

# Sustainable Urban and Green Building Design in the Tropics



Wong Nyuk Hien

Professor, Department of Building, School of Design and Environment, National University of Singapore.

## **Abstract**

For this presentation, I will first talk about National University of Singapore and the international research partners that NUS has been working with on the topic of Sustainable Urban and Green Building Design. I will then talk about the research conducted in the Department of Building. Lastly I will focus on the research topics that I have been working on in the area of Climate Change and Sustainable Urban and Green Building Design for the tropics. My talk will focus on the key environmental issues faced by the urban built environment specifically the Urban Heat Island effect and what are the mitigation measures and solutions that could be employed to overcome this effect. The key mitigation measures discussed include the use of urban greenery, cool materials, urban ventilation design as well as passive design for buildings.

## **Introduction of the speaker**

**Professor Wong Nyuk Hien** graduated with a PhD degree in Building Performance and Diagnostics from Carnegie Mellon University, USA in 1998. Currently he is professor and Deputy Head for academic matters in the Department of Building, NUS. He is also the Research Thrust Leader for Planning and Design, NUS-JTC Industrial Infrastructure Innovation (I<sup>3</sup>) Centre and the Principal Investigator for the Centre for Sustainable Asian Cities (CSAC), School of Design and Environment, NUS. He has been the Principal Investigator for a number of research projects funded by the various Singapore government agencies to study the natural ventilation performance of food centres, public housing and the Zero Energy Building of Building and Construction Authority. At the urban level, Prof Wong has also worked on a number of projects to study the Urban Heat Island effect in Singapore and to explore the various mitigation measures such as the effective utilization of urban greenery and cool roof materials. Over the years, he has researched on how greenery can be effectively integrated with building facades through the incorporation of rooftop gardens and vertical greenery systems to reduce the heat gain into the buildings and also to reduce the urban heat. He is currently working on Urban Climatic Mapping studies with a number of government agencies and also on Climate Change project looking into how Climate Change will affect the temperature profile in the urban context as well as the impact on energy consumption of buildings. Prof. Wong has been engaged as member of the advisory boards to the various government agencies in Singapore. He is currently the chair of the Green Mark Sub-committee on ventilation simulation and also the President of the International Building Performance Association (Singapore Chapter). Prof Wong has written 12 books/book chapters and published more than 400 international referred journal and conference papers in these related fields.