



CURRICULUM VITAE

Dr. Nirmal Kishnani

*Educator & Researcher
Industry Advocate
Sustainability Consultant*

BIOGRAPHICAL DETAILS

- Nationality: Singaporean
- Date of Birth: 26 February 1962
- Place of Birth: Baroda, Gujarat, India
- Current Positions: Associate Professor
Programme Director
*Department of Architecture, School of Design and Environment,
National University of Singapore (2007-ongoing)*
Visiting Professor
School of Architecture, University of Navarra, Spain (2018-ongoing)
- Past positions: Assistant Dean (2014-2015)
Vice Dean (2016-2017)
School of Design and Environment, National University of Singapore
Director
CPGreen, CPG Consultants (2002-2007)
Executive Architect
Singapore Public Works Department (1988-1998)
- Languages: English (*spoken and written*)
Malay, Hindi, and Sindhi (*spoken*)

QUALIFICATIONS

- Bachelor of Architecture (Hons)
School of Design and Environment, National University of Singapore (graduated in 1988)
- Master of Science, Environmental Psychology
Department of Psychology, University of Surrey, United Kingdom (graduated in 1992)
- Doctor of Philosophy
School of Built Environment, Curtin University of Technology, Australia (graduated in 2002)

SKILLS

- Strategy formulation
- Critical thinking
- Cross-disciplinary bridging
- Process management
- Content structure and curation
- Communication (written and oral)

INTERESTS

- Environmental psychology
 - Indoor comfort and health
 - Biophilic design
- Curriculum and pedagogy
- Integrated design process
- Systems-thinking
 - Multiscalar approach
 - Human-nature interface
 - Livability and resilience
 - Policies and blueprints

VISION

I question the incrementalism of the Green building movement and reject its underlying reductivism. Through my research and editorial work, I advocate an altogether different worldview; one that seeks new *wholes* by focusing on the connectedness of systems and scales.

What makes some wholes better than others, and how wholes are formed, has lead me to *complexity science* and *systems-thinking*. I am interested in the nature of *change*, the process by which many parts come together to form new entities with altogether new attributes that cannot be modelled as a 'sum of'. To that end, I am interested in edge conditions between architecture and urbanism - what connects big to small elements (and vice versa), along with the design of overlaps and porosities that facilitate *emergent outcomes*

To understand change, I study the space between frontline theories and drawing-board pragmatism to ask why some types of change are embraced, others resisted. I am interested in path-dependence in the field of design, how predispositions and assumptions about form, nature and sustainability have become obstacles to change.

My research is deeply contextual. In Asian cities, the tension between the social and the economic tear away at spatial networks with devastating impact on both human-made and natural systems. Here, the power of form-making is, in my view, underestimated. It has a capacity not just to mitigate impact but also to reverse damage. I argue for restoration of *place*, since the root causes of the crises we face today – from climate change to species extinction – are social, economic and cultural.

My book, **Greening Asia: Emerging Principles for Sustainable Architecture** (2012), was an explicit critique of the Green building movement. It argued for upstream imagination over acts of downstream mitigation, distilled into Green checklists. Six design principles were illustrated with 12 case studies in Asia that go beyond Green. Questioning the status quo again, **Ecopuncture: Transforming Architecture and Urbanism in Asia** (2019) presents a new socio-ecological prism for regeneration and repair with 16 projects that push the discourse further. Two other books that I co-authored document thought-experiments on what might be a better model for urbanism: **SG³, Decoding Sustainable Urbanism – Case Study, Singapore**, 2016, and **A Tale of Three Cities – Rethinking Asian Urbanism¹** (*completion: mid-2020*).

My views on form-making, as a mode of systems-thinking, are central to what and how I teach. The postgraduate programme I founded in 2011 – **Master of Science, Integrated Sustainable Design** – focuses on Asia, and is pedagogically rooted in a multiscale, systems approach. Most recently, I completed a four-semester study with students of the programme and industry partner, WOHA, into a **Self-Sufficient and Resilient Singapore** which demonstrates how action at the scale of buildings can have a profound, aggregated impact at the city scale. I am in the midst of a two-semester study on **Circularity and Zero Waste** for an industrial masterplan in Singapore, which will be published in 2020.

Two design competitions that I launched in 2009 – **FuturArc Prize** and **FuturArc Green Leadership Award** – champion design innovation and thought-leadership in Asia. The Prize, in particular, calls for an examination of the city as a system-of-systems, wherein the insertion of buildings and urban elements creates ripples of good. The **FuturArc magazine**, where I have been editor-in-chief since 2008, is a quarterly publication that presents alternatives to the orthodoxy of Green buildings in Asia.

From 2014 to 2017, I *process managed* the new **Net Zero Energy Building (SDE4)** at the School of Design and Environment, National University of Singapore. This ground-breaking development is the first purpose-built zero energy building in Singapore with new ideas on comfort and cooling that can be transferred to any building in the tropics. I wrote its brief and shepherded cross-disciplinary collaboration and stakeholder engagement. SDE4 opened in 2019. The renovation of adjacent existing buildings is now underway, for which I have set in motion a similar design-construction process.

¹ Working title

ACCOMPLISHMENTS

EDUCATION

Since mid-2007 I have held a full time teaching position with the Department of Architecture, School of Design and Environment, National University of Singapore. Initially, I provided leadership to its undergraduate curriculum – the *Design, Technology and Sustainability (DTS)* track of the Master of Architecture (MArch) professional degree programme – shaping how sustainability is taught. Since 2011, I helped launch a post-graduate degree programme – *Master of Science, Integrated Sustainable Design (MSc ISD)* – that offers an Asia-centric, cross-disciplinary platform to train sustainability leaders.

Teaching

- Leadership: **'Design Technology' Research and Teaching Group (RTG)** overseeing environmental science curriculum for the Bachelor of Architecture (BArch) programme
- Leadership: **'Design, Technology and Sustainability' (DTS)** track of the Master of Architecture (MArch) professional degree programme; contributed to teaching and curriculum development
- Programme Director: **Master of Science, Integrated Sustainable Design (MSc ISD)** degree programme. Responsible for curriculum formulation and development, administration, marketing, planning and teaching 50% of programme content
- Tutor: **Design studios of the DTS track of the MArch programme** focusing on passive, low-energy design
- Tutor and coordinator: **Design studios for the MSc ISD programme** focusing on architecture and urbanism in Asia
- Supervisor: **Thesis students in the final year of the MArch programme**; focusing on climate change and urbanisation in Southeast Asia
- Lecturer: **Module on 'Climate Responsive Architecture'** – undergraduate architecture programme
- Lecturer: **Module on 'Green Buildings in the Tropics'** – MSc ISD programme
- Co-lecturer: **Module on 'Integrated Sustainable Design'** – MArch programme

Research studios

- **Green buildings and carbon-neutral developments.** An industry sponsored studio that examined industrial parks and carbon metrics was undertaken with students in the Master of Architecture degree programme at NUS.
- **Climate change and urbanisation in Vietnam.** An industry sponsored studio carried out by eight MArch thesis students who each examined ideas as diverse as sea level rise and slum housing.
- **Sustainable Urbanism I.** Three semester-long studios looking at sites within Singapore. The work of students was curated and compiled into **SG³, Decoding Sustainable Urbanism – Case Study, Singapore** (2016) a publication by the Centre for Advanced Studies in Architecture (CASA). It was co-authored with Asma Khawatmi, and offered a perspective on pedagogy and practice.
- **Sustainable Urbanism II.** Three semester-long studios looking at three cities in Asia: Hong Kong, Bangkok and Shanghai. The work of students is being curated and compiled into **A Tale of Three Cities – Rethinking Asian Urbanism**. It is co-authored with Asma Khawatmi, and offers a perspective on specific urban challenges in Asia.
- **Circularity and Zero Waste.** Two semester-long studios looking at the challenge of circularity and zero waste applied to the Sungei Kadut Industrial Estate. The work of students is being curated and compiled into a book that will be released in 2020.
- **Self-Sufficient and Resilient Singapore.** Four semester-long studios looking at integration of five systems: energy, water, food, public space and green cover. Students examined how this affects building typology, cost and policy. The goal is to demonstrate Singapore can be 100% self-sufficient and improve its livability if buildings were incentivised to engage all five systems.

RESEARCH

My research initially centred on human well-being and resource use, which were tied to the topic of my doctorate studies (1998-2002). Since 2012, I have widened the canvas, triggered in part by a failure of the Green movement to halt the fragmentation of urban and ecological systems in Asia. My current research focuses on systems-thinking with multiple areas of interest: multiscalar design, human-nature interface, livability and resilience, policies and blueprints.

Human comfort and energy use

- **Workplace Comfort in Malaysia and Singapore**, assessing Bioclimatic office buildings of the 1990s. Over 2000 occupants of office buildings in Singapore and Malaysia surveyed, completed in 2001
- **Energy and Water Indices of Campus Buildings**; benchmarking performance of building stock in the National University of Singapore, completed in 2006
- **Energy Demand of Large-Volume Cooled Spaces in Hot-Humid Conditions**; alternative cooling strategies and energy scenarios for Gardens by the Bay project in Singapore.
- **Workplace Comfort**; a post occupancy survey following retrofit of the **Headquarters of the Asian Development Bank, Manila**.

- **Post occupancy evaluation of Green-Mark rated buildings in Singapore.** Managed team of 3 researchers; collaborated with partners in Serbia, Australia and Singapore. The project funded by the Ministry of National Development, Singapore.

Systems-thinking

- **Enhancing Blue-Green and Social Performance in High Density Urban Environment.** In this multinational research project, I managed a team of researchers in Singapore and collaborate with research teams in Zeppelin University (Germany), Harvard University (USA), MIT (USA). The one-year project was funded by Ramboll Foundation (Denmark). The focus of my research was Biophilic Design, looking at two projects in Singapore: the Khoo Teck Puat Hospital and the Bishan-Ang Mo Kio Park. Completed in 2015.
- **Greening Asia- Emerging Principles for Sustainable Architecture,** 2012. A 334-page publication on buildings in the Asia that go beyond Green, with 12 in-depth case studies from Singapore, India, Indonesia, China, Malaysia and Japan. This book has been translated to the Vietnamese (2016) and Bahasa Indonesia (2017).
- **Ecopuncture – Transforming Architecture and Urbanism in Asia,** 2019. A 432-page publication featuring 16 projects from India, Indonesia, Singapore, Sri Lanka, People’s Republic of China, Taiwan, Republic of China. This book unpacks misconceptions about Nature and sustainability, and examines the designer’s role in bridging human-made and natural systems. To contextualise the challenge, it reports on several Asian cities that have succumbed to ecological squalor, as well as others that have begun to reverse the damage done, by embracing a whole-systems approach. The 16 built projects featured here bear testimony to an ecological worldview. These extraordinary acts of ecopuncture far exceed what we expect of Green today. Each aims to better its world in different ways, and for different reasons. However, all share a key attribute: overlapping layers of blue, green, and grey marked by life-sustaining exchanges. Every project also presents a perspective on form, discussed as something more than shape or style. Rather, form is an underlying structure of relations that gives rise to new. The book is accompanied by a documentary, *The Ecopuncture Archives: Designing with Nature in Asia*. The book and video will be translated into Vietnamese by early 2020.

INDUSTRY ADVOCATE

I have built up a network of contacts within the building sector in Singapore and parts of Asia, which started when I worked as a Green consultant. Lately, these networks have expanded as a result of my work as an advisor, trainer and facilitator, editor and juror of several major design competitions.

Advisor

- Member: Advisory Board, **Vertical Farm Institute**, Austria, 2016-ongoing
- Member: Advisory Board, **Centre for Sustainable Buildings & Construction, Building & Construction Authority**, 2012-ongoing
- Member: Advisory Group, **Singapore’s 3rd Green Building Masterplan**, 2013
- Member: Panel of experts, **Ministry of National Development Green Building Roadmap 2009**
- Member: Singapore **Building Construction Authority’s Green Mark Committee**, 2008-2012
- Member: **Singapore Institute of Architects Green Practice Committee**, 2008-2011 | Lead researcher and author: **Position Paper by the Singapore Institute of Architects: Attributes of a Sustainable Built Environment**, 2011
- Advisor: **Vietnam Green Building Council** on the **LOTUS rating tool**, 2008-2010
- Member: Singapore **Building Construction Authority’s International Panel of Experts on Sustainability**, 2008-2009
- Member: Singapore **Building Construction Authority’s Energy Modeling Technical Committee**, 2006-2007
- Lead researcher and author: **Training Guide for Green Building Design in Vietnam**, appointed by the **United Nations Environment Programme (UNEP) + the Vietnam Ministry of Construction** 2011
- Advisor: **Eco-City in Tianjin**, China, Singapore, 2007-2008

Trainer and facilitator

- Presented papers and key notes at multiple **Green building conferences** in Asia
- Invited to speak at two **World Green Building Council (WGBC) roundtable discussions** (Hyderabad, 2004 and Taipei, 2006)
- Chairperson: Regional Seminar on the **Design and Delivery of Green Buildings, Strategic Thinking for Asia**, Singapore, 7-8 April, 2005
- Trainer and Facilitator: **Awareness Workshop** for the **United Nations Environment Programme + Ministry of Construction**, Vietnam, Hanoi, Vietnam (6 December 2010)
- Trainer: Capability-building workshops on **Green Architecture and the Integrated Design Process**
 - 2007-2011. Building Construction Authority Academy, Singapore, as part of its Green Mark Professional (GMP) course
 - 2008. Hanoi (December 4-6) in collaboration with FuturArc magazine and Vietnam Green Building Council
 - 2009. Jakarta (May 19), Manila (May 26) and Kuala Lumpur (June 16) in collaboration with FuturArc magazine
- Chair, **Conference of the International Network of Tropical Architecture**, 2012, Singapore
- Co-Chair, **SB13_SG, Sustainable Buildings 2013**, Singapore

Editor

- Editor-in-Chief, **FuturArc magazine**, 2007-ongoing:
 - I direct coverage of Green projects and issues in the Asia context
 - I have made significant editorial contributions including a series of lead interviews with prominent thought leaders and policy-makers, shaping the discourse on the Green in the region

Juror

- Jury Chair: **FuturArc Prize** and **FuturArc Green Leadership Award**, two platforms that I helped launch in recognition of innovation and thought-leadership in Asia, 2008 – ongoing
- Juror: Vietnam Institute of Architects '**Spec Go Green**' Award, 2015, 2016, and 2017 + 2018 and 2019 as Jury Chair
- Juror: **The Emerson Cup 2010** – Innovations in Climate Technologies, 2010
- Juror: **Lafarge Holcim Awards 2017, Asia-Pacific**
- *Upcoming: Jury Chair, Lafarge Holcim Awards 2020, Asia-Pacific*

CONSULTANCY

Pre-1998, I worked as an architect on public projects such as the Singapore Changi Airport and schools. Upon completing my doctorate in 2002, my role shifted to Green specialist who guided project teams on environmental goals and performance. Post 2007, after joining academia, I continue to offer ad-hoc consultancy to select projects, only where the brief called for deep targets that go beyond the conventions of Greening.

2002-2007

- Set up CPGreen, a Green building design unit within CPG Consultants Pte Ltd
- Formulated framework for communication and promotion of Green design
- Assembled specialist team to deliver advisory services on building performance
- Operationalised Green principles at the drawing board using simulation tools and virtual models to assess resource consumption, climate response and occupant comfort
- CPGreen operated Asia-wide, undertaking a wide range of assignments which included Gardens by the Bay (Singapore), retrofit of the Asian Development Bank (Manila, the Philippines) and the Van Giang Commercial Masterplan (Hanoi, Vietnam)
- CPGreen was profitable in its 3rd year of operation

2007-ongoing

- **Net Zero Energy Building at the School of Design and Environment.** I have managed the design development of the new building since 2014. My role has included the articulation of SDE aspirations and targets, the integration of multi-stakeholder inputs. The project is now under construction. My responsibilities moving ahead are to scrutinise all submissions by contractor, including mockups and prototypes that affect the quality and performance of the new building. I will appoint and train an energy manager who will see the project through commissioning, into operations.
- **Renovation of Existing Buildings at the School of Design and Environment.** I manage the design development of the SDE Renovation. My role has included the articulation of SDE aspirations and targets, the integration of multi-stakeholder inputs. My responsibilities moving ahead will be ensure signoff of tender drawings by the consultants and to assist in tender evaluation and appointment of contractor. A critical area of focus will be the design integration of all SDE blocks, plus decanting and coordination of SDE operations during construction.