Megacity Research Project
TP. Ho Chi Minh

Integrative Urban and Environmental Planning
Adaptation Framework to Global Climate Change

Introduction
The challenge of global climate change for metropolitan areas have stimulated the German government, Ministry of Education and Research, to edit the research programme „Urban Growth Hub“, with supervision of the project coordinator DLR.
The Brandenburg University of Technology Cottbus takes part in this programme with a project called „Megacity Research Project TP. Ho Chi Minh - Integrative Urban and Environmental Planning Adaptation Framework to Global Climate Change“. After a successful starting phase of cooperation with the main Vietnamese administration to develop sustainable targets for housing policy, now the focus is enlarged to the urban and environmental development of the whole city with scientific skills and climate-orientated implementation of concrete models. The project will be carried out within a 5 years period in cooperation with international partners in a transdisciplinary dialogue of German and Vietnamese institutions and universities.

Stage 1

**The Balance of Urban Growth and Redevelopment in Ho Chi Minh City -
Sustainable Housing Policies for Megacities of Tomorrow**

Background and objectives of the research project
Ho Chi Minh City (HCMC) is a dynamically growing metropolitan area in the south of Vietnam. Counting over 8 million inhabitants today and facing ongoing in-migration, HCMC will soon cross the threshold to a megacity (GSO 2006; Waibel 2005:13).
One of the most pressing problems of the emerging megacity is the enormous demand for housing, especially for low-income residents (Hiep 2005:1).
Since the demand for housing space could not be met so far, large-scale informal settlements have developed all over the city, causing negative effects on the environment and the urban society. Uncontrolled by urban planning, the extensive land use at the periphery indicates the beginning of urban sprawl, whereas some of the inner districts are so densely populated that the quality of life is often very low. In general, the informal settlements are characterized by poor constructions standards, a lack of adequate technical and social infrastructure, severe environmental problems and, all in all, precarious living conditions.

In view of these problems of urban development in HCMC, the research project “The Balance of Urban Growth and Redevelopment in HCMC – Sustainable Housing Policies for Megacities of Tomorrow” focuses on housing provision as a key element and prerequisite for an overall sustainable urban development. The project aims at the formulation of strategies for housing provision that take the balance of redevelopment in the inner city districts and of urban expansion at the periphery into account.
These strategies do not only focus on spatial aspects of the built environment. Rather, they refer to the multidimensional context of housing provision, thereby contributing to the social, economic, and ecological dimension of urban sustainability.
Furthermore, the strategies address the target group of low-income households who are mostly affected by the lack of affordable housing. Since the introduction of a liberal economy in Vietnam the housing market is dominated by private investors who concentrate on serving the demand for housing of the upper-income groups, causing spatial segregation parallel to an increasing social polarization. (Waibel 2006).

In order to counteract these segregation processes and to contribute to social cohesion, the strategies envisage a socially mixed population with all the positive effects on the community life.

Project Structure and Results
The research design of the project is based on the core principles of a transdisciplinary and integrative planning approach and of an orientation towards application and joint learning processes.

a) Integrative planning approach
Sustainable urban development requires an integrative planning approach that reflects the various spatial levels (region, city, district and neighborhood) as well as the different, yet interrelated fields of urban development (urban management, land use, community building, environment, traffic and infrastructure etc.).

In correspondence to the complexity of a transdisciplinary approach, the research project is organized in six action fields: 1. planning management, 2. integrated regional development, 3. spatial planning and land use, 4. housing market and provision, 5. livable neighborhoods, 6. monitoring and evaluating sustainability via a GIS-based indicator framework. The German-Vietnamese research team is composed of experts from the fields of architecture, urban, regional and environmental planning, geography and social sciences.

In the respective action fields, different approaches and demands have been identified on one hand and on the other hand conceptual elements have been developed that are now incorporated in comprehensive strategies for a sustainable housing provision in HCMC.

b) Orientation towards application and learning
The implementation of a starter project (P_1) for housing on the neighborhood level followed by the realization several demonstration projects ($P_{2,3...}$) in urban expansion and redevelopment has been an integral component of the research design from the onset. These projects have a dual function: first, they serve as examples in which the implementation can be tested in a specific urban context and the applicability of the formulated strategies for sustainable housing provision can be demonstrated. Secondly, they allow the re-formulation and improvement of the overall strategies based on the experiences made in concrete projects. Thereby, the projects create opportunities for intensive joint learning processes and the development of capacity-building measures that respond to the actual needs of the stakeholders involved.

Lessons learned and specific characteristics of the project's context
At the end of the first research phase the results have confirmed the need for action in housing provision in the future megacity HCMC. The findings can be summarized as follows:

- Insufficient cross-sectoral and cross-departmental cooperation and almost inexistent information exchange between the regional and the local level create a need to focus on connecting the relevant local stakeholders. Here, the project functions as a catalyst for transdisciplinary cooperation and extended partnerships.

- Successful approaches and projects have been carried out in HCMC in the past. However, these did not take into account the perspective of the entire city but dealt with sectoral issues such as canal sanitation, slum upgrading, wastewater treatment, etc. In addition, experiences made in these individual projects were not incorporated systematically into the mainstream of urban policies. Therefore, integrative, long-term projects that influence housing policies and the overall planning system are needed that are based on step-by-step learning processes and close cooperation.

- The planning system – including its institutions, legal frameworks and enforcement of regulations – lags behind the rapid pace of the actual urban development. Also the centralized and hierarchical structure of the political system often inhibits action appropriate to the dynamics of development in HCMC. Therefore, the demand for strong strategies that are oriented toward direct application is evident.

- Since policy-making is still characterized by its top-down-style, there is a need for decentralization and capacity building for qualified urban governance. It is important to strengthen the regional and local administrative levels as well as participatory approaches to enable the local inhabitants to utilize their capacities and social resources as part of the solution of the housing problem.

- With regard to urban design, different life-styles as well as different incomes and economic activities such as home production require flexible housing typologies to serve the demands of the low-income population. This requires minimizing construction and maintenance costs, which implies a shift from the high-rise building practice to low-rise and affordable housing solutions that at the same time allow high urban density.

The first stage was very successful and led to positive evaluations by the German Government. The project, with the main focus on climate change, was prolonged to a duration of five years. The active cooperation between German and Vietnamese partners has intensified the scientific and practical dialogue.

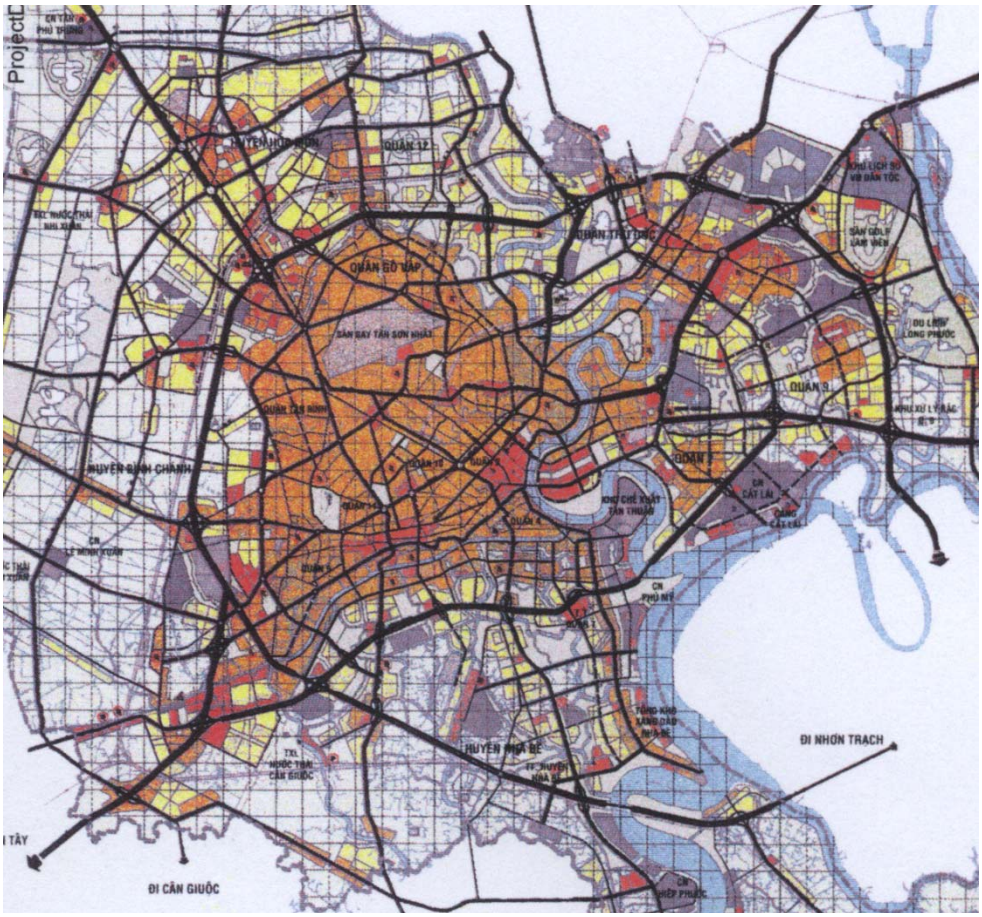

Fig. 1 Masterplan Ho Chi Minh City 2020

Stage 2

Megacity Research Project TP. Ho Chi Minh - Integrative Urban and Environmental Planning Adaptation Framework to Global Climate Change

Overview and Findings to Date

All global comparative country studies list Vietnam as a country which will be extremely vulnerable to future climate change, caused by global warming, because of its topography. The metropolis and economic centre Ho Chi Minh City (HCMC) north of the Mekong Delta is particularly affected. Even today, HCMC has to struggle with climate-related problems whose impacts are brought about or intensified by shortcomings in managing rapid urban growth, in spatial urban planning and in urban infrastructure management. Against the background of climate change, it is necessary to carry out a well-founded examination of the consequences for urban development as well as substantial countermeasures on all levels of current urban development planning.

As a densely built-up urban area in a low-lying region, HCMC has been historically sensitive to climatic effects. However, the vulnerabilities of lives and livelihoods to climate-related environmental processes are primarily the result of inadequate and unsustainable urban development practices associated with complex natural settings and societal structures. This combination of factors results in a high degree of physical and social vulnerability in most parts of HCMC.

Vulnerability analysis of these climate-related natural processes and the enhancement of adaptive capacities are major challenges, as the areas prone to potential climate-related impacts vary and overlap with respect to their spatial scope, time and social environment.

Since the adverse impacts of climate change will affect the land-use structures, the population and the natural resources of HCMC, efficient planned adaptation responses must be based on site-specific designations within the decision-making processes of urban planning and development in HCMC.

The current research will build upon the findings of the preliminary phase. These include, among others, the extensive knowledge of all aspects of urban development in HCMC and of the institutions and stakeholders involved. In addition, analytical tools such as the environmental information system

developed in the work to date will be further developed for application in the main phase. The requirements for sustainable neighbourhood models and building typologies from the first phase of the research project will be further developed with emphasis on energy-efficiency and climate-appropriateness.

Objectives of the Project

The main objective of the research project is to develop strategies for adapting urban land, urban structures and urban development concepts to climate changes and to avoid or minimize impacts of climate change in the context of the megacity HCMC.

The principles of adaptation policy, as formulated by the International Panel on Climate Change (IPCC), will serve as the starting point for the research work in HCMC. In particular, the work will focus on improving the ability of decision-makers to manage the information relevant to adaptation and on evaluating the range of technological options for adaptation in urban planning and design.

The research project is divided into two Action Fields with their own respective thematic Work Packages (see below).

The Action Field “Urban Environment” will evaluate the local impacts of climate change as well as their spatial manifestations. The Action Field “Urban Development” will develop strategies for adapting the built urban environment.

With a transdisciplinary consortium of scientists from German and Vietnamese research and administrative institutions, adaptation strategies will be developed for climate-appropriate and energy-efficient urban development and housing provision.

Expected Contributions to an Energy and Climate Efficient Development of Future Megacities

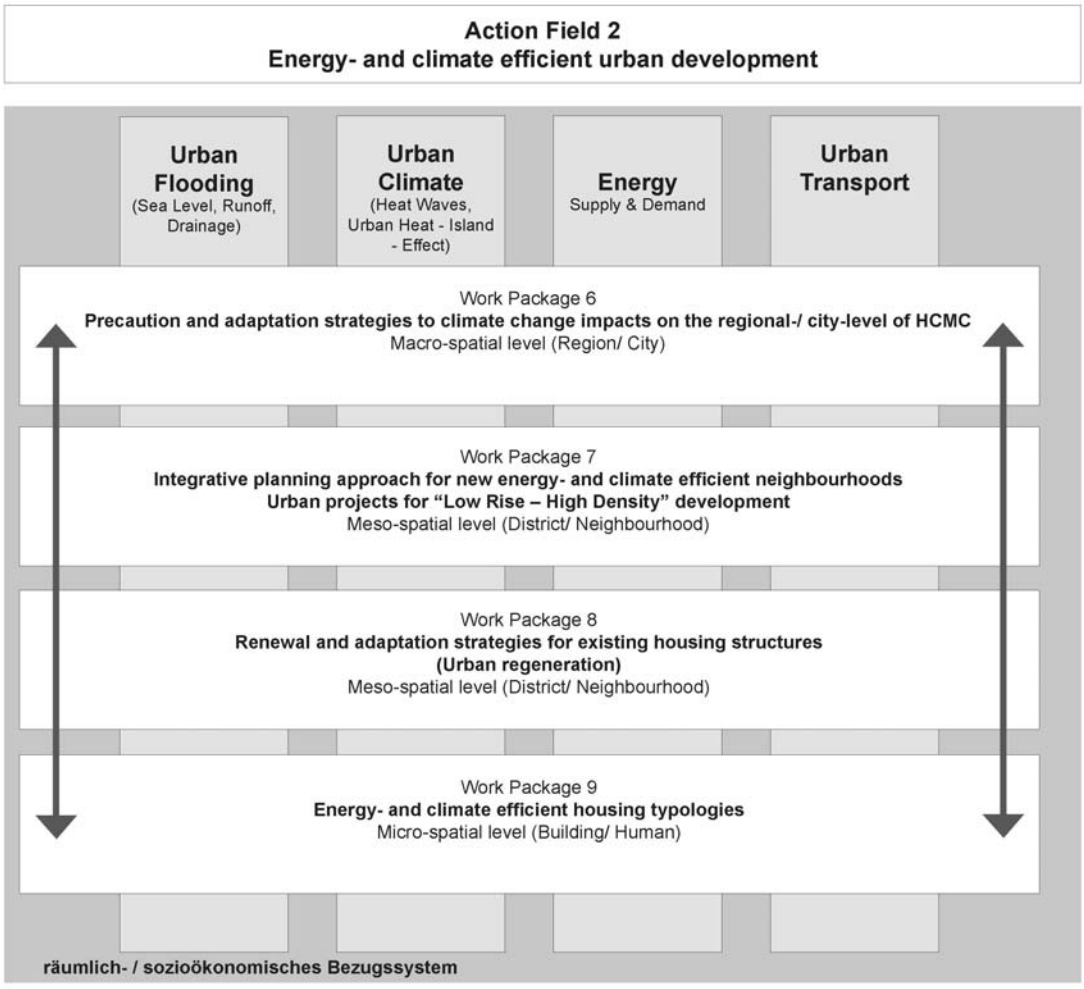

Fig. 2 In vertical order of the main Work Packages of Action Field 1

Both the analytical and the implementation-oriented aspects of the research project can serve as useful approaches to the energy-efficient and climate-appropriate development of other future megacities, not only in Southeast Asia. This includes analytical methods and tools to evaluate the future effects of climate change which can be applied in other megacities as well as model projects in settlement development and housing provision which, under consideration of the respective local conditions, can be emulated in emerging and existent megacities. The model "low rise – high density," for example, promises to be applicable in practically any urban agglomeration.
Due to the role of HCMC as a model city for the overall development of Vietnam, the successful implementation of innovative adaptation planning policies and climate- and energy-efficient model buildings here is likely to be emulated in other regions of Vietnam or to be integrated into national policy.

- **Knowledge, Technologies and Performance**

Due to the global nature of the problems of climate change, response has primarily elicited the launching of policies and strategies on the international and national level. Efficient adaptation measures must, however, be implemented on all planning levels and in all sectors since dealing with the adverse effects of climate change on the environment and societies is also a profound issue of urban land-use planning. The process of adaptation needs a sound adaptation planning framework for incorporating vulnerability and resilience of land uses into urban policy and decision-making. This framework is to be based on specifically selected sustainability indicators and data resources and linked to available planning and assessment instruments, including strategic environmental assessment (SEA). Within the scope of the research project, such a framework will be developed to support site-specific decisions on locations and design of urban development with the objective of reducing the vulnerability of the urban system of HCMC to climate change.

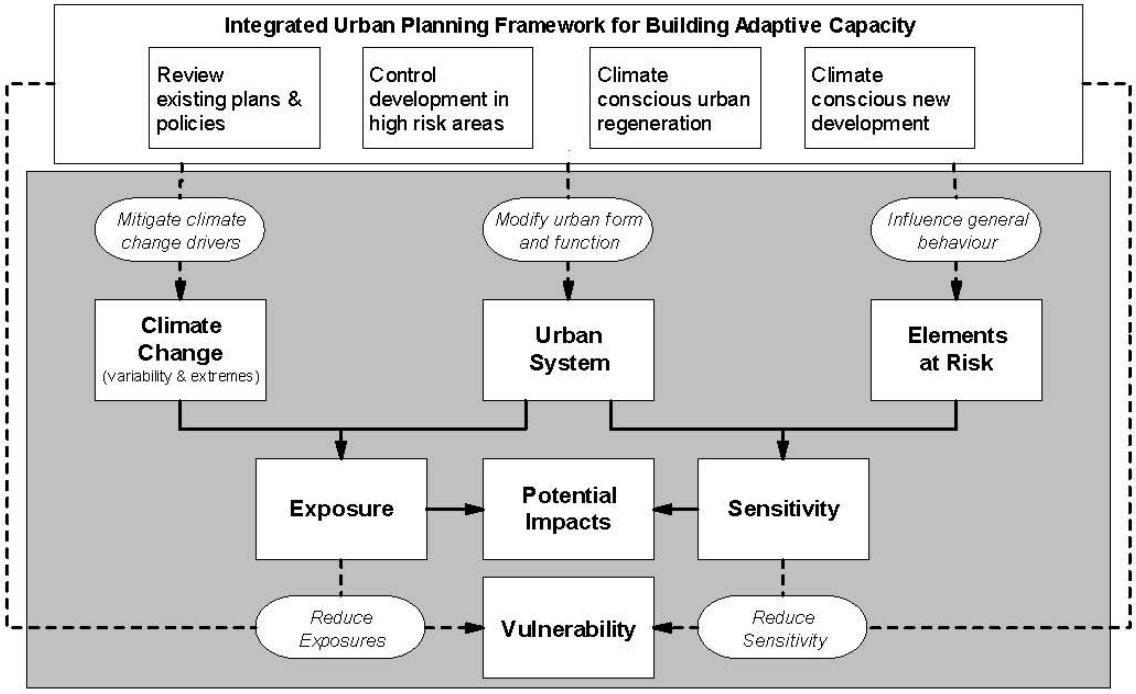

Fig. 3 Integrated urban planning framework for building adaptive capacity

- **Applicable Instruments, Tools and Methodologies**

The research on climate change has two main points of emphasis: environmental protection, the mitigation of further changes in the climate due to human influences; and protection from the effects of climate change, the adaptation to the consequences of climate change.
In the current phase, a multi-layered typological approach which was developed in the preliminary phase of research will be utilised to assess the sustainability of urban settlement developments. This "urban typology framework" will provide important environmental and social information which in turn will be drawn upon in the vulnerability assessment, based on strategic environmental assessment

(SEA). SEA is both a valuable process and a response instrument for transferring scientifically well understood and documented problems of climate change into adapted planning systems and for selecting criteria to assess these in the context of complex planning systems.
In an interdisciplinary approach, the assessment criteria and methodology will be selected with the aim of assessing contents and objectives of the regional land-use planning system for their adequacy and efficiency in adaptation to climate change.
The AF 1 "Urban Environment" encompasses the Work Packages Adaptation Planning Framework, Urban Flooding, Urban Climate, Urban Redevelopment and Upgrading, Urban Energy and Urban Transport.
The AF 2 "Urban Development" includes the following four Work Packages Precaution and adaptation strategies to climate change impacts on the regional and city level; Integrative Planning approach for new energy- and climate oriented neighbourhoods; Liveable city, urban regeneration and community-based adaptation; and Energy- and climate-efficient housing typologies.
The primary objective within AF 2 is to mainstream sustainable urban development strategies under the conditions of climate change into the urban system of HCMC. Based on the knowledge gained from the research in AF 1, small-scale projects such as building structures and prototypes will be conducted with the Vietnamese partners to promote best-practices for further appropriate responses.
On the practical level, the instruments of zoning and building codes will be examined and recommendations made for their improvement with regard to sustainable urban development, energy-efficiency and resiliency to adverse climate changes.

- **Result Capacity Building, Integration and Networking of Institutions**

This second phase of the research work, close cooperation will occur with the Vietnamese, both the existing partners from the preliminary phase as well as the new partners for the current main phase of the research project. These include experts in the various departments of the municipal administration of HCMC, such as the Department of Planning and Architecture (DPA) and the Department of Natural Resources and Environment (DoNRE), and in the relevant national ministries in Hanoi and their related institutions. The common workshops and fora will constitute the main activities of the integration process, whereby the emphasis will be shifted in this second phase of research to conducting smaller, bi- or multilateral work sessions in conjunction with the working visits to Vietnam.
Within the context of the EU-funded Urban Environmental Planning Programme in Vietnam (UEPP-VN), capacity-building will focus on professional planners, in this case on the staff and students of the **HCMC University of Architecture (UARCHCMC)**
Similarly, capacity building activities will be conducted at the **HCMC University of Social Sciences and Humanities (USSH)** in the Faculty of Geography, the main university partner for the Action Field "Urban Environment." This institution will assist in producing an urban environmental atlas linking climate change risk data with spatial information. German partners from the Senate Administration for Urban Development in Berlin will provide training of the staff and students. A mutual and regular exchange of lectures will be beneficial for both sides.
At the Brandenburg University of Technology (BTU) Cottbus, graduates from the Vietnamese partner universities will participate in the **PhD programme "Environmental and Resource Management" (ERM)**.

- **Socio-Economic, Integrative and Overall Sustainability Aspects**

The research project aims first to identify potential impacts of climate change in HCMC and then to develop strategies to reduce the vulnerability of affected sites through urban planning decisions. The shift from risk research related to natural hazards to the more integrated view of vulnerability in climate change research includes two important aspects. Firstly, vulnerability assessment focuses on social and not only physical vulnerability. Secondly, it focuses more on factors related to society development, institutional organisation and administrative decision-making. Because the concept of vulnerability not only relates to the exposure of property and humans or to the physical susceptibility of exposed elements, adaptive capacity is strongly related to development issues.
Within the scope of the conferences and workshops, a wide range of stakeholders involved in the urban environment and urban development will be included in the common discussions.

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Website

www.megacity-hcmc.org