



Climate Change and Challenges for the Urban Development of Ho Chi Minh City / Vietnam

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The latest reports of the Intergovernmental Panel on Climate Change (IPCC) and different other scientific sources confirm that climate change is no longer a “distant possibility but a current reality” (World Bank 2008). Although Vietnam has only played a tiny part in creating the problems of global environmental change, it is among the countries most seriously affected by this threatening development (Waibel 2008). Already in the past decades, a significant rise in weather extremes such as tropical typhoons and flooding events as a consequence of climate change has been observed there.

Climate change and urban development are closely interlinked and often interact negatively (Wamsler 2008: 96).

In this paper, the authors analyze sector- and spatial-level-specific dangers of climate change for the most prosperous city and first mega-urban region of Viet-nam Ho Chi Minh City (HCMC). Thereby, a dual-track approach to dealing with climate impacts will be proposed consisting of adaptation and mitigation.

Impacts of climate change

Vietnam is extremely vulnerable to climate change impacts, mainly because of its topography. The overwhelming part of the Vietnamese population and most of its economic activities are concentrated in the low elevated coastal zones along the more than 3,000 km of coast-line. The two densely-populated main delta regions of the Red River and the Mekong are particularly affected. There, according to IPCC (2007: 59) a 1-meter sea level rise (SLR) would lead to a flooding of up to 20,000 km² of Mekong River delta (see map) and 5,000 km² of the Red River delta (Waibel 2008). The metropolises of Hanoi and HCMC, being situated within the delta regions, will not only be endangered by SLR itself, but may also experience a massive migration pressure of climate change refugees from the surrounding areas. Nguyen Duc Ngu, former general director of the Viet Nam Meteorology and Hydrology Centre, predicts an average SLR in

Vietnam of 35 cm by 2050, of 50 cm by 2070, and of 100 cm by 2100 (Vietnam News, 26.05.2008). With a forecast SLR of 1 m and over 11 % of urban areas, around 10 % of the population and 10 % of the gross domestic product will be affected by flooding (World Bank 2007: 18). The SLR adds to the danger of flood-tides, which in HCMC have already reached a height of 1.47 m (2006) and most recently in November 2008 even a height of 1.54 m (Thanh Nien Daily News, 15.11.2008). A SLR of just 50 cm, added to a flood-tide of about 1.50 m, makes a temporary rise of water level of +2.00 m. This would lead to a flooding of 300 km² of HCMC, with 2 mill. inhabitants. The flooding events in the recent past have already placed severe strains on the metropolis, e.g. in the case of traffic (see photos above).

Climate change, and especially SLR, threaten the general spatial urban development path of HCMC. It could result in a totally new dynamic in the progress of the settlement structures in the medium to long run, simply because large parts of the city areas will become unfit for human habitation. The current system of planning, guiding, and implementing urban development is not prepared for this tremendous challenge at all.

A further challenge related to climate change is the “Urban Heat Island (UHI) Effect”, which is clearly noticeable in the densely built inner city districts. Even today, the temperature in these areas is up

to 10 degrees above the average temperature of the surrounding districts. This increases the energy demand for cooling and also puts a lot of stress on the human health and comfort of the local population, especially the elderly and the young people.

UHIs can be largely blamed for deficiencies in urban planning that have led to insufficient ventilation, lack of green spaces, augmented use of air-conditioning, and a strongly increased traffic volume.

In general, the metropolis of HCMC has witnessed a disproportionate rise of urban energy consumption due to the successful implementation of a strategy of export-led industrialization, suburbanization processes and rising living standards as well as more resource-intensive lifestyles of the urban population.

Current urban development

Apart from the horror scenarios of climate change, the urban planning authorities in Ho Chi Minh City are already now overburdened with the problems that are typical of mega-cities in developing countries all over the world. The metropolis is suffering from environmental degradation, air and water pollution, insufficient governmental capacities to cope with the fast growth, migration pressure (about 200,000 migrants move in every year), and increasing socio-spatial fragmentation (Waibel 2009). The latter is further promoted by the increasing inclusion of non-state actors in ur-



Pictures from Flooding Events in HCMC and in Hanoi.

Source: Vietnam News & Thanh Nien Daily News 2008

ban development projects through public-private partnership models.

One example is the development of Saigon South New Urban Area implemented by a joint venture enterprise of a Taiwanese developer and a daughter company of the People's Committee of HCMC. It is a functionally mixed urban development covering 3,300 hectares. For this showcase urban development project, which exclusively targets the nouveaux riches, vast wetland areas have been transformed into urban fabric. In this way, a large space that had previously served to buffer water in times of flooding has disappeared. Less than 10 years after the construction of the main development axis, the Saigon South Parkway already had to be massively elevated due to marshy underground and the danger of flooding. Another showcase project, the development of the new Central Business District Thu Thiem on a low-rise peninsula opposite central District 1, suffered significant delays as result of major modifications of the master plan that became necessary after it became obvious that the whole area is under enormous threat of flooding.

All in all, urban development is dominated by single-sector and single-project approaches, which reflects institutional fragmentation. To combat the consequences of climate change, however, cross-sector planning and comprehensive approaches are needed.

Mainstreaming Climate Change

Given the institutional constraints in Vietnam, mainstreaming adequate responses to climate change into urban development seems to be a big challenge. Firstly, what is required is a well-founded examination of the consequences for urban development as well as substantial countermeasures on all levels of current urban development planning, from the level of the metropolitan region, the municipality, the urban district, the neighbourhood, and the building, down to the level of the individual household.

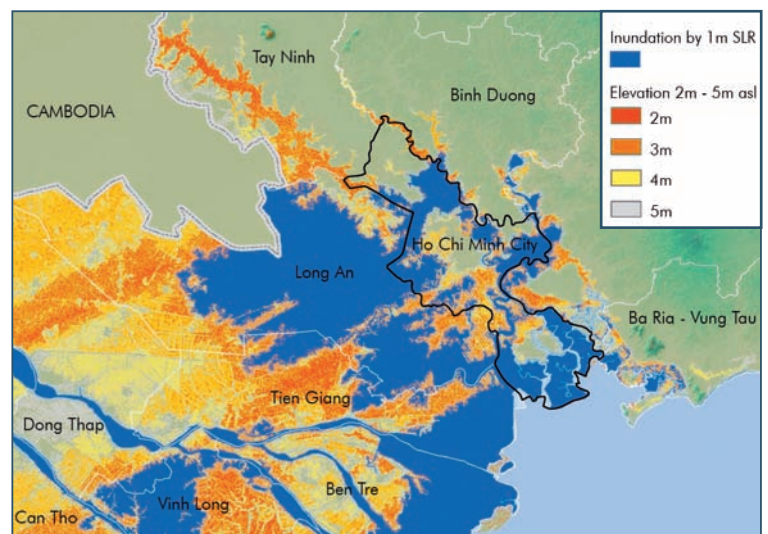
The foundations for climate change adaptation are laid at the levels of the region and the city. The main aim of urban development must be the protection of urban areas from flooding. Potential solutions for adapting urban areas include elevation of building sites by land filling or the construction of dikes. Due to the low elevated marshy lands and the fine-meshed network of canals in HCMC, these measures bring with them immense technical challenges and will be very cost-intensive. In the long run, the relocation of existing infrastructure and settlements away from the worst affected flood-prone areas will be inevitable.

The continuous demand for new building sites due to economic progress, suburbanization, and high migration flows should be strictly limited to flood-safe areas from now on, which is almost impossible to achieve. A first step would be a precise evaluation of the local impacts of flooding and their spatial manifestation within the urban area of HCMC (Eckert 2008). The current regional and urban development concepts (Regional Development Plan 2020, Master Plan 2025) are addressing the problem of continuous urban expansion into low-lying marshland for the first time (PC HCMC 2007: 2-20). However, no specific consequences for the proposed future development of HCMC are drawn. The master plan needs additional statements designating flood-safe areas for future settlements as well as areas with definite building prohibitions. Within these zones where construction is banned, marshlands can be used as buffer against

flooding and SLR (World Bank 2008).

To prevent or minimize the phenomena of UHIs, a city-wide system of open spaces for adequate air ventilation and for developing cold air generation areas has to be established. In this context, the urban morphology, the orientation of buildings, and the ratio of sealed surfaces also play an important role (TCPA 2007: 19). All these aspects have to be taken into account in the context of redevelopment measures of existing neighbourhoods, and particularly where new neighbourhoods are being developed.

On the level of buildings, there is only little local knowledge on the construction of energy-efficient housing typologies, alternative technical solutions like solar cooling, and energy-saving behaviour in the field of housing in general. Promising approaches to promote energy-efficient housing would be to adopt technical and constructional solutions in terms of energy-efficiency, to support local research efforts in this field, to raise awareness among the owners of real estate, and to establish a whole range of policies measures that would



Impact of 1 m SLR on Ho Chi Minh City and on the NE-Mekong River Delta. Source: ADB 2008

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Under the leadership of the Brandenburg University of Technology Cottbus (BTU), a trans-disciplinary team of German and Vietnamese researchers, including the Department of Economic Geography at the University of Hamburg, aims at the adaptation of the built environment of Ho Chi Minh City to climate changes, with the goal of minimizing or avoiding severe impacts of climate change in the future.

More info: www.megacity-hcmc.org

serve to stimulate energy-efficiency on the one hand, and would penalize energy wastage, on the other hand. In terms of energy-efficient housing, the individual households are the main stakeholders. In the best case, their behaviour would be market-driven. That means that the money saved through technical and constructional solutions exceeds the extra costs incurred. These actions should be supported by state policies and financial drivers, as described above.

"Mitaptation" as a response

Adaptation measures certainly rank at the top of the agenda due to the high vulnerability of HCMC. However, economic success and the mostly uncontrolled urban growth have also made HCMC the country's main emitter of human-induced greenhouse gas emissions. Therefore, just adapting to the consequences of climate change is not sufficient. In expanding mega-urban regions such as HCMC, there are strategic potentials to reduce the consumption of resources and to lower emissions, for example by the promotion of inner-city redevelopment prior to growth in outer areas. Furthermore, the rapidly emerging urban middle classes that are only beginning to

adopt resource-intensive lifestyles could become a key target group for increased sustainability.

The implementation of a dual-track approach consisting of both adaptation and mitigation measures seems mandatory. This is especially true for a highly dynamic urban economy such as HCMC. In this context, Droege recommends a combination of adaptation and avoidance strategies for urban growth regions, which he labels as "mitigating adaptation" or "mitaptation" (Droege 2006: 70).

By contrast, pursuing either of these strategies on its own may result in conflicting aims for urban development. For example, the scientific discourse on adequate urban forms in developed countries of temperate climate zones recommends compact and dense settlement structures to meet the requirements for reduced land consumption. This approach follows the classic model of the European City (Bauriedl et al. 2008). However, in tropical hot-humid countries such as Vietnam and in the context of global warming, the impacts of the UHIs' excessive temperatures on densely built urban areas have to be taken into account. Therefore, a sensible balance between compact settlement structures and a linked network of well-irrigated open spaces to secure the infiltration of rain water is needed. This implies a coordinated application of both mitigation and adaptation measures.

Conclusions

Dealing with climate change and increasing the adaptive capacity of the mega-urban region of HCMC does not imply a need to reinvent the wheel. Many policies can be derived simply from the ongoing sustainable-city discourse. The toolbox of sustainable city development offers various solutions to promote the concept of a compact city, for example. However, the urgency of the threats of climate change can be leveraged to develop specific sustainable city planning solutions and to promote new institutional arrangements. In this respect, innovative

forms of governance coalitions could serve as learning fields for reorganising urban development agencies in a broader context and to overcome the biggest problem of urban development in Vietnam: Institutional fragmentation.

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