot nieuwe technologieën en regelgeving in een context van zelfredzaamheid ten aanzien van klimaatverandering. Een half jaar lang hadden de denkers ontmoetingen en stakeholdersdebatten met kabinetten, bedrijven, onderzoeksinstellingen en NGO’s. Op 17 juni vond het druk bijgewoonde slotsymposium plaats. Wie zijn de ‘denkers’? Wat is hun boodschap voor Vlaanderen?

Glen T. Daigger

Glen Daigger is professor aan de University of Michigan en oprichter van ‘One Water Solutions’, een organisatie voor waterbouw en innovatie. Hij is voormalig voorzitter van de International Water Association.

Hoe ben je betrokken geraakt bij het Denkersprogramma van de Academie?

Water is de rode draad doorheen mijn carrière. Willy Verstraete contacteerde me voor het Denkersprogramma en ik was meteen geïntrigeerd. Op dat moment was ik ook aan het verhuizen van Colorado naar Michigan. Colorado is een hooggelegen, droog, woestijnachtig gebied dat waterarm is. Michigan daarentegen is vochtig, omringd door grote meren, op het eerste zicht dus een overvloed aan water. Ik zag meteen parallellen tussen Vlaanderen en mijn nieuwe thuis in Michigan. Een analogie vinden we er bijvoorbeeld ook op het vlak van de economie: 1 op 5 jobs in Michigan zijn afhankelijk van water, in Vlaanderen is dat 1 op 6.

Ondanks ons natte klimaat is één van de punten in het rapport van de denkers dat waterschaarste ook een probleem kan worden voor Vlaanderen...

Er is een misperceptie dat droogte enkel samenhangt met een gebrek aan regen. De bevolkingsdichtheid speelt hier een cruciale rol. België is dichtbevolkt maar in de VS geldt dat bijvoorbeeld ook voor Florida en Washington DC. Florida is een van de pioniers op het vlak van wateropslag en Washington hergebruikt water op zeer grote schaal. Een grote droogte zoals die van 1976 zal in Vlaanderen frequenter voorkomen. Om een waterzekere toekomst te garanderen moet de overheid nu in actie schieten met een gedegen actieplan dat regeringstermijnen overstijgt. Er is enorm veel expertise aanwezig in Vlaanderen - dat werd duidelijk naarmate we meer en meer mensen spraken tijdens het Denkersprogramma - maar er is nood aan het meer delen van die kennis en aan het samenwerken aan gemeenschappelijke doelstellingen, die gedragen worden door het overheidsbeleid.

Is de verandering van het klimaat ondertussen ‘oud nieuws’ geworden? Het Denkersprogramma wil een positief verhaal brengen, hoe doe je dat? Werken doemscenario’s soms niet beter om de problematiek onder de aandacht te brengen?

Klimaatverandering is ondertussen min of meer algemeen aanvaard als een feit. Die aanvaarding kwam er sneller bij de Europeanen dan bij de Amerikanen. Met het verhaal over de klimaatverandering moeten we de mensen blijvend bereiken. Sommigen bereik je gemakkelijker met een doemscenario, anderen voelen zich eerder aangesproken door een positief verhaal. Uiteindelijk zijn het twee kanten van de medaille. In het Chinese symbool voor ‘opportuniteit’ zit het symbool voor risico reeds verweven.

Het perspectief dat we nu zouden moeten hebben op klimaatverandering is vergelijkbaar met dat op gezondheid: bij jonge mannen komt het wel eens voor dat ze een bepaalde periode van hun leven slechte eet- en leefgewoontes hebben. Op iets latere leeftijd, onder invloed van een veranderend metabolisme, komen de kilo’s er dan snel bij. Dit los je niet op door op dieet te gaan, want een dieet is iets tijdelijks. De enige manier om hiermee om te gaan is om fundamenteel iets te veranderen aan de manier waarop je leeft. Als we dit toepassen op klimaatverandering en water in het bijzonder zien we dat water beheren iets is dat we al eeuwenlang doen. Wat er nu nodig is, is een fundamentele verandering in de manier waarop we dit doen: een nieuwe praktijk maar ook een nieuwe ethiek. Dit nieuwe systeem moet ingebed worden in het beleid. De vraag “Hoe gaan we dit betalen?” hoeft zich niet te stellen. De economische impact van water

Denkersprogramma “Water & Klimaat: Een adaptatiestrategie voor Vlaanderen”

(1 op 6 jobs, of het belang van water op het vlak van transport) beantwoordt deze vraag. De voordelen van een goed waterbeheer overstijgen in grote mate de kosten. Het is eenvoudigweg een kwestie van de veranderingen nu door te voeren. Landen die in een veel meer precaire situatie zaten op het gebied van water hebben hiervoor oplossingen gevonden: deze oplossingen zijn er kunnen komen omdat het systeem veranderd is. Tijdens het Denkersprogramma hebben we ondervonden dat de kennis en de competenties die vereist zijn om dit in Vlaanderen te doen in ieder geval aanwezig zijn.

> *“Als mensen het belang van water gaan inzien zullen ze er ook mee zorg voor dragen!”*

Jullie rapport spreekt van het probleem van de hoge graad van bodemafdekking in Vlaanderen. Vlamingen hebben een ‘baksteen in de maag’ wordt wel eens gezegd. Minister Schauvliege stelt een betonstop voor tegen 2050. Zullen we anders moeten gaan bouwen en leven?

Het is van belang om goed te weten hoe je de vraag stelt. Afhankelijk van hoe je de vraag stelt beperk je al de antwoordmogelijkheden. Nee, we zullen in de toekomst niet kunnen bouwen zoals we dat in het verleden gedaan hebben. Maar als je de vraag stelt of we in de toekomst woningen kunnen blijven creëren die beantwoorden aan de noden en verlangens van mensen op een manier die ook waterzekerheid biedt, dan is het antwoord wel degelijk ja. De menselijke vindingrijkheid mag hier niet onderschat worden. Mensen zijn de meest succesvolle soort omdat we ons zeer snel kunnen aanpassen, vandaar dat ik verwijs naar adaptatiestrategie. Eisenhower zei ooit: "If a problem cannot be solved, enlarge it.".

Als we 5 jaar verder gaan in de toekomst: wat wens je Vlaanderen toe op het vlak van water?

Ik vind het vooral belangrijk dat de man in de straat zich bewust is van het belang van water. In Singapore heeft de overheid vele stappen ondernomen om te communiceren naar een breed publiek over de noodzaak en de vele voordelen van water en waterzekerheid. Nu is het zo dat zelfs een taxichauffeur aldaar je kan vertellen over het belang van water en hoe hun land werkt aan waterzekerheid. Als mensen het belang ervan inzien, zullen ze ook mee zorg dragen voor water.

Margaret Catley-Carlson

Margaret Catley-Carlson is een beleidsdeskundige uit Canada. Ze is o.m. vicevoorzitter van de Canadian Water Network Board en lid van het adviesorgaan voor water van de Verenigde Naties.

Hoe ben je als politica binnen het domein van buitenlandse zaken en ontwikkelingshulp terechtgekomen bij water?

Ik ben geen hydroloog, geoloog of iets anders wat eindigt op “-loog” en wat betekent dat je expert bent in dergelijk onderwerp. Het verhaal begon toen ik 15 jaar geleden getrakteerd werd op een etentje. Het is gebruikelijk dat als je een gratis lunch aanvaardt daarop volgt dat je iets terugdoet voor wie je trakteert. Dit etentje vond plaats met twee ingenieurs. Zij vroegen me om voorzitter te worden van de “Water Supply & Sanitation Collaborative Council” – wat een vreselijke titel was, iets wat alleen maar ingenieurs kunnen bedenken. Het feit dat ik helemaal niets afwist van water was niet van belang, ze zagen in mij de geknipte persoon omwille van mijn expertise op vlak van beleid en financiering. Vanaf dat moment begon het ‘huwelijk’ van mijn inzichten op het terrein van beleid, organisatie en financiering enerzijds en water anderzijds. Het werd een geweldige ervaring voor mezelf: ik heb alle domeinen van water kunnen ontdekken en de wereld kunnen afreizen om te zien hoe mensen hiermee omgaan. Zo heb ik zelf expertise kunnen opbouwen op het gebied van waterbeleid. Ik heb misschien geen diploma’s in die richting maar ik heb wel 15 jaar lang geluisterd naar mensen over de hele wereld en hun bekommernissen op het vlak van waterbeheer en -beleid.

Margaret Catley-Carlson, één van de Denkers, overhandigt het rapport met de conclusies aan Joke Schauvliege, Vlaams Minister van Omgeving, Natuur en Landbouw, op de persconferentie.

Hoe kwam je bij het Denkersprogramma van de Academie?
Als voorzitter van de Foresight Advisory Committee voor Suez Environment ontmoette ik Willy Verstraete. Ik was heel vereerd dat hij me contacteerde omdat ik voor hem een toonaangevend 'denker' ben inzake waterbeleid.

Je bent de geknipte persoon om de vertaalslag te maken tussen de feiten die een wetenschapper onderzoekt in zijn laboratorium enerzijds en realistisch, duurzaam beleid anderzijds. Hoe ervaar je deze rol?
Als generalist en als iemand die kan luisteren naar velen ben ik ideaal geplaatst om naast de feiten ook een mening te vormen. Wetenschappers ondervinden op dat vlak grote moeilijkheden. Ze durven de sprong niet te doen. Ze zijn getraind om te werken op een specifieke hypothese en gaan hierbij niet verder dan de bewezen feiten. Ik moedig hen aan om na te denken over de praktische implicaties van hun theorieën en in functie daarvan een stap vooruit te zetten. Ik probeer wetenschappers te overtuigen dat het niet het einde van de wereld is om niet alleen te zeggen wat ze weten maar ook wat ze denken.

Hoe blik je terug op dit Denkersprogramma?
Met ongelofelijk veel dankbaarheid. We werden zo goed ontvangen en verzorgd wat het sowieso een fijne ervaring maakte. Het is ook een enorm privilege om gevraagd te worden om een land of regio te mogen analyseren. We mogen zeggen met wie we willen praten en dit wordt voor ons geregeld. Achteraf mogen we een onafhankelijk rapport schrijven over wat wij vinden welke de prioriteiten zouden moeten zijn en dan komen diezelfde mensen opnieuw luisteren naar wat we te zeggen hebben. We hebben tal van competente en vriendelijke mensen ontmoet. Dit was gewoon een heel erg mooi aanbod en het is een geweldige ervaring geworden.

Caroline Van Steendam
Caroline Van Steendam behaalde haar Masterdiploma aan de KU Leuven. Vandaag is ze doctoraatsstudent aan de University of Michigan. Ze werd "Associate Thinker" voor het Denkersprogramma Water & Klimaat.

Hoe ben je bij dit Denkersprogramma van de Academie terecht gekomen?
Wel, professor Glen Daigger verhuisde vorig jaar naar de universiteit van Michigan. Hij wilde dat zijn betrokkenheid bij het Denkersprogramma ook deels kon kaderen in zijn opdracht aan de universiteit. Omdat ik afkomstig was uit Vlaanderen en aan zijn universiteit werkte rond een gerelateerd onderwerp nam hij contact op met mij. Vanaf dat ogenblik ben ik er steeds nauwer bij betrokken geraakt.

Welke impact heeft het gehad op jou?
Het Denkersprogramma heeft een grote impact gehad. Als docoraatsstudent werk je altijd alleen op je eigen project, je bent wat geïsoleerd. Ik ben heel toegepast bezig met een erg specifieke technologie met betrekking tot afvalwaterzuivering. Dit Denkersprogramma was voor mij enorm interessant om te leren wat de algemene waterproblemen in Vlaanderen zijn en hoe mensen daarmee omgaan, wat de verschillende stakeholders denken en zeggen. Met het Denkersprogramma gingen we de interactie aan met zowel mensen uit de industrie, de overheid, de NGO's. Door de interactie met zoveel mensen uit diverse hoeken heeft het Denkersprogramma mijn visie op de wereld vergroot.

"Water & klimaat" situeert zich zowel op technologisch vlak als op beleid. Je bent zelf hoofdzakelijk met technologie bezig, zie je voor jezelf ook een toekomst weggelegd om een rol te spelen bij het beleid?
Vóór het Denkersprogramma leek het duidelijk dat ik verder ging gaan op technisch vlak. Maar gaandeweg heb ik ingezien hoe belangrijk het beleid is en ook hoe groot de meerwaarde van een wetenschappelijk-technische achtergrond is voor de beleidsmakers. Nu zie ik mezelf nog beide kanten uitgaan.

A Better Water future for Flanders

"Not too much; not too little"

Royal Flemish Academy 2016 Thinkers Programme

Margaret Catley-Carlson[1]

Glen T. Daigger, Ph.D., P.E., BCEE, NAE[2]

Caroline van Steendam[3]

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1. INTRODUCTION

1.1. The Royal Flemish Academy of Belgium for Science and Arts 2016 Thinkers Programme

The Royal Flemish Academy of Belgium for Science and the Arts (The Royal Flemish Academy) receives financial resources from the Flemish Government to invite 1 or 2 highly regarded scholars, called 'thinkers', to come to Flanders at several occasions over the period of about a year. The scholars are introduced to the specifics of a particular topic in Flanders via the members of a task force, appointed by the Academy. They are given the opportunity to discuss with important opinion makers, politicians, university professors, industrial managers, and other types of stakeholders, as appropriate. The thinkers construct their specific appraisal /evaluation of the situation in Flanders concerning the selected theme /topic of concern over this timeframe. They have the full freedom to draft a set of recommendations, actions, confrontations, as they see fit. The year is closed by a one-day symposium at the Royal Academy in Brussels. The overall quintessence of their 'experience ' is consolidated in a short document, and should provide guidance for the Flemish Government.

1.2. 2015-2016 Thinkers Programme

The theme selected by the Academy for the 2015-2016 Thinkers Programme is: RESILIENT PATHWAYS FOR TACKLING WATER & CLIMATE CHALLENGES (VEERKRACHTIGE PADEN VOOR DE AANPAK VAN WATER & KLIMAAT UITDAGINGEN). Two parts were proposed to be developed in parallel:

1. **Governance with respect to the cluster of Water/Climate Change/Resilience.** There is a problem of serious overuse of groundwater in Flanders by society and industry. There is also a very long lasting problem of poor water quality in terms of nitrate, particularly due to intensive agriculture. However, there are also very intriguing cases of best practices, such as the recycling of wastewater to drinking water in Oostduinkerke (the first case in Europe). Margaret Catley-Carson was selected as one of the two "water thinkers" particularly to address these issues.
2. **Technological potential in the context of Water/Climate Change/Resilience**. Flanders has to face various problems in terms of flooding, development of technology for resource recovery, designing new water services, and planning of cities for the future. Glen Daigger was selected as one of the two "water thinkers" particularly to address these issues.

Caroline van Steendam, a Ph.D. candidate at the University of Michigan but also a Belgian citizen, was further enlisted as "associate thinker". Brief biographical sketches of the three thinkers are attached below.

1.3. Methodology

Two one-week-long visits provided the opportunity for the thinkers to interact as described above. The first visit occurred October 26-30, 2015, and the second March 7-11, 2016. A complete list of meetings and activities during these two visits, and those who attended the meetings, is attached. A concluding symposium was held in Brussels June 17, 2016. This report documents the outcomes of the programme and the findings and recommendations of the thinkers.

In response to our charge, we have **not** herein described Flanders' water resources, governance structure or current players or regulations; these are well described in many quality studies. We have concentrated on needed change as perceived through hours of dialogue with dozens of helpful and informative interlocutors, and on how, given the current structures and processes, such changes can be made. To accomplish this, we sought to answer the following questions:

1. Can Flanders be more water-safe against coastal erosion and urban flooding, from coastal and river fronts? What short- and long-term measures are needed?
2. Can Flanders be made more water-secure for people's health and livelihoods and national economic prosperity: those water needs in agriculture, industry, transport, environment, and potable use? What immediate and long-term measures are needed?
3. Are Flanders' resources adequate to meet the challenges to provide such a water-safe and water-secure region: physical, human, governance, and financial resources?
4. How can these measures be aggregated into a do-able strategy for improvement now, and for laying the basis for substantial medium-term change?

The following sections address these four questions, including our assessment and needed actions, with the fourth question addressed in our **Findings and Recommendations**.

2. IS FLANDERS WATER-SAFE, OR IS "TOO MUCH" WATER INEVITABLE?

2.1. Urban and Peri-Urban Flooding

The current and anticipated future situation appears to be well characterized. Precipitation patterns are changing, and extreme weather conditions are becoming more frequent (VMM, 2014b). For example, the annual precipitation increased by 0.55 mm/year (with a total increase of 94 mm from 1833 to 2014, see Figure 1.a), while the number of days with heavy precipitation doubled since the 1950s (Figure 1.b**Fout! Verwijzingsbron niet gevonden.**). Past spatial planning practices (or the lack hereof) have resulted in construction in locations vulnerable to flooding. These practices also adversely impact modern water management approaches by, e.g., denying implementation of the "room for the river" approach. Water safety of the people and economy of Flanders are subject to real threats. The combination of dense urbanization and intensified rainfall in Flanders leads to more numerous and severe floods. 7,000 homes are subject to flooding which, together with major storms, will cause property and land damage as the coasts and river inlets experience increasing storm and weather events. The average annual damage associated with floods in Flanders currently already exceeds 50 million euros (VMM, 2015d).

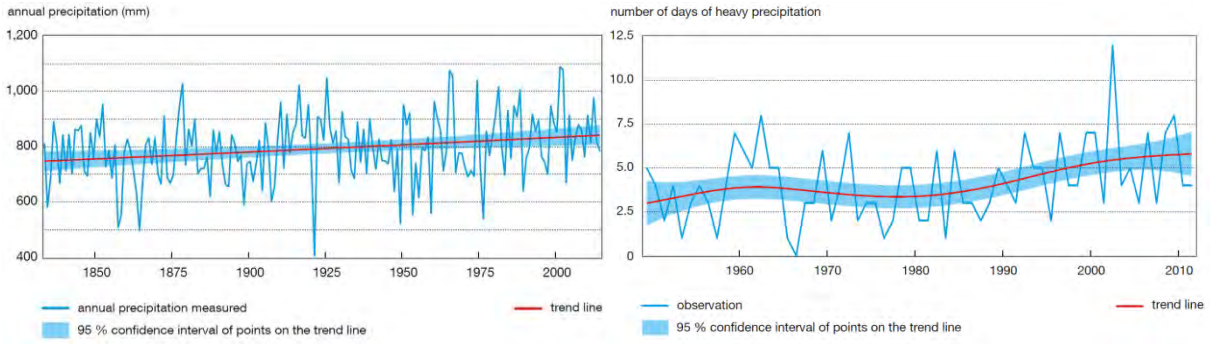

Figure 1: (a) The evolution of annual precipitation in Uccle (1833 – 2014), (b) Number of days of heavy precipitation (≤ 20.0 mm per day) in Uccle (1951 – 2013). Source: (VMM, 2015c).

There are very good human and science resources devoted to urban flood forecasting and modelling (e.g., the Flanders Environment Agency or VMM). Governments have taken coordinated action at several levels to forestall the expansion of flooding. There is agreement on procedures to designate flood prone zones and advisories against construction. There is also general compliance with the EU Framework Directive on Flooding. There is agreement on a 30+ year plan which would make the 2050 risk level the same as the one in 2010.

Although the current and future situation is well characterized, actions are needed to implement the necessary responses. It is difficult, if not impossible, to make changes in public policy if the media, social communication, and general public are not aware of the issues, what is being done about them, *and what needs to be done.* The general public is, to a large extent, unaware of measures taken by public authorities, and of the element of personal responsibility involved. Moreover, in some instances there appears to be a fair element of 'capture' by which interest groups can elongate the public consultation process to indefinitely postpone measures needed to create environmental improvement. A major increased investment in a **professionally managed communication campaign** should be undertaken to **improve** understanding of why policies exist, and of personal and household responsibility, vis à vis urban flooding: housing design, location etc. The tone should be optimistic that property damage and inconvenience can be minimized with common effort. The recent campaign about multilayered water security in Flanders organized by the Integrated Water Policy in Flanders (CIW) and the corresponding video 'Hoog water zonder kater' is a good example of this.

The Government should affirm the current policy intention to meet increasing flood challenges with continued public investments at a level necessary to keep **risk at the current levels** or lower. It should be repeated that all taxpayers will be paying these costs, which will increase, depending in good part on whether all home and building owners comply with flood regulations. Holding this strategy will entail continuous costs but will avoid sudden and major cost increases, explaining why a budget needs to be laid out for the next 40 years.

Once the communication campaign is running, the Government should give public notice of an **intention to convert the current construction advice regarding building in flood plains (promulgated by CIW) to a binding proscription.** There will need to be consultations with the different orders of government which have responsibilities in this area. Some compensation or offset financing may be needed, which

should be weighed against the amounts the Government is paying when flooding does occur. The date of this taking effect might also have to be negotiated.

The Government should request a trusted individual to **review the procedures for public hearings** for environmental projects and to determine whether some reshaping is necessary to prevent non-involved parties from stalling actions.

2.2. Coastal and River Defenses

Actions are already being taken to address the potential impacts of climate change on some components of the water cycle. The risk for flooding is further increased by sea-level rise at the Belgian coast (Figure 2), i.e., 115 mm in Oostende (1951 – 2013), 81 mm in Nieuwpoort (1967 – 2013), and 42 mm in Zeebrugge (1979 – 2013), as 15% of the land surface in Flanders is less than 5 meters above the average sea level (VMM, 2015c). A plan to address coastal flooding up to a 1,000-year storm incorporates provisions to address expected climate change through the year 2050 or 2100 (as appropriate for the specific components), and initial efforts are underway to develop further defenses (K. Van den Berghe et al., 2014; Agentschap Maritieme Dienstverlening en Kust et al., 2014). Flanders has world-acknowledged private sector capabilities in this area, and their expertise should be brought into the analytical task. A successful, although slow and expensive, project in the Scheldt river has buttressed water defenses of Antwerp and surrounding areas.

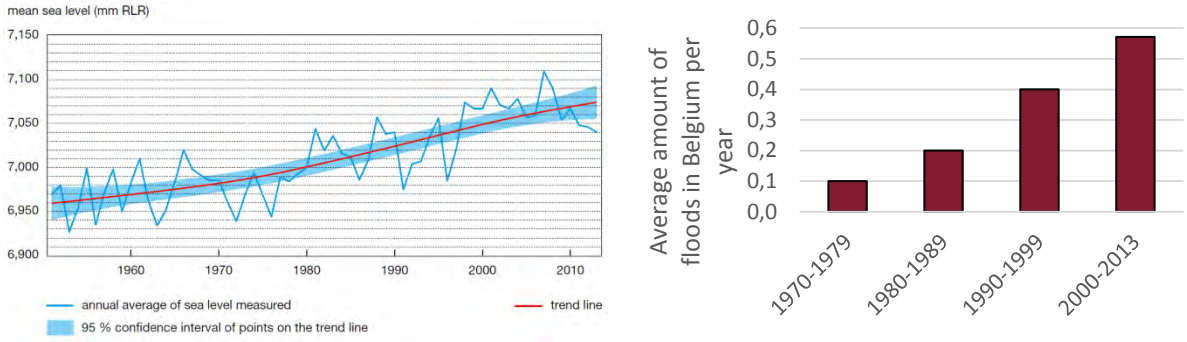

Figure 2: (left) Evolution of the mean sea level at the Belgian coast (Oostende, 1951 – 2013) (VMM, 2015c). (right) The average amount of floods in Belgium per year (VMM, 2014a).

Short and long term action is needed on coastal/river water safety:

- While a Coastal Defense plan exists and has been in implementation for some time, the **lack of public awareness** on options, current response, and risks needs to be remedied in the aforementioned communication work. An understanding of how 'building with nature', as opposed to dikes and dams, is being adopted around the world and should be included. The success of the Sigma project should be included in this effort.
- A **Multi Party Working Group** should be established with political representatives from as many parties as possible to inform all parties of the pros and cons of several possible approaches to protection, costs, domestic capabilities, and potential changes in order that the future government coalitions and their plans are well informed on this issue of vital importance to Flanders, and prepared to assume the financial costs associated with action.

3. IS FLANDERS WATER-SECURE: CAN SUFFICIENT WATER BE MADE AVAILABLE FOR DESIRED USES?

While Flanders possesses sufficient water resources (see below), these must be used wisely because high population density creates the potential for restricted water availability. Climate change will exacerbate this, as it is estimated that the severe droughts, such as that experienced in 1976, may become the norm in the future (H. Tabari et al., 2015a, 2015b). The significant impact of water availability on the Flemish economy is indicated by the fact that the number of employees working in the top 15% of industries, and consuming the largest volumes of water, account for 16.7% of all employees in Flanders. In other words, 1 out of 6 jobs in Flanders is directly interlinked with water (Vlakwa, 2013). Important industrial sectors are highly dependent on a reliable and robust water supply, including important chemical and food process industries and agriculture, and water-based transport of industrial goods is widely used.

Several elements of change are needed quite urgently to increase Flanders' water security. Economy and jobs are menaced by the serious drawdown of groundwater in some (but not all) areas, which, firstly, brings forth the need for stricter regulation involving minimizing drawdown as well as maximizing recharge. A report from the Rekenhof (a collateral institution of the parliament) shows that the water level in 14 out of 42 groundwater reservoirs in Flanders did not meet the European Framework Directive guidelines (2000/60/EG) in 2014 (Rekenhof, 2014). Secondly, the (sometimes related) real dangers of water shortage should be brought into focus and given resources and attention now. Thirdly, water-reuse regulations should be broadened and assess the required water-quality for a certain application, instead of the water-source (fit for purpose water quality standards). Even though Flanders announced (to the European Commission) intentions to spend € 60 million on grey-water projects, only about € 5 million was allocated to such projects by 2014. Only two out of nine proposed projects were selected, which further illustrates the need for a broadening of regulation (Rekenhof, 2014). Utilities and operators are competent but could do more with more policy space and less strictures which decrease initiative and profit opportunities. Finally, agreements with neighboring source countries should be considered.

Water quality is also compromised by past practices. Recent (i.e., 2014) data collected in accordance with the European Union Water Framework Directive indicate that none of the water bodies in Flanders are in 'good status', mainly due to a substandard biological and hydromorphological quality (VMM, 2014c). 80% do not comply with the requirements for macro-invertebrates, macrophytes, and phytobenthos, while only 12% are in 'good' or 'very good' hydromorphological status. More than 50% of groundwater bodies are reported to have poor chemical status (EEA, 2015). Agriculture is dominantly responsible for the high nutrient concentrations observed (i.e., for 61% of emitted nitrogen and 44% of emitted phosphorus (VMM (2015a). Due to the large surplus of nitrogen in agricultural soils (118 kg of nitrogen per hectare of land, corresponding to the 5th largest surplus of all member countries of the organization of economic co-operation and development (OECD) as shown in Figure 3 (OECD, 2015), the annual diffuse agricultural nitrogen emissions approach 100 kg per hectare of land area (EEA, 2010). Discharge of domestic wastewater was responsible for 73% of the biochemical and 44% of the chemical oxygen demand concentrations in surface waters in 2014 (VMM, 2015a). Substantial progress has been made in wastewater treatment as, while only one third of the domestic wastewater was actually treated in 1991 (Aquafin), it was substantially higher for most Flemish communities in 2014 (VMM, 2015b), averaging to, e.g., 73.3% in 2008 (VMM, 2013).

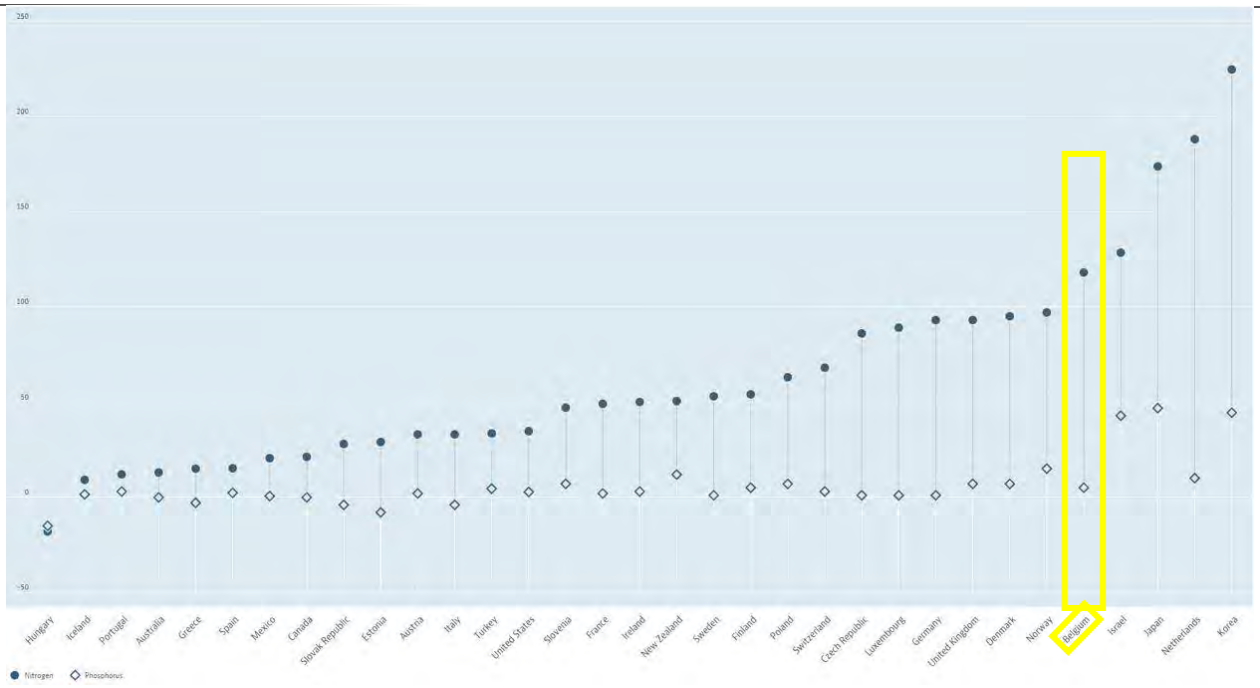

Figure 3: Nutrient surplus for all OECD countries, calculated as the difference between the nutrient inputs entering a farming system (mainly livestock manure and fertilizers) and the nutrient outputs leaving the system (the uptake of nutrients for crop and pasture production). Source: OECD (2015).

The following actions are suggested:

- **Water *shortage* must be monitored**. Shortage can be serious to a large part of the economy, even if it does not reach the level of a formal declaration of a state of *drought*. Shortage, which can be regional or sectoral (for example for transport in a canal or river), is not seen as a major monitored issue in water management, possibly because the last serious full drought was 40 years ago. However, current estimates suggest that the severe water shortage experienced in 1976 could become the future norm with the expected temperature rises. The adverse economic consequences for Flanders would be severe if this situation were to develop and justifies significant actions and investments to prevent it.
- Senior officials (e.g., CIW) should be charged (and financially enabled) to create analogous high quality data now existing for groundwater monitoring provided by VMM towards the purpose of flood modelling. There is a need to predict and warn water shortages.
- Serious and sustained programmes should be initiated in **groundwater areas where drawdown consistently exceeds uptake** (although *n*ot all aquifers are in this situation). Remedy should be sought for areas with groundwater deficits, in collaboration with utilities and industrial and agricultural users. Tailored solutions will be needed for individual situations. Aquifer storage and recovery, which is a common practice in many locations outside of Flanders, should be implemented where appropriate, along with restrictions on withdrawals to match recharge rates.
- A **national workshop on water re-use for all purposes** should be convened, and should take advantage of international expertise on groundwater re-charge.
- The Government should prepare for periods of shortage through prior decision on **restrictions and priorities for water availability** in times and areas of shortage, as is done in neighboring countries.

The CIW in the first instance would appear to have the capabilities to suggest a schedule for Ministerial attention.

- The Government should build on the positive and far seeing regulation which requires new houses and buildings to have rainwater harvesting facilities, and that these are used for indoor flushing. Why not **a campaign to extend this practice to existing houses and buildings in areas that experience water shortage**? Similarly, the public can be informed about and encouraged to pay a great deal more attention to infiltration.
- Flanders can stop missing out on important new developments in wastewater treatment such as energy saving and resource extraction.
    - Water, and the products which can be extracted from it, can be an essential component of the circular economy. While initial efforts to develop the components of such a system, such as the recovery of energy, phosphorus, and other materials, are being investigated, including initial pilots and demonstrations, barriers appear to exist to the broader integration of these components into the Flanders economy. The Government should commission a trusted individual or group to prepare a concise statement of the degree to which re-use of water and materials is permitted in the EU, and the current practices of a sample of EU member states. To the extent that EU regulations are constraining desirable practice, Flanders should make common cause with others for change.
    - OVAM offers an example of a high performing organization and entrepreneurial civil service for waste management to sustainable materials management. This example should be emulated for wastewater treatment, establishing performance standards and monitoring arrangements and allowing a more entrepreneurial approach to emerge.
- The two major rivers in Flanders are transboundary from both a Federal and international perspective. While some agreements exist to resolve transboundary water issues and water availability, others are lacking, for example concerning the Meuse which originates in France. This compromises important components of Flanders' water supply.

4. ARE FLANDERS WATER RESOURCES SUFFICIENT?

Water resources include not only physical resources, but human, financial, and governance resources.

4.1. Physical resources

While Flanders is a humid climate with abundant rainfall, it is also densely populated which results in a relatively low water resource per capita, as illustrated in Figure 4 (VMM, 2013). These further result in water challenges which are unique compared to other Northern European countries. Moreover, the two major rivers in Flanders are transboundary from both a Federal and international perspective. While some agreements exist to resolve transboundary water issues and water availability, others are lacking, for example concerning the Meuse which originates in France. Ground water is plentiful in some areas, declining in others; well managed in some places, less in others.

While this situation poses challenges for Flanders, proven approaches are readily available to address them. Numerous developed and prosperous societies around the world face significantly greater challenges than does Flanders but have applied a variety of approaches to achieve water security; Israel and Singapore representing two prime examples. These include water efficiency, rainwater harvesting,

water reclamation and reuse, and seawater desalination. Thus, the available physical resources do not prevent Flanders from achieving a water-secure future.

4.2. Human Resources

Flanders possesses an abundance of intellectual and professional resources for addressing the full range of water issues. These include well-known and highly capable university programs, a competent professional community, and capable professional organizations such as water utilities, government research organizations, and commercial enterprises. There are excellent long-term reports on virtually all of the issues covered in this paper.

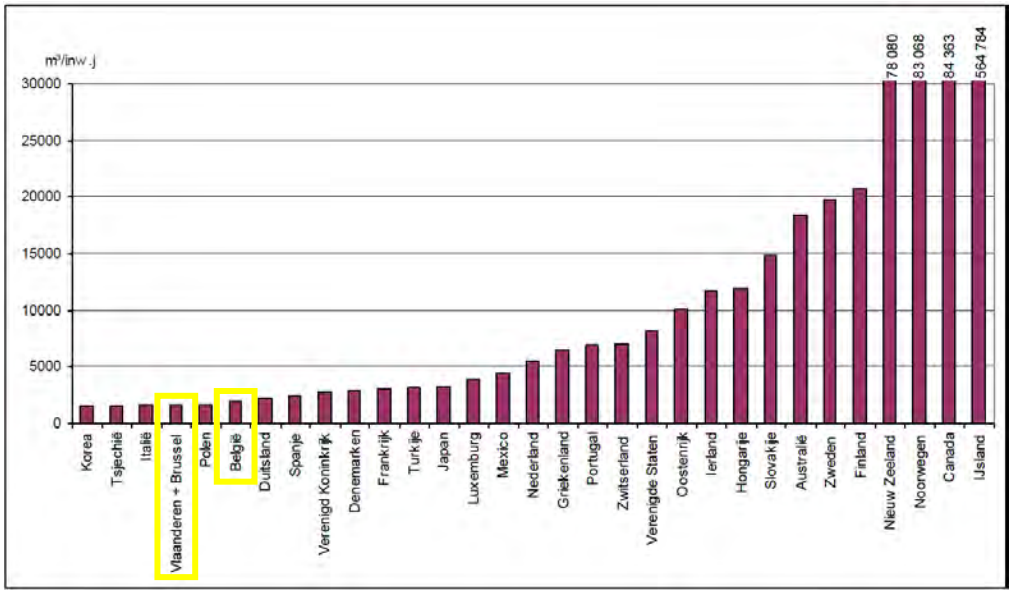

Figure 4: Water availability in the OECD countries. Source: (VMM, 2013).

The CIW is providing an important coordinating function between the various ministries and agencies responsible for various components of the Flanders water system. In particular, CIW is m

4.3. New Financial Resource Needs

This Report calls for additional resources for communication, for monitoring water shortages, and perhaps for financial incentives to move the 'advisory' notices on construction to 'prescriptive'. Some expenditure is needed now to establish the he suggested long-term political level work on coastal resources options. The infrastructure expenditures decided upon will be very costly, but with potential for shared expenditure and energy revenue which can be included in future decisions on major resources for coastal defenses and further river work.

The most important resource being sought is public time and attention on water management.

4.4. Governance Resources

The general public does not appear to appreciate the essential role water plays in the Flanders economy (OECD, 2011), in spite of the relative water scarcity which exists. This occurs, apparently, because water appears to the general public to be relatively available, and domestic water service is reliable.

There are many instances of more than adequate governance and management: the water utilities, etc., but the existing governance structure in Flanders is complex, includes many actors, and provides numerous opportunities for local self-interest to over-ride actions which can be of broader benefit. Some elements of this are not unusual in a democracy, but the general success of various water management measures vary. It appears that this issue exists to a certain extent due to incomplete understanding of program approaches and objectives, and of the actual status of specific projects. This unequal and incomplete understanding of objectives and status is an important barrier to developing consensus on the actual situation in Flanders and the most desirable path forward.

5. FINDINGS AND RECOMMENDATIONS

5.1. Findings

In summary, we find that Flanders possesses the necessary resources to secure a water-safe and water-secure future for its citizens. It possesses the physical, human, and financial resources to do so. Past approaches and practices must evolve, however, as Flanders is faced with a growing population, evolving economy and social structure, and climate change, as is every other region. The necessary changes to secure a water-safe and water-secure future are well within reach for Flanders, but the decision to make these changes must be taken and acted on.

We also find that, while the potential negative effects of climate change on water supply are quantified, few if any actions are apparent to prepare for and mitigate them. Flanders is acting to address the mandates of the European Union Water Framework Directive (WFD) and Flood Directive (FD). Progress on addressing flooding is apparent (as identified above), but Flanders' waterways largely do not comply with the objectives of the WFD. While progress is being made in the control of pollutant mass loadings from point sources (municipal and industrial), little progress is apparent from non-point sources, particularly agriculture. Thus, actions are necessary to secure a water-safe and water-secure-future. The suggestions of the Thinkers, some of which have already been introduced above, are listed below.

5.2. Recommendations

<u>An immediate set of actions to be implemented now:</u>

- Begin a **communication campaign** on Flanders Water Management, focused on challenges and roles to be played. Message should be "light" but purposeful (e.g., 'Hoog water zonder kater'). It should be designed to raise the level of awareness of the essential nature of water to the Flanders economy, to develop public support for change, and to encourage individual and household behavior consistent with flood protection and water harvesting objectives.
- Establish a **monitoring and early warning system for water shortages** (using existing data and the flood models and by reinforcing VMM personnel).
- Decide and announce what level of government will make decisions on water **allocations and water restrictions in times of shortage.**
- Establish an industry/government/utilities short term high level **Task Force to recommend changes now in order to replenish acquirers and groundwater**, drawing on the best existing models of international practice. Begin with shortage-prone areas.
- Announce a **campaign to encourage rooftop rainwater capture for external water** use (and a subsidy program for piping the water indoors for, e.g., toilet use).

- **For Coastal flooding** response **establish an all-party exercise** to inform on the prospects and potential remedial measures. The next Government should have as a priority the establishment of budget, and this should be discussed in a manner which shares available information and best practice as widely as possible across the political spectrum.
- Assemble the human and financial resources to begin work on a **Flanders Water Management Strategy**, to be carried forward in the next Plan (see immediately below).

A commitment now, backed by action, to lay a better foundation for future water management in Flanders:

These short-term actions should be coupled with the development of a commitment in principle to develop a **consensus vision for water in Flanders**, along with an **action plan for achieving it**. We call for development of a **Flanders Water Management Plan**, focused on ensuring a reliable, robust, and resilient water supply, coupled with protection against flooding. Midterm preparatory action would include budgetary provisions, and an agenda for development of the Plan. Action on **water governance** must be an **integral part of such a plan** and such an exercise. Consensus by all that we talked to was that the situation in Flanders significantly restricts available options and slows actions which appear to be quite beneficial. The attempt to get permission for action was described to us as 'nightmarish', and many interlocutors were of the strong view that the current situation in its complexity and overlapping nature, with so many levels, was a great deterrent to initiative and change. Not only is a plan needed, but it must be implemented. In essence we are recommending an on-going process, with development of the plan as only one component. Essential actions in support of this process include:

- A **consensus vision for water in Flanders**, along with an **action plan for achieving it**, must be developed. This vision and plan should build on the foundation provided by the existing human capital and institutional and physical infrastructure, but provide the basis for a secure water future for Flanders. The method to develop this vision, and the plan to achieve it, will require some level of institutional reform and agreement on institutional parties. The CIW is a logical institution to provide essential components to achieve this, but consideration should be given to other approaches as well.
- An **integrated approach** to increase the **resilience of the water supply system to water shortages and flooding** is needed. Important steps have been taken in this direction through the aggregation of formerly competing Departments into a single Ministry and Minister, and through the work done by CIW. Current vulnerabilities exist, however, and will only become more severe in response to population and economic growth and climate change.
- **Budgetary and plan provision** must be made now, and included in **broad based and effective communication**. Communication is needed to provide access to relevant information and to engage stakeholders and actors in the decision and implementation process. Communication with the general public is also necessary
- **Actions** necessary to implement such a plan must be **firmly anchored in government actions**, including **commitment of the necessary long-term funding**, going forward. It must be anchored in a manner which transcends multiple governments, as full realization of the steps necessary to ensure a safe and secure water future for Flanders will take considerable time. Consistent actions will be required over time, with focus on the social benefits that will result, rather than simply consideration of the cost.

- Finally, action on **water governance** must be an **integral part of such a plan** and such an exercise. The current situation in Flanders, which significantly restricts available options and slows actions which appear to be quite beneficial, must be addressed and resolved.

6. ACKNOWLEDGEMENTS

The three of us would like to thank the Royal Flemish Academy of Belgium for Science and the Arts (The Royal Flemish Academy) for inviting us to serve as Thinkers. We hope that we have contributed something to improved water management in Flanders to at least partially compensate for what we have learned. Moreover, the hospitality and openness to discussions shown by all has been truly extraordinary. We thank the Royal Flemish Academy for the excellent arrangements consistently provided. While there are too many to thank explicitly, we especially need to recognize Inez Dua of the Royal Flemish Academy for taking such good care of us, and Professor Willy Verstraete for inviting us.

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THE THINKERS

Margaret Catley-Carlson operates within Boards of Organizations focused on improved water resource management and agricultural productivity and rural development, serving with 20+ in the last decades. Now PAC Chair of the International Commission on Integrated Mountain Development (ICIMOD), Vice Chair Canadian Water Network Board, member Syngenta Foundation for Sustainable Development, International Fertilizer Development Council, International Food Policy Research Institute (IFPRI). She is a Patron/ past Chair Global Water Partnership, member of the Council of Advisors of the World Food Prize, Library of Alexandria in Egypt, and the Robert Daughterly Institute on Water for Food production. Jurist of the Tyler and Stockholm Water Prizes; President Canadian International Development Agency 1983-89; Deputy Executive Director UNICEF New York 1981-1983; President Population Council New York 1993-98; Deputy Minister Health and Welfare Canada 1989-92. Ms. Catley-Carlson has ten honorary degrees and is an Officer of the Order of Canada

Glen T. Daigger, Ph.D., P.E., BCEE, NAE is currently Professor of Engineering Practice at the University of Michigan and President and Founder of One Water Solutions, LLC, a water engineering and innovation firm. He previously served as Senior Vice President and Chief Technology Officer for CH2M HILL where he was employed for 35 years, as well as Professor and Chair of Environmental Systems Engineering at Clemson University. Actively engaged in the water profession through major projects, and as author or co-author of more than 100 technical papers, four books, and several technical manuals, he contributes to significantly advance practice within the water profession. Deeply involved in professional activities, he is currently Immediate Past President of the International Water Association (IWA). The recipient of numerous awards, including the Kappe, Freese, and Feng lectures and the Harrison Prescott Eddy, Morgan, and the Gascoigne Awards, he is a Distinguished Member of the American Society of Civil Engineers (ASCE), a Distinguished Fellow of IWA, and a Fellow of the Water Environment Federation (WEF). A member of a number of professional societies, Dr. Daigger is also a member of the U.S. National Academy of Engineers.

Caroline van Steendam is a PhD candidate, pursuing a degree in Environmental Engineering at the University of Michigan and in Chemical Engineering at the University of Leuven (KU Leuven, Belgium). Co-advised by Profs. Ilse Smets, Steven Skerlos, Lutgarde Raskin, she is spearheading a pilot-scale and bench-scale study to decrease impacts related to wastewater treatment by facilitating widespread implementation of anaerobic membrane bioreactors. To further support this endeavor, she is currently performing a life cycle assessment to identify the field in which this technology constitutes a more sustainable option than current alternatives. She was awarded with the '*TNAV prize: Best Thesis regarding Water and Sludge Technology*' for her Master's Thesis (Chemical Engineering, KU Leuven) and recently received the honor of becoming an ITiMS fellow (Integrated Training in Microbial Systems. As an officer for GrEENPEAS (a departmental organization aspiring to bring students and faculty closer together) and the outreach-officer for the Society of Women in Engineering (SWE) at the University of Michigan, she organizes many educational and engaging events for students of all ages.

Thinkers Program Water & Climate – Meetings & Activities

1. Meetings

June 8, 2015

Kick-off meeting Steering Committee

Present: Willy Verstraete (coördinator Denkersprogramma, KTW), Joos Vandewalle (bestuurder KTW), Erik Mathijs (KU Leuven), Willy Bauwens (VUB), Jeroen Buysse (UGent), Patrick Meire (UAntwerpen), Freddy Dumortier (vast secretaris KVAB), Bert Seghers (staff member), Inez Dua (staff member).

Sept 2, 2015

Meeting @Cabinet Minister Schauvliege

Present: Willy Verstraete, Karel Debeuf.

Sept 2, 2015

Meeting Steering Committee & Experts Group

Present: Willy Verstraete (coördinator), Willy Bauwens, Stan Beernaert, Jean Berlamont, Luc Bossyns, Jeroen Buysse, Frederik De Laender, Inez Dua, Erik Mathijs, Erik Matthijs, Patrick Meire, Marnick Vanclooster, Joos Vandewalle.

FACT FINDING WEEK I

Oct 26, 2015

Round table Agencies Flemish Government

Margaret	Catley-Carlson	Thinker-in-Residence
Glen	Daigger	Thinker-in-Residence
Piet	Desiere	Agentschap Ondernemen
Luc	Goeteyn	OVAM Openbare Vlaamse Afvalstoffenmaatschappij
Veerle	Lories	IWT
Erik	Mathijs	Stuurgroep DP Water & Klimaat
Erik	Matthijs	Stuurgroep DP Water & Klimaat
Patrick	Meire	Stuurgroep DP Water & Klimaat
Jeroen	Panis	ANB Agentschap voor Natuur en Bos
Dirk	Van der Stede	VLAKWA Vlaams Kenniscentrum Water
Caroline	Van Steendam	Assistant-thinker, University of Michigan / KU Leuven
Joos	Vandewalle	Stuurgroep DP Water & Klimaat
Marie	Verhassel	Departement Landbouw en Visserij
Willy	Verstraete	Stuurgroep DP Water & Klimaat

Oct 27, 2015

Round table Firms

Danny	Baeten	Aquafin
Jean	Berlamont	Expertengroep DP Water & Klimaat
Margaret	Catley-Carlson	Thinker-in-Residence
Glen	Daigger	Thinker-in-Residence

Geert	Dekegel	Vivaqua
Wendy	Francken	VLARIO overlegplatform
Christiane	Legros	Belgaqua
Boudewijn	Meesschaert	B-IWA
Ann	Nachtergaele	Fevia
Nathalie	Oosterlinck	DEME
Iris	Penninckx	Boerenbond
Baudouin	Ska	Febem
Boudewijn	Van De Steene	Watergroep
Patrick	Van den Bossche	Agoria
Erwin	Van San	PIDPA
Caroline	Van Steendam	Assistant-thinker, University of Michigan / KU Leuven
Johan	Verbauwhede	IWVA
Willy	Verstraete	Stuurgroep DP Water & Klimaat

Oct 28, 2015

Round table Universities & research institutes

Jan	Arends	Laboratory of Microbial Ecology and Technology (UGent)
Willy	Bauwens	Stuurgroep DP Water & Klimaat
Jean	Berlamont	Expertengroep DP Water & Klimaat
Ronny	Blust	SPHERE (UA)
Margaret	Catley-Carlson	Thinker-in-Residence
Glen	Daigger	Thinker-in-Residence
Mathieu	Depoorter	Laboratory of Hydrology and Water Management (UGent)
Jeroen	De Waegemaeker	ILVO
Ludo	Diels	ECOBE (UA)
Ludo	Gelders	Expertengroep DP Water & Klimaat
Dominique	Huits	Inagro
Patrick	Meire	Stuurgroep DP Water & Klimaat
Ingmar	Nopens	Centre Environmental Science and Technology (UGent)
Korneel	Rabaey	Laboratory of Microbial Ecology and Technology (UGent)
Jan	Seys	VLIZ Vlaams Instituut voor de Zee
Ilse	Smets	Expertengroep DP Water & Klimaat
Ann	van Griensven	HYDR (VUB)
Stijn	Van Hulle	LIWET - Laboratory of Industrial Water and Ecotechnology (UGent)
Caroline	Van Steendam	Assistant-thinker, University of Michigan / KU Leuven
Willy	Verstraete	Stuurgroep DP Water & Klimaat
Siegfried	Vlaeminck	Sustainable Energy, Air and Water Technology (UA)

Oct 28, 2015
Meeting Experts Group
Present: Willy Bauwens, Jean Berlamont, Luc Bossyns, Jeroen Buysse, Margaret Catley-Carlson, Glen Daigger, Greet De Gueldre, Inez Dua, Ludo Gelders, Caroline Van Steendam, Ronny Verhoeven, Willy Verstraete.

Meeting Thinkers @Cabinet Minister Muyters (Innovation, Science)

Meeting Thinkers @Cabinet Minister Schauvliege (Agriculture, Environment)

Oct 29, 2015
Round table NGO's

Joris	Blanckaert	IMDC International Marine & Dredging Consultants
Margaret	Catley-Carlson	Thinker-in-Residence
Glen	Daigger	Thinker-in-Residence
Frederik	De Laender	Stuurgroep DP Water & Klimaat
Erik	Mathijs	Stuurgroep DP Water & Klimaat
Jos	Peters	Royal HaskoningDHV
Wim	Van Gils	Natuurpunt
Katrien	Van Hooydonk	Protos
Julie	Van Houtryve	Klimaatcoalitie
Jan	Vannoppen	Velt
Caroline	Van Steendam	Assistant-thinker, University of Michigan / KU Leuven
Willy	Verstraete	Stuurgroep DP Water & Klimaat
Justine	Moonens	JNM (Jeugdbond voor Natuur en Milieu)

Oct 30, 2015
Meeting Thinkers @Cabinet Minister Weyts (Mobility, Public Works)

Meeting Thinkers with Marleen Van Steertegem (VMM) @Academy

Meeting Thinkers @Cabinet Minister Homans (Climate, Energy)

Closing meeting Steering Committee & Experts Group + Lecture Mark Saeys (UGent)
Present: Willy Verstraete (coördinator), Willy Bauwens, Jean Berlamont, Margaret Catley-Carlson, Glen Daigger, Inez Dua, Erik Mathijs, Patrick Meire, Mark Saeys, Ilse Smets, Marnick Vanclooster, Joos Vandewalle, Caroline Van Steendam, Ronny Verhoeven, Patrick Willems.

Dec 21, 2015
Meeting Experts Group
Present: Willy Verstraete (coördinator), Stan Beernaert, Jean Berlamont, Luc Bossyns, Jeroen Buysse, Inez Dua, Ludo Gelders, Erik Mathijs, Erik Matthijs, Patrick Meire, Marnick Vanclooster, Joos Vandewalle, Ivo Van Vaerenbergh en Patrick Willems.

Febr 15, 2016
Meeting Experts Group
Present: Willy Verstraete (coördinator); Stan Beernaert, Jean Berlamont, Luc Bossyns, Inez Dua, Ludo Gelders, Erik Matthijs, Ilse Smets, Ivo Van Vaerenbergh, Joos Vandewalle en Patrick Willems.

Febr 25, 2016
Meeting Tinne Rombouts @Flemish Parliament
Present: Erik Matthijs, Joos Vandewalle, Ivo Van Vaerenbergh, Willy Verstraete.

FACT FINDING WEEK II
March 7, 2016
Meeting Thinkers with Bruno Verbist (KLIMOS Department Forest, Nature & Agriculture) & Gert Verreet (EWI Department Research, FUST and UNESCO)

Meeting Thinkers with Jos Delbeke (European Commission, Director General for Climate Action) and Beatriz Yordi Aguirre (Head of Unit for Eco-innovation, EACI).

March 8, 2016
Meeting @CIW/VMM Aalst
Present: Ingeborg Barrez, Stan Beernaert, Jean Berlamont, Margaret Catley-Carlson, Glen Daigger, Robin De Smedt, Lieve De Roeck (secretaris CIW, VMM), Annick De Winter, Didier Dhont, Philippe D'Hondt (directeur-generaal VMM, voorzitter CIW), Inez Dua, Kris Van den Belt, Caroline Van Steendam, Marleen Van Steertegem, Willy Verstraete, Patrick Willems.

March 9, 2016
Meeting University Clusters UGent-UA & VUB-KUL @KU Leuven
Present: *Willy Bauwens, Jeroen Buysse, Margaret Catley-Carlson, Glen Daigger, Ilse Smets, Ronald Waterman, Patrick Willems, Caroline Van Steendam, Willy Verstraete, and international students from KU Leuven.*

March 10, 2016
Meeting De Watergroep + introduction Smart Water @Brussels
Present: Stan Beernaert, Jean Berlamont, Margaret Catley-Carlson, Glen Daigger, Ludo Gelders, Luc Keustermans, Caroline Van Steendam, Ivo Van Vaerenbergh, Willy Verstraete, Ronald Waterman.

March 10, 2016
Meeting Toon Verwaest (Waterbouwkundig laboratorium) @Borgerhout
Present: Jean Berlamont, Katleen Bernaerts, Glen Daigger, Frank Mostaert, Wouter Vannieuville, Caroline Van Steendam, Toon Verwaest.

Meeting Victor Dries
Present: Margaret Catley-Carlson, Willy Verstraete.

March 11, 2016

Meeting Thinkers with Erik Matthijs

Round table Ecosystem Services

Present: Michel Bocneau (VMM), Steven Broeckx (VITO), Jeroen Buysse, Margaret Catley-Carlson, Ann Cliquet (UGent), Greet De Gueldre (Aquafin), Erwin De Meyer (ANB), Frederik De Laender, Glen Daigger, Erik Mathijs (KULeuven), Patrick Meire (UA), Jeroen Panis (ANB), Jan Staes (UAntwerpen), Maarten Stevens (INBO), Anneloes Van Noordt (Ruimte Vlaanderen), Caroline Van Steendam, Jan Van Velk (VMM), Willy Verstraete.

March 11, 2016

Network Event + Lecture Thomas Van Waeyenberghe

Tahmina	Akter	IUPWARE, KU Leuven
Willy	Bauwens	Vrije Universiteit Brussel
Yolande	Berbers	KU Leuven, vicedecaan FirW
Murray	Biedler	Deep Blue Consultants
Luc	Bossyns	KVAB, Aquafin
Karl	Buttiens	ArcelorMittal
Jeroen	Buysse	UGent
Margaret	Catley-Carlson	Thinker-in-Residence
Glen	Daigger	Thinker-in-Residence
Erwin	De Meyer	Agentschap voor Natuur en Bos
Renaat	De Sutter	UGent
Jeroen	De Waegemaeker	Institute for Agricultural and Fisheries Research
Geert	Dekegel	VIVAQUA
Marc	Despiegelaere	Protos
Bart	Devos	GoodPlanet Belgium
Philippe	D'Hondt	Flanders Environment Agency
Victor	Dries	Kabinet Minister Homans
Ludo	Gelders	KVAB/Kuleuven
Greet	Keppens	Barco
Erik	Mathijs	KU Leuven
Boudewijn	Meesschaert	KU Leuven
Ann	Overmeire	Flanders' Maritime Cluster
Jeroen	Panis	Agency for Nature and Forests
Iris	Penninckx	Boerenbond
Ludo	Rochette	FBS Foriegn Affairs & development Cooperation
Jan	Staes	UAntwerpen
Maarten	Stevens	Research Institute for Nature and Forest (INBO)
Rudy	Swennen	KU Leuven
Wim	Van Gils	Natuurpunt
Anneloes	van Noordt	Spatial Development Department Flanders
Caroline	Van Steendam	Assistant-thinker, University of Michigan / KU Leuven
Guido	Van Steendam	KU Leuven, HIW

Thomas	Van Waeyenberghe	AquaFed
Marnik	Vanclooster	UCL
Joos	Vandewalle	KVAB, KU Leuven
Jan	Vanvelk	Vlaamse Milieumaatschappij / Bekkensecretariaat Demerbekken
Jan	Verheeke	Minaraad
Willy	Verstraete	KVAB, UGent
Ronald	Waterman	Building With Nature
Patrick	Willems	KU Leuven

2. Activities

Oct 27, 2015
Field visit Thinkers @IWVA Oostduinkerke & farm Oudekapelle

Oct 29, 2015
Field visit Thinkers @Sigmaplan Rupelmonde

March 8, 2016
Field visit Thinkers @DEME Zwijndrecht (Coastal Safety, Vlaamse Baaien)

March 9, 2016
Field visit Thinkers @VMM Leuven – projects: Waterinfo.be, Egenhoven, Vaartkom

March 11, 2016
Field visit Thinkers @Aquafin – RWZI Antwerp-South