

# Build4People Project

## Work Package #1: Behaviour Change Research Approach

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### RATIONALE & BACKGROUND

Cambodia has been witnessing widespread changes in the economic and societal situation in the recent past.

With the availability of more goods and the increasing purchasing power of the emerging middle class (the so-called „new consumers“; Myers, & Kent, 2004), the lifestyle of the Cambodian society changes in regard to environmental issues.

Despite the increasing electricity prices and environmental concerns, the new buildings erected as part of Cambodia's ongoing construction boom are neither energy-efficient nor adapted to the tropical climate.

Our research focusses on understanding specific constraints and changing life styles and demands for housing and urban structure of citizens of Phnom Penh.

### THEORETICAL FRAMEWORK

Our work group focusses on main constraints and motives for pro-environmental behaviour of people in Phnom Penh and cognitive and moral factors that influence the behaviour. The standardized measures of environmental relevant constructs are based on theoretical models as the Theory of planned behaviour (Ajzen, 1991; see figure below) and the Norm-activation model (Schwartz, 1977).

Urban quality of life incorporates different constructs concerning psychological basic needs, psychological stress, coping mechanisms and resilience (Antonovsky, 1987).

Furthermore, our approach takes social dynamics and local culture into account. We consider the influence of neighbourhood and community activities on the individual life experiences and how the perception of urban quality of life reflects those experiences (Marans, 2012).

### RESEARCH QUESTIONS

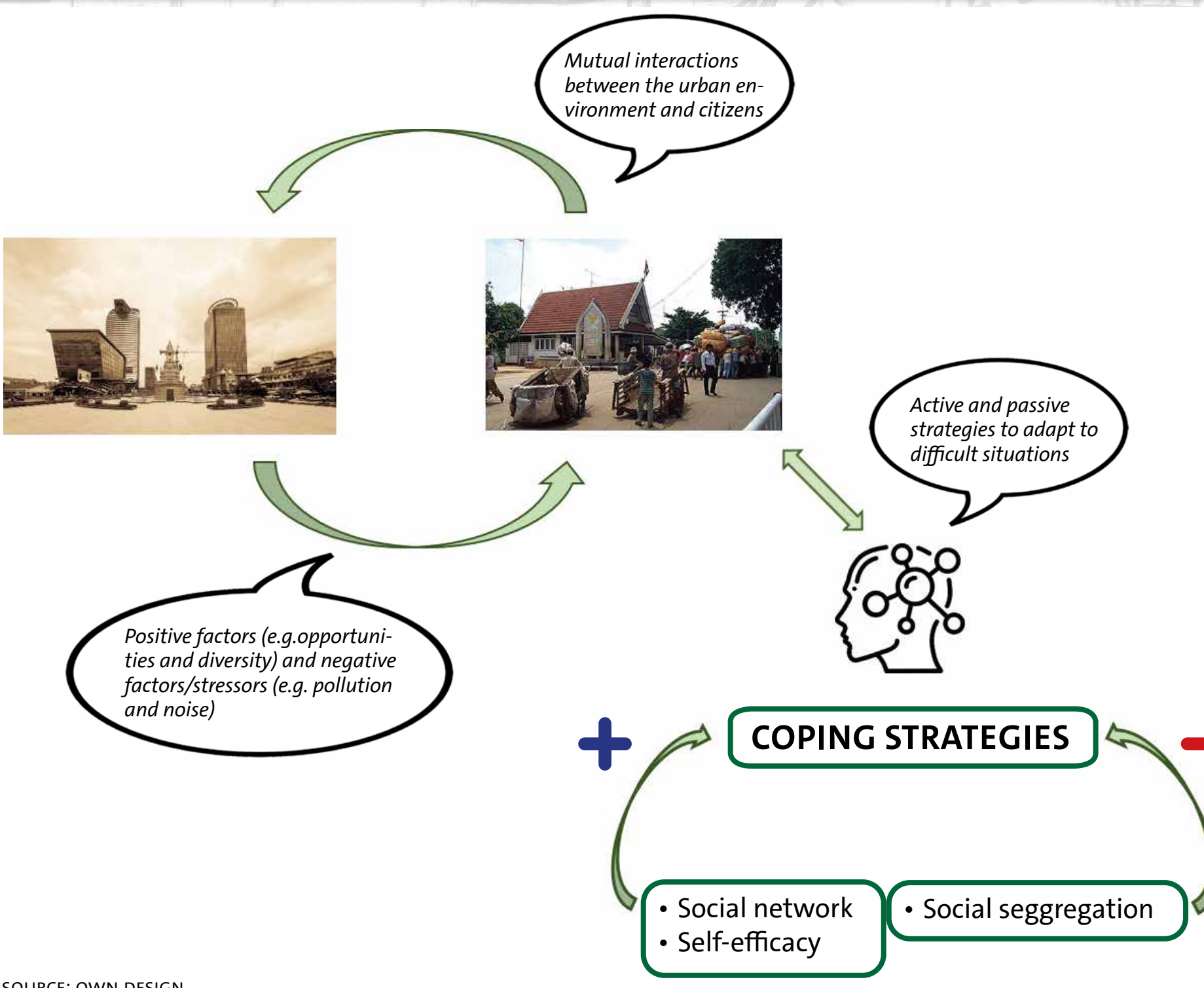
- Which factors (constraints and motives) determine pro-environmental behaviour in the daily life of the citizens of Phnom Penh?
- What factors determine the perception and evaluation of urban quality of life in Phnom Penh?
- Which psychological constructs can be considered as universal or culturally dependent?
- How can pro-environmental behaviour and environmental consciousness be fostered through tailored interventions?
- How can educational institutions be supported in their programs on Education for Sustainable Development (ESD)?

### OBJECTIVES

The work package „Behaviour Change“ envisions to gain a deeper understanding of the mindset, value system, environmental worldview and behaviour of citizens of Phnom Penh. This increase of knowledge will allow us to:

- Conceptualize a curriculum for Environmental Psychology at the Royal University of Phnom Penh
- Develop an intervention tool to increase pro-environmental behaviour at the Green School Demonstration project
- Develop a transdisciplinary measure for urban quality of life in Phnom Penh
- Integrate the survey results of the Cambodian context to cross-cultural psychological models

### URBAN QUALITY OF LIFE AS A DYNAMIC PROCESS

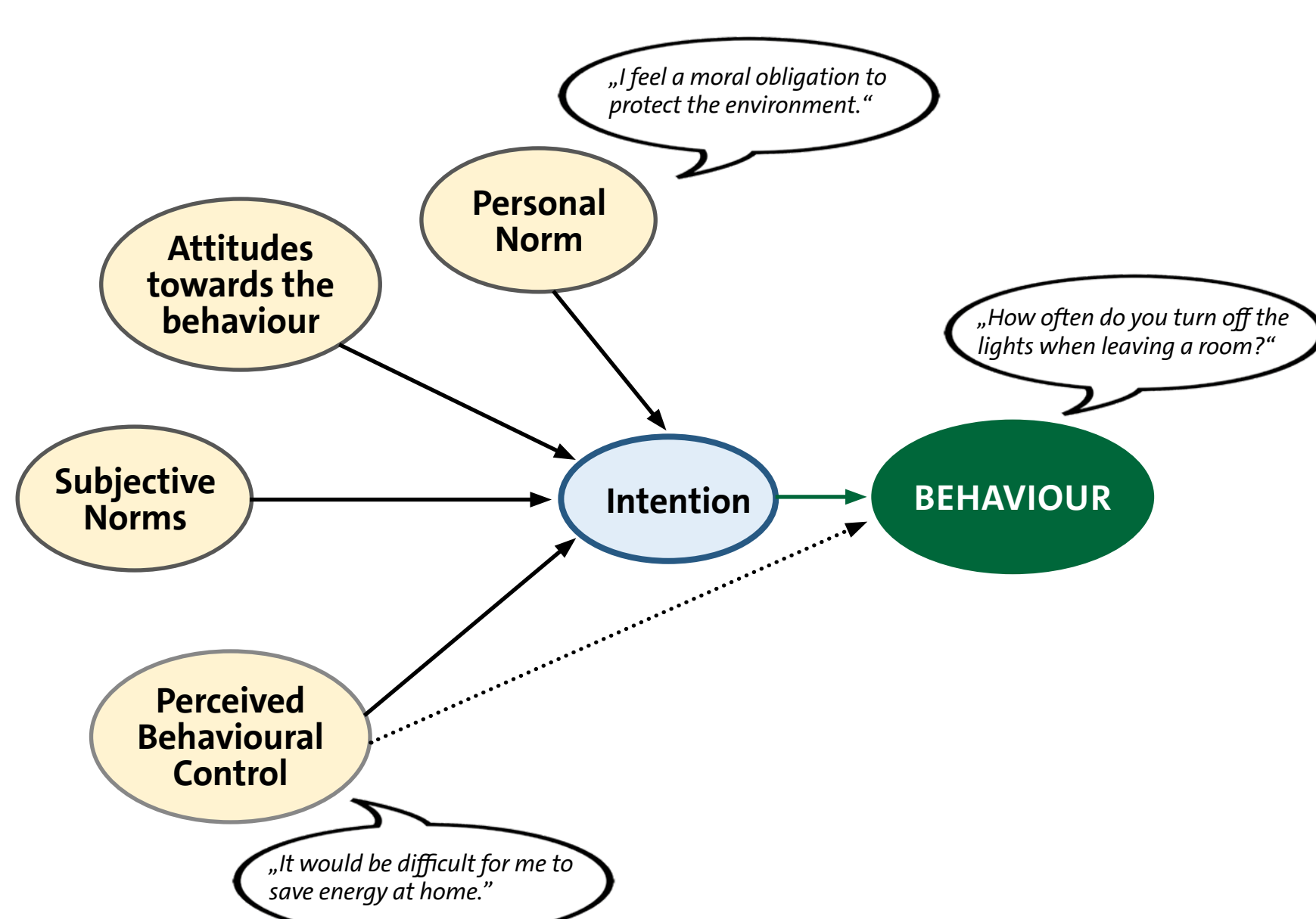


SOURCE: OWN DESIGN.

### MILESTONES OF THE DEFINITION PHASE

- First step of integrating Environmental Psychology to the curriculum of Psychology at the RUPP
- Baseline Report: Approaches towards quality of life in Phnom Penh: results from a pre-test survey
- Baseline Report: First insights into possible approaches for promoting sustainable behaviour in Phnom Penh
- Baseline Report: First insights into environmental beliefs, ecological norms, sustainable behaviour, and gender-specific demands for housing of people in Phnom Penh
- Behaviour Change Intervention at Green School Demonstration Project
- Finalized project proposal for R&D phase with a vision towards implementation phase

### ADAPTED THEORY OF PLANNED BEHAVIOUR



SOURCE: ADAPTED FROM: BAMBERG & SCHMIDT (2003).

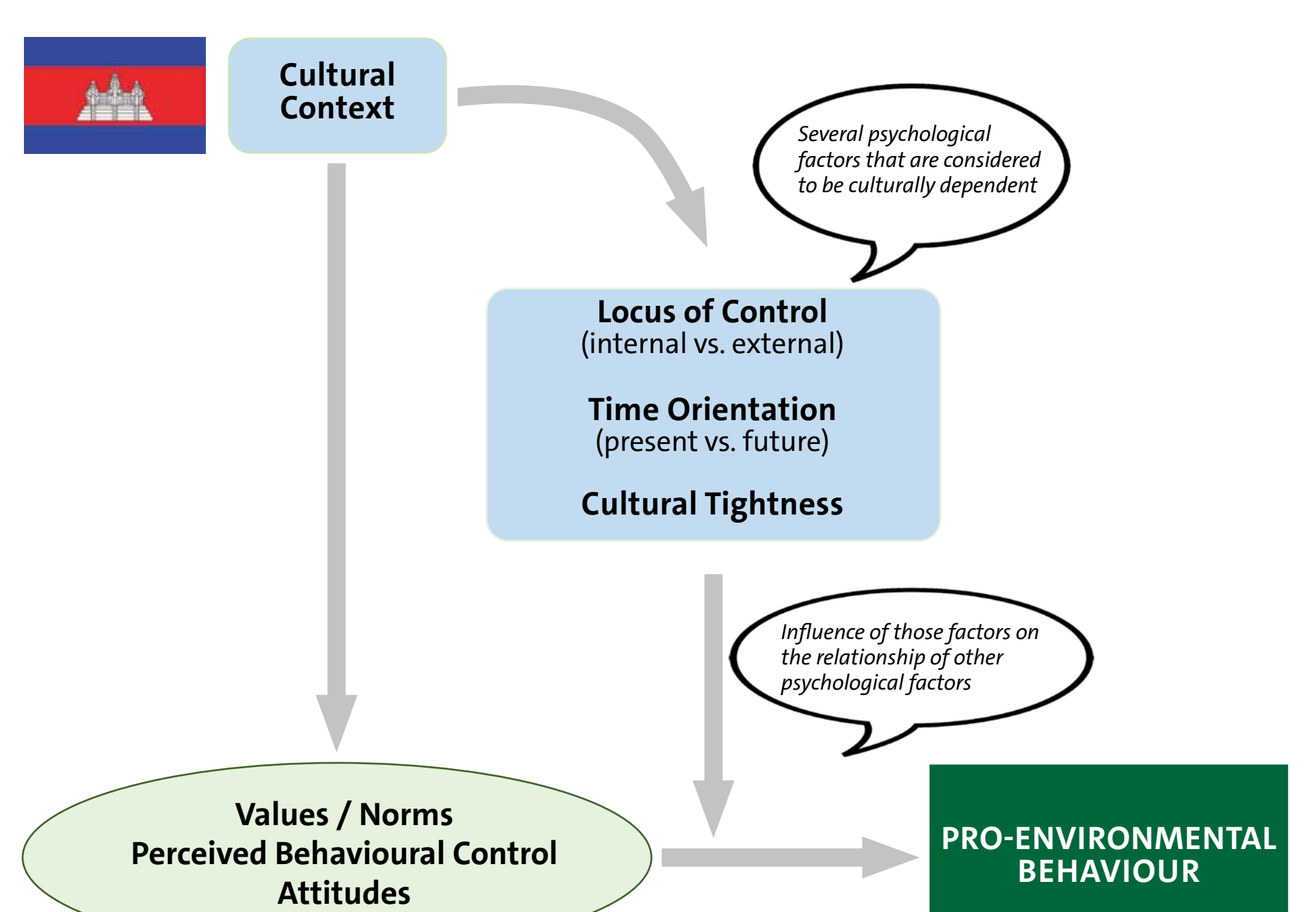
### OUTLOOK

Based on first results of the pre-test and the elaboration of our questionnaire with the Cambodian research partners, we will adapt psychological measures to the societal context of Cambodia. The survey results will give an insight in cultural dependent psychological mechanisms that need to be considered when taking theoretical models to the global context.

The exchange with the Green School Demonstration Project and the department of Psychology at the RUPP will allow us to assess the feasibility of educational programs and interventions, and the capacity building in those educational institutions.

The insight into relevant dimensions for urban quality of life in Phnom Penh will allow us to further develop a holistic approach to a trans-disciplinary measurement.

### CROSS-CULTURAL PERSPECTIVE



SOURCE: ADAPTED FROM: TAM & GHAN (2017).

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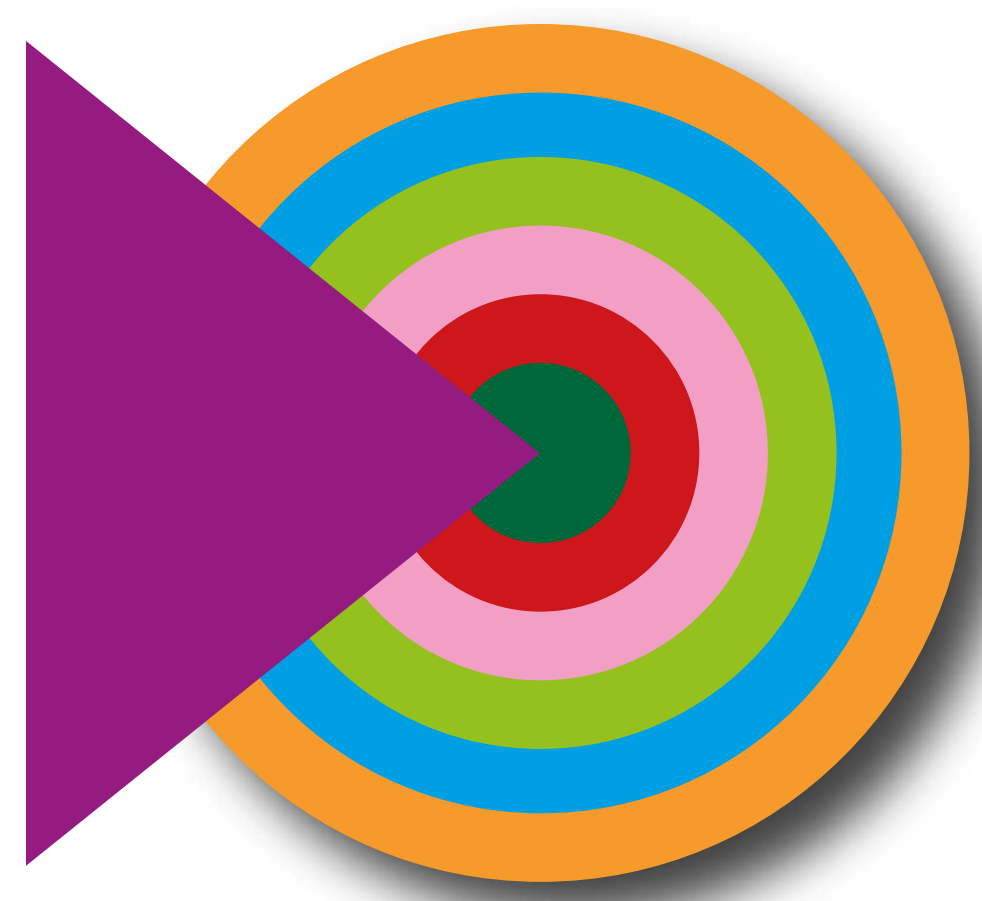
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BUILD4PEOPLE PROJECT LEADER







# Build4People Project

## Work Package #2: Sustainable Building Research Approach

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### RATIONALE & BACKGROUND

Although the construction activity is highly dynamic in Cambodia already today, the major transformation is yet to be expected. It will result in significant impacts through increased energy demand and use of resources. In the early stage of development, the situation in Cambodia is unique (e.g. high energy prices, contemporary tropical design experience).

Early and effective interventions in the urban and residential built environment based on evidence and transdisciplinary research of this project shall lead towards sustainable qualities in the urban context and to comfortable and energy-efficient living conditions in future sustainable buildings. Thereby the functional and technological augmentation of traditional building concepts, shall be developed as preferred strategy of the transformative process.

### THEORETICAL FRAMEWORK

The theory seeks to understand the starting point of sustainable building today and the preferred future condition of the built environment. It will develop pathways from the condition today to a future stage avoiding harmful detours (Kosow & Gaßner, 2008).

We will apply three conceptual frameworks for analysis, and adapt these to the Cambodian context:

1. Framework of locally adapted architecture and building technology (Schwede, 2019)
2. Framework strong sustainability in building (efficiency, sufficiency and consistency) (Hegger et al., 2013; Ott & Döring, 2004)
3. Life-cycle assessment (settlement, building, component, Material level) (DIN EN 15804:2014-07)

### RESEARCH QUESTIONS

- What are the parameters of desired living conditions and the perception of "Quality of Life" of the modern population in Cambodia?
- What are the domains of sustainable building, that are relevant as criteria for sustainable buildings in Cambodia today and in future?
- How can sustainable building practice (design, construction and operation) contribute to urban quality of life without increasing the use of resources beyond the sustainable limits?
- How can sustainable design, construction and operation of buildings be introduced effectively into the Cambodian practice? Which technologies and which capacities need to be developed in this context?

### OBJECTIVES

The WP "Sustainable Building" has a two-tier approach towards a sustainable building practice in Cambodia:

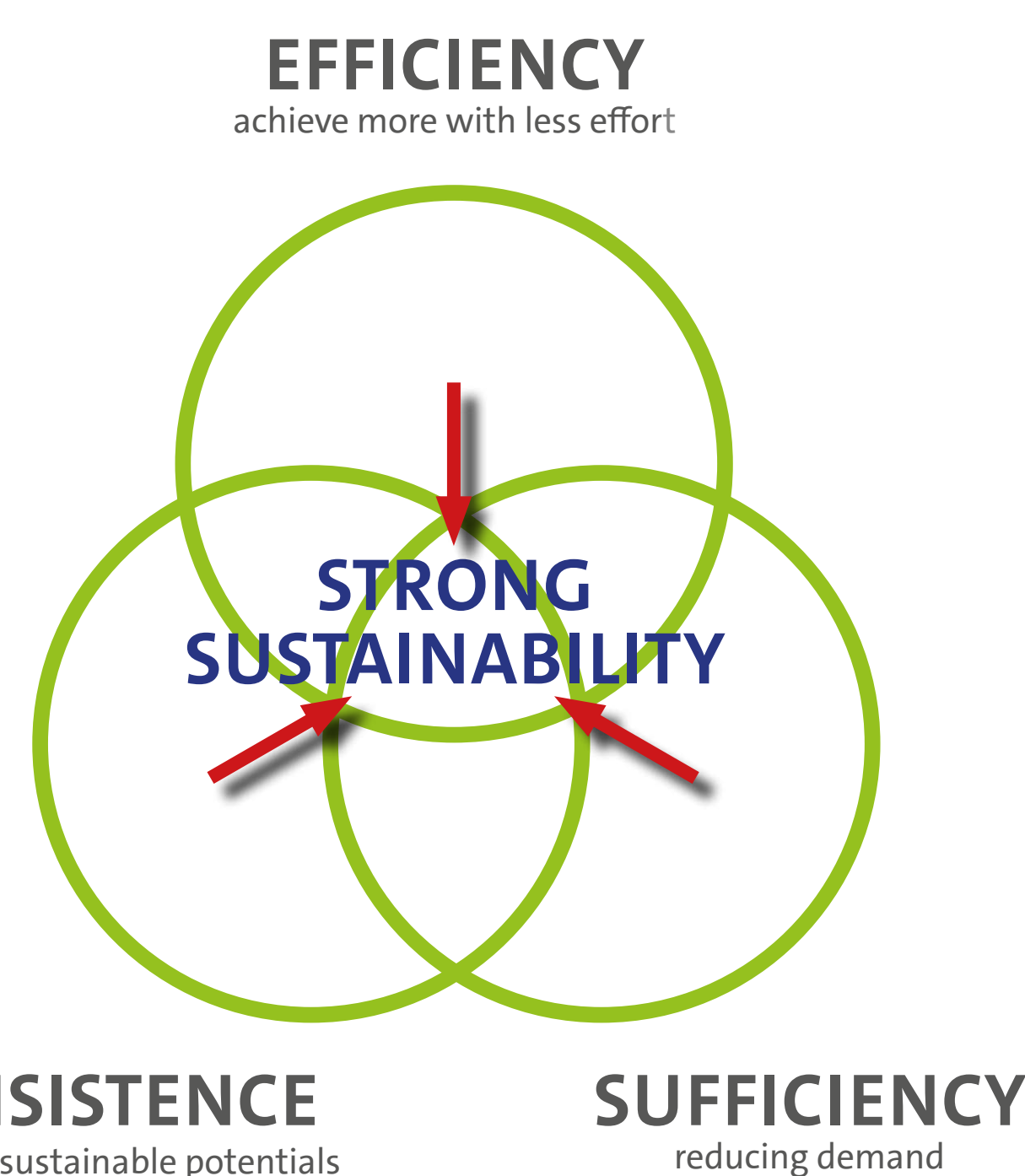
#### Analytical Level

- Understanding the concept of desired living conditions and the perception of "Quality of Life".
- Analysis of modern traditional, current design, building and operation practice
- Conceptualisation of pathways towards sustainable building practice, including design, construction and operation.

#### Normative / Prescriptive Level

- Development of building standards for energy-efficient, resource-efficient and overall sustainable building.
- Support transformative change towards sustainable building and towards the realization of the SDGs, particular SDG3, 7, 11, 12.

### STRATEGIES TOWARDS SUSTAINABLE BUILDING



SOURCE: ADAPTED FROM: HEGGER ET AL., 2013.

### MILESTONES OF THE DEFINITION PHASE

- Conceptualisation of methods for the detailed building audit survey and Measurement of indoor environmental quality parameters in modern residential settings
- Baseline Report: Technologies and Systems for Sustainable Building – current and future applications in construction projects in Cambodia
- Baseline Report: Measuring urban quality of life from a sustainable building perspective
- Conceptualisation of pathways towards sustainable building practice in Cambodia, including design, construction and operation
- Contributions to the development of building standards by the General Department of Housing (GDH)
- Preparation of a solid theory-based proposal in regard to the RD-phase

### LIFE-CYCLE PERSPECTIVE

#### life cycle phases for building assessment

building assessment information				
building life cycle information				supplementary information beyond the building life cycle
PRODUCT stage	CONSTRUCTION PROCESS stage	USE stage	END OF LIFE stage	benefits and loads beyond the systems boundaries
A1 Raw material supply	A4 Transport	B1 Use	C1 Deconstruction	D Reuse-Recovery-Recycling Potential
A2 Transport	A5 Construction Installation process	B2 Maintenance	C2 Waste Processing	
A3 Manufacturing		B3 Repair	C3 Transport	
		B4 Replacement	C4 Deposal	
		B5 Refurbishment		
		B6 operat. Energy Use		
		B7 operat. Water Use		

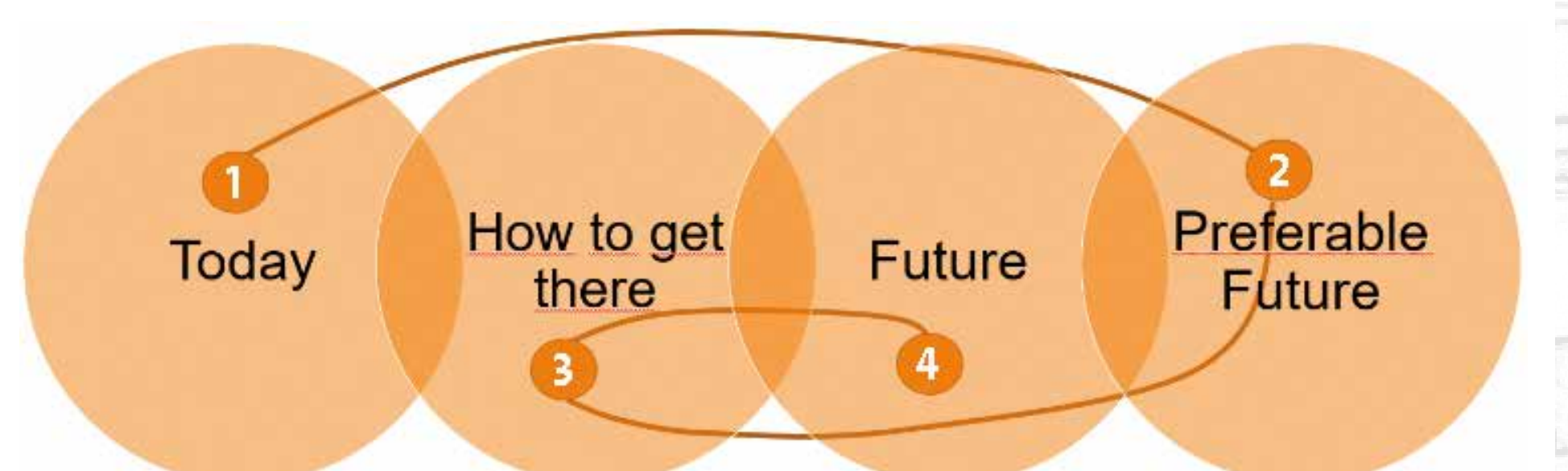
SOURCE: ADAPTED FROM: DIN EN 15804:2014-07.

### OUTLOOK

Based on the preliminary analysis in the definition phase, we will consolidate the framework of sustainable building for the Cambodian context for today and will draw up a path for the future sustainable development towards a high level of quality of life in the built environment with a high degree of energy-efficiency, resource efficiency and life-cycle performance.

Thereby we will draw from the green building framework of the German Sustainable Building Council (DGNB) as well as from the life-cycle assessment approach (DIN EN 15804:2014-07) for environmental impact assessment and economic performance in the operation phase and the concept of strong sustainability in building (Hegger et al. 2013).

### METHODOLOGY OF FUTURE & SCENARIO ANALYSIS



Research & Development Phase of Build4People Project

SOURCE: KOSOW HANNAH; GAßNER ROBERT (2008).

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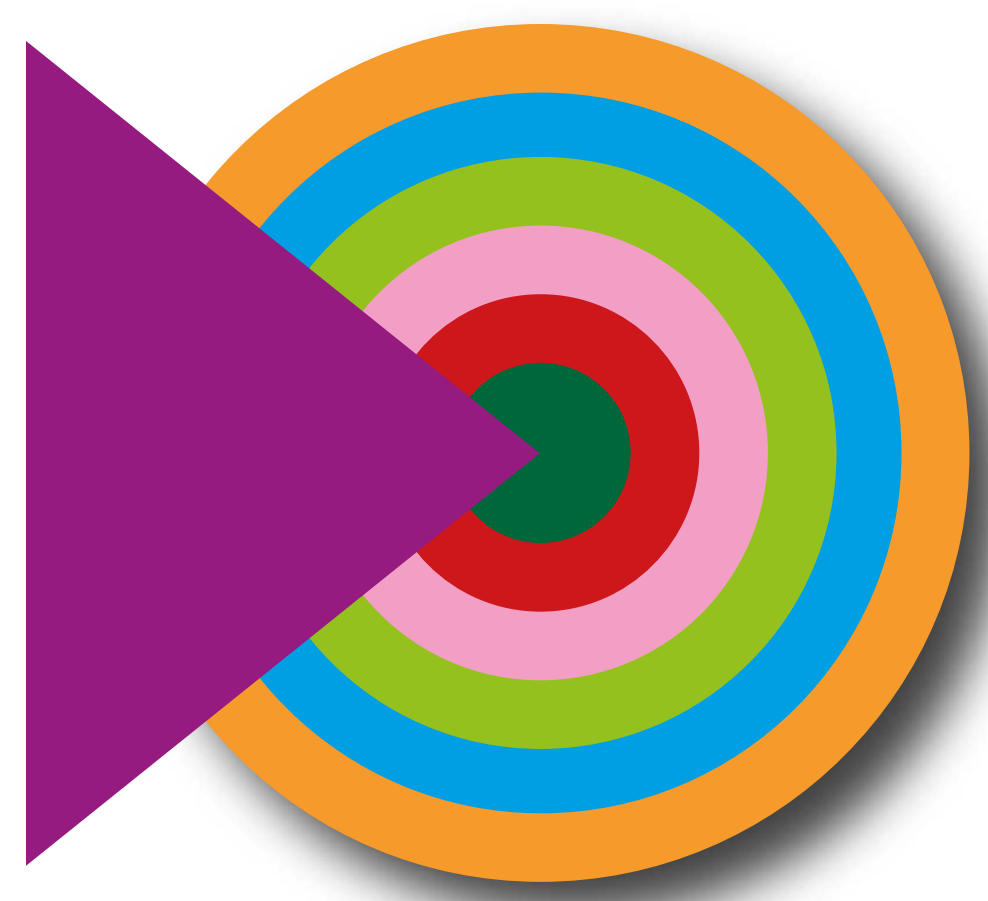
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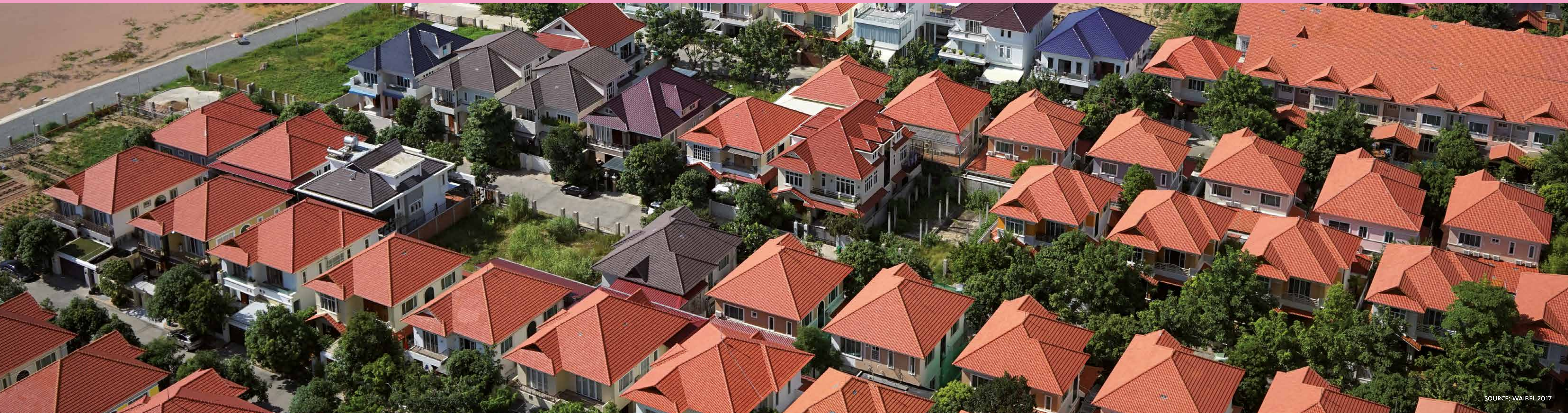
# Build4People Project

## Work Package #3: Sustainable Neighbourhoods Research Approach

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### RATIONALE & BACKGROUND

There is a rapid and often unplanned urbanisation over the last twenty years in Cambodia. A doubling of urbanisation level is expected until 2030. This leads to an unbalanced population growth, particularly in Phnom Penh, which tripled in the past ten years reaching around 2.1 million inhabitants.

A significant improvement of living standards is expected for the next years, especially of the urban middle class. As a result there is a strong demand for urban renewal and new neighbourhoods with a large socio-cultural, economic and environmental impact. Thus, there is a need to better understand and analyse its causes, patterns and trends.

Based on this, sustainable neighbourhoods are considered as key elements for enhancing the quality of urban life in Phnom Penh and are crucial for climate protection, climate adaptation and resilience.

### THEORETICAL FRAMEWORK

The following framework projects will be used as background and a starting point:

- The EU funded project „Ecocity“ as a European framework for sustainable urban planning (30 partners, 8 European countries) (Messerschmidt et al., 2002-2005)
- The EU funded project „SNOWBALL – Energy Smart Urban Design“, including a city coaching and process design methodology (Messerschmidt et al., 2006-2008)
- The assessment and rating system for sustainable urban districts by the German Sustainable Building Council DGNB, including a comprehensive set of criteria and indicators (DGNB, Messerschmidt et al., from 2009 on)
- Multi-layered neighbourhood development strategies and experts workshop methodology as applied for „UMore Park“ in Minneapolis (Eble Messerschmidt Partner in cooperation the University of Minneapolis 2011)

### RESEARCH QUESTIONS

Our WP investigates how sustainable neighbourhoods (design, construction, operation and management) can contribute to the quality of urban life with special regards to:

- Addressing the cultural heritage of Cambodia, changing socio-cultural conditions and the need for an increased public space area with a high quality of sojourn and livability, applied both for new and existing developments
- Climate protection by energy-efficient buildings, employing smart energy supply systems and using renewable energy sources on the neighbourhood level
- Climate adaptation by climate responsive urban design for buildings and open spaces supporting comfort and health
- Circular economy including sustainable resource management, material flows and water cycles in a blue-green infrastructure

### OBJECTIVES

- To understand the environmental, socio-cultural and institutional context in Cambodia.
- To establish and to consolidate the cooperation with Phnom Penh Capital Hall (PPCH).
- To achieve a first conceptualisations of strategies and an assessment system for “Sustainable Neighbourhoods”.
- To prepare a feasibility study for an eco-town development for the application of the strategies.
- To develop the 1<sup>st</sup> edition of the exhibition on “Green Buildings and Sustainable Neighbourhoods” as a road show in Cambodia in order to increase awareness about the topic of sustainable buildings and urbanisation.
- To contribute to trans-disciplinary products such as the “Green School Demonstration Project”, a joint survey and the subsequent “Urban Quality of Life City Index”.

### ASSESSMENT CRITERIA FOR URBAN DISTRICTS

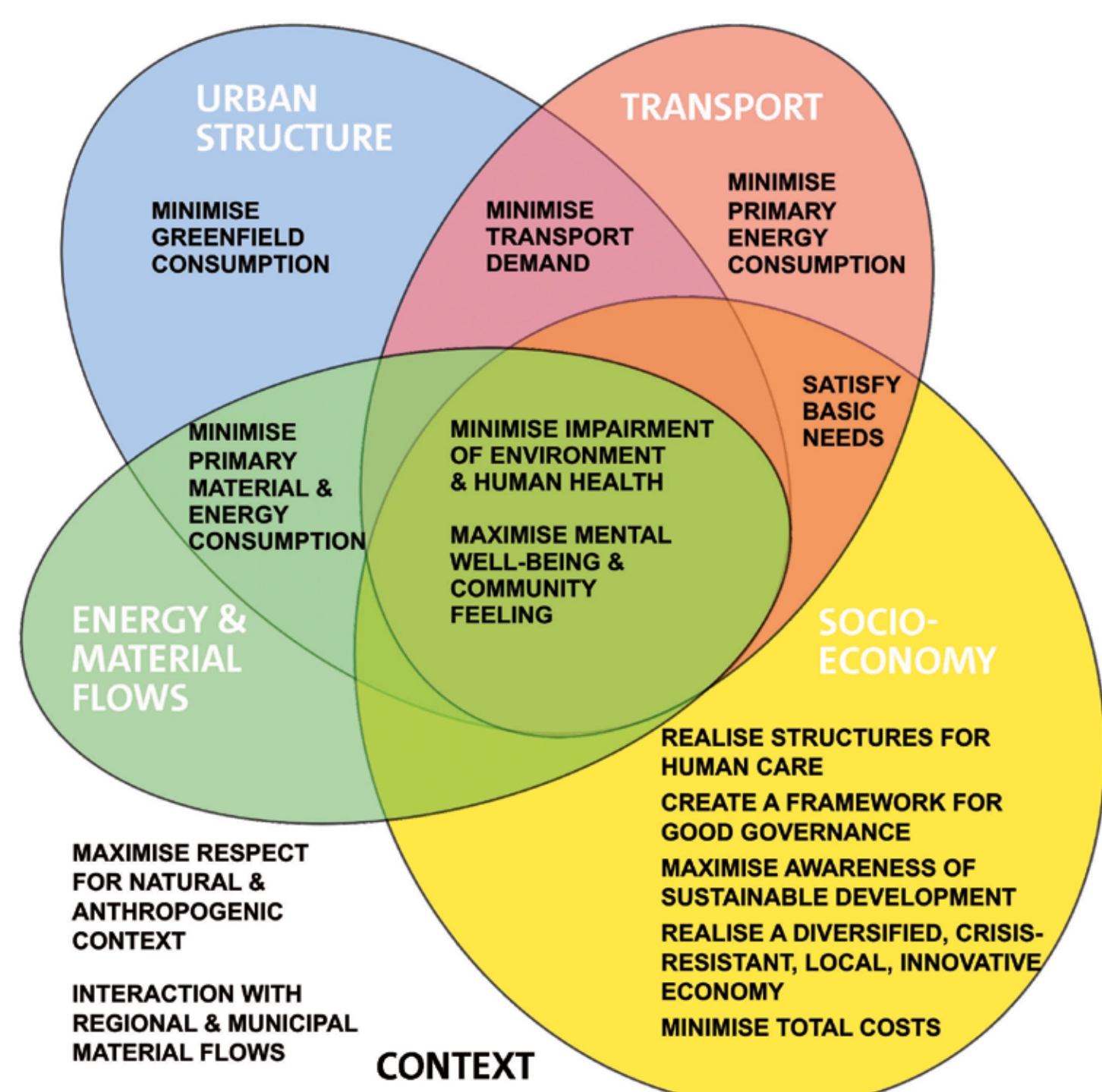
Environmental Quality	Economic Quality	Sociocultural and Functional Quality	Technical Quality	Process Quality
<ul style="list-style-type: none"> <li>• (LCA) Life Cycle Assessment</li> <li>• Urban Climate</li> <li>• Environmental Risks</li> <li>• Water Cycle</li> <li>• Land Use</li> <li>• Biodiversity</li> </ul>	<ul style="list-style-type: none"> <li>• (LCC) Life Cycle Costs</li> <li>• Resilience and Adaptability</li> <li>• Land Use Efficiency</li> <li>• Value Stability</li> </ul>	<ul style="list-style-type: none"> <li>• Micro Climate-Thermal Comfort in Open Spaces</li> <li>• Open Space</li> <li>• Emissions/Immissions</li> <li>• Accessibility</li> <li>• Urban Design</li> <li>• Social and Functional Mix</li> <li>• Social and Commercial Infrastructure</li> </ul>	<ul style="list-style-type: none"> <li>• Energy Infrastructure</li> <li>• Resource Management</li> <li>• Smart Infrastructure</li> <li>• Mobility Infrastructure - Motorised Transportation</li> <li>• Mobility Infrastructure - Pedestrians and Cyclists</li> </ul>	<ul style="list-style-type: none"> <li>• Integral Planning</li> <li>• Participation</li> <li>• Project Management</li> <li>• Governance</li> <li>• Construction Process</li> <li>• Monitoring</li> </ul>

SOURCE: DGNB.

### MILESTONES OF THE DEFINITION PHASE

- 3 baseline reports, including preconditions for sustainable neighbourhood development, planning framework, processes and stakeholders
- Pre-feasibility study on Phnom Penh „Eco Town Development“ and capacity building with PPCH
- First conceptualisation of planning strategies and assessment system for “Sustainable Neighbourhoods”
- First conceptualisation of strategies and assessment system for “Sustainable Neighbourhoods”
- 1<sup>st</sup> edition of the exhibition on “Green Buildings and Sustainable Neighbourhoods” as a road show in Cambodia
- Contributions to the “School Demonstration Project”, the joint “BuildPeople Survey” and the “Urban Quality of Life City Index”

### SUSTAINABLE URBAN PLANNING



SOURCE: EU PROJECT ECOCITY.

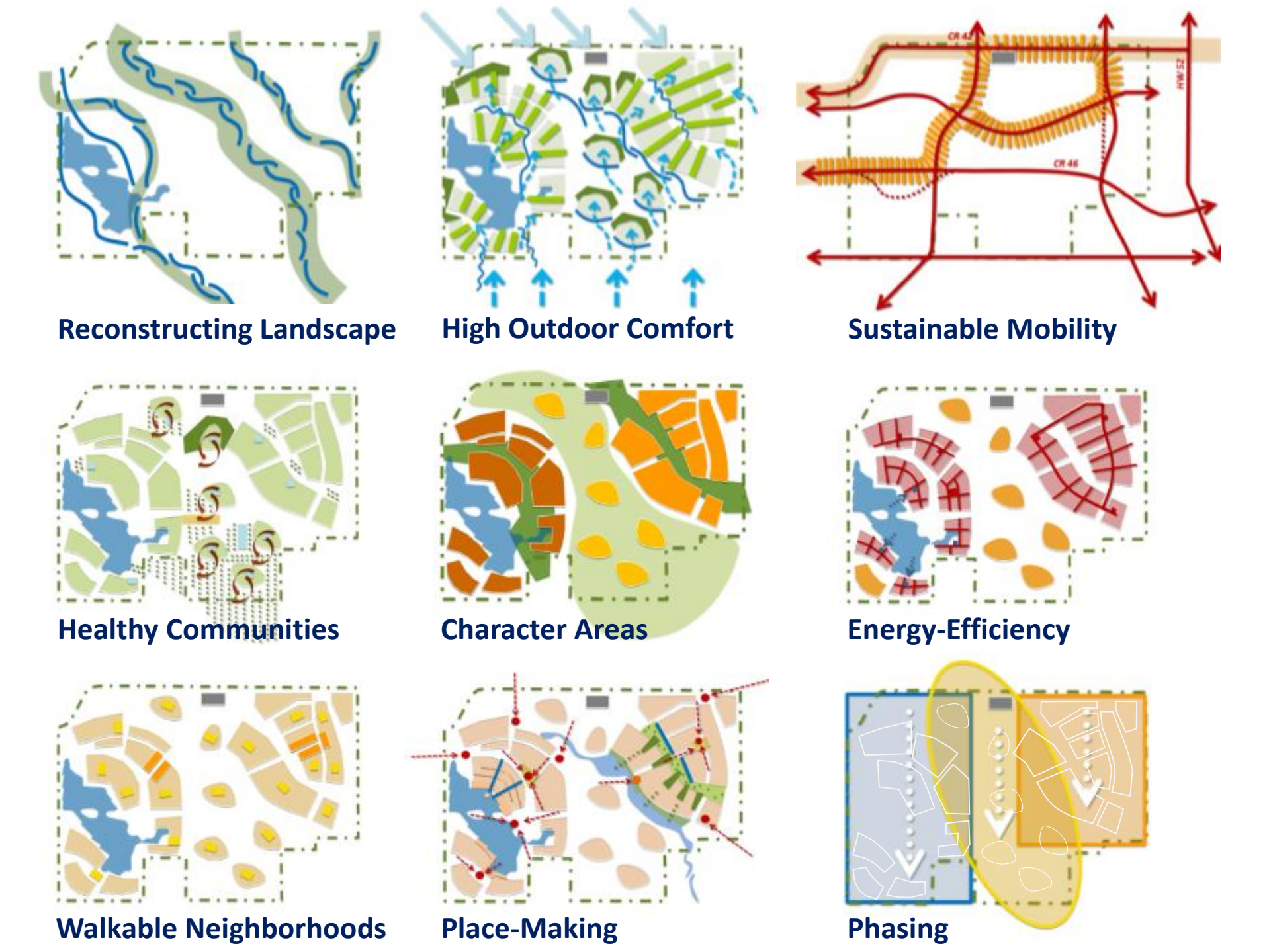
### OUTLOOK

The knowledge transfer of European and international strategies will lead to innovative ways of neighbourhood development in Cambodia and South-East Asia.

It is expected that the research results contribute to:

- Raising considerably value to design and to foster the sustainability performance
- Assessment and audits for certification of sustainable neighbourhoods by DGNB or a Cambodian institution
- New multi-layered and collaborative planning strategies for implementing sustainable neighbourhood development („Ecocity Transition Lab“)
- Dissemination of results through presentations at conferences, scientific publications as well as contribution to the work of the international Green Building Council (GBC).

### MULTILAYERED NEIGHBOURHOOD DEVELOPMENT



SOURCE: INTEGRATION PLAN - UMORE PARK, MINNEAPOLIS, EMP.

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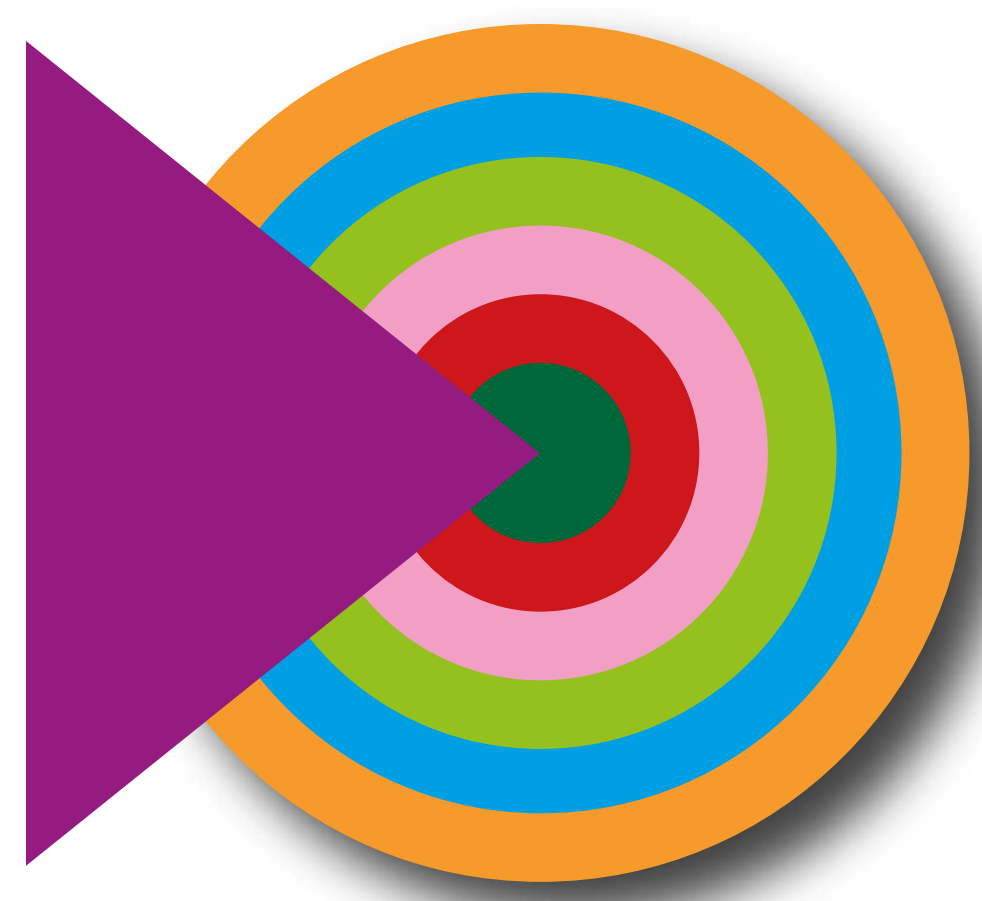
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EBLE MESSERSCHMIDT PARTNER  
Architekten und Stadtplaner PartGmbH







# Build4People Project

## Work Package #4: Urban Green Research Approach

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### RATIONALE & BACKGROUND

Urban green spaces (UGS) offer multifaceted benefits for urban residents and the city itself. UGS belong to our global ecosystems supplying ecosystem services, such as biodiversity and climate regulations (Marques 2019), not only to the inhabitants of a city. Recently scholars more often draw parallels between UGS and general human well-being and people's health - physically, socially and mentally (Huang et al. (2017). Taking this into consideration, it is believed that UGS contributes to improving the quality of life in cities. Today it's a thriving challenge in sustainable urban planning to actively maintain and develop green infrastructure (GI), especially in fast growing cities like Phnom Penh (PP).

The Phnom Penh Sustainable City Plan 2018-2030 acknowledges the importance of UGS and includes in section 5.2 the task to double the size of UGS in PP to a minimum of 2.2m<sup>2</sup> per person in 2030 (GGGI 2019).

### OBJECTIVES

The objective of this research is to develop, test and apply four different products about UGS in PP.

1. Typology of urban green space
2. Map of urban green space in 2019
3. Index maps of city properties
4. Time Series Change since 2000

A step-by-step approach will be elaborated to create a land cover classification for PP. Different image classification systems will be tested to extract physical features of land cover types mainly UGS. As input data for the classification will be used PlanetScope and Rapideye image products.

New data products like Sentinel-2 will be utilized to calculate three different indices named "Urban Green Space Index" (UGSI); "Urban Green Neighborhood Index" (UGNI) and "Urban Surface Roughness Index (USRI)".

### EXAMPLE FOR AN URBAN GREEN SPACE TYPOLOGY



SOURCE: DAVID COLE (IN: [HTTPS://WWW.REALESTATE.COM.KH/NEWS/THREE-IDEAS-FOR-IMPROVING-PHNUM-PENH-PUBLIC-SPACE/](https://www.realestate.com.kh/news/three-ideas-for-improving-phnom-penh-public-space/))

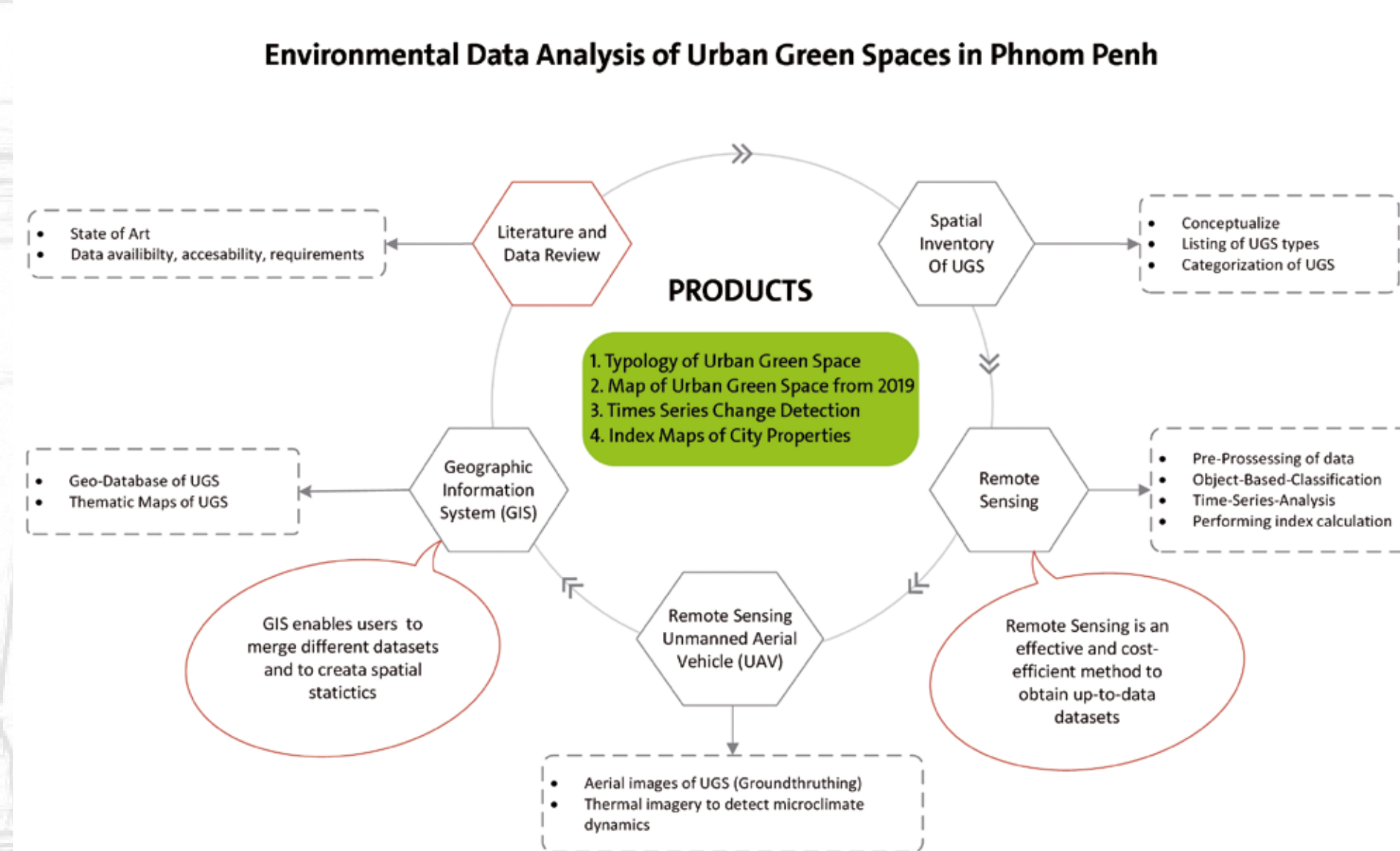
### THEORETICAL FRAMEWORK

The main focus of this research is to explore and collect information on the spatial distribution and configuration of UGS. This will be achieved by performing different RS techniques.

1. the identification and mapping of physical features of UGS in PP and its surrounding areas (Taubenböck 2010)
2. the investigation of different urban properties performing different index models (Gupta et al. 2012; Jhaldiyal et al. 2016)
3. comparing the past and present with human impact change applying a time series of remote sensing data (Kuenzer et al. 2015)

Analyzing the spectral properties of plants and other landscape features allows to generate a broad but up-to-date land cover type classification. The evaluation of such classifications enables to efficiently obtain and describe important characteristics (location, vegetation structure, patch connectivity and size etc.) on global and local level.

### ENVIRONMENTAL DATA ANALYSIS OF UGS IN PP



SOURCE: ILLUSTRATION OF DIFFERENT DISCIPLINES AND METHODS CONNECTED TO CONDUCT AN ENVIRONMENTAL DATA ANALYSIS (OWN DESIGN BY AMELIE MCKENNA, 2019)

### OUTLOOK

- Expected results should serve to improve the scientific knowledge and academic understanding of WP 4 research topics and research questions among all project partners and other stakeholders groups in Phnom Penh
- Spatial-temporal mapping products can be integrated into measures for ecological sustainable and environmentally friendly urban planning or serve as addition information for specific spatial regulation and management measures
- The results will help to highlight the interaction between the human and physical environment of Phnom Penh
- [...]

### IDEAL MODEL OF URBAN GREEN SPACE (UGS)



SOURCE: DAVID COLE (IN: [HTTPS://WWW.REALESTATE.COM.KH/NEWS/THREE-IDEAS-FOR-IMPROVING-PHNUM-PENH-PUBLIC-SPACE/](https://www.realestate.com.kh/news/three-ideas-for-improving-phnom-penh-public-space/))

### RESEARCH QUESTIONS

- What types of UGS exists in Phnom Penh and how they can be categorized?
- What is the spatial distribution, density and topology of UGS in Phnom Penh in 2019?
- How did UGS develop over time in Phnom Penh at city and district level (Sangkat)?
- How many different types of UGS can we identify using remote sensing classification algorithms?
- Which classification system performs best in extracting information on UGS in urban environments?
- What are the advantages / disadvantage using images taken by Unmanned Aerial Vehicle (UAV) to support or verify above mentioned land cover classifications in urban areas?
- What can we learn about the urban environment when calculating different indices?

### MILESTONES OF THE DEFINITION PHASE

- Typology and classification of UGS
- Understanding the spatial structure of UGS
- Knowledge on change of UGS over time
- Testing different metrics e.g.
  - "Urban Green Space Index",
  - "Urban Green Neighbourhood Index",
  - "Urban Surface Roughness Index".
- Presenting geospatial research products to the end-user and stakeholders
- Implementation of a citizen-science approach to UGS on the local level in the context of the "Green School Demonstration project"
- Development of a data management environment to assure easy and flexible data access and storage for day-to-day operations

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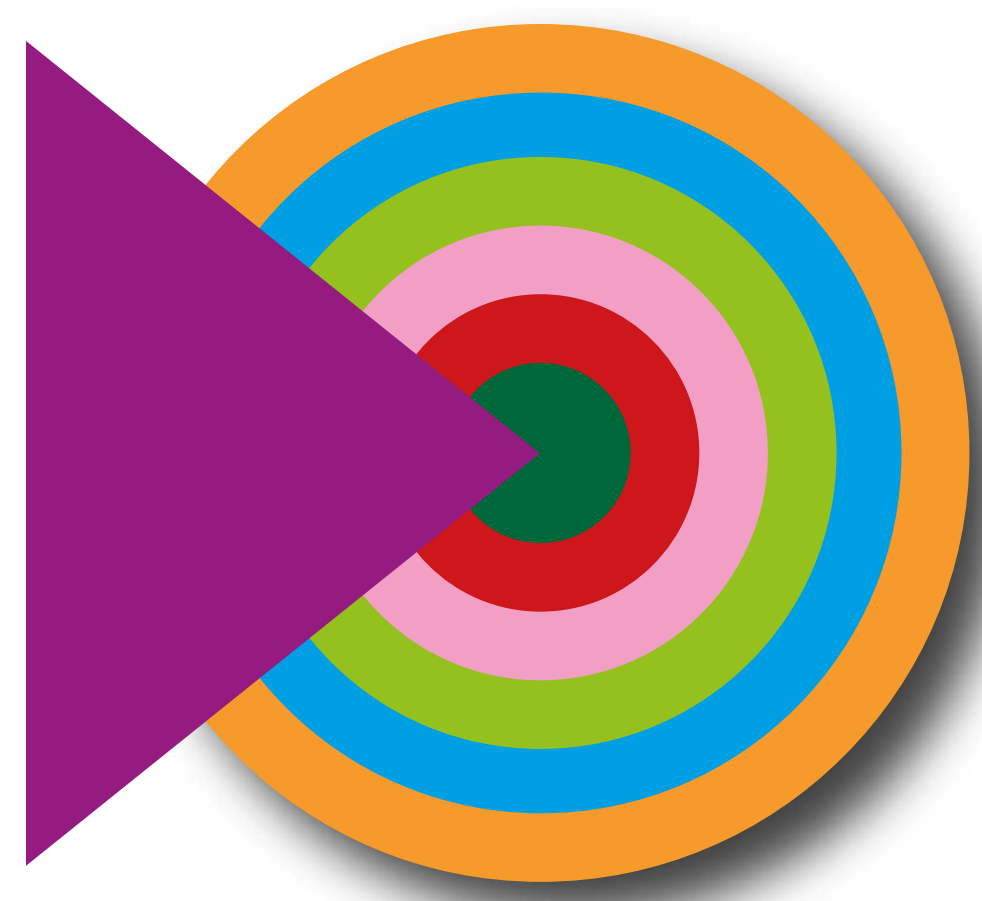
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# Build4People Project

## Work Package #5: Urban Climate Research Approach

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### RATIONALE & BACKGROUND

For city development of Cambodia the urban climate especially the urban heat island has to be considered. Dealing with the thermal and air pollution aspects it is crucial not only to deal with the presentation of large-scale mean climatic conditions, but also to assess differing observations of individual inner city local climates including their reciprocal interactions.

The main urban climate tools are urban climatic maps in different scales, which provide relevant information for planning and make qualitative as well as quantitative statements on thermal and air quality issues.

The maps demonstrate the thermal efficiency complex which refers to the effects of the total meteorological relevant aspects of the urban canopy layer (radiant heat, sensible and latent heat, anthropogenically generated heat, thermal circulation, wind).

### OBJECTIVES

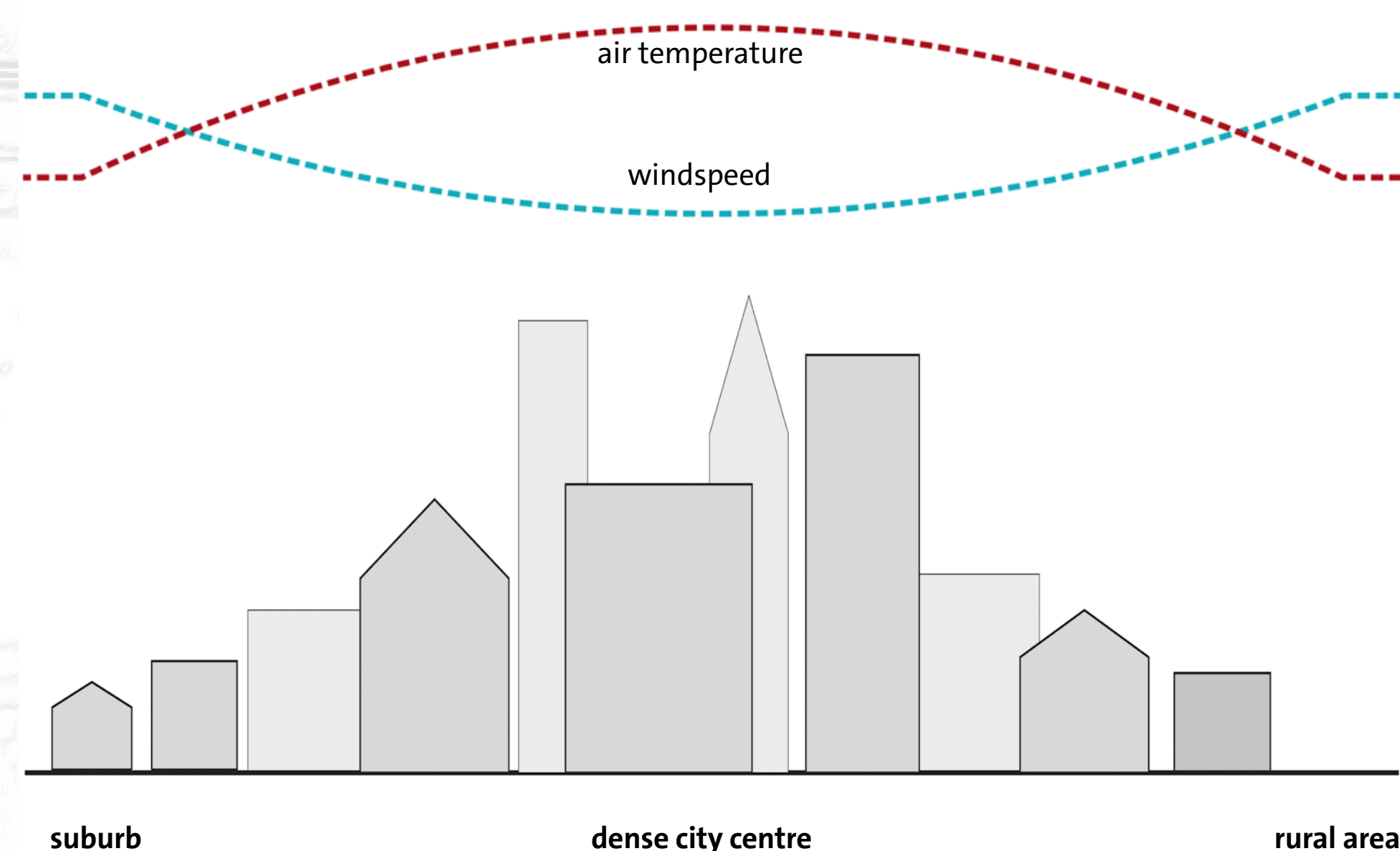
Within the Build4People project urban climate recommendation lead to more sustainable development and sustainable buildings. Consequently, formal planning needs to be addressed with climate information's. Additional informal planning analyses are needed to be part of the formal procedure.

The approach to urban climate issues should incorporate a planning approach to urban climate investigation methods and in their presentation of results.

Further objectives are:

- To increase quality of urban planning and building design with meso and microscale climatic analysis.
- To improve thermal and air pollution outdoor comfort by using urban climatic recommendation maps and analysis.

### URBAN HEAT ISLAND



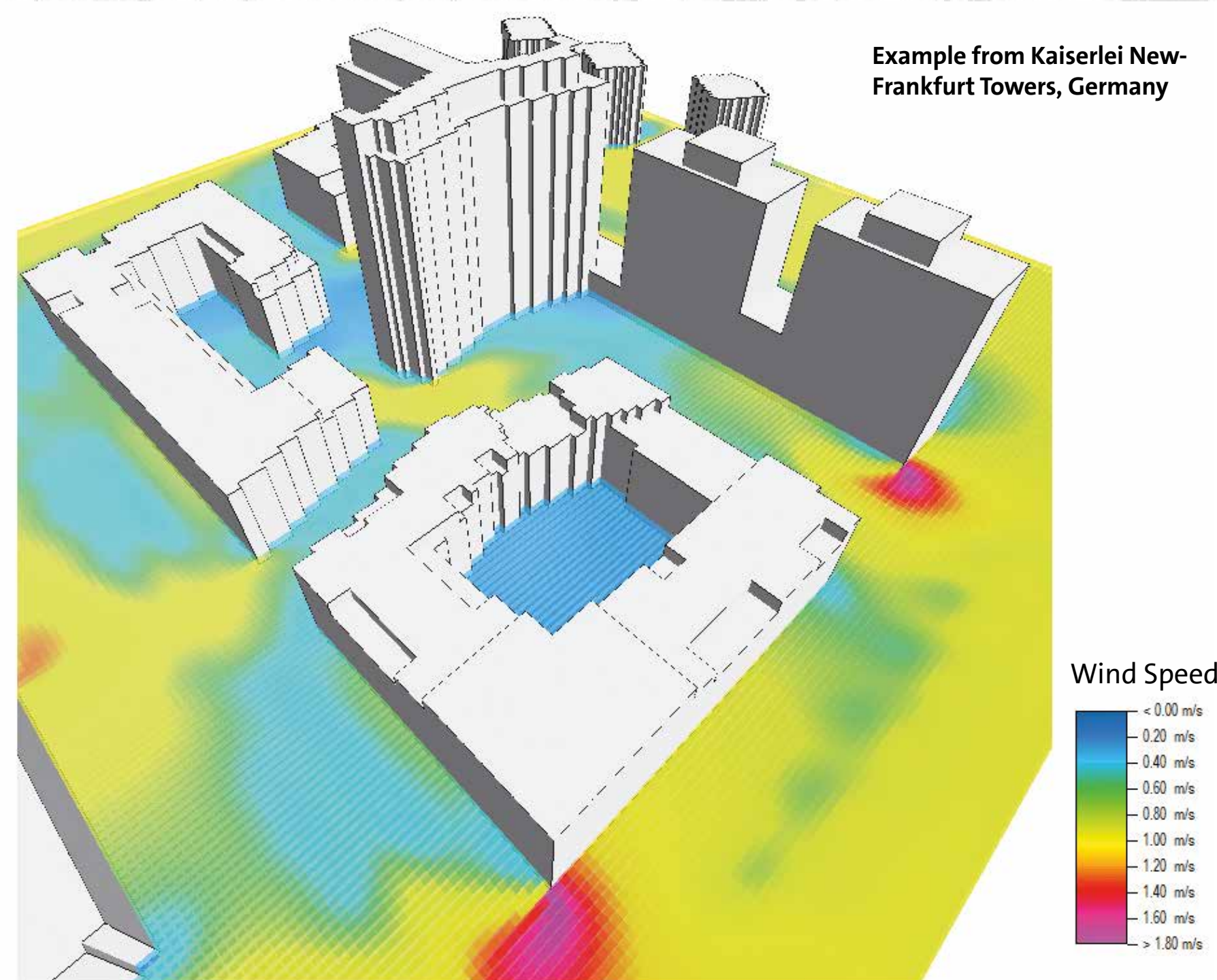
SOURCE: OWN DESIGN.

### THEORETICAL FRAMEWORK

Climatic systems describe areas with the same urban climatological characteristics. They are generated and influenced by morphological and city fabric factors. They include thermal load, ventilation and can also evaluate air pollution aspects. The climatope information on the territorial level is then used to specify recommendations depending on existing wind regimes and can also be used to make recommendations for specific planning purposes.

The underlying methodology for the map is to combine layers, which were deduced from land use maps or other maps, translated to thermal and dynamic aspects with weighting factors. These weighting factors range from building volume to heat storage, greenery to heat budget, openness to ventilation, roughness to wind speed and topographical information.

### SIMULATION OF MICRO-CLIMATE



SOURCE: INKEK GMBH INSTITUT FÜR KLIMA- UND ENERGIEKONZEPTE (MODELLING BY SEBASTIAN KUPSKI)

### OUTLOOK

Based on the previous analyses of urban climate conditions following perspectives and plans can be derived:

- Climate recommendations for urban master plans to characterize areas for city for development perspectives.
- Recommendations for zoning plans or neighborhood plans or blocks with detailed specifications.
- Recommendation for building design, building sites and building density
- Future perspectives will take the climate change into account, especially for open spaces and input of vegetation types.

### RESEARCH QUESTIONS

The task of planning-related urban climatology is to improve air quality and thermal conditions for a liveable city asking the relevant questions:

- How to reduce urban heat islands (heat island as an indication of thermal comfort / discomfort)?
- How to optimize urban ventilation (air exchange, ventilation lanes), urban planning and urban development for air quality and thermal comfort?
- What is the aim of open space planning?
- Are there possibilities to preserve or to promote fresh air or cold air influx areas to foster air exchange?

### MILESTONES OF THE DEFINITION PHASE

- First conceptualisation of an urban climate map
- Baseline Report: Measuring urban quality of life from an urban climate perspective.
- Input to eco-city model pilot project
- Input to touring exhibition „Green Buildings and Sustainable Neighbourhoods“
- Consulting services and feasibility studies in the context of the Green School Demonstration project
- Exploration of urban-rural linkages in terms of urban climate and material flows
- Preparation of a solid theory-based proposal in regard to the RD-phase

### URBAN CLIMATE MEASUREMENT EQUIPMENT



SOURCE: LUTZ KATZSCHNER.

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List of references cited within this poster /  
Further reading

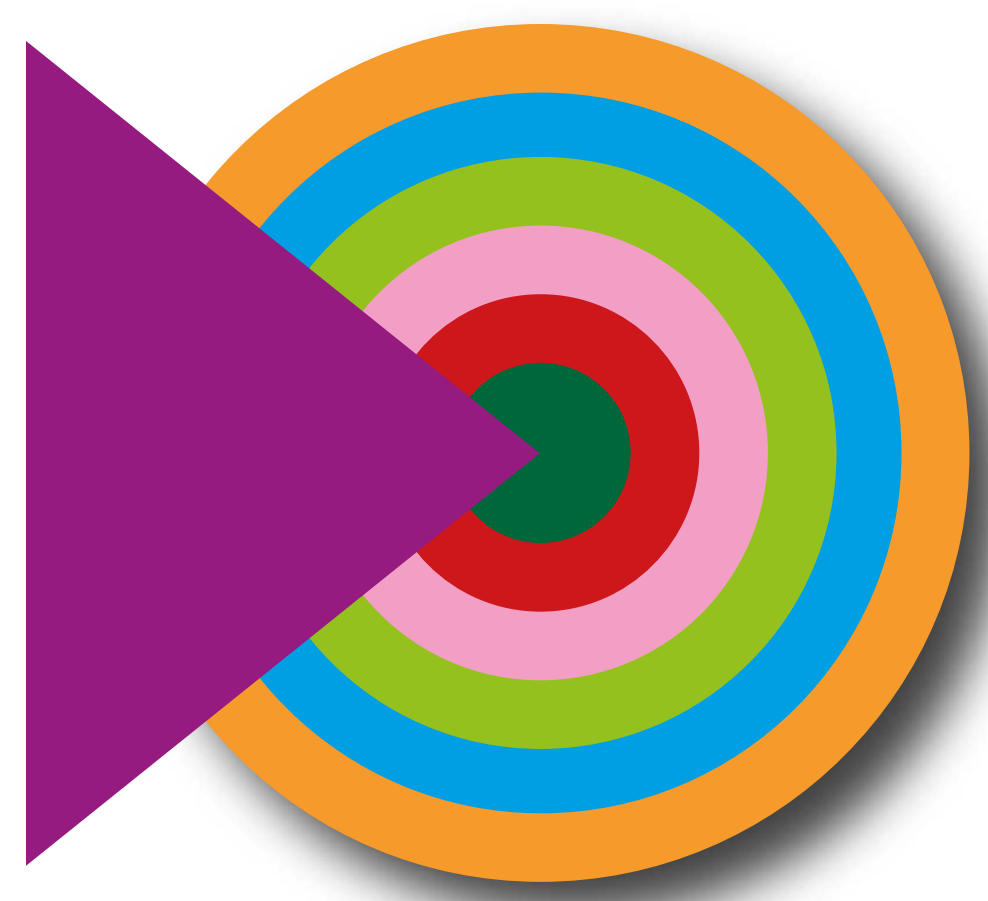
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BUILD4PEOPLE PROJECT LEADER

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# Build4People Project

## Work Package #6: Sustainable Urban Transformation Research Approach

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### RATIONALE & BACKGROUND

Cambodia has been witnessing highly-dynamic urbanization in the recent past.

However, its current urban development path is considered multidimensionally unsustainable because it goes along with carbon intense growth - particularly in the building sector, economic fragmentation and social segregation, environmental degradation, strains on infrastructure, lack of affordable housing, insufficient public service delivery, etc. All this is leading to a less livable urban environment.

Within our project we want to analyse and to explore innovative pathways towards a sustainable urban transformation. We define this as long-term purposive and vision-led systemic change.

### THEORETICAL FRAMEWORK

Transitions Theory seeks to (a) understand & anticipate transitions, and (b) explore ways to advance transitions (Loorbach et al., 2017).

We will apply two core conceptual frameworks for analysis:

- Multi-level perspective on transition (niche, regime, landscape) (Geels, 2005)
- Multi-phase concept of transition (predevelopment, take-off, acceleration, stabilization) (Chang & Lu, 2017) and adapt them to the Cambodian Context, considering aspects of informality, external dependency, inclusivity and the politics of „just transitions“ (Swilling 2016, Hansen et al 2018, Sengers & Raven 2014, Wicczorek 2018, Noboa & Upham 2018).

### RESEARCH QUESTIONS

- How can people-centred governance-approaches be identified that could (potentially) initiate and support a sustainable urban transformation of Cambodia and increase the urban quality of life?
- What are the incumbent routines / practices, powers, interests, discourses, and regulations that create path dependencies in Cambodia building sector? Which drivers and barriers for a sustainable transition can be determined and is there potential for (social) learning?
- How can the identified approaches then be applied to strengthen or initiate transformative change towards urban sustainability in Cambodia?

### OBJECTIVES

The Work Package „Sustainable Urban Transformation“ has a two-tier approach of scientific analysis and of actively supporting change in Cambodia:

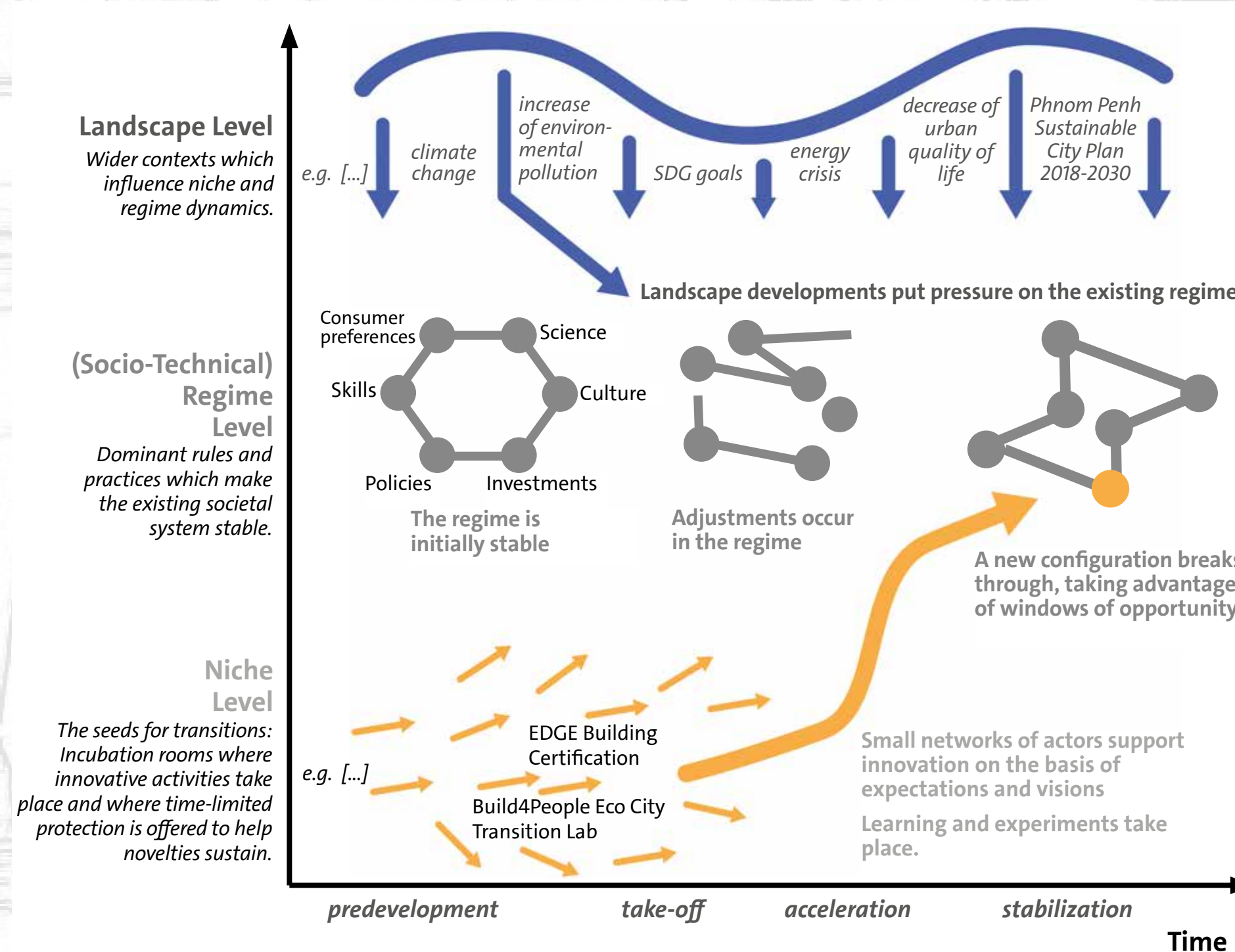
#### Analytical Level

- Assessment of the current urban governance system and transition dynamics
- Conceptualization of a governance approach that initiates and supports transformative change towards urban sustainability and improvement of urban quality of life

#### Normative / Prescriptive Level

- Implementation of explorative governance experiments
- Support transformative change towards urban sustainability and towards the realization of the SDGs, particularly SDG11

### MULTI-LEVEL AND MULTI-PHASE PERSPECTIVES

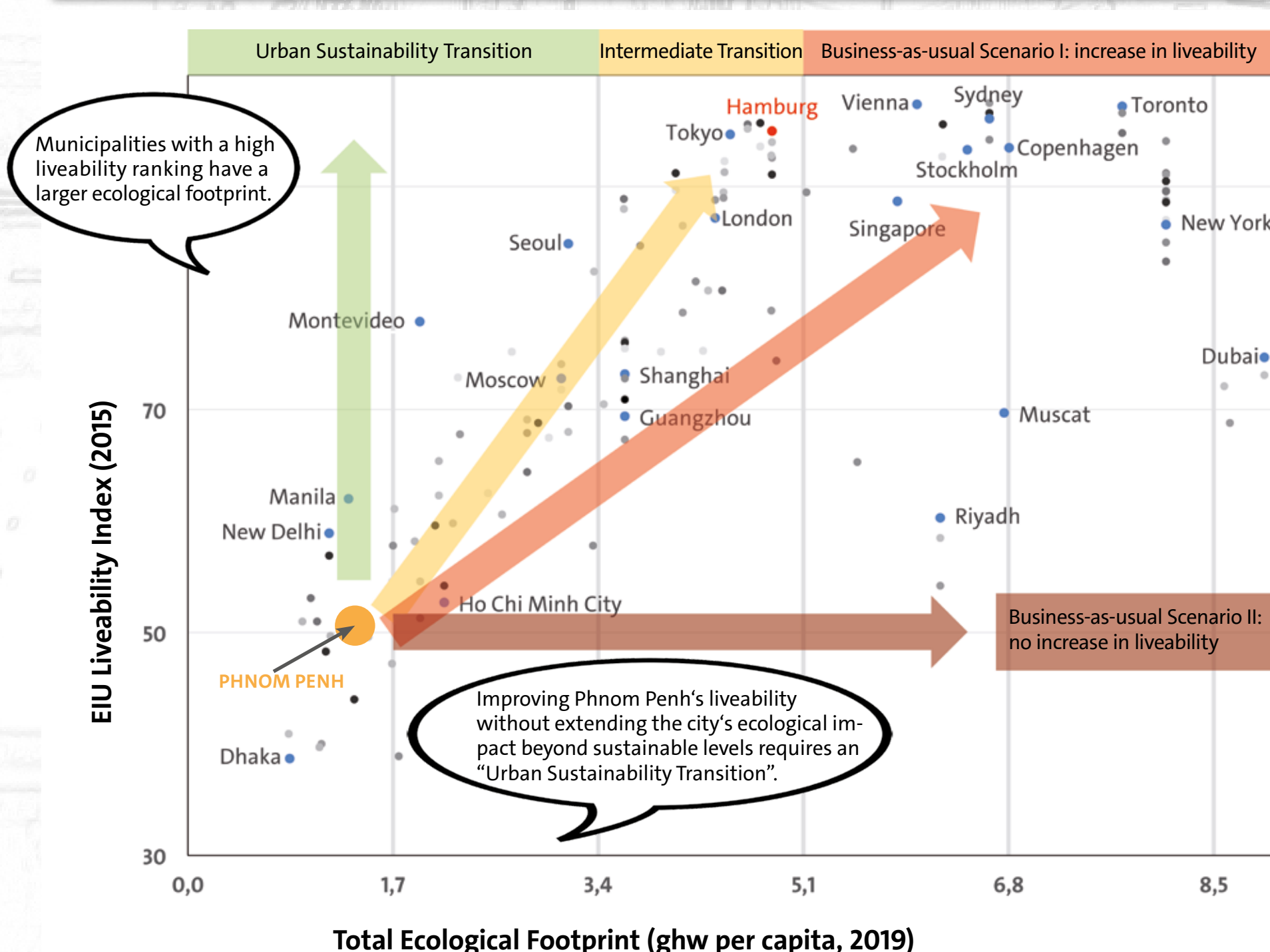


SOURCE: ADAPTED FROM THE EUROPEAN ENVIRONMENT AGENCY, 2017.

### MILESTONES OF THE DEFINITION PHASE

- Implementation of extensive qualitative analysis
- Co-implementation of the quantitative Build4People household survey investigating urban quality of life
- Conceptualization of pathways towards a sustainable urban transformation with a focus on the transition of the building sector
- Baseline Report: Analysis of the current governance system and transition dynamics
- Baseline Report: Measuring urban quality of life from a transition perspective
- Coordinating the Green School Demonstration project in the field of Education for Sustainable Development (ESD)
- Preparation of a solid theory-based proposal in regard to RD-phase

### POTENTIAL PATHWAYS OF TRANSITION



SOURCE: OWN GRAPH, BASED ON EIU 2015 & WORLD FOOTPRINT NETWORK 2019.

### OUTLOOK

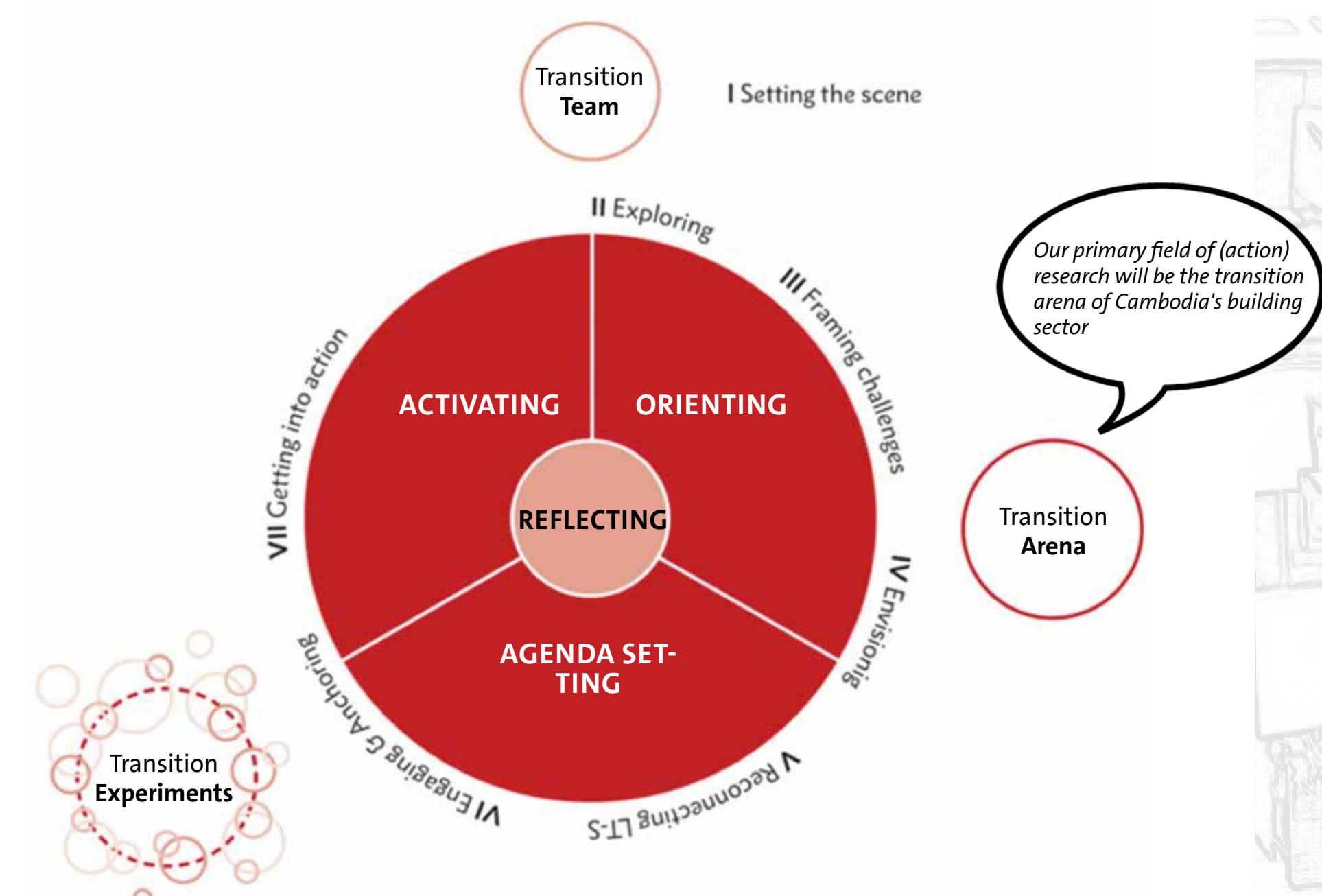
Based on our previous analysis we will further conceptualize and explore urban governance patterns.

Our aim is to influence speed and direction of transition towards sustainability with a focus on the building sector.

Thereby, we will draw on approaches of:

- Transition Management (Loorbach et al., 2017) with instruments such as:
  - visioning, backcasting, transition labs (i.e. Build4People Eco City Transition Lab), and
- Strategic Niche Management (Raven et al., 2010, Schot & Geels 2008) with its focus on key niche processes such as:
  - learning, network building & expectation dynamics, as well as the development of niche-regime relations.

### URBAN TRANSITION MANAGEMENT PROCESS



SOURCE: ROORDA ET AL., 2017.

Original title of the graph: The transition management process structure including the four types of interventions in transition management

### CONTACT: WP #6 "SUSTAINABLE URBAN TRANSFORMATION"

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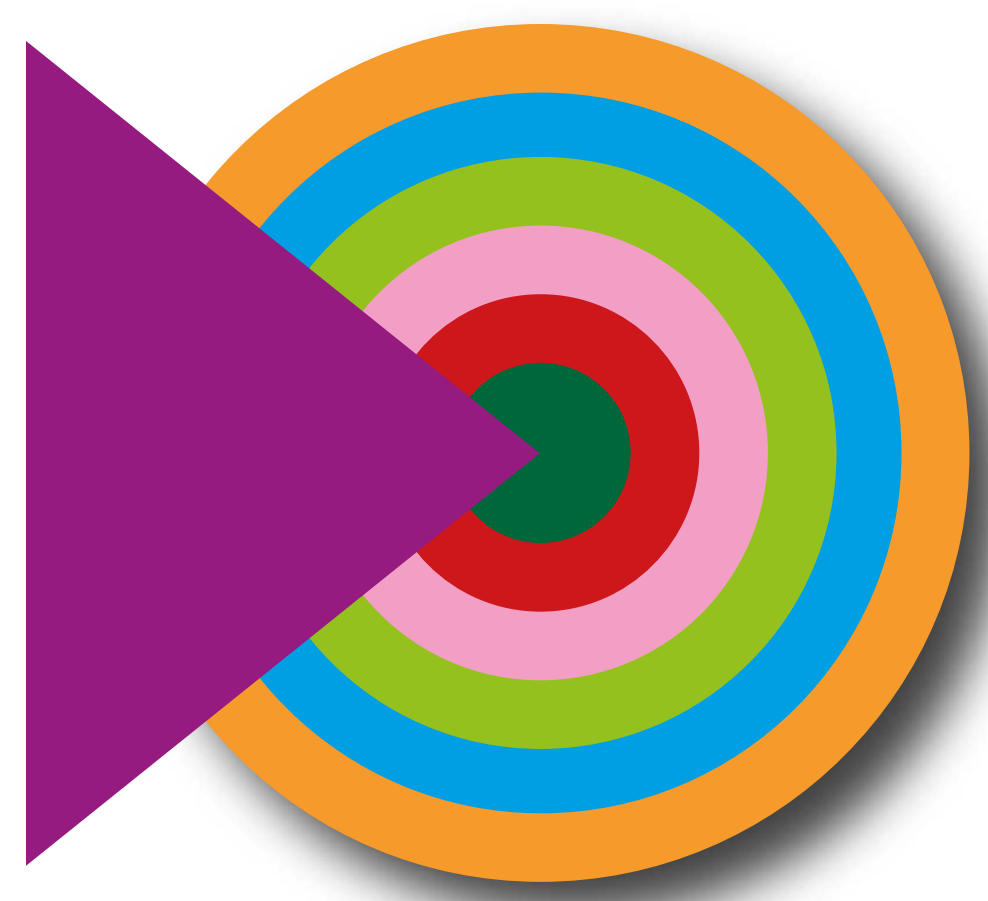
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# Build4People Project

## Work Package #7: Coordination, Communication & Dissemination Research Approach

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### RATIONALE & BACKGROUND

The construction boom in Phnom Penh does not primarily address the needs of the broader population - the urban poor and the emerging middle class. The large apartment blocks in the city center, which are increasingly shaping the cityscape, are often speculative investments aimed primarily at international investors, built by companies with almost exclusively the goal of short-term profit maximization. The large borey settlements which arise in the urban periphery of Phnom Penh, have enormous high land consumption and generate high volumes of traffic.

Despite the high local electricity prices, the newly constructed buildings are usually neither energy-efficient nor adapted to the tropical climate.

Currently, sustainability issues have not been taken sufficiently into account. Therefore, the Build4People's project approach is particularly relevant.

### OBJECTIVES

Our project promotes sustainable buildings and sustainable urban development in Cambodia from a people-centred perspective whose connecting scientific-conceptual, analytical and superior normative bracket is always the quality of urban life.

With this project, our multi-disciplinary team focuses on aligning people's needs and aspirations with tools to benefit and enhance their living. We believe this will lead to major effects on urban sustainability through more energy- and resource-efficient buildings. The results we seek are no less than significantly lowered pollutant emissions, an increase of urban green, a healthier urban climate, raised awareness among decision makers, modified behaviour among the citizens and an overall better quality of urban life.

Our Scientific Advisory Board will ensure that our measures are demand-driven and adapted to the local context.

### VARIOUS ASPECTS OF A SUSTAINABLE CITY



SOURCE: ADAPTED FROM UN-HABITAT 2016.

### ORIGINALITY

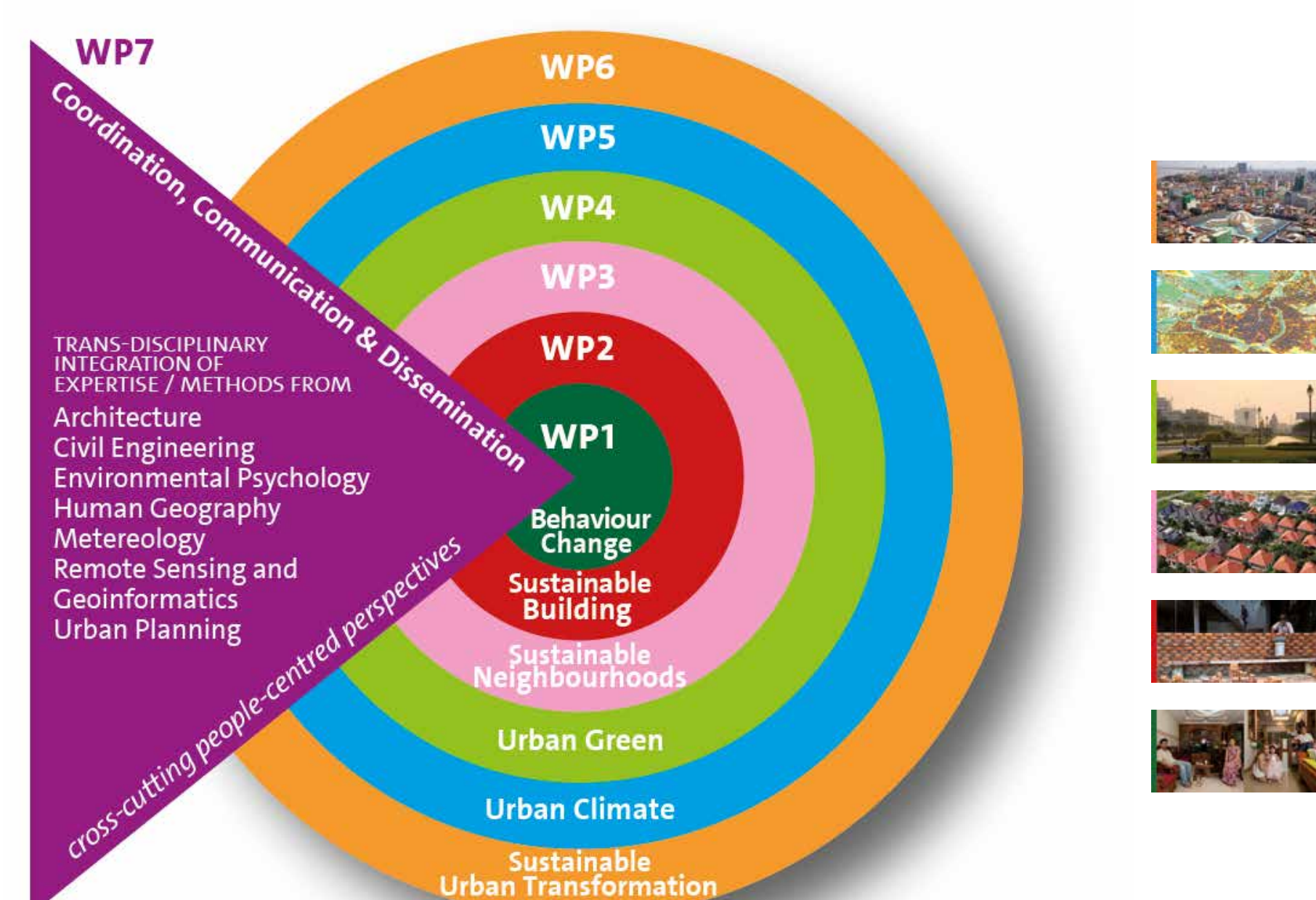
Sustainability is a transversal issue. To achieve a viable implementation, with a sustained impact, we pursue a trans-disciplinary and holistic approach incorporating innovative methods and expertise from various fields.

The work package teams will cooperate together, share their findings and develop joint deliverables. Tools and products will systematically build upon each other. Learning curves and feedback loops will be incorporated into the project design.

The promotion of sustainable buildings cannot only happen in the top-down manner of simply issuing regulations. To kick-start change and advocate implementation we will therefore follow an inclusive method of engagement, encouragement, enablement and exemplification (Jackson 2016).

Our general approach is to convince people rather than to force them.

### OVERVIEW OF WORK PACKAGES



SOURCE: OWN DESIGN

### OUTLOOK

#### Research & Development Phase (2021-2025)

At the start of the four-year R&D phase we will research in-depth information on the local conditions to create a valid basis for evidence-based decision-making at all levels. The information reference tools and resources that we produce will be destined for use by the municipal and relevant national authorities, the local industry and the general public. Several feasibility studies will also be conducted during this phase to prepare the companies and donor organisations for their inclusion into the subsequent implementation phase

#### Implementation Phase (2025-2027)

The final two-year phase aims to encourage the practical implementation by involving partners such as GIZ, KfW, UNDP or other donor organisations, and to extend the results of our project to other cities in Cambodia.

### MILESTONES & SELECT RESULTS

- Ensuring integrative research through trans-disciplinarity
- Adapted implementation and dissemination strategy
- Coordinating the cooperation with the implementation and the dissemination partners
- Social media campaign including video clip trailers
- Preparing for the placement of a CIM expert for national and local key authorities to facilitate implementation
- Eco-city transition lab in cooperation with Phnom Penh City Hall
- Development of a first urban quality of life city index
- Green school demonstration project
- 1<sup>st</sup> edition of the exhibition „Green Buildings & Sustainable Neighbourhoods“
- Participation at industrial fair “Cambodia Architect & Décor”

### TIMELINE & ACTIVITIES

#### Definition Phase (2019-2021)

The 18 month definition phase initially serves to consolidate the partnership structures with our local research, implementation and dissemination partners. At the research level, key milestones are the joint identification of relevant indicators and methods intended to serve a trans-disciplinary, mutual understanding of the notion of quality of urban life.

Our research results are summarized in the basic reports of each work package and are the foundation for evidence-based decision-making for our implementation partners.

The trans-disciplinarily developed Build4People products, such as the 1<sup>st</sup> edition of the touring exhibition “Green Buildings and Sustainable Neighbourhoods” or the results of our surveys on urban quality of life, will be presented at several dissemination events. Intensive public relations campaigns will be launched in parallel to all activities.

### BUILD4PEOPLE CONSORTIUM

#### CONSORTIUM LEADER



#### LOCAL PROJECT MANAGEMENT PARTNER



#### GERMAN RESEARCH PARTNERS



#### LOCAL RESEARCH AND IMPLEMENTATION PARTNERS / SUPPORT



#### DISSEMINATION PARTNERS



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