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Cambodia: Sustainable buildings for people?

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Abstract: Although Cambodia has a long tradition of vernacular architecture where initial building practices took climate conditions into account, currently there is only limited knowledge and awareness about the subject of sustainable buildings among stakeholders of the real estate sector. The Cambodian city of Phnom Penh is witnessing a construction boom and the lack of attention given to sustainability issues threatens dire consequences in the not so distant future.

This research note discusses various approaches and measures to promote sustainable buildings in Cambodia. It will be concluded that successful policies towards increasing sustainability need to be less technocratic, less top-down, more inclusive thereby taking into account the behavioural dimension and aspirations of the urban citizens. To achieve a viable implementation with a sustained impact a trans-disciplinary and holistic approach incorporating innovative methods and expertise from various fields should be pursued. Thereby, the vision of “buildings for people” may serve as impetus to enhance the quality of life of Cambodia’s urban citizens.

Keywords: Cambodia, Phnom Penh, sustainable buildings, sustainability, bottom-up approaches, people-centred approaches, sustainable urbanization, urban quality of life

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Buildings account for nearly 40% of global energy consumption, the building sector should therefore play a key role in promoting sustainable urbanization (CCAP 2010). According to the IPCC, the building sector offers the largest low-cost potential for carbon dioxide emission reductions globally by 2030 (IPCC 2007). This is also the case in Cambodia. The International Finance Corporation (IFC) of World Bank Group has recently maintained during a presentation at EuroCham Cambodia that 50% of the buildings that will be standing in 2050 have not been built yet and that incorporating efficiencies into new design is up to 10x more cost-efficient than retrofitting later (IFC 2016). In China, for example, Richertzhagen et al. (2008) showed that the incremental costs for new energy-efficient buildings are rather low, accounting for 5-7% of the entire investment costs of a new building. Their analysis demonstrated that the costs for energy-efficient buildings are often overestimated and that not only households, but also key players in the real estate sector often misjudge the costs and benefits of energy- and resource-efficient buildings and are therefore reluctant to invest in sustainability (Waibel 2012).



Figure 1: Construction boom in the city centre of Phnom Penh



Source: Michael Waibel 2017.

Figure 2: Phnom Penh's affluent retreat to gated communities in the urban periphery: Borey Peng Huot, Mean Chey District

Background & Rationale

In 2016, the World Bank Group reclassified Cambodia up from the status of a „low-income country“ to the status of a “lower-middle income country” due to a significant reduction of poverty and a vivid economic growth (McGrath & Kimsay 2016). The reclassification is concurrent with a construction boom focussing on the capital city Phnom Penh (Sokhorng 2016). Building expansion is necessary because the Global Green Growth Institute, among others, anticipates a doubling of the urban population in Cambodia by 2030 and warns of housing shortages and an under-supply of infrastructure in this context (GGI 2016). In 2016, investment in Cambodia’s real estate and construction sector peaked with a total volume of 8.5 billion US\$ (Meng 2017). However, it seems doubtful if the erected building stock mostly targeting the high-end market will match the demand of a society profoundly polarized in socio-economic terms. Further, the buildings are overwhelmingly erected with imported steel, glass and cement (Runcie 2015) which are wasteful and use resource intensive conditioning modes. Only rarely are passive

energy saving potentials applied to building techniques. All this happens despite a surprisingly vast heritage of aesthetically pleasing representative and residential buildings from the modernist era (also known as New Khmer Architecture, see article of Bodach & Waibel within this issue) and from the colonial era erected with abundant measures of constructive shading (Kolnberger 2014; Waibel 2017). Indeed, modern sustainable buildings should integrate traditional concepts, adapt them into up-to-date forms and favour aspects of indoor environment, quality of buildings materials and use of renewable energies, among others (Schwede et al. 2015). Apparently, there is only very limited knowledge and awareness about the topic among the urban population and among stakeholders of the real estate sector. At the same time, the development towards a modern consumer society in Cambodia is resulting in more resource-intensive life-styles which also strongly effects the way buildings are designed, built and operated. As a result, electricity consumption per capita in Cambodia has almost quintupled within just 10 years from 67 kWh in 2005 to 328 kWh in 2015, according to the latest

figures from the International Energy Agency (IAE 2017: 62). While their energy consumption may seem low when compared with others in the region (PR China: 4,047 kWh and Vietnam: 1,534 kWh) it is expected to further rise in the future. Another major structural advantage to invest into energy efficiency in Cambodia is that electricity prices are among the highest in the region. The price of one kWh is about 0.25 USD. Investing in energy efficiency promises very good paybacks for efficiency improvements and may save hundreds of millions of dollars each year (IFC 2016). Yet another advantage will be to decrease energy import dependencies thus increasing the competitiveness of Cambodia’s economy (Renzenbrink 2013). However the usage of renewable energies is still negligible in the urban energy mix. For example, Cambodia hardly utilizes solar water heaters in contrast to other countries in the region such as China or Vietnam where this energy- and cost-effective method is ubiquitous.

Yet, up to now, surprisingly little research has been done in the field regarding how to promote modern forms of climate-adapted housing and energy efficient buildings in Cambodia.

Sustainable approaches to promote sustainable buildings

Sustainability is a transversal issue. Just promulgating technocratic solutions and the pure transfer of high-tech technology from a developed country won't do it. It is not enough to merely promote energy-efficiency in this context. Sustainable building practices encompass a much wider array of measures than simply replacing clay burnt bricks by non-fired materials or importing a construction material with good insulation values, for example. To achieve sustained impact requires consideration of features such as climate-adapted design, the socio-economic conditions and the specific local culture.

To overcome institutional fragmentation it is essential to promote intensive interaction within a broad alliance of stakeholders from the national and local state, from the construction sector, from the civil society and from educational institutions. More horizontal cooperation is needed because sectorial approaches still dominate. It is fundamental to create platforms to bring those stakeholders together. Through this method, prevalent implementation gaps, lock-in effects and widespread silo mentalities can be overcome and public involvement in decision-making at different levels shall be increased (Waibel 2016). To bring stakeholders together, one option would be for establishing a Green Building Council,

which does not exist yet in Cambodia. Such a support structure would also help to minimize the general misperception that the additional costs for green buildings have to be borne solely by the developer rather than shared with the end-user, who is perceived as being the only party to reap financial benefits (SGSEP 2008).

Evidently, the promotion of sustainable buildings cannot only happen in the top-down manner of simply issuing regulations. Successful policies towards more sustainability need to be less top-down, more holistic, and more inclusive (Waibel 2014), with, for example, a balanced set of economic incentives to promote energy efficiency in the field of housing. Well-designed incentives (tax system, grants and rewards schemes) would not only kick-start behaviour change but could also support the dissemination of environmentally friendly construction materials, which currently suffer from a "vicious circle of low demand – high cost" (Lindlein 2012).

To raise the awareness about positive effects of sustainable buildings, a promising approach is to accompany and to offer consultation for innovative, pioneering domestic architecture offices during the design and construction phases of contracted buildings. This may also serve to disseminate international building certification labels such as EDGE, LEED or DGNB. Among the advantages of this procedure, one

is that this will enable researchers to carry out measurement campaigns and surveys, e.g. to quantify and monetize energy savings due to specific constructive measures, due to the use of sustainable building materials and due to specific actions. Houses erected with this kind of support shall serve as demonstration projects for sustainable buildings and can be replicated by others to achieve mass effects. The extensive measurement campaigns will also serve as a data basis for the development of guidelines, policies and standards to promote sustainable buildings on a regulatory level. By these means, innovative architecture offices will receive more credibility and visibility and as a result may receive further contracts to erect sustainable buildings in the future. Additionally, new green jobs will be created as part of a national green growth strategy.

Establishing a lighthouse project of green building design with a local school by providing consultation and guidance, and incorporating an "Education for Sustainable Development (ESD)" component to the school curriculum, supports transforming the way students gain knowledge about sustainability.

Finally, as a fundamental part of every programme to promote sustainable buildings, there needs to be a component of capacity building measures for institutions of higher education and training measures for professionals.



Source: Michael Waibel 2017.

Figure 3: The erection of high-rise condominium apartments targeting the upper scale of the real estate market



Source: Michael Waibel 2016.

Figure 4: Housing for the urban middle-class population: Dangkao District

Advocating for the people’s perspective

In contrast to the predominantly poverty-led approaches implemented by donor organisations or NGOs in Cambodia, additional focus should be put on the so-called “new consumers”, a key group in terms of global sustainability (Myers & Kent 2003; Waibel 2009). Despite ongoing domestic political turbulence, significant improvement of the living standards is anticipated in Phnom Penh over the course of the expected boost of urbanisation in the next years. During this time, the urban middle-class population is expected to massively increase prompting a sharply rising ecological footprint due to consumption as a status symbol and increasing building demands, among other factors. Therefore, the urban middle-class values, norms and behaviour should be scrutinized. The urban middle-class population is expected to have specific demands in terms of urban health and urban quality of life. It is important to understand that the notion of “urban quality of life” is a multiple-dimensional concept that brings together “physical, psychological,

social and ecological aspects and takes into account both subjectively perceived well-being and objective conditions” (WBGU 2016: 86). It can be also considered the link between the level of building and the spatial level of the city regarding issues of urban green and of urban climate.

Analysing the needs as stated by the user and the urban citizens’ aspirations towards urban quality of life may serve as a normative aim and as a legitimization basis of specific activities. Such an analysis could happen through the field of environmental psychology, for example, which could also look for ways for increased public participation. Such a research approach may also set the basis for developing awareness campaigns with the aim of changing people’s mindset to overcome value-action gaps. A tool for this component could take the form of a “Handbook for Green Housing”. This tangible product would present in an easy-to-understand manner the range of measures covering all types of construction, design and building operations, and lifecycle aspects, as well as the behavioural dimension. In general, the principles introduced

could be understood like a menu from which the end user choose according to their individual capacities, needs, and personal preferences (Waibel 2014). Such a handbook would also include information on how to rediscover the basic principles of bioclimatic architecture and further provide valid data on payback times of specific measures in this context (Waibel 2014; Schwede et al. 2015). Dissemination efforts should not only be done through established print media channels but also through social media channels, which are highly popular among the urban population in Cambodia.

To kick-start behaviour change and advocate implementation, a comprehensive approach of engagement, encouragement, enablement and exemplification could be followed (Jackson 2006).

To promote buildings for people it is more effective to convince people rather than to force them (Hesse et al. 2011; Waibel 2014). Nonetheless, it is necessary to keep in mind that people won’t be easily convinced to adopt environmentally friendly behaviour if top tier state representatives are not leading by example themselves.



Figure 5: Burnt clay bricks are still the dominant construction material in Cambodia

Conclusions

Promoting sustainable buildings is always a challenge, particularly within Cambodia's fragmented institutional and politically insecure stakeholder landscape where the primary focus is on achieving of short-term profits without a long-term action-plan. Against this background, it would be recommended to first create awareness about the tremendous benefits of sustainable buildings, for the individual end-user, for the urban space of Phnom Penh, for the national economy of Cambodia and, last but not least, for the global climate. It is indeed possible to create win-win situations for the stakeholders involved, e.g. the developers, the construction companies and the homeowners. As people learn from the demonstration projects, and replicate these measures because they are convinced of their capacity to apply bio-climatic principles of architecture to their buildings, use energy-efficient technical equipment and good construction materials, engage in pro-environmental behaviour, there will be a significant impact and achievement of mass effects.

Further solution-based research and intensive advocacy and dissemination activities are needed. Changing people's mind-set takes time, involves a lot of communication and requires

inclusive procedures. To achieve a viable implementation with a sustained impact, a trans-disciplinary approach incorporating innovative methods and expertise from various fields such as environmental psychology should be pursued.

Finally, the vision of "buildings for people" may serve as an impetus and the legitimization basis to enhance the quality of life of the urban citizens of Cambodia.

Acknowledgement

This research note summarizes arguments from a new research project entitled "Sustainable Buildings for People - Enhancing Urban Quality of Life in Cambodia (www.buildpeople.de)" with the objective both to promote sustainable buildings and sustainable urban development. Within this project a multi-disciplinary team focuses on people's needs and aspirations and aligning their stated needs with tools to benefit and enhance their living. It is firmly believed that this will lead to major effects on urban sustainability through more energy- and resource-efficient buildings. The results sought after are no less than significantly lowered greenhouse gas and pollutant emissions, a better indoor environment, an increase of urban green, a healthier urban climate, raised awareness among decision

makers, modified behaviour among the urban population and an overall better quality of urban life.

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