



Urban Management Tools for Climate Change (UMTCC)

Course Handbook
June 11 – June 29, 2018

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1. Introduction

Welcome to the IHS executive course in Urban Management Tools for Climate Change (UMTCC). This handbook presents the contents and structure of the course.

All over the world, cities are increasingly expected to undertake concrete actions to adapt to natural disasters and climate hazards (such as sea level rise, floods, and droughts) exacerbated by climate change and climate variability. On the other hand, they also need to plan and implement low emissions development strategies supporting national plans and contributing to climate change mitigation while generating other multiple local benefits. What concrete activities should cities undertake? What kind of tools can urban professionals and municipality officials use in order to make decisions about their course of actions, develop, and implement local climate change action plans?

The Urban Management Tools for Climate Change course (UMTCC) offers the opportunity to national and local urban policy makers, municipality officials, planners, and lecturers in the field of climate and environmental management to gain knowledge of cities vulnerability and its linkages with other human factors exacerbating climate stresses, such as land use management and spatial planning decisions. The course showcases varied examples of cities' strategies to adapt and mitigate climate change, through lectures and discussions, gaming, analysis of data inventories, and group exercises built on decision-making and climate change action planning.

2. Overall Course Objectives

By the end of this course, participants will:

- Get familiar with the international climate change policy context;
- Have acquired knowledge of the 'state of the art' on climate vulnerability, climate adaptation and resilience, and low carbon emission development;
- Understand who is vulnerable and why, and the role of local actors as one of the building blocks of resilience;
- Understand the complexity of governing climate adaptation projects, and how cities are mainstreaming climate change into their development planning;
- Be able to apply strategies for different typologies of climate change adaptation and mitigation measures;
- Have acquired knowledge to analyse sectoral approaches to climate adaptation and mitigation;
- Have reflected on different low carbon urban development options;
- Be able to apply key components of climate change planning with specific attention to vulnerability assessment, GHG emission inventories, climate actions prioritisation, and climate change action planning; and
- Be familiar with Rotterdam's Climate Change Initiative, its ability to reduce GHGs emissions as well as adapt to the impacts of climate change in the city.

3. Course Curriculum

The course introduces climate change as an integral part of sustainability and resilience, highlighting its impacts as well as main mitigation and adaptation measures. The course consists of 3 modules as follows:

- 1) Climate Vulnerability, Adaptation and Resilience;
- 2) Climate Mitigation and Low Carbon Urban Development;
- 3) Climate Change Action Planning.

3.1 Module 1: Climate Vulnerability, Adaptation and Resilience

Module 1 focuses on the role of cities in confronting local climate variability and extreme weather events. It introduces adaptation approaches to a series of climatic impacts, such as riverine, coastal flooding, and water scarcity. Combined with under-investments in critical infrastructure and rapid urbanisation, such impacts can lead to increased vulnerability of people and economic assets. Throughout the module, aspects of governance of adaptation are covered. On the one hand, adaptation depends on the formulation and implementation of strategies depending on information derived from scientific insights with large uncertainty and time spans. On the other hand, it requires the ability to adjust adaptation to the demands of diverse institutional contexts, where strategies are formulated, planned, and implemented. Therefore, we need to have local and national governance that is committed, informed, coordinated, and that has the resources needed in place. The challenges and opportunities to achieve this are discussed.

The module begins by introducing climate change planning and the Vulnerability Assessment as a relevant process to identify people and assets exposed to climate-related events while, at the same time, contributing to raise awareness about climate change. The outcomes of the assessment are used to justify and inform the choice of adaptation measures for reducing the vulnerability of areas, people, and assets. The module also explores the cost-effectiveness of adaptation measures and presents instruments for risk sensitive land management and governance.

Further, the course focuses on adaptation strategies that build on water management, covering concepts and practical examples of integrated water management and engaging in serious games on Climate Delta and Sustainable Delta Planning.

Finally, participants understand how urban agriculture and ecosystem services contribute to disaster risk reduction and adaptation to climate change by reducing runoff, keeping floodplains free from construction, reducing urban temperatures, and capturing dust and CO₂. Growing fresh food close to consumers also reduces energy spent in transport, cooling, processing, and packaging, while reusing urban organic waste, and wastewater (and the nutrients these contain) reduces methane emissions from landfills and energy use in fertilizer production.

During the course, and throughout site visits, participants are also offered the opportunity to learn about the 'Rotterdam Climate Proof programme' and its relevant adaptation measures and initiatives implemented in the city, for instance 'Future Land' in the developing port of Rotterdam. Furthermore, a site visit is scheduled at the largest European urban rooftop farm 'the DakAkker', as part of the adaptation of urban food production in the city.

In summary, Module 1 includes three field visits and covers the following issues:

- Climate Change Adaptation in Cities
- Planning for Climate Adaptation and City Vulnerability Assessment
- Cost-Effectiveness of Adaptation Measures
- Multi-level Governance for Adaptation
- Urban Food Production
- Planning and Implementing Floating Houses

- Ecosystem services and Climate Change
- Adaptation Approaches: Integrated Water Management
- Adaptation Approaches: GIS tool for Climate Vulnerability Assessment
- Adaptation and Gaming: Climate Game Delft
- Adaptation and gaming: Sustainable Delta Planning
- The Rotterdam Climate Proof Programme

3.2 Module 2: Climate Mitigation and Low Carbon Urban Development

Module 2 focuses on strategies cities can implement to reduce greenhouse gases (GHGs) emissions, and how these mitigation measures present both local and global benefits. At first, the module explains how GHGs emission inventories are built through the hands-on experience of using Carbonn Cities Climate Registry (cCCR), the world leading reporting platform where cities self-report greenhouse gases emissions, reduction targets, accomplishments, and mitigation measures.

The concepts of climate mitigation financing and circular economy are presented through reflections on current city strategies and designs, and by addressing the key economic arguments surrounding this notion. For instance, the Dutch consultancy Climate Focus will elucidate different financing options for reducing CO₂ emissions, including but not limited to tradable emission permits under the Flexible Mechanisms of the Kyoto Protocol. The latter became a lucrative business for ‘green’ and ‘clean’ cities, but in recent years the price of carbon emission reduction credits dropped, and other financial markets/aid based or voluntary offsetting mechanisms are growing as alternative, or in parallel to, UNFCCC’s Kyoto Protocol mechanisms.

A large part of the module is dedicated to mitigation approaches in cities. For instance, different options for low carbon and efficient energy pathways and their implications for city planning will be assessed through the climate game developed by Dutch-based StrateGis. A key strategy for Low Carbon Cities is integrating low carbon development into traditional urban planning; this is the main expertise of one of our partners, the European Academy of Bozen’s Institute for Renewable Energy (EURAC).

Finally, a real-life example of energy efficiency innovations from the city of Milan is presented as an integral part of Smart Cities planning, which provides insights on how to reduce consumption of resources and to commit to a low carbon strategy for mitigating climate impacts. This is comprised in the mission of the Italian-based start-up Climalia. Further notions are presented on the climate action planning process conducted by cities, with special focus on the development of GHGs emissions inventories, implementation of plans, and target achievement. The integration of the mitigation agenda into the urban form is also explored.

In summary, Module 2 covers the following issues:

- Climate Mitigation and GHGs Emission Inventories
- Climate Mitigation Financing and Circular Economy
- Energy and Climate Mitigation in Rotterdam
- Sustainable Energy Planning
- Smart Cities for Energy Efficiency
- Climate action planning and target setting
- Mitigation and Gaming: Strategies Urban Development Role Play Game

3.3 Module 3: Climate Change Action Planning

Module 3 will translate strategies for mitigation and adaptation into concrete actions that are based on the review of city vulnerability assessments, and mitigation and adaptation assessments considering the capacity (and limits) of urban centres to respond to climate change. What should city climate change plans address? How are cities mainstreaming climate change into their city development planning? What can policy planning do in general terms, and more specifically, to address mitigation and adaptation challenges? Module 3 will address some case studies where cities are playing a principal role in developing a Local Climate Change Action Plan. As a final exercise, participants will be asked to develop a Local Climate Change Action Plan for a specific city, based on the mitigation and adaptation actions prioritised during previous exercises.

Current methodologies for decision-making and planning for climate change will be presented with a focus on practical applications of the IHS CLIMACT Prio Tool for guiding and structuring stakeholders' decisions regarding possible climate change actions in cities.

Finally, Module 3 will consist of a final walking tour that recaps the 'Rotterdam Climate Proof' themes addressed throughout Module 1 on vulnerability, adaptation and resilience. This is scheduled in collaboration with Rotterdam Municipality.

In summary, Module 3 includes a field visit and covers the following issues:

- Prioritisation of Climate Adaptation and Mitigation Actions
- Local Climate Change Action Plans
- Planning for Climate Resilient Cities
- The Rotterdam Climate Proof Programme

4. Training Methodology

The course blends lecturing and discussion formats, serious gaming, analysis of data inventories, and exercises built on decision-making and action planning. Participants will be engaged a lot in group work. In this regard, participants will be involved in the following activities:

- Analysis of data for GHG emissions inventory, vulnerability assessment, climate change prioritisation, the online Carbon Registry, and a repository of climate technologies and actions, the Climate TechWiki;
- Serious gaming;
- Review of literature about urban management tools for climate change;
- Organised field trips, which include:
 - The Maeslantkering, the Netherlands' impressive storm surge barrier;
 - The extension of Rotterdam's port (Future Land);
 - The largest urban rooftop-farm in Europe, the DakAkker; and
 - A tour of some of Rotterdam's climate adaptation interventions
- Analysis and discussion about case studies

From the onset, participants will apply theory and best practices to actual group work. Local Climate Change Action Plans for specific case study cities will include adaptation and mitigation actions in line with findings from vulnerability assessments and GHG emissions inventories. Actions will be part of a concrete plan detailing visions, objectives, stakeholders' roles and responsibilities, financial arrangements and time schedule.

5. Resources

The resources used during the course are the following:

5.1 CLIMACT Prio Tool

The Climate Actions Prioritization (CLIMACT Prio) tool, developed by IHS, is a climate decision support and capacity building tool for the prioritisation and assessment of climate mitigation and/or adaptation actions at a local level. CLIMACT Prio tool applies a multi-criteria approach to assist decision-makers and urban planners to identify a wide range of decision criteria and set objectives to assess and prioritize climate actions and technologies. Participants will have the chance to apply this tool during group exercises.

5.2 Planning for Climate Change Guide

The United Nations Human Settlements Programme (UN-HABITAT) developed this guide for city planners and other allied professionals to better understand, assess, and take action on climate change at the local level. While climate change is a global issue, this guide is specifically intended for urban communities in low and middle-income countries where the challenges are unique and the human stakes of planning for climate change are particularly high.

5.3 Carbonn Cities Climate Registry (cCCR) platform

The carbonn[®] Climate Registry (cCR) is the world's leading reporting platform to enhance transparency, accountability and credibility of climate action by local and subnational governments. It is designated as the central repository of the Compact of Mayors, launched at the Climate Summit 2014. The carbonn[®] Climate Registry is designed as the global response of local and subnational governments towards Measurable, Reportable and Verifiable (MRV) climate action. Through numerous partnerships on political commitments, capacity building and regarding schemes, the cCR has become the world's leading reporting platform to enhance global transparency and accountability of local and subnational governments' climate action.

5.4 Repositories of climate actions

Climate TechWiki offers a platform for a wide range of stakeholders in developed and developing countries, who are involved in technology transfer and the wider context of low emission and low vulnerability development. Climate Tech-Wiki offers detailed information on a broad set of mitigation and adaptation technologies and actions. Participants will also have the chance to use this online database in combination with the CLIMACT Prio tool and the Planning for climate change guide of UN-Habitat. <http://www.climatetechwiki.org/>

Participants may also use the *Solutions Gateway Platform* from ICLEI and UN-Habitat: <http://www.solutions-gateway.org/>

6. Participants' presentations

The purpose of preparing presentations for the course is to allow the participants to contribute directly with their own experience and, in particular, to do so with their fellow colleagues in the course as well as the lecturers. For this reason, we ask each participant to present a case study of a project/programme you have worked on in the field of climate change. The date and time for participants' presentation will be indicated in the course schedule.

Please develop the presentation taking into consideration the following:

Format: oral presentation - use of Powerpoint or other instruments is possible and optional

Duration of the presentation: 10 minutes

Questions & Answers: 5 minutes

We advise you to **prepare the presentation before the start of the course.**

7. Participants

The course is meant for professionals of local or national governments, representatives of private sector organisations and employees of NGOs and Universities that are dealing, or will deal with, climate change related issues, actions, projects and policies. The list of participants follows below.

Name	Country	Company/Institution	Position
Alvin Penaranda, Principe	Philippines	Development Academy Of The Philippines, Center for Governance	Fellow 1
Armand Nicod-am, Camhol	Philippines	University of the Philippines Population Institute	University Researcher II
Bashir Olufemi, Odufuwa	Nigeria	Olabisi Onabanjo University, Urban & Regional Planning	Senior Lecturer
Chikaodili Arinze, Orakwue	Nigeria	Institute for Peace and Conflict Resolution, External Conflict Prevention and Resolution	Senior Research Fellow
Frances Ifeoma, Ukonze	Nigeria	University of Nigeria - Nsukka Campus	Graduate Assistant
Hadiza Kabiru, Mado	Nigeria	Ahmadu Bello University Zaria, Urban and Regional planning	Lecturer II
Illuminado Jr., Quinto	Philippines	University of Mindanao, College of Architecture and Fine Arts Education	Dean
Janet, Lumayag	Philippines	Social Housing Finance Corporation (SHFC), Office of the President	Chairperson
Larytha Kayrona, Fletcher	Jamaica		Urban and Regional Planner
Osama Mohamed Elsaid, Omar	Egypt		Assistant University
Piyapong, Janmaimool	Thailand		
Roland, Nassour	Lebanon		
Ronard, Mukuye	Uganda		
Yakubu, Bununu	Nigeria	Ahmadu Bello University, Department of Building	Lecturer

8. Lecturers

The lecturers and trainers who contribute to the course are professionals working in academia, international organisations, research institutes, municipal authorities and consultancies in the field of climate change. We are pleased to announce this year's contributors:

Lecturer	Institution	Profile
Taslim Alade	IHS (The Netherlands)	https://www.egsh.eur.nl/people/taslim-alade/
Claudio Aciocly	UN-HABITAT (Kenya)	https://nl.linkedin.com/in/claudio-aciocly-b6708b47 ; http://www.claudioaciocly.com/
Anthony Bigio	George Washington University (Washington D.C., United States of America)	https://www.linkedin.com/in/anthony-gad-bigio-5779718
Eveline Bronsdijk	Rotterdam Climate Proof (The Netherlands)	https://www.linkedin.com/in/eveline-bronsdijk-55009014?ppe=1
Marcin Dabrowski	Delft University of Technology (The Netherlands)	https://www.tudelft.nl/staff/m.m.dabrowski/
Barbara Dal Bo Zanon	DeltaSync (The Netherlands)	https://www.linkedin.com/in/barbara-dal-bo-zanon-4003893a/?ppe=1
Elena Marie Enseñado	IHS (The Netherlands)	https://www.ihs.nl/en/about/ihs-staff/ihs-academic-staff/elena-marie-ensenado
Luciana Freitas Ezequiel	ArchUrb Company (The Netherlands)	https://www.linkedin.com/in/luciana-freitas-ezequiel-69120b2b/?ppe=1
Alberto Gianoli	IHS (The Netherlands)	https://www.ihs.nl/en/about/ihs-staff/ihs-academic-staff/alberto-gianoli
Stelios Grafakos	IHS (The Netherlands)	https://www.ihs.nl/about_ihs/ihs_staff/ihs_academic_staff/stelios_grafakos/
Jen Heemann	IHS (The Netherlands)	https://www.ihs.nl/en/about/ihs-staff/ihs-academic-staff/jen-heemann
Hansje Hooghiemstra	Tygron (The Netherlands)	https://www.linkedin.com/in/hansje-hooghiemstra-19121946/?ppe=1
Jelmer Hoogzaad	Climate Focus (The Netherlands)	http://www.climatefocus.com/team/jelmer-hoogzaad
Carla Mariño	ICLEI (Germany)	http://www.iclei.org/about/management/iclei-ws-staff.html
Piero Pelizzaro	Climalia (Italy)	https://www.linkedin.com/in/pieropelizzaro/en?ppe=1
Paul Rabé	IHS (The Netherlands)	https://www.ihs.nl/en/about/ihs-staff/ihs-academic-staff/paul-rabe
Kathryn Roscoe	Deltares (The Netherlands)	https://www.linkedin.com/in/kathrynroscoe
Bert Smolders	Arcadis (The Netherlands)	https://www.linkedin.com/in/bert-smolders-63b99519/?ppe=1
Nico Tillie	Delft University of Technology (The Netherlands)	https://www.linkedin.com/in/nico-tillie-77672114/?ppe=1
Marco van Hoek	Strategis (The Netherlands)	http://www.strategisgroep.nl/en/about/people/
René van Veenhuizen	Resource Centre on Urban Agriculture and Food Security (RUAFA) (The Netherlands)	https://www.linkedin.com/in/rene-van-veenhuizen-3ba5811a?ppe=1

Daniele Vettorato	European Academy of Bozen/Bolzano (EURAC) (Italy)	http://www.eurac.edu/en/research/technologies/renewableenergy/staff/Pages/staffdetails.aspx?persId=21703
Andy Warren	Deltares (The Netherlands)	https://www.deltares.nl/en/contactperson/andrew-warren/
Sharon Welsh	IHS (The Netherlands)	https://www.ihs.nl/en/about/ihs-staff/ihs-support-staff/sharon-welsh

9. Schedule

Lecture
 Workshop
 Game
 Excursion
 Participants' presentation

CLIMATE VULNERABILITY, ADAPTATION AND RESILIENCE						
Time	Monday 11 June	Tuesday 12 June	Wednesday 13 June	Thursday 14 June	Friday 15 June	
Week 1	09.00-10.30	Opening (Kees van Roojen, IHS Director)	Planning for climate adaptation (E. Ensenado, IHS)	Introduction to Climate Adaptation and Decision Support Tools (E. Ensenado, IHS)	Integrated Water Management (B. Smolders, Arcadis)	Site visit at the Maeslantkering storm surge barrier
	11.00-12.30	Introduction to the programme (S. Grafakos, IHS)	City Vulnerability Assessment (E. Ensenado, IHS)	Cost-Effectiveness of adaptation action: the case of HCMC, Vietnam (A. Gianoli, IHS)		
	13.30-15.00	Information on library use, other practical issues (S. Welsh)	GIS for Climate Vulnerability Assessment (Taslim Alade, IHS)	Multi-level Governance for Climate Change in Delta Urban Regions (M. Dabrowski, TU Delft)	Climate Game Delft (H. Hooghiemstra, Tygron)	Site visit at Future Land, Rotterdam port
	15.30-17.00	Climate Change and Cities (S. Grafakos, IHS)		Urban land and CC: instruments for risk sensitive land management and governance (P. Rabe)		

Lecture
 Workshop
 Game
 Excursion
 Participants' presentation

		CLIMATE VULNERABILITY, ADAPTATION AND RESILIENCE			CLIMATE MITIGATION AND LOW CARBON URBAN DEVELOPMENT, NCE	
Week 2	Time	Monday 18 June	Tuesday 19 June	Wednesday 20 June	Thursday 21 June	Friday 22 June
	09.00-10.30	Sustainable Delta Game (A. Warren - K. Roscoe, Deltares)	DakAkker rooftop garden (W. Bauman – R. van Katwijk)	Introduction to Climate Mitigation and GHG inventories (C. Marino, ICLEI)	Participants' presentations (2)	Sustainable Energy Planning in Cities (D. Vettorato, EURAC)
	11.00-12.30				Strategies Urban Development Role Play Game (M. van Hoek, StrateGis)	Milan Lighthouse smart city for better energy efficiency (P. Pelizzaro, Climalia)
	13.30-15.00	100 Resilient Cities - Turin AND Milan (P. Pelizzaro, Climalia)	Planning and implementing floating houses as an adaptation measure in the Netherlands (B. Dal Bo Zanon, Deltasync)	Climate Mitigation Financing and Circular Economy (J. Hoogzaad, Climate Focus)	Strategies Urban Development Role Play Game (M. van Hoek, StrateGis)	Cities and Climate Change: from commitment to action (J. Heemann, IHS)
	15.30-17.00	Climate Change and Urban Food Production (R. van Veenhuizen, RUAf)	Ecosystem services and climate change adaptation (L. Ezequiel)	Participants' presentations (1)	Energy and Climate Mitigation in Rotterdam (N. Tillie, Delft University of Technology)	Participants' presentations (3)
					Participants' presentations (2)	

Lecture
 Workshop
 Game
 Excursion
 Participants' presentation

		CLIMATE MITIGATION AND LOW CARBON URBAN DEVELOPMENT		CLIMATE CHANGE ACTION PLANNING		
		Monday 25 June	Tuesday 26 June	Wednesday 27 June	Thursday 28 June	Friday 29 June
Week 3	09.00-10.30	Urban form and climate mitigation (A. Bigio, GWU)	Rotterdam Climate Proof guided walking tour (Rotterdam Municipality)	Group exercise on prioritization of mitigation actions	Planning for Climate Change (C. Alcioly, UN-HABITAT)	UN-HABITAT intervention (C. Acioly, UN-HABITAT)
	11.00-12.30	Introduction to CLIMACT Prio tool and exercise (E. Ensenado, S. Grafakos, J. Heemann, IHS)	Group work on prioritizing adaptation actions		Local CC action plans - exercise	Final presentation of participants
	13.30-15.00	Group work on prioritizing adaptation actions	Intro to Mitigation + Group exercise on prioritization of mitigation actions	Local CC action plans - exercise		
	15.30-17.00					Course Evaluation & Closing ceremony

10. Miscellaneous

10.1 Contract

During the introduction programme of the course, all participants will receive a contract in duplicate. One signed copy of this contract has to be returned to Annette van Engen, Head Course Bureau, in the first week of the course.

10.2 Computer Use /Equipment

For the preparation of assignments and the hands-on sessions, IHS has computer facilities available and supporting the use of personal computers during the course period. Though a short introduction to the computers will be part of the introduction programme, skills in computer use will be an advantage.

The following software is available at IHS:

- Word 2000 Text processing
- Excel 2000 Spreadsheet
- PowerPoint 2000 Presentation programme
- Chrome/Firefox browsers

All computers have access to Internet.

Most types of conversion are possible. If you are not sure whether you can use certain software, please contact IHS before the beginning of the course.

Software provided by IHS can be used on any of the personal computers available to participants. All computers are connected to a NOVELL network. Laser printers are at your disposal in the network. Digital data will be checked for the presence of viruses. You will not be allowed to copy your own software onto the computers connected to the network, or copy software from the network.

If you have access to a laptop computer please bring it with you.

10.3. Participation in Monitoring and Evaluation

In any educational institute, there is a need for feedback from participants to staff, especially when those involved are all professionals. We attempt to achieve this in the introduction programme of the course, where expectations are discussed, and during the evaluation process at the end of the course.

In order to appreciate your views on the administrative and training aspects of the course, we welcome suggestions and criticism.

10.4 Rules of Attendance

Responsibility for the process of learning is with the participants themselves. For a number of pragmatic reasons, but even more for the participant's performance appraisal system, a 100% presence during scheduled classroom/module sessions is required. Only with permission of the Course Coordinator may leave be granted. This leave, for special reasons only including sickness, may not exceed 5 working days. If these rules of attendance are violated, no diploma can be granted; rather only a Certificate of Attendance can be given. In case of violating this rule on purpose, a formal warning letter should inform the participant that no diploma or certificate would be granted. This rule is based in the aims and methods of learning of the present course.

11. Appraisal system

The policy of the Board of IHS requires the staff to appraise the performance of all participants and to communicate this assessment to each participant. For the post-graduate diploma course the staff has adopted a system of appraisal that takes into consideration the varying backgrounds, professional training and experience of participants.

Participants are appraised on their active participation, as well as understanding and application of theories in the course's assignments.

Participants whose work did not meet the standards established by the staff for the award of a post-graduate diploma, but who have completed most of the required work in the course, are awarded with a Certificate of Attendance. Participants who did not complete, or were absent from, one or more elements of the course do not receive an award.

Participants are appraised on their course performance and contribution to work sessions, on quality of work shown in papers, exercises and individual and/or group assignments.

The final overall assessment will be given by:

- Participation in class: 20%
- Participation in discussions and group work: 20%
- Final group work presentations: 60%

Successful students are awarded with a post-graduate diploma in Urban Management Tools for Climate Change.

12. Awards

Based on its appraisal, the staff may choose to issue one of the following awards:

- Postgraduate diploma for participants who have successfully completed the 3-weeks course;
- Certificate of attendance, for participants whose work does not meet the standards established by the staff for the award of a post-graduate diploma/certificate, but who have completed most of the required work in the course;
- No award, for participants who have not completed or were exempted from one or more elements of the course.

The award is a matter of public record and is communicated to the participant and his/her employer. In addition, each participant will be given a 'fact sheet', in which the title and duration of the course and the course elements followed by the participant, as well as other relevant data, are recorded.

13. Questions and information

In case you have any questions related to this course handbook while preparing yourself for the course, please contact the course bureau or our support person.

- General phone-number IHS: +31 10 4089825
- General fax-number IHS: +31 10 4089826
- Educational Management Office: René van der Zwet (vanderzwet@ihs.nl) - P: +31(0)10408 9856)
- Course support: Giulia Viero (viero@ihs.nl)
- Coordinators: Stelios Grafakos (s.grafakos@ihs.nl) and Jen Heemann (heemann@ihs.nl)

14. Literature

The following literature is meant to support the learning experience throughout the course, in line with the outlined content and objectives.

14.1 Module 1: Climate Vulnerability, Adaptation and Resilience

Literature and resources on Climate Vulnerability

- 1 Alam, M., Rabbani, Md. G., (2007). Vulnerabilities and Responses to Climate Change for Dhaka. *Environment and Urbanization*, Vol. 19, 81-97. Available at: http://www.researchgate.net/profile/Rabbani/publication/251165788_Climate_Change_Implications_for_Dhaka_City_A_Need_for_Immediate_Measures_to_Reduce_Vulnerability/links/0c96051f0fb76aa569000000.pdf
- 2 Boateng (2012) GIS assessment of coastal vulnerability to climate change and coastal adaptation planning in Vietnam. *Journal of Coastal Conservation* Vol.16(1):25-36 Available at: <http://link.springer.com/article/10.1007%2Fs11852-011-0165-0>
- 3 Brooks, N. (2003). Vulnerability, risk and adaptation: A conceptual framework. Tyndall Centre for Climate Change Research. Working Paper 38. Available at: <http://www.tyndall.ac.uk/sites/default/files/wp38.pdf>
- 4 Dodman, D. (2009). Blaming cities for climate change? An Analysis of Urban Greenhouse gas emission inventories. *Environment & Urbanization*, Vol. 21 (1), 185-201. Available at: <http://eau.sagepub.com/content/21/1/185.full.pdf+html>
- 5 Few, R. (2003). Flooding, vulnerability and coping strategies: local responses to a global threat. *Progress in Development Studies*, Vol. 3, 43-58. Available at: <http://pdj.sagepub.com/content/3/1/43.short?rss=1&ssource=mfr>
- 6 Friend, R., Moench, M., (2013). What is the purpose of urban climate resilience? Implications for addressing poverty and vulnerability. *Urban Climate* 6, 98-113. Available at: <http://www.sciencedirect.com/science/article/pii/S2212095513000394>
- 7 Fussel, M., Klein, R. (2006). Climate change vulnerability assessments: an evolution of conceptual thinking. *Climatic Change* 75, 301–329. Available at: <http://www.springerlink.com/content/4j2039u68u0466l8/fulltext.pdf>
- 8 Godfrey, N., Savage, R. (2012). Future proofing cities: risks and opportunities for inclusive urban growth in developing countries. *Atkins Epsom*, 188. Available at: http://futureproofingcities.com/downloads/Executive_Summary_Online_Hi-Res.pdf?dl=1
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