BLOXHUB Summer School
Urban Resilience

12- 19 September 2019 I Copenhagen Denmark

Organizers

SDU University of Southern Denmark

BUILD AALBORG UNIVERSITET

BLOXHUB

Partners

UN-HABITAT FOR A BETTER URBAN FUTURE

UNDRR UN Office for Disaster Risk Reduction

ICLEI Local Governments for Sustainability

recnet.

WWF

TU Delft BK Bouwkunde

Università Iuav di Venezia

Naciones Unidas Organización Educativa, Científica y Cultural · Universitat Politècnica de Catalunya Barcelonatech · Cátedra UNESCO de Sostenibilidad

United Nations Educational, Scientific and Cultural Organization · Intergovernmental Hydrological Programme

CTCN Climate Technology Centre & Network

ICCCAD International Centre for Climate Change and Development

GERICS Climate Service Center Germany

Politecnico di Torino · R3C Responsible Risk Resilience Centre

NORDIC URBAN RESILIENCE INSTITUTE

With financial support from

GI Grundejernes Investeringsfond

Realdania

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Organizers

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Foreword

BLOXHUB Summer School on Urban Resilience was organized responding to the Cities-IPCC call for fostering dialogue between practitioners, policy makers and researchers; to develop and promote peer-to-peer learning across regions, sectors and disciplines. Urban resilience is instrumental to address both causes and effects of the mayor global challenges (urbanization, development pattern, environmental challenge which are exacerbated by climate change) re-thinking the way in which cities are designed, planned and managed, at the same time fostering innovation.

BLOXHUB Summer School on Urban Resilience 2019 was the first activity of the International Urban Resilience Academy (IURA), a platform for education and capacity building activities on Urban Resilience, at Civil and Architectural Engineering, University of Southern Denmark.

BLOXHUB Summer School on Urban Resilience gathered 26 policy makers policy-makers, researchers and practitioners from 20 countries and 4 continents, coming for capacity building on & per to peer learning during an intensive eight days course 12 - 19 September 2019 in Copenhagen. The summer school provided multi-disciplinary knowledge and perspectives on the different global and local challenges in cities of the Global South and the Global North, and built capacities of participants to develop informed policies, strategies, plans and solutions for urban resilience in their context.

Through problem-based workshops using Copenhagen's real-life experience and challenges as a living laboratory, 4 groups of participants developed Urban Resilience Plans. Strategic and action plans targeted the challenges of heat wave, water scarcity, cloudburst and storms in Copenhagen and specific area: Sydhavn, with integrated and systemic solutions, though the use of inter alia nature-based solutions creating various co-benefits for the health, energy and food sectors, as well as focusing on enabling conditions to make the strategies and action come through.

The executive summary presents the background, programme structure and methods, results from the BLOXHUB Summer School on Urban Resilience. We would like to congratulate the alumni of the BLOXHUB Summer School on Urban Resilience 2019 edition for an impressive outcome and to complement them on their wholeheartedly effort, collaborative skills, openness throughout the entire process. We look forward to continued collaboration towards 2020 and onwards!

On behalf of the entire Organizing Committee of BLOXHUB Summer School on Urban Resilience 2019,

Nicola Tollin

Contents

1. Rationale - Urban Resilience

Today over 50% of world population lives in urban areas, and cities account for 60-80% of global energy consumption and the same level of greenhouse gases emissions, producing 50% of global waste, consuming 75% of natural resources and producing 80% of global GDP. Cities and their populations are vulnerable and increasingly exposed to rapid and slow on-setting climate and environmental disasters, which frequency and intensity is growing exponentially. Cities and urban communities are also the cause of climate change. Cities are also major centres of economic activity, social life and culture, innovation and knowledge-creation.

The scientific research on urban resilience has been exponentially growing in the last decade, parallel a growing number of cities worldwide started developing resilience related plans and actions, following the recommendations and prescriptions national and international policies international policies, as: Sustainable Development Goals, Paris Agreement, New Urban Agenda and Sendai Framework for Disaster Risk Reduction.

The key challenge for urban resilience is to co-develop and harmonize scientific and practice led knowledge to support informed and science-based decision and policy making, to enable our cities to evolve and innovate.

Urban resilience aims at increasing the ability of urban systems, to respond systemically and dynamically to present and future shock and stresses related to major global challenges as: unsustainable development patterns, rapid and unplanned urbanization, climate change mitigation and adaptation.

Urban resilience is instrumental to address both causes and effects of these mayor global challenges, re-thinking the way in which cities are designed, planned and managed, at the same time fostering innovation.

2. Summer School's goal

BLOXHUB Summer School on Urban Resilience brought together **researchers, practitioners and policymakers** during and intensive eight days course from 12-19 September 2019 at Bloxhub in Copenhagen.

The summer school aimed at providing the participants with the **latest knowledge on urban resilience research, practice and policies** through lectures; and to co-develop their **skills and knowledge on planning for urban resilience** using Copenhagen's real-life experience and challenges as a living laboratory, through a problem-based workshops.

The summer school goal was to bring together multi-disciplinary knowledge and perspectives, from science and practice, on the different global and local challenges faced by cities, and to provide a process design methodology and the necessary skills to **developed informed policies, strategies, plans and solutions for urban resilience**, that can be later used in the specific context of work of the participants.

3. Learning objectives

The participants developed their **knowledge** on:
• the basis of **urban resilience science**, and **the development of resilience research** in different disciplinary contexts;
• **international policies** (Sustainable Development Goals, Paris Agreement, New Urban Agenda and Sendai Framework for Disaster Risk Reduction);
• **national policies regarding climate adaptation and mitigation**, including urban content of Nationally Determined Contributions and urban aspects of National Adaptation Plans and Policies;
• **urban resilience practices** with specific case studies from cities world-wide, including strategic plans, action plans, and technological solutions.

The participants developed **competencies** on the use of:
• **process design methodology** for urban resilience;
• **system thinking** for the analysis of urban shock and stresses;
• different **future scenarios methods**: forecasting, visioning and backcasting.

BLOXHUB Summer School on Urban Resilience Alumni 2019

Alessandra Buffa
Angela Wagner
Chiara Tomaselli
Corina Angheloiu
Cristobal Reveco
Danial Mohobat Doost
Danilo Amaral Cançado
Oluwaseun Odewale
Emanuele Naboni
Geomilie S. Tumamao-Guittap
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Jenna Dutton
Karim Selouane
Kirsten van Dam
Lookman Oshodi
Mariana da Cunha Oliveira Santos
Mariano Rossi
Michaela Koucka
Monica Daniela Pandele
Mrudhula Koshy
Peter Gijs van Enk
Sam Hart
Tanni Abramovitz
Wendy Tsoriyo
Victoria Guadalupe Vital Estrada

4. Target groups

The summer school welcomed applicants with different disciplinary backgrounds and professions:

- **Scientists** and **researchers**: including PhD candidates, post-docs, research fellows and lecturers from universities and research organizations

- **Practitioners,** including **policy makers**, from national and subnational governments and public organizations, officers from international and intergovernmental organizations, staff from private profit and non-profit organizations.

Participants represented different disciplinary background including engineering, architecture, planning, environmental, economic and social sciences.

26	14	12
Participants	Female participants	Male participants

12	14	7
Practitioners	Scientists & Researchers	Policy-makers

22	Germany, Italy (3), France (2), Romania(2), Australia, Chile, Italy, Iran, Brazil (2), Philippines, Colombia, South Korea, Great Britain, Canada, Netherlands (2), Nigeria (2), Denmark, Mexico, Zimbabwe, Argentina, Czech Republic, India
Countries	

5. Programme

5.1. Site Visit

During the first day we conducted technical visit to 6 current resilient and climate adaptation projects in Copenhagen, and to understand the cities' challenges in Sydhavn neighborhood.

Kalvebod Bølge (2012-2013) JDS + Urban Agency

With the opening of the Kalvebod Waves at the harbor-font of Copenhagen, a central part of the inner harbour has become accessible and attractive to the public. This new public space on the water gives the harbour a new dimension as recreational space in the centre of the city. Historically this part of the harbour was devoted to industrial activities. Then in the 80's and 90's, the city sold the land and the area was developed into a both urbanistically and architecturally harsh and mono-programmed harbour front, leaving its quay barren and open to strong winds, devoid of any public life.

Scandiagade (2018) 1:1 landskab

An innovative cloudburst project can handle heavy amounts of rainwater, act as a recreational park for residents and provide a space with rich biodiversity with 120 different plants. This urban space with eight basins can hold 1,500 cubic meters of rainwater. When it rains, the basins delay the rainwater so not to compromise capacity of sewers. When dry, basins open up a wealth of activities. The urban space is designed in close cooperation with the citizens that determining identity and recreational profile of each basin, fx: a miniature forest playground, or a pool with utility gardens.

Sønder Boulevard (2006) SLA

Sønder Boulevard is a grassy strip and local hotspot in Copenhagen's Vesterbro neighbourhood. A participative project of the long, calm boulevard in 2006 made way for a new and popular green belt of possibilities and activities for Copenhageners of all ages. The objective with the makeover was to create an attractive and green city space on Vesterbro. The mission proved highly successful as the boulevard today is one of Vesterbro's most popular recreational areas and hang out spots filled with shopping and great cafés

Superkilen Park (2012) BIG

Under the name Superkilen, a team with BIG at the forefront has created a three colour multicultural, urban, open space in Nørrebro located in the Quarter of Mimersgade. The park is divided into three main areas: The Red Square, The Black Market and The Green Park. The aim has been to give the neighbourhood around Mimersgade on Nørrebro in Copenhagen a new and more positive identity - for the benefit of those living in the area.


TREATMENT WETLANDS FOR POLLUTED EFFLUENT TREATMENT
Macrophyte plants
Affluent circulation
Granular Media
Polluted affluent
Treated effluent

5.2. Lectures

The lectures provided an overview on major international policies in relation to urban resilience, key practices worldwide including those developed in the frame of major international organizations, and the latest developments and perspectives for research. The lectures also addressed key cross-sectorial and thematic issues.

RESEARCH

- Developed by universities leading in research on Urban Resilience

INTERNATIONAL POLICIES

- Sustainable Development Goals
- Paris Agreement
- Sendai Framework for Disaster Risk Reduction
- New Urban Agenda

KEY PRACTICES WORLDWIDE

- Developed in the frame of major international organizations as ICLEI, UN-Habitat City Resilience Profiling Programme

CROSS-SECTORAL & THEMATIC ISSUES

• Multi-level governance • Finance • Generation of co-benefits • Appropriate technology
• Participatory processes & stakeholder involvements • Urban metabolism
• Circular economy • Planning & design

Lecture	Lecturer	Theme	Thursday 12 September Day 1
1	Lykke Leonardsen - Copenhagen Municipality	**CPH climate adaptation strategy and action**	The lecture focused on depicting climate adaptation planning process, challenges, and specific planned or implemented project in Copenhagen, to tackle the risks of flooding from heavy precipitation – cloudburst, but also from storm surge and sea level rise. City wide management accounts for the natural flow of water - cities' catchments area, to manage rain water in various ways (store, delay, convey, discharge) creating co-benefits such as recreational value, biodiversity, improved microclimate, accessibility and safety through multifunctional solutions.
2	Alberto Innocenti University IUAV of Venice	**Green Infrastructure: an Overview of Best Practices in Copenhagen**	The lecture aims to unfold the main features of green infrastructures solutions, from the implementation of the climate adaptation plan to the cloudburst management plan of the Municipality of Copenhagen. The lecture provides an overview of best practices of adaptation solution by classifying them through sizes and typologies of benefits and co-benefits (flow of air, water, social impact, reduced energy consumption). The cases show the importance of maximizing the co-benefits of the solutions, to design solutions in a systemic way, the significance of considering the local characteristics and the process to involve communities while developing climate solutions.
			Friday 13 September Day 2
3	Nicola Tollin - University of Southern Denmark (SDU)	**Framing Urban Resilience**	Urban resilience aims at increasing the ability of urban systems, to respond systemically and dynamically to present and future shock and stresses related to major global challenges as: unsustainable development patterns, rapid and unplanned urbanization, climate change mitigation and adaptation. Urban resilience is instrumental to address both causes and effects of these mayor global challenges, re-thinking the way in which cities are designed, planned and managed, at the same time fostering innovation.
4	Grazia Brunetta & Ombretta Caldarice - POLITO University	**Urban Resilience in Spatial Planning. Status and Knowledge Gaps**	A critical review of the value of the resilience concept in planning highlights the main challenges on how to reinforce the potential of resilience to become a driver for innovation in spatial planning. There are three main problematic challenges. 1) 'structural challenge'. 2) 'technical challenge', 3) 'political challenge'. Policy recommendations were presented broadly applicable in implementing resilience that has currently developed in the science, policy and practice interactions, and education programmes of the Responsible Risk Resilience Centre – R3C of Politecnico di Torino.

5	Umberto Janin Rivolin - POLITO University	**Urban Resilience in Higher Education. The Urban and Regional Development Programme at POLITO.**	PhD Programme in Urban and Regional Development established at Politecnico di Torino (POLITO) and Università di Torino. The programme is designed to train highly-qualified specialists in urban and territorial development. This multi- and inter-disciplinary programme integrates: urban and regional studies, geo-territorial analysis, economics, transportation systems, environmental engineering, policy sciences, spatial planning and management.
6	Magnus Qvant & Silvia Haslinger Olsson - Nordic Urban Resilience Institute (NURI)	**Urban Flows**	Urban Flows is a method to identify stakeholders to be involved in the development of urban resilience. The method takes the departure from six types of urban flows; people, goods, services, money, information and energy. Using the urban flow model allows for a comprehensive analysis of what makes a city or region function, both during shocks and stresses and on everyday basis. By analysing each of the six flows, critical interdependencies can be discovered and therefore critical and relevant stakeholders, responsible in one way or another, for the functionality of each flow and the system itself.
7	Maryke van Staden - ICLEI - Local Governments for Sustainability	**Integrated climate action - process design in a city**	ICLEI supports cities, towns and regions worldwide to deal with competing priorities, where many local needs and pressures require well-planned action, across community and in government operations. ICLEI is working with Local and Regional Governments (LRGs) which administer and guide their territories. The GreenClimateCitiesTM (GCC) Program offers a comprehensive and iterative approach, providing step-by-step guidance on achieving climate neutrality at the latest by 2050. The focus of the GCC is on “how”, helping LRGs understand and implement their roles in leading, driving and shaping the transition process.
8	Alexandros Makarigakis - UNESCO - International Hydrological Programme (video)	**Flash Floods: from a Disaster to an Opportunity** **Urban Heat Island: Cities facing challenges of global change**	Flash floods are a Rapid/Sudden-onset hydrological events. They are disruptive events, resulting in political disruption that lead to instability of countries. Numerous structural and non-structural approaches to deal with flash floods are provided. governmental, early warning systems, permeable pavements, land use control, Natural Based Solutions. Urban Heat Island can have an effect on: Increase Energy Consumption, Air Quality and Greenhouse Gases, Human Health and Comfort, Water Quality. To reduce the Urban Heat Island Effect can be done by engineering solutions, policy implementation solutions.

		Saturday 14 September Day 3	
9	Simone Sandholz - United Nations University (UNU-EHS)	**Nature-based solutions for urban disaster risk reduction and climate change adaptation**	This presentation gave an overview on available urban Eco-DRR and Ecosystem Based Approaches, focused on particular challenges related to their introduction in urban contexts. Using the city of Rio de Janeiro as case study, the governance system and organizational processes with regard to reducing urban landslide risk with special focus on ecosystem-based measures and their potentials was assessed. The potential governance challenges for fostering ecosystem-based approaches were analyzed and clustered to provide an insight on paths that could facilitate the future consideration of Eco-DRR/EbA.
10	Roberto Rocco -Delft University of Technology	**The Justice of Transitions: Integrating notions of socio-spatial justice into sustainability transitions**	This lecture explored the intersection between justice and space through the "tragedy of the commons" as explained by Hardin in his 1968 article. The tragedy of the commons unveils crucial environmental and social impacts of the rational pursuit of self-interest by economic actors, and exposes the tragedy of resource exhaustion if self-interest is pursued mindlessly and free of societal control. It also reveals the challenges surrounding (Ostrom's theories on the governance of the commons, Fainstein's propositions on the just city) the just redistribution of the fruits of human activity, and how it is decided.
11	Stelios Grafakos - Global Green Growth Institute	**Marginal Abatement Cost Analysis for Urban Climate Resilience**	The lecture presents the main steps to conduct Marginal Abatement Cost Analysis for Climate Mitigation, that is considered as economics of climate mitigation or cost-effectiveness analysis. The analysis can be used to identify the abatement potential and cost of various mitigation measures. The aim for the lecture is to understand the objectives and main steps of Marginal Abatement Cost Analysis, how (and when) to construct a Marginal Abatement Cost curve, the strengths and limitations of Marginal Abatement Cost analysis.
12	María Máñez Costa - Climate Service Center Germany (GERICS)	**Climate services for supporting transformative adaptation: Using Nature Based Solutions in Urban Areas**	The transformation of climate-related data – together with other relevant information – into customised products such as projections, forecasts, information, trends, economic analyses, assessments (including technology assessments), counselling on best practices, development and evaluation of solutions and any other service in relation to climate that may be of use for the society at large.
13	Signe Barnes (video) - SCALGO	**SCALGO Live - a decision making tool in the field of climate adaptation and urban resilience**	The Purpose of the exercise was to to get familiar with SCALGO Live. The specific case study of Frederikssund in Denmark was chosen. SCALGO Live Flood Risk is the national flood risk platform for working with climate adaptation, urban planning, emergency management and administration of watercourses. mapping flash floods.

			Sunday 15 September Day 4
14	Jordi Morato - UNESCO Chair of Sustainability at UPC /Recycling the city Network (RECNET)	**Tools for re-thinking urban participative transformation in the framework of circular economy**	Presentation depict a participatory community development approach oriented to SDG through the trans-fer of experiences and the development of transformation projects at local scale, promoting dialogue and socio-environmental and awareness activities and the empowerment of all stakeholders. A toolkit to implement action for transformation framework is described, including best practices based on for exam-ple: intangible cultural heritage, nature-based solutions, with case studies of socio-environmental resto-ration of Moravia Hill in Medellin, and the community resilience landslide control risk management and build up a metropolitan park in Altos de la Estancia, Ciudad Bolivar, Bogota.
15	Marcus Mayr - United Nations Human Settlements Programme (UN-Habitat)	**Climate Change Mitigation and Adaptation in Cities**	International goals and processes as well as national governments with national legislation, regulation and financing in developing resilient cities and communities matters. The lecture present Agenda 2030 – SGDs - a global set of goals, targets and measuring framework, especially goal 13 Climate Action and goal 11 Sustainable Cities and Communities are explained. The NEW URBAN AGENDA is guiding framework for sustainable urbanization in the 21st century. It provides for the global principles, policies and standards required to achieve sustainable urban development, to transform the way human construct, manage, operate and live in our cities.
16	Morten Birkved - University of Southern Denmark (SDU)	**Absolute sustainable buildings**	The sustainability performance of buildings is most often reported relatively . This ensures a development in the right direction however it does not ensure that the buildings receiving sustainability certification actually are sustainable. A building is considered absolute sustainable if its annual environmental burden is less than its share of the earth environmental carrying capacity. The lecture presents approaches for absolute sustainability assessment of building's environmental performance in Denmark and internationally, and various novel pathways for to absolute sustainable buildings.
17	Marcus Mayr - United Nations Human Settlements Programme (UN-Habitat)	**Urban Resilience in Informal Settlements**	Climate Action in informal settlements, must begin with a detailed, in-depth and nuanced understanding of the physical conditions, the demographics and of the differentiated vulnerability in order to adequately plan interventions that are feasible and targeted. Resilience-building requires a multi-pronged approach which addresses also social, economic and political capacities in four or more areas: (i) upgrading to more resilient housing, (ii) upgrading infrastructure, (iii) enhancing ecosystems, and (iv) supporting community capacities.
18	Morten Birkved - University of Southern Denmark (SDU)	**The sustainable potential of urban farming**	Development of more sustainable food solutions requires Identification and quantifying of the main impacts, a life cycle perspective and holistic perspective on impacts. For food products, the future sustainability challenges might demand radical solutions representing "lesser of two evils" rather than free choice. Food is a major contributor to the impacts resulting from "consumption" and hence the impact resulting from the way we spend our money. Humanity can however affect the impacts from food consumption by relying on less impacting nutritional strategies and new technologies

		Monday 16 September Day 5	
19	Martin Frick (video) - United Nations Climate Change (UNFCCC)	I**nternational governance and the global climate crisis**	The UNFCCC secretariat (UN Climate Change) was established in 1992 when countries adopted the United Nations Framework Convention on Climate Change (UNFCCC). The UNFCCC objective is to „stabilize greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system. The lecture describe the process, challenges and opportunities in providing high quality technical input and advice to Parties on all aspects related to the negotiation process as well as efforts undertaken by governments to implement the mandates under the Convention, the Kyoto Protocol and the Paris Agreement.
20	Marianne Skov - Ramboll	**Risk based climate adaptation approach**	The lecture present Ramboll approach for Risk Based Resilience. On the example of Cloudburst Resiliency Planning Study the steps are explained: 1) Determine Risk, 2) Plan & Design, 3) Measuring effect 4) Evaluate costs. GIS data act as the foundation of the study and are crucial in providing a solid basis for informed decision-making. Spatial overlay of datasets and analyses at multiple levels help to identify potential synergies and cumulative effects. Examples of Danish and international projects are explained: SKT. ANNÆ SQUARE, Hans Tavsens Park, BUZZARD POINT (DC, USA).
21	Esteban Leon - United Nations Human Settlements Programme (UN-Habitat)	**Urban Resilience**	UN-Habitat's goal is to increase the resilience of cities to the impacts of natural and human made crisis. To do so, UN-Habitat firmly believes that working directly with local governments and their partners is essential as they are the level of governance, which is closer to citizens. For this reason, it has launched the City Resilience Profiling Programme (CRPP), which supports local governments to build their capacity to improve resilience by developing a comprehensive and integrated urban planning and management approach, as well as tools for measuring and profiling city resilience to all types of hazards.
22	Matthias Garschagen (video) - Ludwig- Maximilians-Universität München (LMU)	**Urbanization: driver of disaster risk or opportunity resilience in the future**	Urban risk at the interface of the two global mega-trends urbanization and global environmental and climate change is of central concern for global sustainability at large. Urbanization has the potential to drive up disaster risk not only through the exposure dimension but also through its effects on other vulnerability components. But urbanization will not stop and can hold substantial opportunities for risk reduction. Whether or not this potential can be realized does not only depend on technocratic risk management and "easy fixes" at the surface. Rather, it depends on the deeper governance context and the political economy of risk and urbanization.
23	Saleemul Huq (video) - International Centre for Climate Change and Development (ICCAD)	**Building Climate resilient migrant friendly towns in Bangladesh**	Bangladesh has been experiencing a rapid growth in urban population during last four decades. However, this growth follows an imbalanced spatial distribution, mostly directed towards Dhaka city, resulting in excessive pressure on its housing, transportation, infrastructure, and basic services. The strategy is to invest in secondary "climate resilient and migrant-friendly". The most important is the provision of jobs, followed by housing, schooling and healthcare. Hence building on the cities' comparative economic advantage to invest in manufacturing or services that will generate employment to attract migrants

		Tuesday 17 September Day 6	
24	Sanjaya Bhatia (video) - UN Office for Disaster Risk Reduction (UNDRR)	**A simple methodology to develop DRR and CCA strategy at the local level**	Through the Making Cities Resilient (MCR) Campaign, UDRR has been supporting local governments in reducing risk, addressing sustainable development challenges, and to achieve target 'e' of the Sendai Framework and indicator 11b of the Sustainable Development Goals (SDGs), i.e. the development of DRR strategies. Useful tools for assessing the resilience in cities including the Ten Essentials and Disaster Resilience Scorecard for Cities, a simple tool which urban planners can utilize to for the development of disaster risk reduction strategies and action plans, in accordance with the Sendai Framework for disaster risk reduction 2015-2030.
25	Anna Esbjørn - CONCITO	**Climate Action Planning in Denmark**	Denmark's green think tank CONCITO convey new and proven climate solutions to politicians, companies and citizens. Our purpose is to catalyse action to lower emissions of greenhouse gases and action to limit the harmful effects of global warming as a way to build climate safe and robust societies. CONCITO was founded in 2008 and its purpose is to provide science and knowledge based analyses and information on the most effective and cost efficient transition towards a climate-safe society in Denmark and in other parts of the world.
26	Rojina Manandhar - United Nations Climate Change (UNFCCC)	**Overview of key aspects of the Paris Agreement, relevant processes and workstreams on Adaptation as well as examples of thematic engagement with partners in the context of the Nairobi work programme**	At COP 21 in Paris, on 12 December 2015, Parties to the UNFCCC reached a landmark agreement to combat climate change. Existing information on adaptation, and available data sets often fall short of meeting decision-makers' needs. There is a need for effective engagement of various stakeholders—and the management of knowledge for adaptation at each step. The Nairobi work programme, is the UNFCCC's authoritative Knowledge-To-Action Hub, is the UNFCCC's first inclusive stakeholder engagement mechanism and cultivates high-impact partnerships to close critical knowledge gaps and accelerate action around the world.
27	Francesca Cappellaro - Italian National Agency for New Technologies, Energy and Sustainable Economic Development (ENEA)	**Circular economy in city. Approach, strategies and practices towards urban sustainable transformation**	This presentation highlights the circular economy approach for a sustainable urban transformation: Circular economy principles and strategies, according to the RESOLVE framework, and how the adoption of some RESOLVE strategies (as regeneration, optimization, sharing and loops) results in several circular economy practices bringing several advantages at urban scale, on the example of an engagement process adopting CE strategies in Rome (Italy). In particular, an open innovation process (based on Urban Living Lab approach) allowed engaging several urban local stakeholders. The combination of the collaborative approach and circular economy acted as catalyst for smart community implementation achieving mutual advantages activating urban transformation

			Wednesday 18 September Day 7
29	Dražen Kučan (video) - Green Climate Fund (GCF)	**Cities and Climate Change in the context of Green Climate Fund (GCF)**	The Green Climate Fund's mandate is to promote the paradigm of shift towards low emission and climate resilient development pathways by providing support to developing countries to limit or reduce their greenhouse gas emissions (mitigation) and adapt to the impacts of climate change (adaptation).
30	Jaime Webbe - Climate Technology Centre and Network (CTCN)	**Adaptation needs of developing countries in the water sector: case studies' analysis from CTCN technical assistance portfolio**	CTCN as implementing body to the Conference Of the Parties (COP) under the UNFCCC focuses on technology, has a unique observatory on developing countries needs in both adaptation and mitigation. CTCN presentation focuses on the water sector being one of its most critical aspects as it affects the urban ecosystem in several ways. The presentation showcased four case studies dealing with flooding and water conservation matters, located in Asia and Caribbean regions, describing the adaptation challenge highlighted by countries and analysed CTCN technical response to the specific climate problem and relate outcomes.
31	Francesco Musco - IUAV University of Venice	**Urban Resilience from theory to perationalization**	Planning and Design for Resilient Cities. The role of university as knowledge transfer platform.
32	Carina Borgström-Hansson World Wide Fund for Nature - WWF Cities	**One Planet City Challenge**	The One Planet City Challenge is a friendly competition organized by WWF in collaboration with C40, CITIES and ICLEI, to mobilize and support climate action in cities, which has to date engaged more than 500 cities on all inhabited continents. Following the Paris Agreement and the IPCC Special Report on 1.5°C, the OPCC assessment and feedback framework has been updated to enable assessment and guidance to all participating cities on science based target setting (for meeting the objectives of the Paris Agreement), evidence based climate action planning and opportunities for accelerated mitigation and adaptation action.
33	Magnus Qvant & Silvia Haslinger Olsson - Nordic Urban Resilience Institute (NURI)	**Navigating among different stakeholder incentives. (Role play exercise)**	Urban resilience is a complex business involving many different stakeholders and on top of that with different incentives and agendas. Being able to negotiate and creating common aims and a collaborative atmosphere is essential for success. This will be demonstrated by a role-play exercise and a follow up discussion. The objective of the of the presentation was to gain understanding on how different incentives and driving forces of organisations and individuals will influence negotiations and willingness to engage in creating more resilient cities.
			Thursday 19 September Day 8
34	Lars Stenfeldt - Green Smarter Living	**Zhelt (human defense) Zettl (human housing)**	Living in a home of your own should be a human right, and affordable to everyone. Soon the growing population around the world will bring us new and unseen challenges, and this will encourage us to live in environmentally friendly and downscaled homes, powered by sustainable and alternate energy sources. The lecture present example of projects and prototypes of modular houses.

5.3. Workshops

During the afternoons, the workshop gived the opportunity to the participants to engage, through group work, with real-life problems and challenges faced by The City of Copenhagen, and to develop a strategy and action plan following a process design methodology, that includes specific methods as system analysis, forecasting, vision and backcasting of future scenarios, monitoring and evaluation.

6. Copenhagen's challenge

Denmark's future climate, as outlined by the IPCC Fifth Assessment Report, will be warmer and wetter. This will include changes in variability, frequency and intensity of extreme events such as more frequent and severe periods of drought, heatwaves and more intense downpours and storms as well as a higher mean sea-level and storm surges.

Since it's 2009 Climate Plan, Copenhagen has developed, tested and implemented an increasing number of plans and tools to address climate change impacts, especially water-related ones, on its urban environment (see Annex 1). The path already undertaken by the city in managing both the causes and the effects of climate change has led to numerous sector-based innovations. For example, the Cloudburst Management Plan, and its subsequent updating developed a physical, organizational and financial way to manage surface water and flooding.

The response to both present and future shocks and stresses driven by climate change are strongly related to Copenhagen's ability to address systemically and dynamically these challenges in an integrated way. However, in order to successfully cope with a complex set of causes and effects that result in no single, nor static combination of immediate and secondary consequences, the city needs an integrated and systematic way to mitigate and adapt holistically.

Riding the momentum of these sector-based experiences, the challenge to urban resilience in Copenhagen is now to address and embed in a systemic way the wider range of impacts the urban environment is exposed to. Rising challenges such as air and water pollution, extreme temperatures and water scarcity have to be addressed and coordinated in the increasing pressure for urbanization, densification, population growth and land use. Successfully embedding urban resilience in these dynamics is a primary objective to mitigate and reduce major secondary effects on the urban system and on sectors such as health, energy and food.

In this complex interrelation between causes and effects, it's fundamental to acknowledge the urban resilience challenge in a system-thinking perspective. This is required in order to support integrated evaluation and informed decision making to address these impacts in a systemic way.

7. Resilience Plan

Integrated and systemic solutions to face the climate challenge

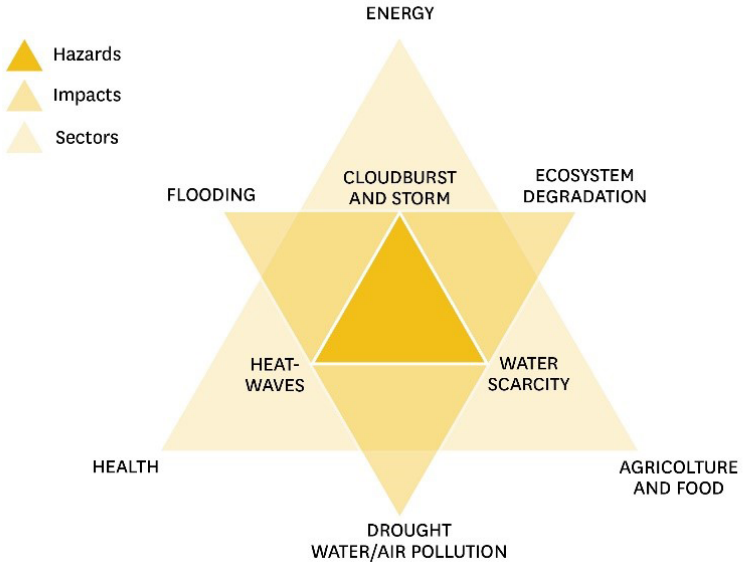
The aim was developing a set of solutions that can find synergies with the current governance structure, couple with the water management system and be mainstreamed in the future development of the city. These financial, technological and design solutions should change the city on different levels, aiming at the principles of nature and ecosystem-based solution, maximizing the co-benefits for the health, energy and food sectors.

The resilience plan shall focus on generating co-benefits, tackling both causes and effects of the 4 urban global challenges, e.g. including mitigation of CO2 emissions, improve health conditions.

The resilience plan aimed at include appropriate provisions regarding key enabling factors, such as: finance, technologies, capacity building, data availability, stakeholders' participation, policies and legislation.

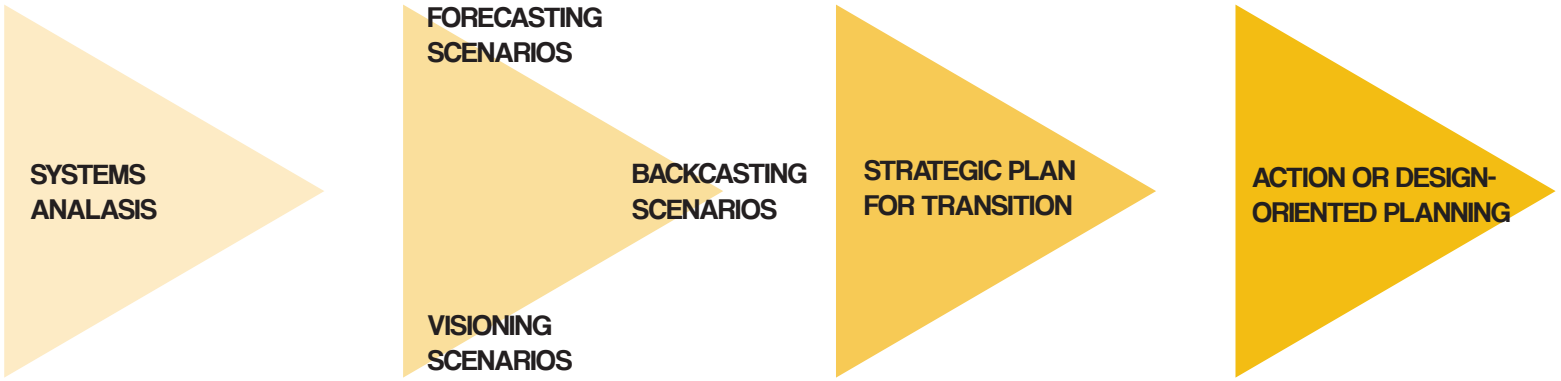
The addition of specific planning/design solutions were welcome, depending on the skills set available in each group.

The resilience plan aimed to have 20 years time-line, integrating multiple temporal dimensions (short, medium and long term) and multiple spatial dimensions, integrating site, city, region and nation-wide strategies and actions, considering also potential for up-scalability and replicability.

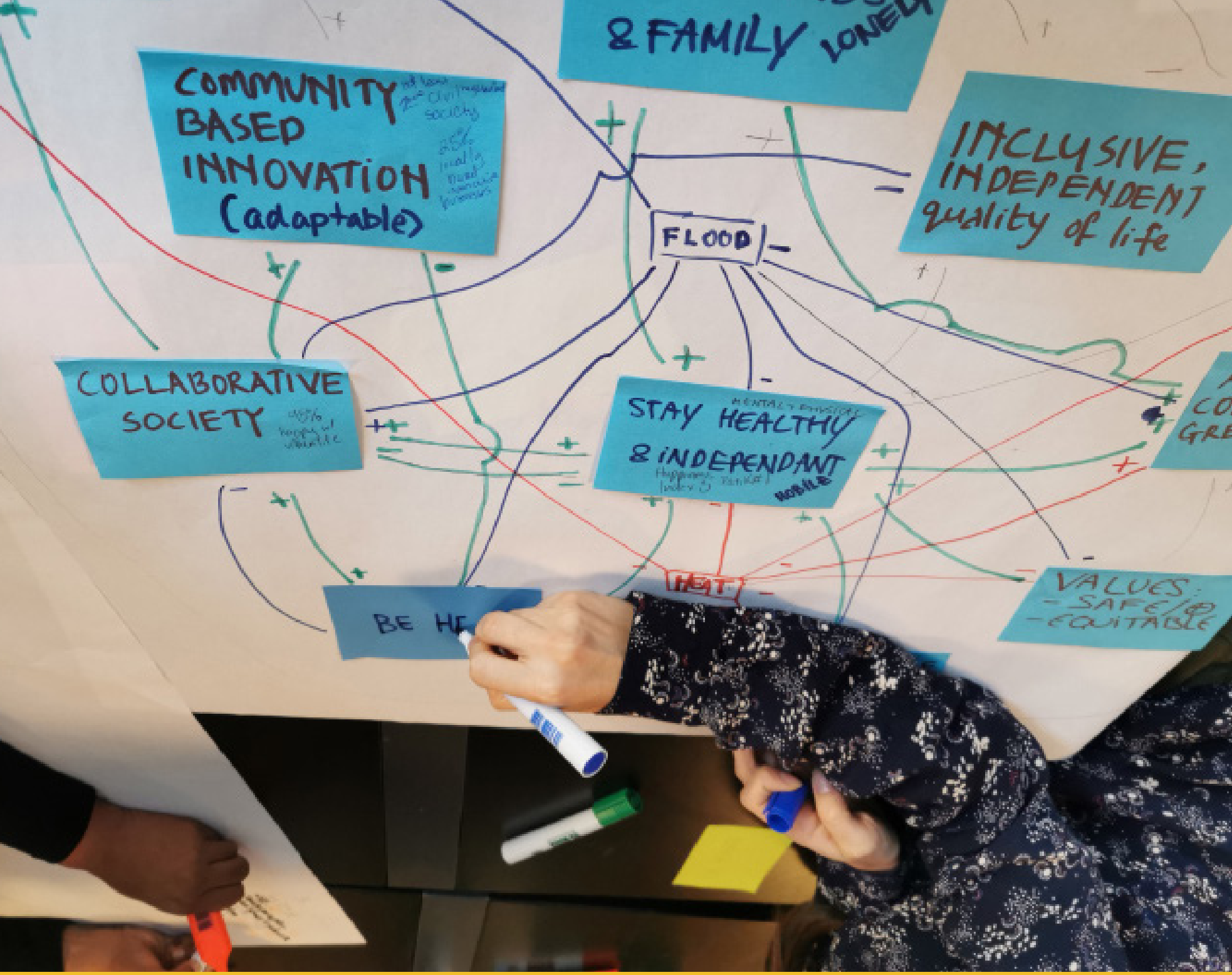


8. Process design methodology

RESILIENCE PLAN was realized following a process design methodology in six steps




LAGOS
Economy Health Reduced value
Sanitation Housing Infrastructure
key resources
key activities
local population
value proposition
Media support
Institutional services
Climate service
NGO's Civil society
University
Funders / insurance

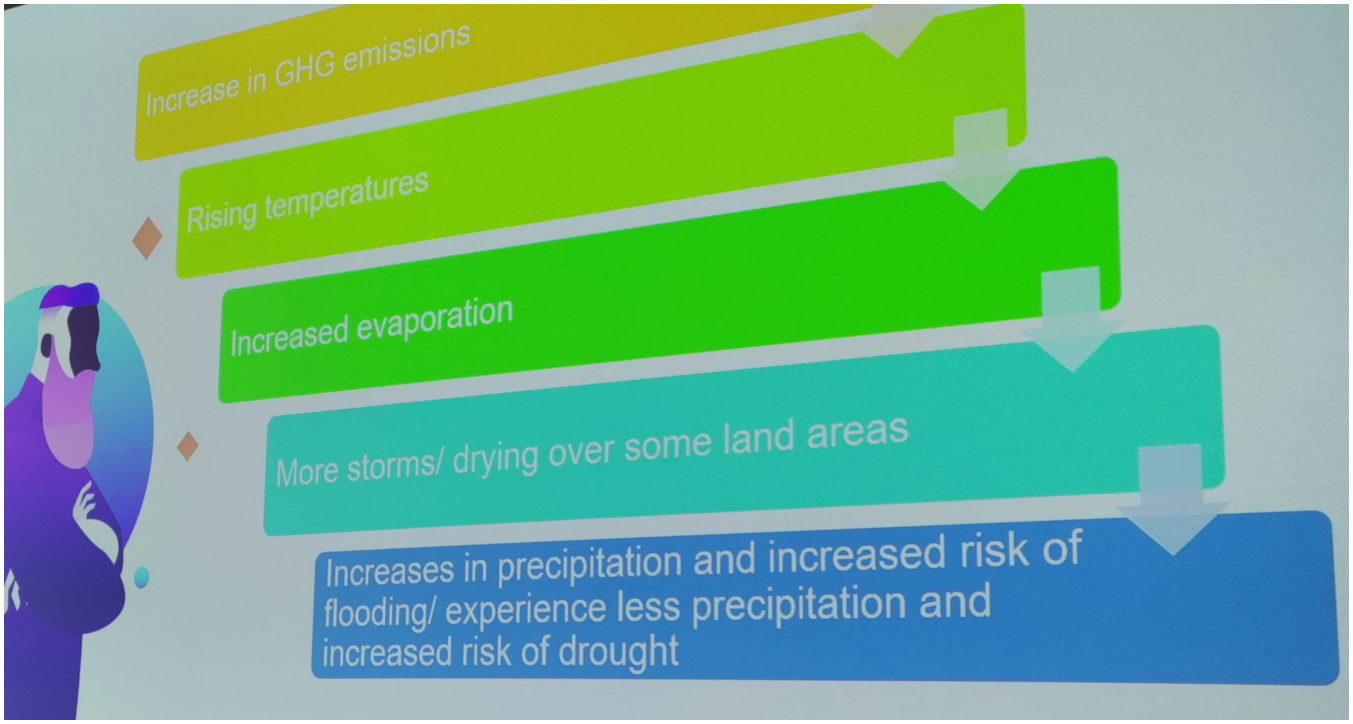

& FAMILY
LONELY
COMMUNITY BASED INNOVATION (adaptable)
INCLUSIVE, INDEPENDENT quality of life
FLOOD
COLLABORATIVE SOCIETY
STAY HEALTHY & INDEPENDANT
HEAT
VALUES:
- SAFE
- EQUITABLE

System Analysis:
System thinking, key elements identification and stakeholder mapping

Participants were mapping elements of a system, stakeholders, as well as physical elements, interrelations, dependencies in order to understand the complexities of the dynamic behaviour of the system on the scale of Copenhagen or Sydhavn.

Forecasting:
The most realistic futures: a projection bounded to the past

Participants were analysing current future trends and drivers, at local and global level, defining the most realistic future scenario based on the projection of already know key trend and dynamics from the past.

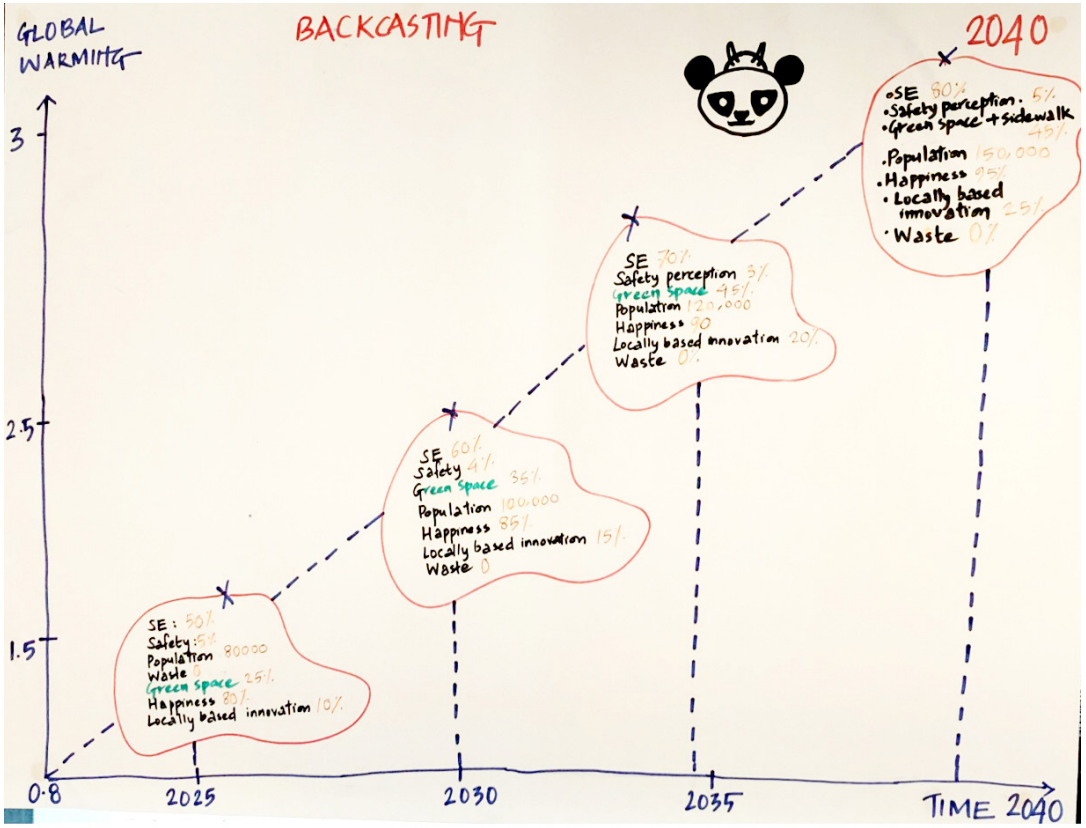


Visioning Scenarios:
The most (un)desirable futures

Participants defined most desirable futures at the local and global level, by exploring and defining which are the key elements and principles that constitute the best (un)desirable futures

Backcasting:
The most desirable and realistic future

Participant defined the most desirable and realistic future derived from mediation between visioning and forecasting. For backcasting participants defined key transition milestones from the future to the present.

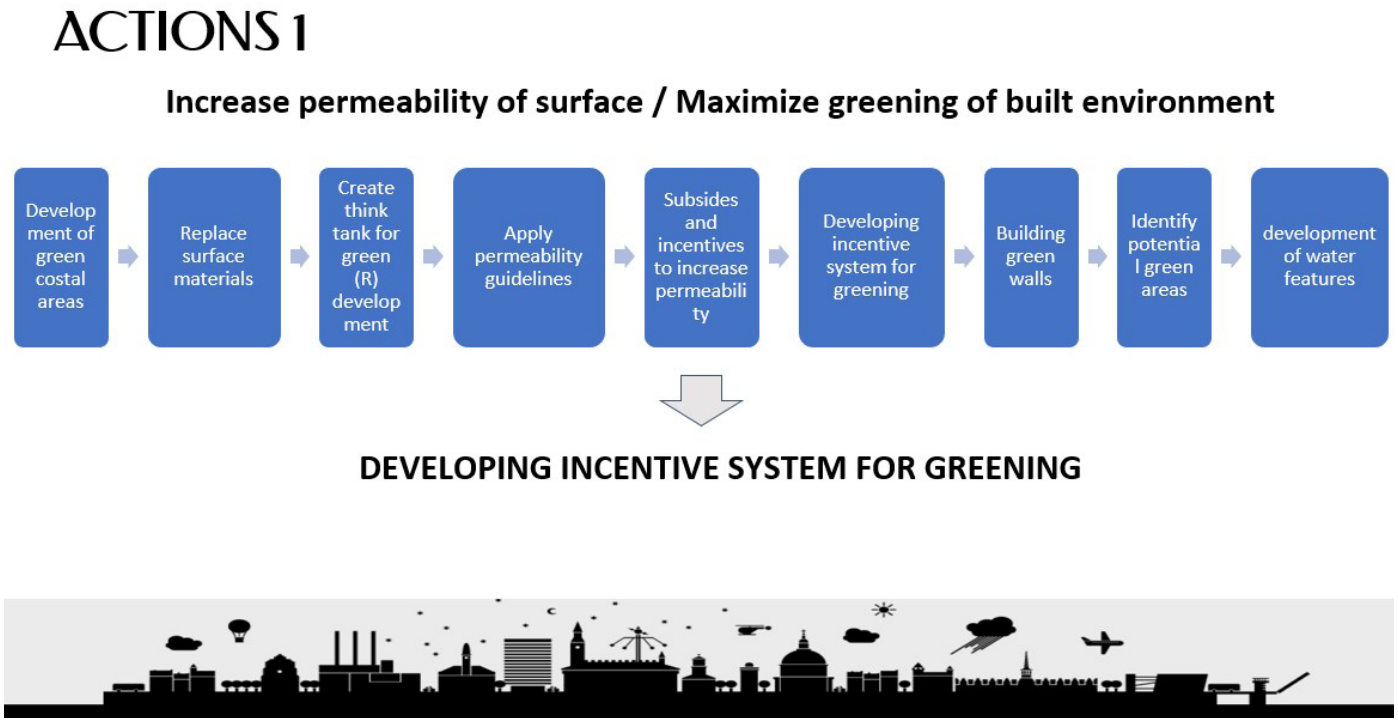


Strategic Plan for Transition:
Tracing the transition pathway

Once the milestones are identified and described, this step included the identification of the necessary resources and capacity, to understanding how to manage the whole process of transition from one milestone to another, from present to future.

Action Plan:
Which actions/design will lead the transition?

Action plan phase aimed to identify the best way to the transition plan. This was done by developing and identifying a set of actions, design options and frame conditions, as: technologies, finance, policies options that can lead the transition in a systemic way.

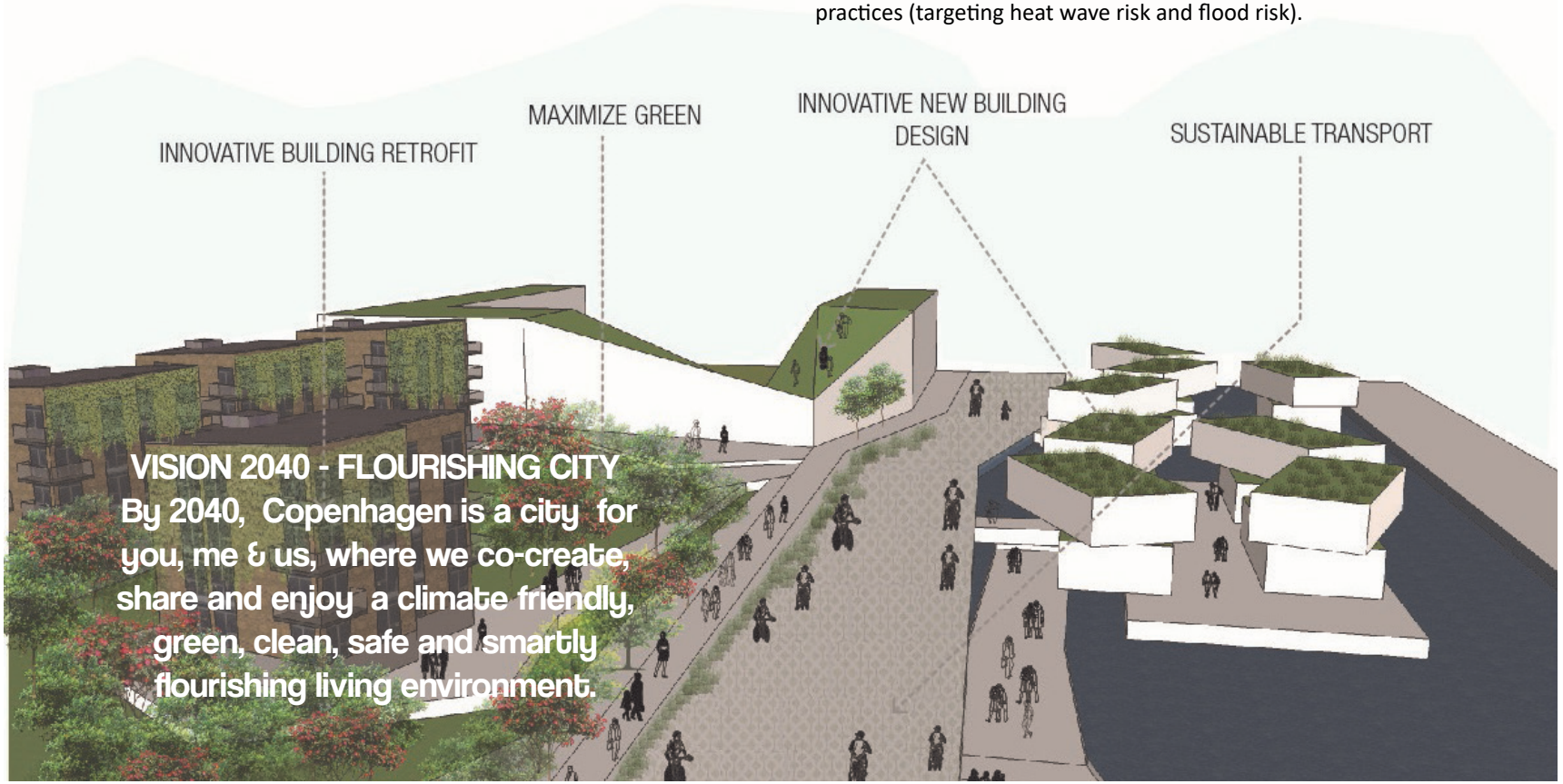


9. Group work: Resilience Plans

Group 1: Copenhagen for you and for me

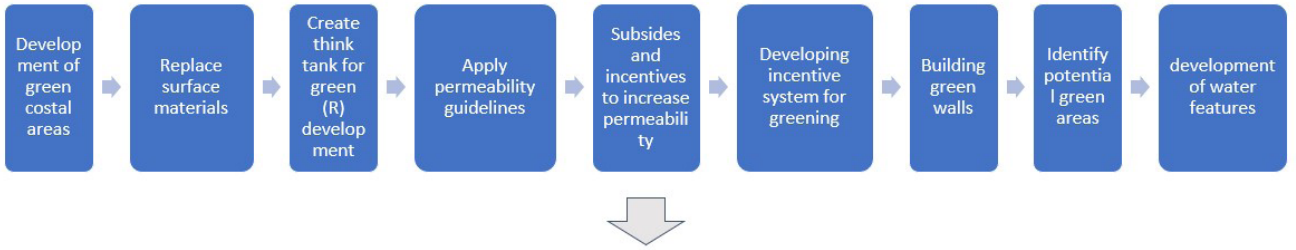
The 2040 vision: Copenhagen for you, me & us was inspired by the ideas of a Jan Gehl who was claims that the city is for people and not for cars, as well as the benchmark sets that Denmark should be fossil fuel free by 2050.

Numbers of objectives were identified: 1) increase permeability of the built environment (targeting heat wave risk and flood risk) 2) maximize the use of localized and sustainable transport options (targeting heat wave risk3) encourage retrofitting of buildings with climate, adaptive materials and practices (targeting heat wave risk and flood risk).



ACTIONS 1

Increase permeability of surface / Maximize greening of built environment



Engage the public and private sector into creating the green environment. E.g. tax reduction, landscape award, public campaigns, workshops

DEVELOPING INCENTIVE SYSTEM FOR GREENING

Enabling strategy

Revisit, revise and adapt urban regulatory framework	Mapping, data collection & quantifying data	Research and creation of innovative measures	Design stakeholder engagement strategy
Design awareness raising and capacity building	Revisit, revise and adapt (municipal) financing strategy	Design monitoring & evaluation plan, with indicators	.....

Co-benefits and innovatin

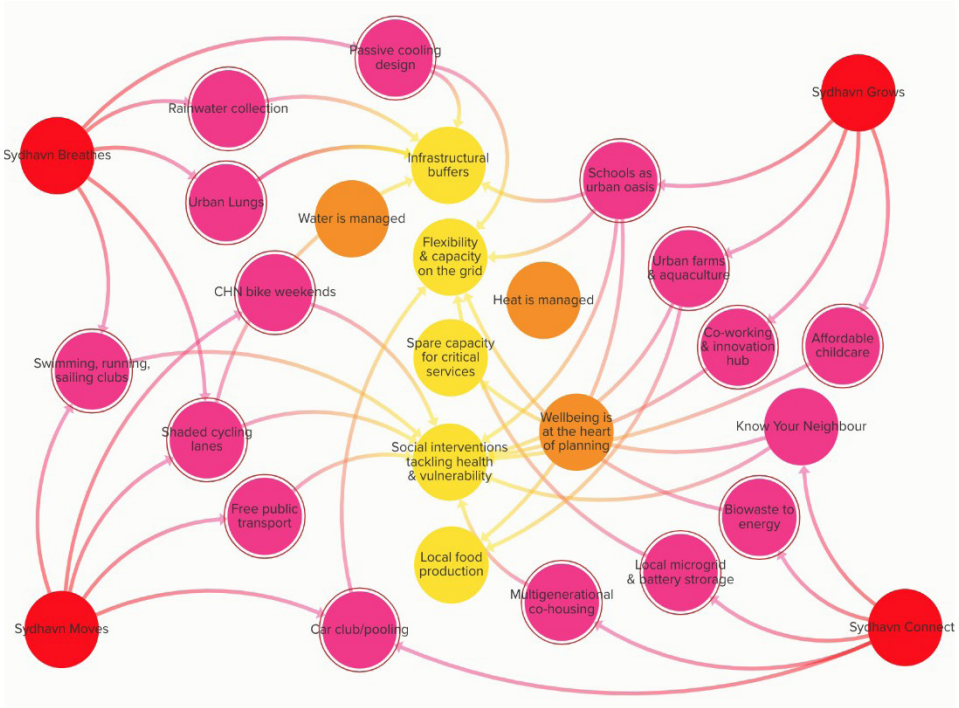
Human health and savings on health care system	Increased biodiversity	Shorter transportation time	Abandon use of fossil fuels and reduce GHG emissions
Improved waste management & growth of shared goods	Improved air, water & LIFE quality	Community cohesion and neighbourliness	Increase aesthetic and Attractiveness of Copenhagen

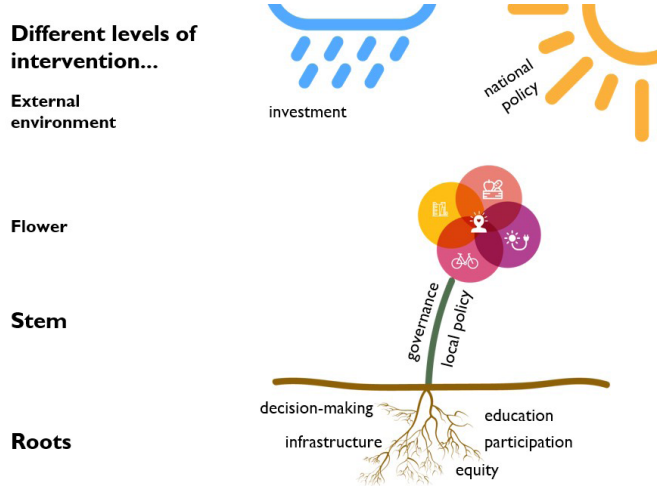
Group 2: Sydhavn Flower

VISION

Well-being at the heart

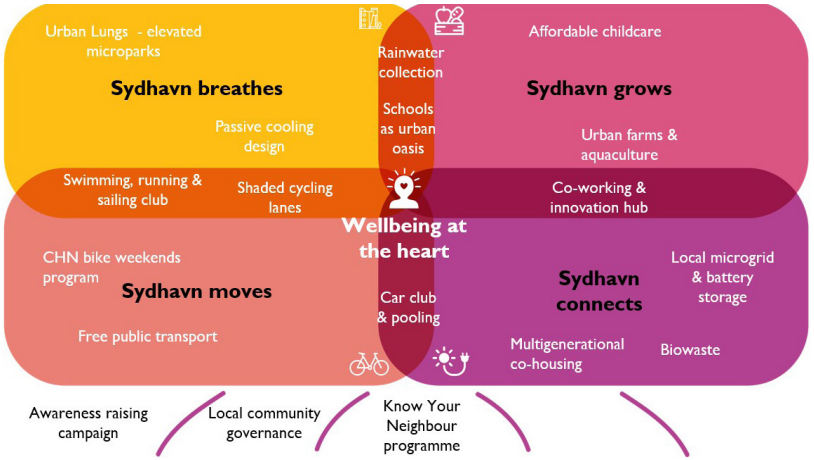
Putting the most vulnerable at the heart of the planning process, aiming for a climate resilient city in which no one is left behind, through ensuring the Sydhavn flower thrives





What would it look like if we design for desired system outcomes? what does it look like if we put the outcomes that we want at the heart of our system ? So if you we know that we want more infrastructural buffers, we know that we want more flexibility and capacity on the grid. We know that we want to also provide safe human capacity for the critical services, tackle health and vulnerability, provide more food resistant approach.

The aim were identifies first order impact, system changes and those were grouped and flagship projects under each of the four key strategies: GROW, CONNECT, BREATHES AND MOVE. And the systemic outcomes are that water is managed, heat is managed and the well-being of people is at the heart of planning.



Strategy

WELL-BEING strategy for Sydhavn, consist of 4 specific areas of intervention: Sydhav Breathes, Sydhavn Grows, Sydhavn connects and Sydhavn Moves. The strategy looks at integrated approach to resilience, meaning the systemic approach of how different issues are interconnected and how to create various co-benefits.

Sydhavn Connect, looks not only into mobility but energy and providing more flexibility into the grid by using the batteries as spare capacity. Sydhvan Connect is not limited only to swimming and running and sailing, mobility and in case of Sydhavn Breathes nature based solutions, but the objectives looks at human element of it, why do people connect? Why do people come together and how by coming together, communities can become more resilient. All of these are underpinned by a series of social programs.

Sydhavn Connects

Objective: Establish a flexible system and diverse mix of clean energy resource. Encourage sharing economy in mobility and built environment

Flagship projects	Actions	Resources	Enabling conditions	Success indicators	Key stakeholders	Co-benefits/ synergies
Building modernization program - Energy system - Building Creation of a neighborhood cooperative hub Creation of a resilient energy observatory	Support for sustainable local startups Community building, car club, microgrid Foster the creation of coworking spaces Foster renewable energies resources Local energy generation on building integrated basis Use locally generated energy in delayed fashioned	Public and private investment concerning infrastructure - Infrastructure - Capacity building - Research center Neighborhood community Experts on data, A.I., circular economy	New energy regulation and new energy taxes New social business model based in the circular economy City-rural RE exchange Consensus with all stakeholders, especially with the neighborhood	Reduction in resource consumption Increase in renewable energy Reduction of energy waste Reduction of print carbon emission	Energy companies (public, Private) Industry Enterprises Startups Households Local government Research centers and universities Farmers/ agriculture sector	Improved social cohesion Place attachment Improved health Reduction of energy price Increased purchase power Green job creation

Sydhavn Grows

Objective: Promote sustainable urban farming practices and nurturing the next generation

Sydhavn Breathes:

Objective: (1) Establish a network of urban lungs of green and blue public urban space that everyone can reach within 5 minutes walking

Sydhavn Breathes:

Objective: (1) Establish a network of urban lungs of green and blue public urban space that everyone can reach within 5 minutes walking

Sydhavn Moves

Objective: Sustainable mobility and physical exercise

Group 3: C3 - Community 3

Vision

By 2040, Sydhavn is the prime	
role	demo-**neighborhood** with the most advanced **eco-sustainable technology**
people	**highest quality of life** for its people **empowered** and **participative citizenry**
economy	**vibrant economy**
physical	**efficient and functional infrastructure**
natural	**thriving, green ecology**
institutions	**strong, accountable and transparent governance**

Goals & Objectives

Precipitation	○ Increase green spaces in the locality by capturing additional 15 per cent of public open spaces to facilitate for rain water collection and diversion (currently at 25 per cent) ○ Develop the necessary support infrastructure to filter, channel and collect at least 50 per cent rain water
Heat	○ Increase vegetation cover by 50 per cent to improve ambient temperature in public spaces ○ Channel the wind around buildings by providing street level improvements ○ Pedestrianize at least 20 per cent of streets
People	○ Increase adequate public facilities to accommodate increased needs of the population ○ Provide additional destinations at ground level to facilitate socialization

Targets & Activities

Increase green spaces in the locality by capturing additional 15 per cent of public open spaces to facilitate for rain water collection and diversion (currently at 25 per cent) within 10 years

Policies	○ Legislation to allow the capture of parts of the side walk for greenery (20 % of all sidewalks) ○ Provide tax incentives to private owners fronting streets to implement greening of at least 20 per cent of their area, pro-rated for added areas ○ Development of guidelines and standards for urban greenery (space per capita) ○ Develop incentive package for private sector funders ○ Provide incentives (point) to individuals to engage in urban greenery ○ Amendments to the Payment Act, Environmental Protection Act and Roads Act
Resources	○ Allocate at least 0.050% of annual budget for public spaces on urban greening ○ Tap private foundations and grant-making bodies to provide counterpart funding for at least 20% of the projects ○ Develop Green bonds/ green stocks that can fund green projects
Advocacy	○ All urban greenery projects to be approved through stakeholder consultation and collaboration ○ Develop the Information, Education and Communication materials using conventional media and social media to facilitate buy-in of the communities (outdoors is good for well-being)
Technical	○ Develop at least 3 project proposals for urban greenery per annum

Increase vegetation cover by 50 per cent to improve ambient temperature in public spaces in the next 15 years
*** Urban agriculture, green walls, vertical gardens and green buffers etc**

Develop the necessary support infrastructure to filter, channel and collect at least 50 per cent rain water in the next 10 years

Urban agriculture, green walls, vertical gardens and green buffers etc

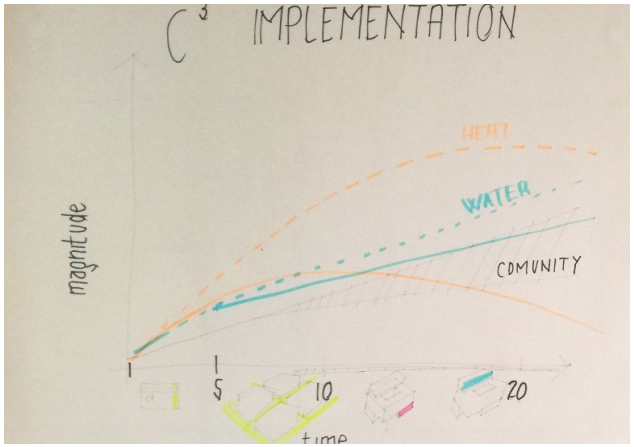
Channel the wind around buildings by providing street level improvements within the next 15 years

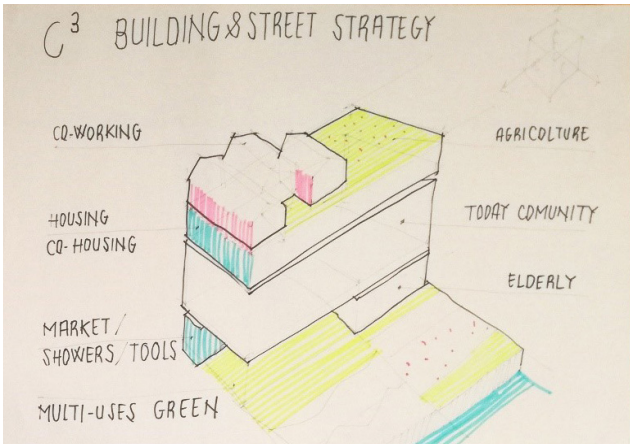
Pedestrianize at least 20 per cent of streets in 10 years

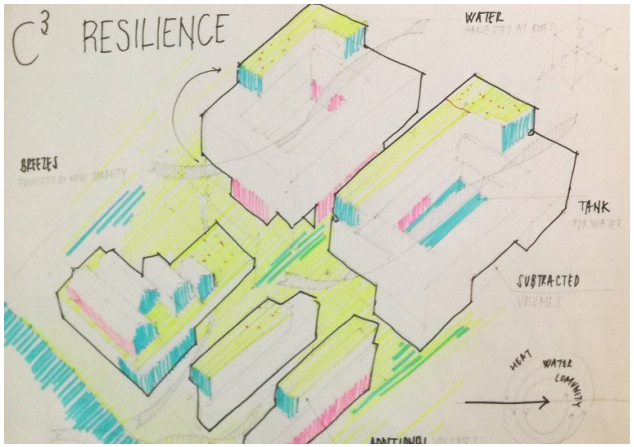
Increase adequate public facilities to accommodate increased needs of the population in 20 years

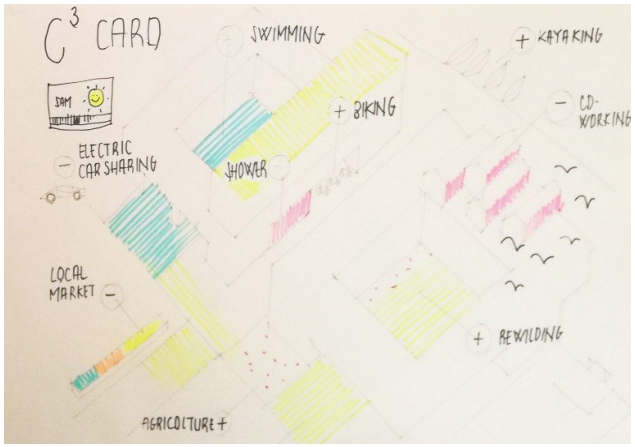
Provide additional destinations at ground level to facilitate socialization within the next 5 years

Actions: C 3 - Community 3



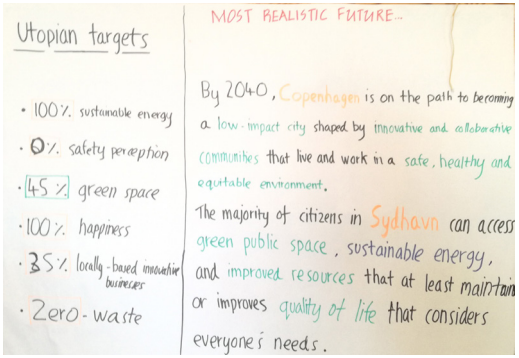




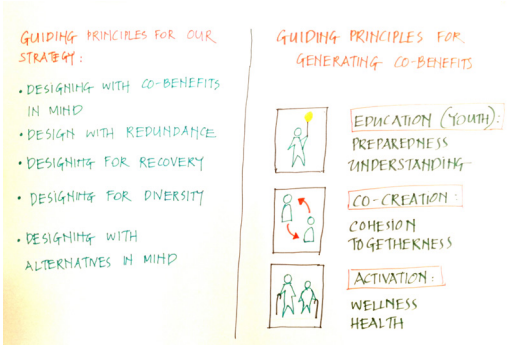


Group 4

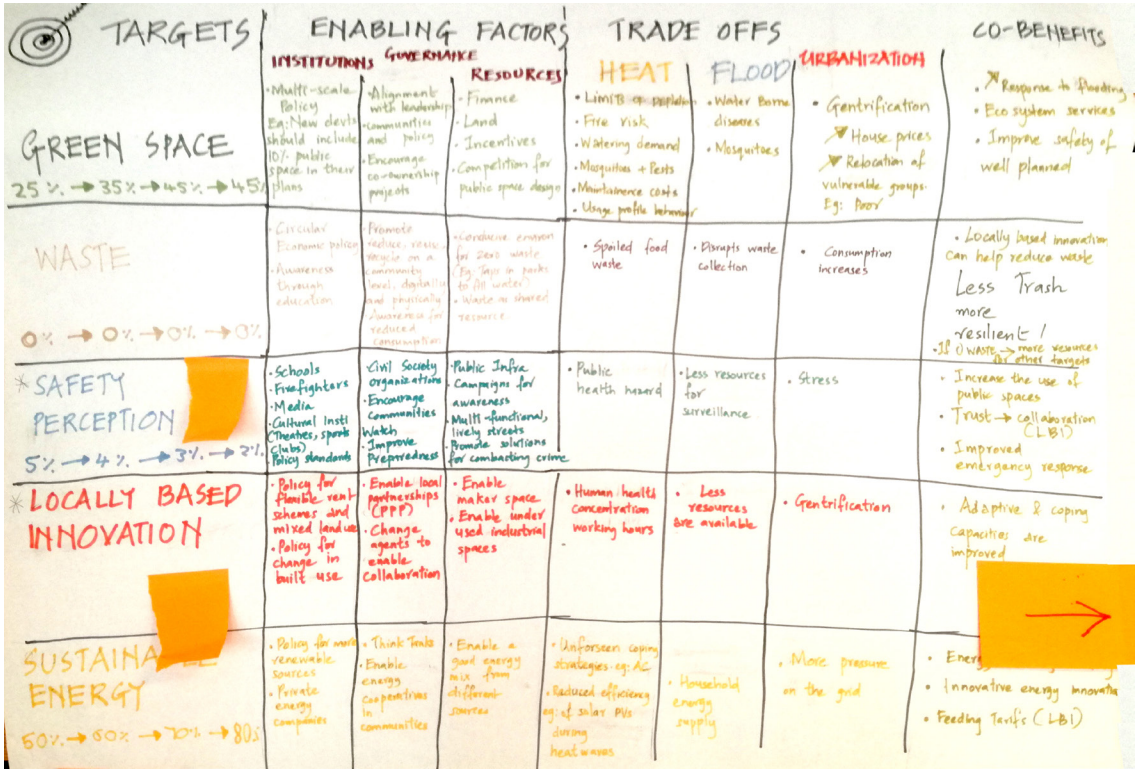
Vision



Guiding principles



Prioritization: Key co-benefits and targets



Actions


ACTION 1 : COPINGHAGEN APP
CO-BENEFITS TO TARGETS
• SAFETY PERCEPTION
• GREEN BLUE INFRASTRUCTURE
• COMMUNITY BASED INNOVATION
Copenhagen City, Hackathon participants
2020 2025 2030 2035 2040
ACTION 2: BUILDING MOATS
CO-BENEFITS TO TARGETS
• SECURE FOUNDATIONS
• GARDEN + RAIN HARVESTING
• ADDRESS WATER SCARCITY
COPENHAGEN CITY + DEVELOPERS + ECOLOGISTS
2020 2025 2030 2035 2040
ACTION 3: CO-HOUSING STRATEGY
CO-BENEFITS TO STRATEGY
• DIVERSITY
• ADAPTIVE REUSE (REUSE VACANT INDUSTRIAL)
• INTERGENERATIONAL
• LOCAL KNOWLEDGE
COPENHAGEN CITY, DEVELOPERS & HOUSING ASSOCIATIONS
2020 2025 2030 2035 2040
SYDHAVEN

10. Survey

What has surprised you the most ?

> ***...we really need a step change in terms of capacity building for both researchers and practitioners.***

If you were to take one thing that you learned during the Summer School and apply it to your practice when you return to your city/workplace, what would that be?

> ***Learning the skills required to collaborate across disciplines and backgrounds is equal to if not more important than 'hard' skills, e.g. systems analysis or risk mapping.***

In what way did the summer school enhance your life-long learning experience?

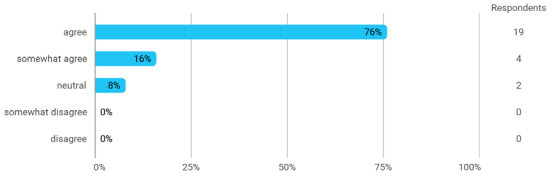
> ***...our focus needs to be on real needs as entry points in our efforts to find solutions, instead of just transferring what may have worked in developed countries in the Global North.***

What was the most useful methods or lectures you've experienced this week?
What new tools do you now have in your personal toolbox?

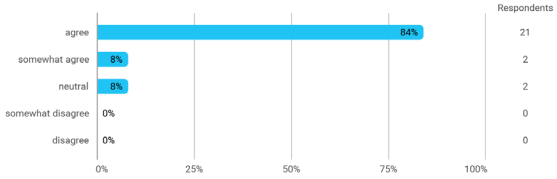
I found the presentations that tied theory and research to examples and real life solutions the most beneficial.

It really stroke me how important is to bring forward the principle of not loosing what cities have achieved and to make that explicit in a resilience strategy...

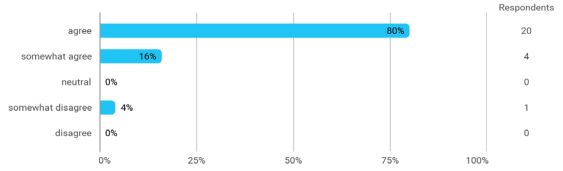
Learned more about urban resilience research?



Learned from practices worldwide ?



The Summer School contributed to your life-long learning experience?



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