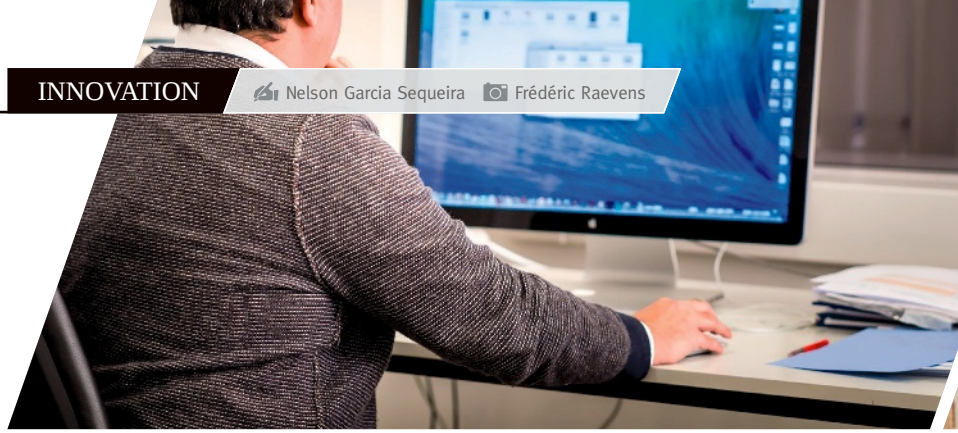
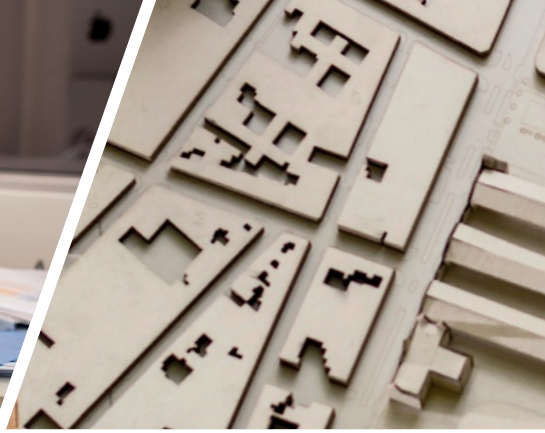
Nelson Garcia Sequeira Frédéric Raevens





Ahmed Z. Khan

A necessary utopia

Ecological architecture and urban planning mean a great deal more than the construction of green buildings. At the very core of a multiple discipline, **Ahmed Khan** is pushing back the boundaries of our thinking to conceive the city of the future.

1995, the east bank of the Ravi river in the Indus Plain. We are in Lahore, the major university centre of Pakistan. It was here that Ahmed Zaib Khan began making a name for himself. "At the end of my architecture degree, my thesis gained recognition. When a journalist took an interest in it, what surprised me most was the title of his article: 'Born to be an architect'." This journalist had hit the nail on the head because it is indeed passion that must guide Ahmed Khan's career. His first professional years were devoted to the practice of his profession. "Mostly, I was ending-up with designing villas for rich Pakistani families", he recalls, before going on to talk about moving into the public sector. "I wanted to explore the potential of design through working on major public projects that could change institutional culture, enhance public space, and improve quality of life. But my enthusiasm was hindered by the inertia of government agencies." It was the start of some soul-searching that would lead Ahmed Khan to the Old Continent.

FROM PRACTICE TO THEORY... OR THE REVERSE!

When in 2013, he joined the Architectural Engineering unit at the School's Building, Architecture & Town Planning department (BATir), Ahmed Khan already had a broad experience in various fields. In fact, in 2003, and after completing an advanced Master of Architecture (2000-01), the researcher had settled in Leuven to complete a doctorate on the relationship between theory and practice. "I was a hands-on kind of person and this doctorate took me in the direction of theory. My subject was the chicken and the egg story, but applied to architecture and urban design. Does theory guide practice or is it the other way round?" His research examined the theory and practice of the Greek architect-urban planner, Constantinos Doxiadis. "As well as his achievements across the world, including his design of the city of Islamabad in the 1960s, he was also the father of Ekistics, a global theory relating to the study of human settlements. He was therefore a precursor, but also a visionary, one of the first to conceive, plan and implement a city of the future and develop the concept of global ecological balance." After his doctorate, Ahmed Khan left Europe to pursue postdoctoral research at MIT (Massachusetts Institute of Technology), before returning to carry out further research in Europe. This included several European projects on a range of subjects, such as sustainable urbanism, climate change and spatial quality.

LESS IS MORE

As part of the BATir department, he directs activities in Sustainable Architecture and Urbanism, a multi-faceted discipline, the core idea of which is the development of transformative theories and practices for moving towards carbon-neutral and environmentally friendly cities and buildings. "The sustainable development of our urban centres remains an open question. There is no miracle formula. We need to continue exploring without closing doors, because nothing is all black or all white. Which technologies, innovative methods or high-performance materials? Is circular economy the solution? Perhaps in part, but it is a robust axiom that needs to be comprehended for the full scale of its effects. The challenge is enormous, as is my motivation." In this quest for a sustainable future, Ahmed Khan is driven by certain convictions and, in particular, by that of our capacity to respond to our needs by using fewer resources. "For a long time now we have been doing the opposite. Examples? In Europe, average car usage time is 8%, ie less than 2 hours. The rest of the time they're immobile. The same is true of offices, unoccupied 70% of the time. With alarming urban sprawl, per capita urban space has quadrupled in less than 50 years."

NATURE AT EVERY STAGE

As a researcher, Ahmed Khan underlines the importance of the link between the challenges of the future and fundamental research subjects. Nature offers inspiring solutions for adaptation and resilience, which should underpin ecological design. So much of the weight of ecological architecture depends on its capacity to meet society's needs. "Our 'Optimising ecosystem services' project, for example, will help to identify the services performed by nature. What services? Regulating fresh air, absorbing pollution, cleaning our water and socio-cultural services too. By modelling the ecosystems of Brussels in this way, we will be able to estimate the amount of green space needed to ensure a certain quality of life in the city." This is not a hollow objective because the demographic boom in Brussels could lead to a reduction in the number of green spaces in order to create accommodation. "Our role is to produce realistic scenarios in order to facilitate decision-making by the public authorities. What is the cost – in terms of ecoservices – of replacing a green open space with housing and urban development? What design solution offers an optimum win-win situation? These are the kind of questions that we wish to answer."

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SUSTAINABLE REDEVELOPMENT OF THE FORMER BARRACKS

Redevelopment of the barracks site near Etterbeek station placed in the hands of students! This was the challenge laid down by the "Sustainable Design Studio" led by Ahmed Khan. The various projects met with great success, notably in addressing the need for student accommodation while putting forward a sustainable project and one that is open to the city. This initiative has made it possible to support dialogue with the public authorities and a public debate on the basis of a set of concrete global visions. As a result, at the start of the year, the ULB and the VUB were commissioned as major stakeholders to redesign the future of the site.

TOWARDS AN INTEGRATED ARCHITECTURE

At Bruface MSc in Architectural Engineering program, Ahmed Khan teaches the "Bioclimate Design", "Sustainable Design Studio" and "Theory of Architecture and Urbanism" courses and encourages his students to adopt a global approach to architecture. "The idea is to provide them with the tools to consider the construction of a building while remaining mindful of a large number of factors: climate, energy, materials, social and environmental considerations." In this respect, nature is an inexhaustible source of inspiration, as shown for example by the architect Jean Nouvel when designing the Arab World Institute building in Paris. "The south façade consists of mechanical devices that imitate the operation of the human eye. These diaphragms open automatically in response to external light levels. Proof that we are capable of optimising our buildings, their position, the materials used, the design, etc." Ahmed Khan also calls for an integrated architecture capable of exploring elements of engineering and assimilating the principles of sustainable development. "For 2000 years now, since Vitruvius, we have been training architects in the same mould: a structure must be beautiful, useful and permanent. Our discipline must evolve to include new sustainable axioms: economy, social cohesion and the environment."

CITY OF THE FUTURE: A NECESSARY UTOPIA

Over the course of his career, Ahmed Khan has never ceased exploring the city of the future. An utopia which, he believes, is not an illusion. On the contrary, this vision of a sustainable future is essential to thinking outside the box. "As Albert Einstein said, 'inventing, is thinking sideways'. To produce new solutions, we must design as we have never done before." New concepts are coming into being all over the planet, like the Masdar City project in Abu Dhabi, a carbon-neutral city that will be home to 50,000 people by 2025. "Masdar may not be the answer, because the city will cost more than 18 billion dollars, but it's an experiment. Through the environmental challenges and such experimental approaches, we are moving towards a new ecological age that will produce its own cities, new ways of living, a new approach to nature." But what will this city of the future look like? "Before the industrial age, who could have imagined the characteristics of our metropolises, of our buildings or indeed our urban structures? All this was inconceivable, just as this ecological age is for us." Ahmed Khan will no doubt be playing his part in building this more sustainable future...

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1995 Graduated as an architect, Lahore (Pakistan) / **5 years** of practice / **2001** Advanced Master of Architecture in Human Settlements, KU Leuven / **2008** PhD in Architecture, Urban Design & Planning, KU Leuven / **2008-09** Postdoctoral fellow, Massachusetts Institute of Technology (MIT) / **2010** Postdoctoral Researcher, VUB & KUL / **2012** Asst. Prof. Sustainable architecture, KUL / **2013** Chair Sustainable Architecture and Urbanism (SAU), Brussels School of Engineering, BATir department, Architecture and Architectural engineering unit (AIA)

URBAN ECOSYSTEM SERVICES OPTIMISATION FOR SUSTAINABLE DEVELOPMENT OF BRUSSELS

BATir has been awarded funding for this research project by INNOviris (Brussels Institute for the encouragement of scientific research and innovation) in collaboration with the CGIS and Hydrology research groups of the VUB.

- This research aims to generate new knowledge on urban ecosystem services (UES) in order to develop a more ecological approach to urban design and planning for the Brussels-Capital Region (BCR).
- Understanding and analysis of UES is necessary in order to address the challenges facing Brussels with regard to climate change, urban heat island effects, increased heat waves, increased precipitation extremes and population growth, while maintaining urban environmental quality.
- To address these multidimensional challenges in an integrated way, the project focuses on analysing the regulation of and cultural services provided by the BCR's green spaces ecosystem.
- Through these analyses, the project is i) building up a GIS-based green space proximity and environmental quality model; ii) coupling urban form with heat flux in relation to local climate zones through the integration of groundwater and heat flux modelling; and iii) combining environmental analysis and research through design approaches for the development of indicators and scenarios in collaboration with stakeholders.