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Building living landscapes – future developments must respect nature

Thailand's unprecedented floods at the end of 2011 devastated many households and industrial estates and drastically affected overall economic growth.

Such catastrophic and devastating events are no longer merely natural calamities; they are undoubtedly man-made disasters.

The recent flooding in Thailand has left no choice but for the government and experts to re-examine policies and infrastructure with the objective of ensuring that, in the long-term, Bangkok and its surrounding regions will be in a much better position to manage such natural events, especially as they are likely to be more frequent and more extreme.

It is now indisputable that any future urban development must respect nature much more.

Urban and regional planning must be developed with full cognizance and understanding of the ecosystem to which the landscape belongs. Under this framework, biophysical and sociological information generates opportunities and places constraints on landscape-use decisions.

For a sustainable future, Bangkok and its surrounding regions should consider alternative approaches that ensure that it remains a living landscape. These approaches require an understanding of the area's dynamism from various scales and perspectives.

The challenges that future generations of decision makers, planners, developers and designers must face include a clear understanding of and how to incorporate natural, scientific and cultural perspectives into future developments.

Cities are always evolving

Cities, like life, are always evolving and changing as rice fields, buildings, roadways and cities' shapes are all constantly in motion.

The past has provided our landscapes with unique and tangible shapes that also directly affect how people live today. These elements are irrevocably bound by continuous development over time–a dynamism that is both productive and destructive.

Cultivating Bangkok's landscape

In 1782, following the fall of Ayutthaya, Bangkok was built as the Rattanakosin Kingdom's new capital on the site of an old settlement close to the mouth of Chao Phraya River. Geographically, its landscape was characterized by a flat and low-lying plain, consisting of young fluvial, brackish and marine deposits.

These natural conditions have formed a vast water reception and dispersion area, which was once a resource for wet cultivation of rice and for tropical orchards. As the city grew, immigrant populations began laying claim to the fertile tidal hinterland for cultivation and along the extensive canals for settlement, to help create the city as "the Venice of the East".

During the late nineteenth century, the construction of extensive canal networks developed Thailand's agricultural industry into a leading global leader. From 1869-70, Bangkok gradually extended northward when the Prem Phrachakorn Canal was constructed.

This canal provided a route between Bangkok and Ayutthaya, extending 51.3 kilometers, and, at the same time, it encouraged people to settle for cultivation purposes.

Other notable developments extended the metropolis further to the east. The 21.5 kilometer Nakhon Nuang Khet Canal (1876) and the 28.7 kilometer Pravet Burirom Canal (1878) were constructed to provide more rapid communication and transportation between Bangkok and Chachoengsao.

This was followed by the most significant development in the late nineteenth century, the Rangsit Irrigation Project, (1890-1904), which enlarged the arable area for rice cultivation on the northern periphery of Bangkok.

From agri-aquaculture to paved-paradise

During the modern era, Bangkok began to lose its embracing connections with water. Rapid urbanization gave rise to a densely-populated land-based city.

In the 1960s the city began evolving from its traditional agricultural foundation into a large diversified and growing metropolis. Large previously exclusively agricultural areas were transformed into urban dwellings that developed along main roads.

In the inner city, many klongs (canals) were filled for further road expansion or became sewage drains behind residential and commercial blocks. New workplaces and residential developments were also built to take advantage of the new infrastructure.

While the nation as a whole enjoyed unprecedented growth as an emerging industrial economy, Bangkok and its surrounding region's rapid urbanization gave rise to a densely-populated urban area.

The expansion eventually extended beyond the city's administrative boundaries, spilling into neighboring provinces, and became the Bangkok Metropolitan Region (BMR).

This conurbation now covers an area of over 7,761 square kilometres, with the evergrowing population reaching approximately 10.3 million registered inhabitants.

Learning from Tung Rangsit and Bang Khun Thain[1]

As part of Bangkok's northern development corridor, Tung Rangsit became a major urbanized area. Typical traditional living accommodations in the less densely populated peripheral areas were gradually replaced by concentrated residential estate projects.

Many fragmented urban clusters also sprouted into mosaic landscapes of urban and rural applications. The land-use shift from rice fields to urban dwellings has significantly reduced stormwater retention areas and increased potential flood hazards.

Similar situations have also occurred in the only coastal district of Bangkok, Bang Khun Thain. Located between the Chao Phraya basin and the Gulf of Thailand, the area, although previously a frequently flooded swamp, developed during the last century as a thriving aqua-cultural and industrial center.

These new forms of rural-urban socio-economic admixture developments including rural-urban industrial, residential, commercial and business land uses, differed greatly from traditional rural-urban land-mix concepts.

These land uses have subjected the urban areas and coastal ecology to more flood disasters. The coastline is eroding at a rate of as much as 10m per year, and is likely to increase.

City at risk[2]

Over the past few decades, urban developments in the ecologically-fragile Chao Phraya Great Plain have made it more vulnerable to the elements. The situation is likely to be further impacted by climate change as various environmental risks are being investigated.

1. Faced with seasonal monsoon rains and daily tidal fluctuations, an increasing number of people in Bangkok and its region currently face regular flood risks. From May to October the combination of elevated Chao Phraya River flows, tidal surges and local runoff often places many city and regional areas under water.

2. Excess groundwater pumping in the past has resulted in continuing land subsidence. The city which is built on thick soft clay sinks by about 5-10 mm and by as much as 30 mm in outlying southeastern and southwestern areas each year. Combined with rising sea levels, this subsidence could potentially leave Bangkok and its region under 50-100 cm of water by 2025.

3. Most of Bangkok's water supply comes from the Chao Phraya and Mae Klong Rivers. Climate change will likely affect the two rivers' water flows and the city's water supply. As temperatures rise, household and industrial water demand will increase and further exacerbate projected water supply changes. Since Bangkok is expected to continue

growing over the next decade, water-supply and contamination of both surface and ground waters problems may worsen.

4. Bangkok's climate has become warmer and dryer than its surrounding suburbs because of its extensive land-use changes. This is also known as the Heat Island Effect. From 1956–1997 Bangkok's lowest temperature increased by 2 °C. Today, Bangkok and its surrounding region are experiencing more days with temperatures above 30 °C.

Notes

1. Source: Sustainable Landscape Design Studio, SLDS, Department of Landscape Architecture, Faculty of Architecture and Planning, Thammasat University, Thailand.

2. Source: Bangkok City Report, Coastal Cities at Risk (CCaR): Building Adaptive Capacity for Managing Climate Change in Coastal Mega cities. Southeast Asia START Regional Center. Thailand.

References

Jarupongsakul, T., Kaida, Y., 2000. The Imagescape of the Chao Phraya delta into the year 2020. Paper presented at the international conference The Chao Phraya Delta: Historical Development, Dynamics, and Challenges of Thailand's Rice Bowl. Bangkok. Kasetsart University. Retrieved May 2010, from web site: http://std.cpc.ku.ac.th/delta

Sowatree, N., 2000. Rangsit in Transition: Urbanization and Cultural Adaptation in Central Thailand. Bangkok. Paper presented at the international conference The Chao Phraya Delta: Historical Development, Dynamics, and Challenges of Thailand's Rice Bowl. Bangkok. Kasetsart University. Retrieved May 2010, from web site: http://std.cpc.ku.ac.th

Suwanarit, A., 2011. Re-structuring Bangkok's Suburbia: Landscape Vision Tung Rangsit. Proceeding of The International Federation of Landscape Architect Asia Pacific Region Congress, IFLA-APR 2011, [CD-Rom], Bangkok, Thailand

Suwanarit, A. 2011. Bangkok Floods: Natural Events That Become Man-Made Disasters. Topos Blog, http://www.toposmagazine.com/blog/bangkok-floods-natural-events-that-become-man-made-disasters.html

Tangchonlatip, K. 2007. Krung Thep Maha Nakorn: Muang toh diew talod karn khong pra tade Tai [Bangkok Metropolis: Primate City of Thailand], Bangkok: Institute of Population and Social Research, Mahidol University

Thaitakoo, D., Takeuchi, K. 2008. Landform Transformation on the Urban Fringe of Bangkok: The Need to Review Landuse Planning Processes with Consideration of the Flows of Fill Materials to Developing Areas. Landscape and Urban Planning, Vol. 84: 74-91