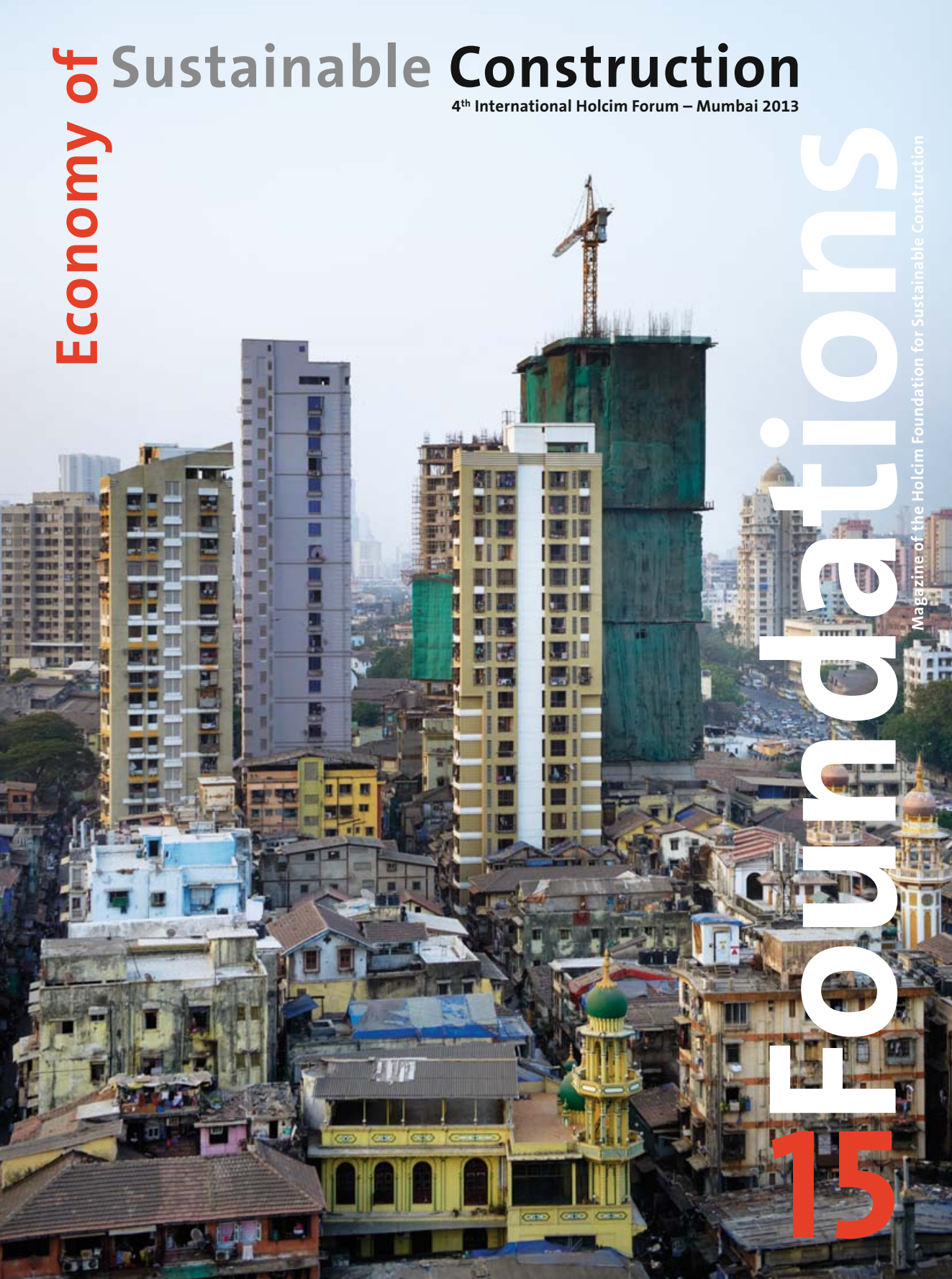
Economy of Sustainable Construction

4th International Holcim Forum – Mumbai 2013



Foundations 15

Magazine of the Holcim Foundation for Sustainable Construction

Economy of Sustainable Construction

4th International Holcim Forum – Mumbai 2013

Hosted by IIT Bombay, India

Holcimforum
for sustainable construction

City of contradictions and of opportunities

Mumbai is an ideal location for a convention on the "Economy of Sustainable Construction": The multifaceted megacity offers views into the life of every imaginable social stratum, it is a testing ground for many new approaches – and it openly shows how urgently sustainable concepts are needed.

Few cities in the world present such a broad spectrum of the economy of construction as Mumbai: Here stands "Antilia," today the most expensive and tallest detached residence on earth, while at the same time countless people have no roof over their head or are living in circumstances beyond description. Brand new towers of glass rise next to housing that the modern age has apparently passed by leaving nearly untouched. And luxury apartment buildings arise amid slums. The challenges that Mumbai must grapple with are gigantic: Green space is critically lacking, and exacerbated by overwhelming traffic; the water is often contaminated, the air is nearly permanently polluted.

Nevertheless, Mumbai remains attractive. One can see why every day new masses of people move to the port city of 18 million inhabitants, because Mumbai is brimming with energy, hope, and opportunity – many unbelievable success stories unfold here, and with ideas, talent, and a bit of luck, one can work their way up with amazing speed. One of the springboards for a successful professional career was the venue for the 4th Holcim Forum: the Indian Institute of Technology, or IIT Bombay.

India has a total of seven such universities, which specialize in engineering sciences and technology. They were established after India became independent with the purpose of cultivating a technical elite who could play a leading role in the economic and social development of the nation. Only the best minds are to study at these seven institutions, therefore the IIT entrance exams are among the world's most stringent. 300,000 students take the exam every year, only two percent pass the test.

Mumbai is a multifaceted megacity offering view into the life of every imaginable social stratum, as illustrated on this page, on the front cover, and opposite on page 2: "Antilia", the tallest detached residence on earth.

Devang Khakhar, Director of the Indian Institute of Technology (IIT Bombay), Mumbai, India.

IIT Bombay opened its doors in 1958 with the support of UNESCO and the former Soviet Union. Since then, 40,000 women and men have graduated here. One of them is the Indian entrepreneur Victor J. Menezes, whose name is carried by the center in which the Holcim Forum was conducted. The IIT Bombay campus, covering 2.2 square kilometers, is in Powai, to the north of the city center, and is exceptionally green: The campus was designed to preserve as many trees as possible. Many of the sidewalks circumnavigate trees, so that one is always walking in the shade and can take in the fresh air, to generate fresh ideas for Mumbai and the world.

Chair of the 4th Holcim Forum:
Mohsen Mostafavi, Dean of the Graduate School of Design at Harvard University in Cambridge, USA.

Co-Chair of the 4th Holcim Forum:
Battula K. Chakravarthy, Professor at the Industrial Design Centre (IDC) at the Indian Institute of Technology (IIT Bombay) in Mumbai, India.

Sustainability pays off

According to a broadly propagated – and widely accepted – definition, the concept of sustainability is based on the three pillars of economic, environmental, and social compatibility. For a long time, the green aspect and the social dimension have been the main focus of sustainable construction: Buildings should use a minimum of resources – and provide an environment in which people feel safe and well.

In the recent past, however, the economic aspect has been gaining greater attention: Financial considerations play a central role in building construction. It has become undeniable that investments in sustainability can also pay off economically – although in many cases, future-ready buildings are more expensive than those which ignore sustainability and merely seek a quick return. The present economic crises in many parts of the industrialized world have therefore dictated a paradigm shift: Governments,

businesses, and numerous other members of society want to more fully exploit the significant economic potential of sustainable development.

This potential was the subject of the 4th Holcim Forum. It took place from April 11 to 13, 2013 in Mumbai – attended by more than 350 experts from around 40 countries on all continents: Architects, engineers, economists, entrepreneurs, sociologists, and other specialists investigated the "Economy of Sustainable Construction." Speakers presented their positions and case studies; the participants discussed manifold aspects of the Forum's topic in workshops and conducted field studies during excursions. New ways to a holistic understanding of sustainable construction emerged – leading to a perspective that takes into consideration the great significance of economy.

The importance of cumulative, organic, and emotional qualities

Sustainable construction? For the award-winning British architect Sir David Chipperfield this has much to do with permanence – but not necessarily of that of material and mass.

"I have probably the least credentials in this room to talk about sustainability." With this typically English understatement, which at times characterizes his multiple prize-winning work, David Chipperfield opened the series of keynote speeches at the Holcim Forum. "But I can offer views from the frontline, how it is to work as a practicing architect." The first view he presented was the one from his office in London. This collection of "singular, uncoordinated, professionally planned, and well-considered buildings," which he must look upon from his workplace, does not please him a bit – in fact, he finds it difficult not to become unsettled by this explicit manifestation of problems. "At best we now have architecture to wonder at, not to be in," observes Chipperfield, although every architect intends to do more than just serve the practical function with their projects: "We all believe that the people who live in our buildings also enjoy them – and that the buildings enhance their context."

Mohsen Mostafavi, presents a concrete level to David Chipperfield – a memento given to all speakers at the 4th International Holcim Forum.

"As architects we have to work even harder to use buildings as a way of creating a setting, of creating something that might last – not just physically as a building, but in terms of how it might set out further development, how it might inspire."

When it comes to sustainability, Chipperfield is especially interested in the notion of permanence – fully aware that longevity is not exactly fashionable these days. "In this age of throwaway and the redundancy of everyday things, taking care of, valuing, and treasuring seem old-fashioned concepts." But he also applies the term "permanence" not simply to the physical properties of a building, such as mass and

View from the office of David Chipperfield: "an explicit expression of problems."

materiality, seeing it much more as "a declaration of lasting priorities. The organization of buildings and their integration in a larger whole give shape and solidity to our vague ideas of society." His office has become famous for conducting its renovation and expansion projects accordingly: He strives to understand which social values a building

"London is a mess. We know it's generating money, so it's some kind of farm where the buildings are the crop. That has always been the case, but in this free-market condition, there has been little coordination or vision as to what these buildings might add up to."

should express, how the building can bond society in this manner – and how the appropriate expression can be achieved. Relying on continuity in this way is justified also because our expectations on the built environment have changed little or none throughout all the upheavals: "We expect to find in our built world opportunities to protect ourselves and possibilities to come together."

The architect sees this last-mentioned function of buildings – as a place to come together – as increasingly endangered. Chipperfield's diagnosis: "There is no public realm, only shopping malls! But in a time when it seems increasingly difficult, if not impossible, to create public space

Chipperfield sees buildings as "a declaration of lasting priorities" – these priorities must be recognized and emphasized in renovation projects.

The careful treatment by Chipperfield is especially sought for renovation and expansion projects such as those on the famous Museum Island in Berlin.

and any other collective form beyond the commercial, it becomes even more important that buildings exploit their potential to contribute whatever they can to an environment that represents the civilized ambitions of society." The architect has the important task of carefully respecting the existing context, because "the tabula rasa visions of modernism – as exciting as they were – underestimated the importance of the cumulative, organic, and emotional qualities of buildings."

"All architects are always terrified when it comes to the question: How do we approach sustainability?"

To clarify this point, David Chipperfield cites the renovation of Rockbund Museum in Shanghai, a commission his office handled, and one which is mundane in several regards: "There is nothing particularly memorable about what we did; it is quite invisible. But I have to admit

“The market always wants to give us the next, we always want to replace one thing with another – and the market seems to be feeding that notion. The notion that something might last longer seems to be in many ways under threat.”

that in the normal contemporary planning environment of Shanghai or most other developing cities it would be difficult to build from new anything so rich.” This can rightly be understood as an indictment of modern architecture, which is often fixed on outward appearance and is thereby inwardly destitute; Chipperfield believes that wrong decisions often have already been made by the time architects are called onto a project.

Architecture has always strived for durability, he asserts, “with buildings that give form to our collective values.” The communal visions have not been lost, but “we seem to have lost the machinery and will to impose other criteria than those inevitably delivered through the free market.” One could regret this. Or one can continue to believe “that architecture is the resistant physical means by which we can express our collective desires to belong to something bigger than ourselves.”

Sir David Chipperfield CBE is Director of David Chipperfield Architects, which has won over 50 national and international competitions and many international awards and citations for design excellence. He is an honorary fellow of both the American Institute of Architects (AIA) and the Bund Deutscher Architekten (BDA). He is also a winner of the Heinrich Tessenow Gold Medal, the Wolf Foundation Prize in the Arts, and the Grand DAI (Verband Deutscher Architekten- und Ingenieurvereine) Award for Building Culture. He was appointed Commander of the Order of the British Empire (CBE) in 2004 and Royal Designer for Industry in 2006, and elected to the Royal Academy in 2008. In 2009 he was awarded the Order of Merit of the Federal Republic of Germany and in 2010 he was knighted for services to architecture in the UK and Germany. He received the RIBA Royal Gold Medal for Architecture in 2011 in recognition of his lifetime work. Chipperfield has taught and lectured worldwide at schools of architecture. He studied at Kingston School of Art (now Kingston University Faculty of Art, Design and Architecture) and at the Architectural Association in London.

“Yes, we should care about this”

Those who build sustainably must often dig deeper into their pockets. Swiss economics professor Lucas Bretschger is convinced that these investments pay off in the long run – and that sustainability in no way chokes economic development.

The economics of sustainability is a broad and extremely important field – or, as the economics professor Geoffrey Heal put it: "Sustainability is a metaphor for some of the most perplexing and consequential issues facing humanity. These might even include the very survival of our species." In spite of this, only a few economics experts are dealing with the subject – and very few with sustainable construction.

> **"Economics is the only field in which two people can get a Nobel Prize by saying exactly the opposite thing."**

One of these experts is the Swiss economics professor Lucas Bretschger. Presenting a few key figures, he showed why his profession should give more attention to sustainable construction: The construction sector is one of the most important energy consumers on earth – in most countries it uses up to 40 percent of the primary energy. It is also the world's largest contributor to greenhouse gas emissions. It is responsible for ten percent of the global GDP, and it provides employment for some 111 million people. Bretschger asserts that this all shows the great potential the construction industry carries for the economy, environment, and society.

Today there is unquestionably a great need for sustainable buildings: "We have changing demographics. Then we have economic changes and changes in lifestyle and technology – and the big issues like climate change, changing energy prices and systems and the associated policies." All this influences the long-term return on real estate. But it is difficult to predict precisely how large this influence will be, admits the expert. Sustainable development is hindered not only by the lack

Keynotes and discussions were recorded for streaming and are now available together with slides for download at www.holcimfoundation.org.

Relative importance of sustainability in property-related decisions

- Does the issue of sustainability, as you understand the term, play a role in your property decisions?

Survey in Switzerland, 207 firms.

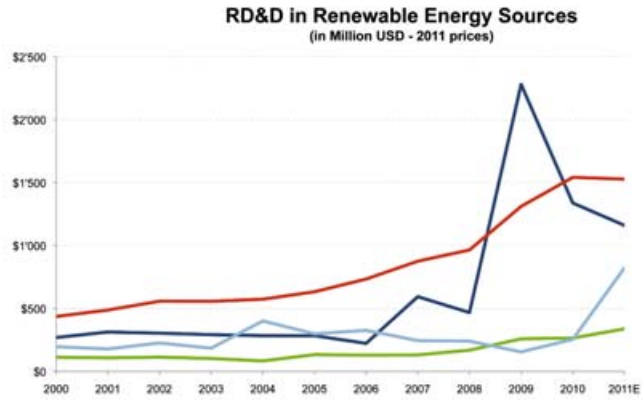
Studies show: Sustainability is becoming more important in the real estate sector.

of information but often by the lack of incentives and specialists. Personal preference also plays an important role: "We know that some people prefer lower investment costs now over lower operational costs later. So it's also a question of how much you value future benefits as opposed to present cost savings. If you have very impatient investors, this might be an obstacle for getting green investments."

Of course, sustainable buildings have many direct advantages, such as lower costs for energy, water, and maintenance; productivity; or health and well-being of the building users. "But this is only a potential, there are no guarantees," says Bretschger, "and when there is a potential we have to think about how we can reap the profits that are possible from this." In sustainable building projects, it is important to incorporate every such idea already in the design phase and to work with a team of specialists. Bretschger is convinced that "successful green buildings will cost only a little bit more than normal buildings." From the macroeconomic perspective, experts face the question of

"During the last years, you can see a remarkable increase of innovation due to exploding energy costs."

Research, development and demonstration



– United States
– Germany
– Japan
– Estimated IEA Europe

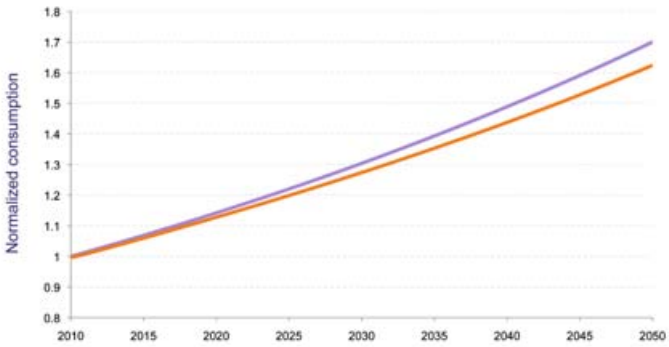
Investments in research for renewable energy: A growing trend.

whether not only investors but also society and business should press harder for sustainability, "and the answer of course is: Yes, we should care about it." For instance, if you can save some of your costs for importing oil and instead use that money for local projects, much good can be achieved. "For me, the distinction between the long and the short run is crucial," says Bretschger. Although it might be easier and cheaper in the short term to use fossil fuel, this situation could change in the long term. Bretschger substantiates this with one of his studies: "There is a negative relationship between the energy used per capita and the growth rate per capita in rich countries. This means, if you choose to use less energy, in the long run you will have a profit."

"In the short run, it might be efficient to use cheap energy; in the long run, it might be the other way round."

Bretschger demonstrated the importance of long-term thinking using a model developed for Switzerland. It shows that a strict carbon tax policy slows down economic development a bit, but has an impressive effect regarding sustainability. The implementation of such a policy requires financial and technical investments, but it pays off in the end and the negative impact on economic development is negligible.

Results of climate policy: Consumption

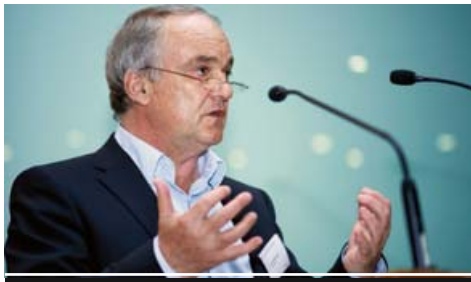


– Business as usual
– With carbon tax

Control mechanisms are important: Carbon tax can significantly drive down energy consumption.

As a member of the Swiss Delegation at the United Nations Climate Change Conferences COP 15 and 17, Bretschger strongly advocated simplification of the negotiations concerning Climate Agreement 2015. It's important not to try to do too many things but rather to concentrate on a few key principles that apply to everyone: principle of "ability to pay" – who can contribute more should do so –, the dessert principle – who does more for the environment should receive a greater reward –, proportional burden sharing regarding the realization costs incurred by individual countries, and general technology development. If agreement could be reached within such a framework, ample freedom would remain for each country to decide independently how to restructure its economy in a sustainable manner.

"For most investors, sustainability is an issue."



Lucas Bretschger is Professor of Economics at the Swiss Federal Institute of Technology (ETH Zurich); Director of CER-ETH, ETH Center for Economic Research; Associated Chair at the Centre for Energy Policy and Economics (CEPE), ETH Zurich; External Research Associate at OxCarre (Oxford Centre for the Analysis of Resource Rich Economies), University of Oxford, UK; and member of the Advisory Body on Climate Change to the Swiss government. His research covers the dynamics of resource use, endogenous growth models, trade and economic development, environmental and regional economics, innovation and biased technical change, and sustainable development. Bretschger's work has been published in numerous academic journals, he has held academic positions at many universities in Europe and the USA, and he was a member of the Swiss Delegation at the United Nations Climate Change Conferences COP 15 (Copenhagen) and COP 17 (Durban). He received his Ph.D. in Economics at the University of Zurich in 1989.


Why is common sense
so uncommon?

The principles of sustainable construction are actually quite simple, says Chilean architect Alejandro Aravena, because they are part of common sense. It's just too bad that common sense is not commonplace!

"Sustainability is nothing but the rigorous use of common sense," assures Alejandro Aravena. And if sustainability is merely an application of common sense, then it follows that sustainable construction must be the simplest thing in the world. But that's not the case, as experience shows. "Why is common sense so uncommon?" asks the architect rhetorically – and investigates the reasons himself: "Because the forces that shape our environment – money and power – follow the commonplace, not common sense." Architects adapt to this concept too often because they and their projects ultimately depend on people with money and power. "The typical question in the building sector in politics is: Has this been done before? If the answer is no, people say: Maybe we can try it next time, but for now..." In this case it doesn't matter whether a solution makes common sense or not; the commonplace usually prevails.

Aravena and his colleagues at the architecture office Elemental have seen how great the pressure of the commonplace is. And they have bent to it. The architect presented the Siamese Towers project, designed for the campus of the Universidad Católica in Santiago, Chile in 2005: "The clients wanted a glass tower because everybody is building glass towers at the moment," – nonsense in terms of sustainability, as the architects with a bit of common sense soon confirmed. Nevertheless, they bowed to the power of the client in order not

"There is no doubt that there is a value in sustainable construction, but the way things are today requires us to pay a higher cost to achieve that value. How do we make the people in power give one to acquire the other?"

Elemental's concept for the reconstruction of Constitución has many advantages – including much more public green space.

to lose the commission. That was a mistake, admits Aravena openly: "We did our best, but in terms of sustainability it wasn't good enough." This project taught us a lesson that must not be repeated in the future.

This lesson critically influenced a subsequent commission for Elemental. On February 27, 2010 the Chilean coastal city of Constitución was destroyed by an earthquake measuring 8.8 on the Richter scale followed by a tsunami. Elemental was asked to develop a master plan for the reconstruction of the city. This was an extraordinary challenge particularly because the planning had to be completed within 100

"Time is one of the major issues if we want to produce shifts and change in the current situation."

days. It was quickly determined that there are basically three ways to protect Constitución against future catastrophes. First, terminate habitation of the endangered coastal area. This plan would be predestined to fail, Aravena says with certainty, "because sooner or later settlements would be rebuilt at ground zero." Also the second way – the "commonplace" approach – seemed practicable at first glance: to build a colossal protection wall along the entire coast. "Building a wall to protect the city from future destruction would have been useless because nature's energy is so big that it is hard to resist it," tells Aravena. The third option remains: not trying to stop a tsunami, but rather breaking its power – with a forest belt. The example of a forest island off the coast of Constitución showed that the trees can dissipate the tremendous energy of a seismic wave. Adopting this approach would be a matter of pure common sense.

Money can be saved by proceeding in steps: Elemental designed buildings that the residents can expand over time – and will be ultimately cheaper than buildings completed at once.

But this solution, the most sustainable in every way, was also the most expensive – which brought Aravena to the core topic of the Forum. He and his team found arguments to make the forest an attractive solution for the authorities. Before the earthquake, various government agencies in Constitución had individually conducted construction projects totaling USD 52 million. “Coordinating rebuilding projects turned out to be cheaper than the uncoordinated projects going on before the earthquake,” told the architect – only USD 48 million.

The architects also found uncommon solutions for the new buildings to be erected. “The usual discussion in Chile, Latin America, and maybe the world is: If we have more money we can deliver bigger units, better built. In order to tackle this issue we had to redefine quality by the capacity of a housing unit to gain value over time.” The architects ultimately developed a system in which half the buildings would be constructed in a first phase – and in a later second phase the residents would build the rest themselves when they have the money – at low cost and with layman’s skills.

The Constitución project allowed Alejandro Aravena and his team to draw significant conclusions regarding sustainability and the economy of sustainable construction: “Sustainable construction has to be

"Economy of Sustainable Construction"

1. **Highest cost is coordination (not money)**
2. **Scarcest resource is synthesis**
3. **Welcome constraints (time, money, coverage)**
4. **Scarcity is a great filter against the superfluous**
5. **Be prepared to loose a job**
6. **Do not innovate if old approach still makes sense**
7. **Global agreement / local performance**

Alejandro Aravena believes that the economy of sustainable construction follows a few simple principles.

cheaper than unsustainable construction. Otherwise, we can make as many projects as we want, but decisions will be made against them." It is common to choose the option that is cheapest at first glance. Limitations such as budget, time, and material do, however, have a positive aspect: They prevent excesses and they foster innovation.

"Houses should be the opposite of cars: They should gain value over time."

But here Aravena advises caution: "Don't innovate for the sake of innovation!" If common sense tells you that the conventional way works, then there's no reason to reinvent the wheel. The architect says that his ideas are nothing spectacular: "All my conclusions are guided by common sense. They are not that brilliant – they are just common sense!"

Alejandro Aravena is Executive Director of Elemental, a socially-motivated architectural practice based in Santiago, Chile. His works have been exhibited at X-hibition, Harvard GSD (2004), X in Centro de Extensión UC, São Paulo Biennale (2007), Milan Triennale (2008), and the Venice Biennale. He received the Silver Lion at the XI Venice Biennale (2008), 1st prize at the XII (2002) and the XV (2006) Santiago Biennale, and the Erich Schelling Architecture Medal 2006 (Germany). He was a Mies van der Rohe Award (2000) and Iakhov Chernikhov Prize (2008) finalist. In 2009, he was one of ten non-British architects recognized as International Fellow of the Royal Institute of British Architects, and was also appointed to the Pritzker Prize for Architecture jury. He lectured at Pontificia Universidad Católica de Chile (UC) since 1994, and was visiting professor at Harvard GSD (2000–05) and the University of Wisconsin (2010). He won the Holcim Awards Silver 2011 for Latin America. He studied architecture at UC, Istituto Universitario di Architettura di Venezi (Italy) and the Architectural Association (UK).

Local thinking

The sustainable construction projects of Indian architect Brinda Somaya cover an enormous spectrum. But certain common elements characterize all of her work: Her projects relate directly to their context, use traditional construction materials and methods – and are based on local needs and possibilities.

"There must be very few countries in the world where architects have such varied challenges as we have in India today," says Brinda Somaya. She speaks from vast experience as not only one of the best known but also one of the most versatile Indian architects. The range of tasks confronting construction professionals in this giant country spans from the construction of large public buildings and ultra-modern corporate headquarters to the upgrading of slums, erection of the most basic housing, and restoration of majestic cathedrals. The contexts into which projects are inserted are also enormously diverse in India: "Buildings in the large metropolitan cities often get the attention, but there's also great need in the nation's nearly 650,000 villages and 8,000 towns," tells Brinda Somaya. So sustainable construction has a very special meaning in India: not treating everything alike, but finding individual solutions that are appropriate to the situation and that meet the needs of the local people. Sustainable solutions are not those that are dictated from some remote office but rather those that are developed for and with the users.

“I am an Indian and my heritage is from here. And this is reflected in my work in many ways.”

Brinda Somaya showed how this looks in practice with examples of her own projects. One is the reconstruction of Bhuj village, destroyed by an earthquake in 2001 along with many other settlements in Gujarat province. “Hindu villages had been taken by Hindu NGOs to rehabilitate, Muslim villages had been taken by Muslim NGOs,” explained the architect. “Nobody had taken Bhuj because it has an unusual blend of Hindus and Muslims.” The local authorities proposed simply razing the village, but for the people, who are rooted in their surroundings, this was not an option. Brinda Somaya therefore sought some way to give the village back to the people. Her idea: Instead of rebuilding the village for the people, let them rebuild it themselves under the guidance of architects – largely using the rubble from the earthquake. The people were given a free hand in designing their own houses. “This is how a house becomes a home,” says the architect. “The most appropriate solutions are brought about by the least authoritarian approach. We as architects just have to become catalysts in the development process.”



For Brinda Somaya, responding to the local situation also means respecting traditional construction practice – because what people have developed for their context over centuries and even millennia is usually an adequate answer to the local requirements. For a school in Sevasi, Brinda Somaya thus used traditional construction methods to keep the building comfortable despite extremely high temperatures. The school requires almost no air conditioning; courtyards, double walls, cavity walls, and many other features provide ample shading and ventilation. “These are the ancient principles of Indian architecture applied today,” says the architect – and principles that couldn’t be more sustainable.

“The most appropriate solutions are brought about by the least authoritarian approach. We as architects just have to become catalysts in the development process.”

Brinda Somaya is convinced that local response is the correct approach not only for low-budget projects. The site for the exclusive Mahindra Resort in Rajasthan province contained some old buildings. These were

not demolished, but rather integrated into the master plan. Local stone was used for the new buildings – as a result, the resort fits perfectly into its surroundings. The architect also chose the indigenous approach for the interior design: “We used local craftsmen. I was certainly not going to import anything from anywhere for the interior. This is happening too much today, so that sometimes you don’t know any more whether you are in Mumbai or Dubai.”

“We have to be very patient in India. We can’t always get what we want as quickly as you can get it in other parts of the world.”

Local response and participation are possible not only in rural areas or for closely managed projects like Mahindra Resort but even for Mumbai, a metropolis of 18 million, explained Brinda Somaya. With Colaba Woods, the architect created one of the rare open spaces in the city by transforming a former landfill into a park. A unique feature is that the site borders on a wealthy neighborhood on one side

“We should not lose the traditional ways of building that are passed on by heritage.”

and on a poor neighborhood on the other. “We wanted to get everybody involved and create something for everybody,” tells the architect. She made a fundamental statement by refusing to impose an entry fee to the park, as the government had foreseen, thus creating a meeting place that all classes may use without restriction. “It became the first project in Mumbai of a public-private partnership. It paved a way for other talks to go ahead.” Those who will conduct those talks might not have as much determination, persuasive power, and experience as Brinda Somaya – but they will have the benefit of her pioneering work.

“A city has to have equality, and until that happens, there is always going to be a problem.”

Brinda Somaya is Principal Architect and Managing Director of Somaya and Kaleppa Consultants, based in Mumbai, India. She is a member of the Committee of Environmental Impact Assessment of New Construction Projects for the Ministry of Environment and Forests of the Indian government; a member of the Mumbai Urban Heritage Conservation Committee; a member of the board of the International Archive of Women in Architecture (USA); and a founding trustee of the HECAR Foundation. Among her many awards, she received a UNESCO Asia Pacific Heritage Award (2004) for her restoration the Cathedral and John Connon School, she was the first woman to win the peer-evaluated Wienerberger Golden Architect Award (2007) for lifetime achievement, and she received a special mention in the International Union of Architects (UIA) Vassilis Sgoutas Prize for the Bhuj village project in 2008. Brinda Somaya received her Bachelor of Architecture from Mumbai University and she was awarded a Master of Architecture and Honorary Doctorate from Smith College in Northampton, MA, USA.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Agarwal Rupa, India
Agnew Elizabeth, Canada
Aguilar-Dubose Carolyn, Mexico
Ahmed Mishkat, India
Alaoui Belghiti Sanae, Morocco
Alvarez López Pilar, Mexico
Ambe Sonam, India
Anaokar Prasad, India
Angel Shlomo, USA
Angélil Marc, Switzerland
Aravena Alejandro, Chile
Armstrong Claude, USA
Aromar Revi, India
Arroyo Carlos, Spain
Athavankar Ameya, India
Athavankar Uday, India

B

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Bachofen Suzanne, Switzerland
Balani Pravin, India
Banchhor Anil, India
Banerjee Rangan, India
Banerjee Sharmistha, India
Bani Prashant Kumar, India
Bankar Ranjit Diliprao, India
Barot Yogesh, India
Basrai Zameer, India
Bastin Olivier, Belgium
Bates Donald, Australia
Baumann Dominik, Switzerland
Beckmann Aldric, France
Bélanger Pierre, USA
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Brager Gail, USA
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Brillembourg Alfredo, Switzerland
Bruelisauer Marcel, Singapore
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Buechi Alex, Indonesia
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Caccavella Nick, Canada
Cape Geoff, Canada
Castillo Jose, Mexico
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Channane Reda, Morocco
Chaudhry Rika, India
Chauhan Janardan, India
Chehab Ghassan, Lebanon
Chen Kian Wee, Singapore
Chiao Sean, China
Chipperfield David, United Kingdom
Chulasai Bundit, Thailand
Cobo Corey Adriana, United Kingdom
Cohen Donna, USA
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Dahmani Imad, Morocco
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Das L. K., India
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Datta Navajyoti, India
Dax Michael, Germany
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de Spot Michel, Canada
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Deschamps Suzanne, Canada
Deshmukh Ravi, India
Dev Kishor Singh, India
Dhariwal Jay, India
Diez Fernando, Argentina
Dikshit A. K., India
Ding Wowo, China
Diniz Camargos Teodomiro, Braz
Dordi Cyrus, India
D'Souza Rebecca, India
Du Plessis Chrisna, South Africa
Ducrey Daniel, India
Dupare Vishal, India

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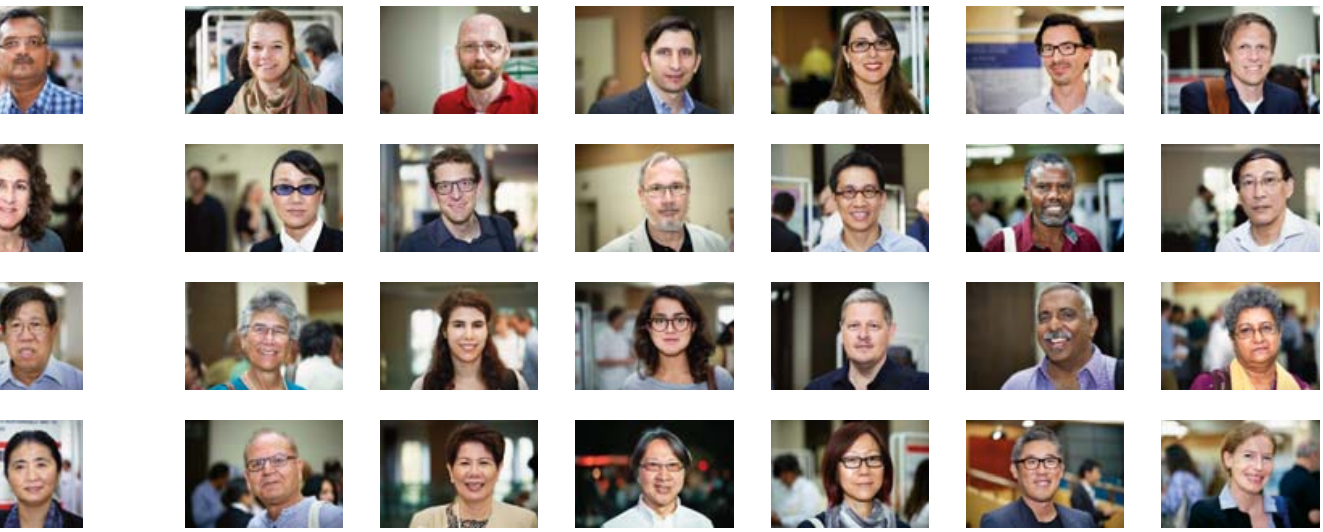
Eichelmann Christine, Germany
El Moumni Lahbib, Morocco
Engineer Maneck, India
Enrique Monzo LLuis, Switzerlar



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Hübsch Reinhard, Germany

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Joshil Vandana, India
Jules-Plag Shelley-Ann, South Africa

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Kusale Sarang, India

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Lee Mark, USA
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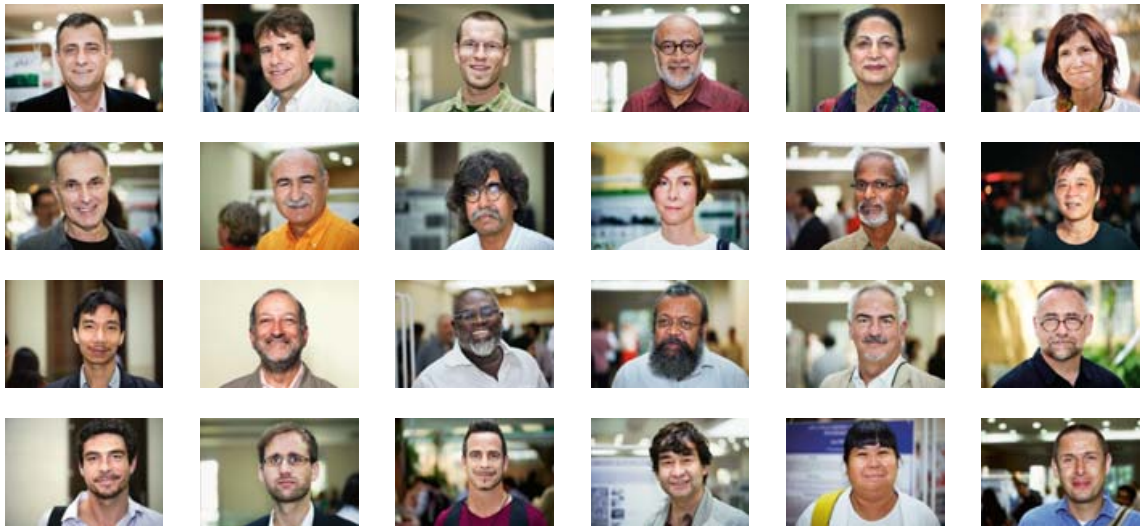
Loveridge Russell, Switzerland



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Márta Irén, Hungary
Maskarenj Marshal, India
Masood Kazi, India
Master Abbas, India
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Meggers Forrest, Singapore
Mehrotra Rahul, USA
Mehta Geeta, USA
Millet Yannick, Vietnam
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Misra Avinash, India
Mitrović Branislav, Serbia
Moitra Masoon, India
Mostafavi Mohsen, USA
Mouline Saïd, Morocco
Mouline Sinan, USA
Mouyal Elie, Morocco
Mueller Langer Thomas, Canada
Mujumdar Pralhad, India
Munshi Naved, India
Murthy Mukesh, India
Musgrave Lucy, United Kingdom

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Nayak Narayan, India
Nensey Gulnaz, India
Nerkar Darshan Madhukar, India
Ng Sor Hiang, Singapore
Nguyen Hoang Manh, Vietnam
Nguyen Cong Minh Bao, Vietnam
Nguyen Thanh Dung, Vietnam
Niaz Rahat, Bangladesh
Nield Andrea, Australia
Nievergelt Werner E., India
Norten Enrique, USA

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Orgill Annie, South Africa
Osae-Addo Joseph, Ghana
Osmani Mohamed, United Kingdom

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Patel Ipsit, India
Pathak Ramesh, India
Pati R. S., India
Paul Aneerudha, India
Pawar Vikram, India
Pearl Daniel S., Canada
Pithawala Cyrus, India
Pizarro Suarez Aramburo Rocio, Mexico
Plemel J. Randolph, India
Poovaiah Ravi, India
Prakash Sanjay, India

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Rahman Shaheda, Bangladesh
Raje Aparna, India
Rajkannu Manikandan, India
Ramakrishana I.N.S., India
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Ray Kallol, India
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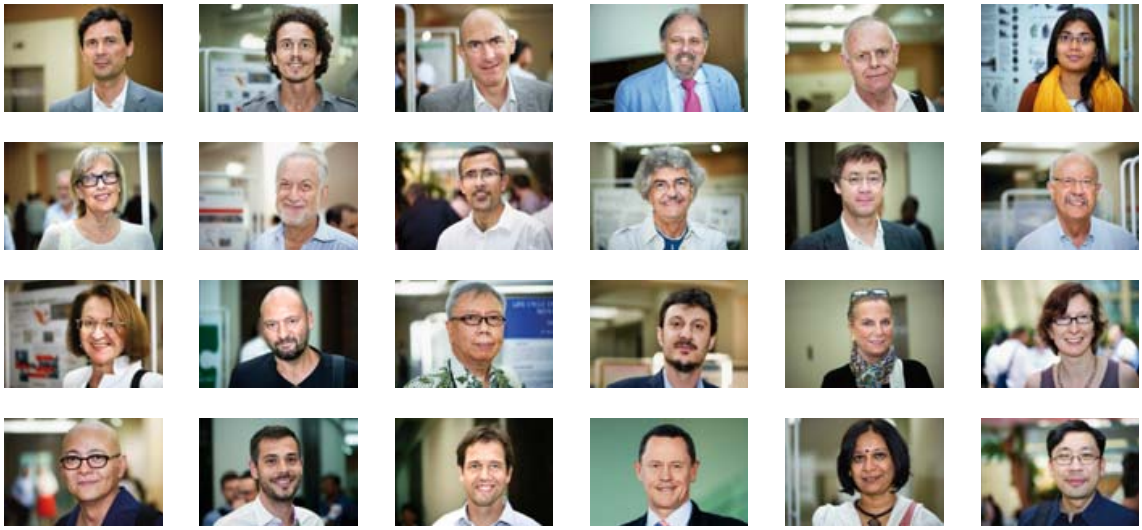
Ruby Ilka, Germany



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Satam Vikas, India
Saxena Divya, India
Schaefer Markus, Switzerland
Schaerer Caspar, Switzerland
Schalcher Hans-Rudolf, Switzerland
Scharpf Michael, Switzerland
Scherfler Martin, India
Schlaich Mike, Germany
Schoettli Urs, Japan
Schubert Julian, Germany
Schuetz Elena, Germany
Schwartz Daniel, Switzerland
Schwarz Edward, Switzerland
Scott Andrew, USA
Sen Ajanta, India
Serrano Orozco Juan Pablo, Mexico
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Streich Leonard, Germany
Suidan Makram, Lebanon
Sukumaran Lekshmi, India
Sun Sunny Xiaonuan, Hong Kong
Suo Chao, China
Suri Sagarika, India
Surin S. Raj, India
Swaminathan Vishnu Ram, India

T

Taipale Kaarin, Finland
Tang Bo, United Kingdom
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Tewari Sunil, India
Tewari Saurabh, India
Tidy Albert, Chile
Tjahjono Gunawan, Indonesia
Torriani Diego, Italy
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Udyavar Yehuda Roshni, India
Ugarte Espinoza Jimena, Costa Rica
Upton Simon, France

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Valder Roshan, India
Van der Weijde Onne, Switzerland
Vanthournout Helga, Switzerland
Varadarajan Soumitri, Australia
Varghese Boban Padikara, South Africa
Vasavada Bindi, India
Verma Chandrashekhar, India
Vinageras Massieu Andrea, Mexico
Viray Erwin, Japan
Vlačić Sandro, Croatia
Volkmann Christian, USA
Von Castelmur Linus, India
Vonnegut Benedikt, Lebanon

W

Wagh Sachin, India
Walker Roland, Switzerland
Wallbaum Holger, Sweden
Werle Ana, Brazil
Widder Lynnette, USA
Willkomm Wolfgang, Germany

X

Xue Fiona Fei, Hong Kong

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Yadav Akhilesh, India
Yue Zhang, China

Z

Zeindler Carmen, Switzerland
Zhang Qian, China

Discussing the workshop findings (from left): Moderator Mohsen Mostafavi, Sustainable Construction Expert Chrisna Du Plessis (South Africa), Settlement Expert Sanjay Prakash (India), Architect Sarah Graham (USA), and Building Systems Researcher Niklaus Haller (Switzerland).

The central feature of the Holcim Forum is the workshops. Four teams comprising moderators, organizers, and speakers each investigate a different topic – and the Forum participants may choose which group they would like to join. Attendees are allowed to change to another workshop at any time, but in Mumbai very few did this. The discussions in each workshop were so stimulating and the combinations of speakers and case studies so promising that most attendees chose intensive engagement in their group of first choice. During two concentrated half days they listen to the expert presentations, discussed their statements, and propounded their own visions and ideas. A third half-day led the workshop participants out of IIT Bombay and into Mumbai: In these mobile workshops case studies were experienced in person.

Moderator Hansjürg Leibundgut, Professor of Engineering at ETH Zurich (Switzerland).

Identity can be understood only on site

How is sustainability regionally characterized? With which local strategies can barriers to sustainable designs and construction be overcome? Such questions were investigated in the Yellow Workshop, led by Hansjürg Leibundgut, member of the Technical Competence Center of the Holcim Foundation. Case studies illustrating the importance of local resources for a more sustainable world were

convincingly presented by experts including Planning Advisor Lucy Musgrave (London, United Kingdom) and Architect Francis Kéré (Berlin, Germany), winner of the Global Holcim Awards Gold 2012.

At the 3rd Holcim Forum 2010 held in Mexico City, the workshop led by Hansjürg Leibundgut presented the "Triple Zero Manifesto": The construction of buildings should consume no fossil fuels, produce no emissions, and leave behind no waste. This time, after heated discussions, the workshop came to the conclusion that the Triple Zero Manifesto does not go far enough – because it does not cover the behavior of people, which still remains completely unsustainable. "We hope that you don't expect a new manifesto," said Niklaus Haller when presenting the workshop results. "We took the old one and added a new zero: zero corruption." Furthermore, the presentations and follow-up discussions revealed several common denominators: that a reality check is necessary to make sure that solutions really work, that the identity of a place can be understood only through physical presence on site, that our cities are ultimately composed of neighborhoods and that urban growth has been increasingly ignoring this aspect, and that we need critical facilitation to help bring ideas from other places and share knowledge to bear on the local condition.

All in all, the goal must always be to achieve a good and sustainable life for everyone. That is why return on investment is not necessarily always only a financial issue. It must also take into consideration the social and community values upon which each system is based. A concrete project idea evolved from these theoretical considerations in the Yellow Workshop: the Research Action Project in Paspoli Village, a low-income community located next to luxurious hotels, middle-class housing, and international corporate buildings. Through this project Paspoli Village is to be seen not as an "island" but as a part of the whole and with the help of local residents upgraded in a sustainable manner.

Led by Aneerudha Paul, Director of the Kamla Rajeha Vidyanidhi Institute for Architecture and Environmental Studies (KRVIA, Mumbai, India) and Ainsley Lewis, Head of the Bachelor of Architecture program at KRVIA, the participants of the Yellow Mobile Workshop first visited Fatima School and Hanuman Temple in the densely developed neighborhood of Vikhroli. The girls' school and the temple share certain rooms in a completely natural way, thereby demonstrating how communities can exist next to and with one another, sharing limited resources and making use of synergies.

The second stop of the workshop was Bhavan's College in Andheri – a giant campus that includes not only the college buildings but also sports facilities, gardens, and a temple. The campus also serves as a place for youth festivals and many other events.

Finally, the participants visited the KRVIA Center in Juhu, one of the most important knowledge centers for architecture and urbanism in Mumbai.

Moderator Hans-Rudolf Schalcher, Professor em. of Engineering at ETH Zurich (Switzerland).

Upgrading without destroying

Nearly every metropolis in the world has districts that developed spontaneously and grow rapidly. These typically poor neighborhoods often grow into independent communities with their own network and elude the formal city planning process. Improving the standard of living for the residents of such districts is a difficult undertaking – especially when trying to preserve the valuable social structures in these communities. The central question of the Blue Workshop, led by Hans-Rudolf Schalcher, member of the Board and former Head of the Technical

Competence Center of the Holcim Foundation, was: How can the standard of living in such settlements be improved without destroying the strengths and identity of the community?

To answer this question, a discussion was held among experts including Architecture Professor Michael Sorkin (The City College of New York, USA), SPARC Founding Director Sheela Patel (Mumbai, India), and Gustavo Restrepo, winner of the Holcim Awards Gold 2008 Latin America (Medellín, Colombia) – covering topics such as urban growth and dynamics, everyday life of poor city dwellers, and conflicts between planned and spontaneous growth.

In his vivid presentation, Uday Athavankar, Emeritus Fellow of the IIT Bombay, pointed out that there is no general recipe; rather, one must always ask the question: Is this or another approach applicable to this specific case? Athavankar presented two entirely different approaches in Mumbai: the upgrading of existing informal settlements and the creation of higher-quality replacement buildings. Both approaches have certain advantages and disadvantages, and neither is applicable everywhere.

"We came to the conclusion that slums are the product of failed policies, of bad governance, of corruption, of inappropriate regulation, dysfunctional land markets, irresponsible financial systems, and a fundamental lack of political will," said American architect Sarah Graham in her summary presentation of the workshop findings. Each case must be considered and solved for itself – because no slum is like any other, not even within the same city. Thus, for example, the densely developed residential towers of the SPARC project in Mumbai are "an enormous upgrade," whereas the case of Dharavi is different: "We were all impressed about the level of common sense and self-sufficiency there," said Graham, "and the conclusion of all this must probably be: Upgrading informal habitats sustainably is about allowing a maximum number of people to have a future that makes sense by improving social, economic, and environmental conditions."

Led by Indian architects and urban planners Keya Kunte and Ameya Athavankar, the Blue Mobile Workshop took the participants first to the SPARC resettlement site in Mankhurd. The Society for the Promotion of Area Resource Centers (SPARC) plans and realizes habitats and infrastructure for the very poor. The new multi-story residential buildings that the NGO has built in Mankhurd are simple but very practical – and are prized by their residents, as one immediately feels when talking with them.

A visit to Dharavi followed. Dharavi is perhaps the most famous informal settlement in India and one of the largest in Asia: Here one million people live on two square kilometers of land. This neighborhood grew organically and today is in the middle of the city, as Mumbai has grown around it. Dharavi is notable for its diversity and well-functioning network. Much work takes place here; even in the smallest shacks one finds tiny factories or businesses – and an enormous spectrum of forms and quality of housing.

Moderator Harry Gugger, Professor of Architecture at the EPFL Lausanne (Switzerland).

Dense is not the same as compact

The compact city is the only sustainable form of human settlement. This is a popular dogma. In terms of economic growth it is indeed indisputable that density represents a good solution – but does the dogma hold regarding social and environmental aspects too? The participants of the Green Workshop, led and moderated by Harry Gugger, member of the Board and of the Technical Competence Center of the Holcim Foundation, sought answers to this complex question.

There are actually several indications that the densified city is not the most sustainable development form. Studies show that the environmental footprint of a Londoner is greater than that of their rural counterpart. And considering social aspects, the dense city seems to be anything but ideal, particularly for socially disadvantaged groups.

It is important not to equate compactness with density – this statement arose time and again during the presentations and discussions of the Green Workshop. While the dense city seeks merely to pack as many people as possible into the smallest possible area, the requirements of the compact city are more complex: It must provide quality of life, meet the basic needs of residents, and be culturally rich and innovative. With such a list of diverse criteria, there is no universal formula for how compact cities actually work. Every city functions according to its own rules, or in other words: The DNA spawns the organism. This is why the second wave of urbanization currently rolling through India and other developing countries will not lead to the same type of cities that were created during the first wave in the West.

It turned out that answering the question in the title of this workshop was not at all as easy as one might have expected, said Sanjay Prakash, Senior Advisor for the Institute for Human Settlements (IIHS), Bangalore, India, in his presentation of the results. One reason for this was that there was first a heated discussion about a precise definition of compactness. The intangibility of this term eventually led to the question of whether the compact city is an idealized construct of the 20th century. A new understanding of cities is urgently needed because urbanization of the world is advancing – three times faster than in the last millennium.


SAIFEE
NOBLE

Led by the two urbanists Neera Adarkar and Prasad Shetty from Mumbai, the workshop participants visited three sites to study the evolving organism of the city. Hiranandani Gardens is a residential neighborhood built on former farm and forest land. Similar projects are being developed in the area – threatening the local lake and green areas.

The Textile Mills District is typical for Mumbai, whose economic growth was once strongly based on the textile industry. Many mills built clusters of factories and employee housing. Each cluster was basically a neighborhood in itself. As the textile mills disappeared, so did the clusters; they are now being replaced by compact high-rise buildings.

The last stop of the mobile workshop was the Saifee Burhani Upliftment Project (SBUT) at Bendhi Bazaar, home of a deeply rooted Muslim community. A non-profit community initiative is working here on one of the largest urban redevelopment projects in India: 4,000 households, 2,000 businesses, and over 300 buildings are being modernized – without damaging the religious and social structures.

Moderator Holger Wallbaum, Professor for Sustainable Building at Chalmers University in Gothenburg (Sweden).

Sustainable is more than just green

Sustainable construction is still too often equated with “green building.” But this term falls short, as moderator Holger Wallbaum, former member of the Technical Competence Center of the Holcim Foundation, stated in his introductory speech. Sustainability is based not only on the pillar of ecology but also on economic and social pillars. Thus genuine sustainability requires additional work,

additional expense, and additional costs. It is accordingly difficult to precisely quantify the actual value created through sustainable construction – especially because there is hardly any database to substantiate the long-term value generated by sustainable buildings.

The discussions of the workshop showed that the notion of the value of a sustainable building must not be limited to financial aspects only. The participants found that much of the value depends on the perspective and is often impossible to precisely measure. The health and well-being of residents belongs in this category along with employee satisfaction, the public image of a sustainable building, and its direct or indirect support of the local economy. The many green building labels found around the world were also inspected regarding their value: It is plausible to assume that such labels enhance the value creation of a building, but hardly any facts and figures exist to prove this assumption. The discussions showed clearly the enormous potential of sustainable construction in India: "75 percent of India is yet to be built in the next 20 years," as Prem C. Jain and Sundaresan Raghupaty, Chairman and Executive Director of IGBC, stated in their case study. The vision of the Indian Green Building Council (IGBC) is for India to become one of the world's leading nations in terms of the sustainable built environment by 2025.

"We had all those discussions around market value, energy consumption, and much more," said Sustainable Construction Expert Chrisna Du Plessis in her summary presentation of the workshop. But it quickly became clear that when it comes to assessing the value of sustainable buildings, no universally applicable or absolute statements can be made outside the monetary realm. "Two expressions were used very often in the discussions," said the professor from South Africa. "The first was 'value for whom?' and the second was 'it depends'." The value of sustainability cannot be calculated on a spreadsheet or determined for every imaginable case.


PALAIS ROYALE

During the Orange Mobile Workshop, led by Architect Rajeev Thakker and Roshni Udyavar Yahuda, Head of the Rachana Sansad's Institute of Environmental Architecture (both Mumbai), the participants visited buildings that exemplify sustainable construction.

Kohinoor Hospital is Asia's first green hospital building and the second in the world with a LEED Platinum rating. Surrounding this giant building is a neighborhood with 1,000 apartments, a hotel, a shopping center, and educational and recreational facilities.

The Palais Royale is equally impressive: Measuring over 300 meters in height, it is the tallest building in India. It meets high standards of energy efficiency, waste management, and safety. The Palais Royale is particularly interesting because it follows vaastu shastra, the ancient Indian way of building.

The last stop was the TCS House, which was completely renovated by Brinda Somaya. The architect conserved the facade and modernized the entire interior of the building.

“Money is an overestimated element in our society”

The concluding debate offers the opportunity to reflect upon the presentations and workshops and tie together all the findings of the Forum. The panel, led by Rolf Soiron, included Marc Angélil, Ashok Lall, Nirmal Kishnani, and Werner Sobek. The experts surprised the audience with bold statements and challenges.

Moderator Rolf Soiron is Chairman of Holcim Ltd and of the Board of the Holcim Foundation (Switzerland).

“Economy has changed the face of the earth,” said moderator **Rolf Soiron**, opening the panel discussion. And he pointed out an interesting detail that he noticed during one of the presentations. “Lukas Bretschger changed one word in his keynote speech: He talked about the economics of sustainable construction – which is not necessarily the same as the economy.” We are all part of a global economy, but we don’t necessarily know which rules of economics this economy follows: “What are the rules and the mechanisms that really steer and influence and shape the economy of sustainable construction?” With this question, he invited the panelists to share with the audience their observations and conclusions from the Forum regarding the economy and the economics of sustainable construction.

From left: Rolf Soiron, Ashok Lall, Werner Sobek, Nirmal Kishnani, and Marc Angélil.

Marc Angélil went straight to the heart of the term – In Greek "economy" means "household management." "Interestingly enough, the word ecology has the same root and refers to what we do as architects and engineers in our disciplines. So maybe the word house is fundamental to both of them." He made another observation: "The two ecos don't match anymore. One has destroyed the other, and we have reached a point where our household management is rotten and the house risks collapse." His conclusion from the many presentations and workshops therefore was that we need to realign our economy: It must be re-coupled with ecology.

Marc Angélil, Professor and Senior Dean of Architecture at ETH Zurich, member of the Board and Head of the Technical Competence Center of the Holcim Foundation (Switzerland).

"We need to understand the development and evolution of capitalism from Adam Smith to Karl Marx to Keynes to Friedman." Marc Angélil

"The true source of change is at the level of the community, at the level of the social force that is negotiating both with the markets and with the political systems." Ashok Lall

Ashok Lall is Principal of Ashok B. Lall Architects and Visiting Professor at the Guru Gobind Singh Indraprastha University in New Delhi (India).

Ashok Lall agreed with the view, expressed by Marc Angélil but doubts whether the necessary realignment will become reality in the near future: "A built environment is an operation of economics and power. Unless we are able to understand this central relationship, we will not be able to make the urgently needed transition."

"We all have to ask ourselves the question: What is sufficient for each of us?" Werner Sobek

Werner Sobek, architect and engineer, is the Director of the Institute for Lightweight Structures and Conceptual Design, University of Stuttgart, and founder of the Werner Sobek Group (Germany).

Werner Sobek expressed his frustration that "we have developed over the last 20 years a lot of technologies, thoughts, and principles on how to turn our world into a more ecological place – and we still provide the young people with the insufficient world that I already grew up in and live in." One must ask then what type of future will be sufficient for each of us. "Maybe we are not the specialists for that, but since this all underlies our daily work we cannot just forget about it." Much was said about corruption – both financial and ethical – during the Forum, and rightly so. "I was deeply shocked when I saw some of the living quarters during the mobile workshop, where we all realized that the mistakes made all over the world in the 1960s and 70s are going to be repeated, that the client had a list of renowned planning firms from the Western world that supported that. I would call that ethical corruption."

Nirmal Kishnani found the discussions between the sessions enlightening: "They showed more skepticism than what was expressed on stage," he said. "In the way we are discussing the subject, the first skepticism was about the pace and magnitude of change. We have a serious condition that the wonderful projects presented in this conference seem to address only inadequately." It seems that the world needs "a certain measure of pain to get this thing moving" – a trigger to snap us out of business as usual. The question is: How great must the pressure be to incite change? Another key issue for Nirmal Kishnani is the role of architects in this overall scenario. He warns against underestimating it: "We should see ourselves as agents of change – which also has a fundamental influence on how we teach architecture."

Nirmal Kishnani is Senior Lecturer of Architecture and Program Director of the Master of Science program in Integrated Sustainable Design at the National University of Singapore.

"The pessimist in me thinks the trigger for a quick change must be something dramatic. Although I'm not sure what." Nirmal Kishnani

Rolf Soiron said that important topics were introduced on the first day of the Forum, but unfortunately these were barely taken up afterwards; for instance, the main message of Alejandro Aravena's keynote speech: "Common sense is the solution," which he affirmed. "For example, in social housing, we could say: Let's take what the system allows now and give them the opportunity to add to that later. The second proposal is: Let's put a price on things – let's make doing harm become costly. Or in other words: If you use land as a luxury, put a hefty price on it! And the third notion is that a code of conduct is not only a question of individual businesses but also a professional code." None of these points are revolutionary, but they would form a solid base for future work.

Marc Angélil advanced that the appeals made at the Forum reached the wrong audience because everyone present is in favor of sustainable change. We need to understand the mechanisms at work with

developers, builders, and government agencies as well." The topic of corruption must be discussed: "They are aware of what is happening, and it worries them because it increases the costs of their projects. Additional issues are the slowly churning gears of bureaucracy and working conditions on construction sites."

"We should not go for durability in the sense of trying to build for eternity. Especially in fast-growing countries like India we must virtually build new cities, and we should try to come up with something that can last but which can also be modified tomorrow if we find out that it was a wrong solution," expand Werner Sobek. Here, architects must assume the role of organizers who are completely open-minded. Regarding business ethics, he sees the need for deep-seated and fundamental change: "I'm not at all a communist, but I'm very much convinced that we have to modify the way we see the importance of money. It is an overestimated element in our society."

Ashok Lall added that there is: "A lack of attention to what you might call the sociology and psychology of developing populations." Also, as a proactive agent, one must look for tools and mechanisms that can change the perception of the world. "That, to me, is a designer's task, because the true source of change is at the level of the communities."

Rolf Soiron affirmed this: "I think by now everybody here is a convert to the notion that communities will make a difference – or there will be no difference made" – thereby drawing a link to the keynote message of Brinda Somaya. The question of whether change will come soon enough remained unanswered.

All the more reason to keep track of extra-urban development, believes Nirmal Kishnani. Until now, we have always thought that problems in a city must be solved through

“We tried to change capitalism various times – not with very convincing results.” Rolf Soiron

solutions within the city. “Perhaps there is a need now to rethink the question why people come to the cities, what it is that we can do for the places they come from, so that people don’t need to come to the cities.” The mobile workshops showed clearly that very many people move to cities out of necessity or sometimes even out of desperation. “We should address the question of how the tension between city and countryside can be resolved.”

This question is being discussed today at universities, added Marc Angélil. Architects and planners must begin to collaborate more with specialists in this field. Ashok Lall stated that simply continuously increasing the density of cities will undoubtedly lead to problems: “I’m also absolutely convinced that the myth of the city as a center of creativity is about to be blown.” History shows repeatedly that revolutionary inventions and findings have also come from simple communities.

Both Rolf Soiron and Werner Sobek warned against trying to invent new market and economic systems almost overnight. “An evolution of an already existing, if heavily criticized, system seems to be a slightly better solution,” said Werner Sobek. “Capitalism is our predominant system,” added Marc Angélil, “and I say we need to retool it. Especially in the last three decades, changes have been introduced that are not to the benefit of humankind but to a leading minority, and this is the aspect that needs to be addressed.” Ashok Lall summarized with a sobering thought: “The idea that the free market is the only way to deliver wealth needs to be changed immediately – because that road is the road to poverty.”

Global networking

Michel Rojkind (Mexico), Lahbib El Moumni (Morocco) and Alejandro Aravena (Chile).

Swiss Ambassador Linus von Castelmur with Françoise Gardies and Pralhad Mujumdar (India).

Donna Cohen (USA), Francis Kéré and Werner Sobek (both Germany).

Nirmal Kishnani and Boon Gee Look (both Singapore).

Elie Mouyal (Morocco) and Luciano Gomez Vallecilla (Colombia).

Roshni Yehuda (India) and Joe Addo (Ghana).

Sustainable construction requires continual exchange among professionals – because, on one hand, the field embraces a diversity of disciplines and, on the other, it is still young and developing. That's why the Holcim Forum is designed to foster encounters at all times. The breaks between the various sessions, as well as the informal program parts such as mealtimes, offer good opportunities for the mutual exchange of ideas. The participants of the Holcim Forum in Mumbai made excellent use of these moments: They made new contacts, explained ideas, went into more depth on the subjects of the workshops and keynote speeches – and even initiated new projects. Our picture gallery documents the diversity of such encounters at the Forum.

Bernard Fontana (Switzerland), Kuldip Kaura (India) and Onne van der Weijde (Switzerland).

Guillaume Habert and Helga Vanthournout (both Switzerland).

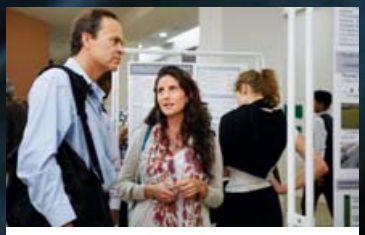
Daniel Irurah and Chrisna Du Plessis (both South Africa).

Shaheda Raman and Roxana Hafiz (both Bangladesh).

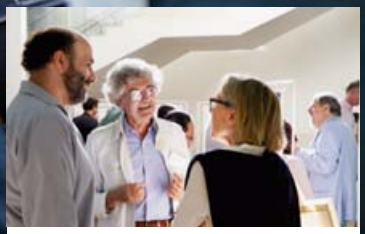
Marshal Maskarenj (India) and LLuis Enrique Monzo (Spain).

Kaarin Taipale (Finland) and Holger Wallbaum (Sweden).

Harry Gugger (Switzerland) and Stuart Smith (UK).



Jaime Lares and Andrea Vinageras (both Mexico).



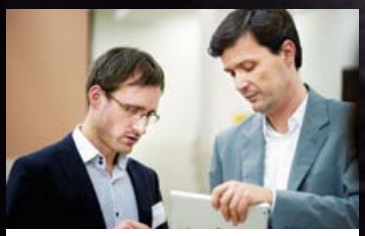
Danny Pearl (Canada), Bruno Stagno (Costa Rica) and Julie Snow (USA).

Normand Roy (Canada) and Diego Torriani (Italy).

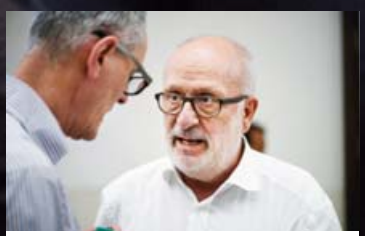
Steven Lau (Hong Kong) and Carolyn Jenkins (USA).

Shelley-Ann Jules-Plag (South Africa) and Albert Tidy (Chile).

Thomas Mueller (Canada) and Michael Dax (Germany).



Philipp Rode (UK) and Markus Schaefer (Switzerland).



Roland Walker and Rolf Soiron (both Switzerland).

Sarah Graham and Reed Kroloff (both USA) and Alfredo Brillembourg (Switzerland).

Gloria Lee (USA) and Suzanne Deschamps (Canada).

Gunawan Tjahjono and Iswandi Imran (both Indonesia).

Sonam Ambe and Uday Athavankar (both India).

Mike Schlaich (Germany), Roman Klis (Switzerland) and Vinay Gupta (India).

Carolyn Aguilar, José Maria Nava and Jose Castillo (all Mexico).

Erwin Viray (Japan) and Olivia la O'Castillo (Philippines).

Exchange between the generations

Sustainable construction essentially has to do with our future. That is why the future generation of architects and engineers is given a dedicated platform at the Holcim Forum: the Student Poster competition.

Following internal competitions at the partner universities of the Holcim Foundation in all regions of the world, 24 winning teams were invited to the Forum in Mumbai to show their project posters and discuss them with the other participants of the event who finally cast their votes for the best.

The Student Poster competition inspires new ideas among the Forum participants. Their creators explained their projects to interested viewers, answered questions, and persuasively supported led their ideas.

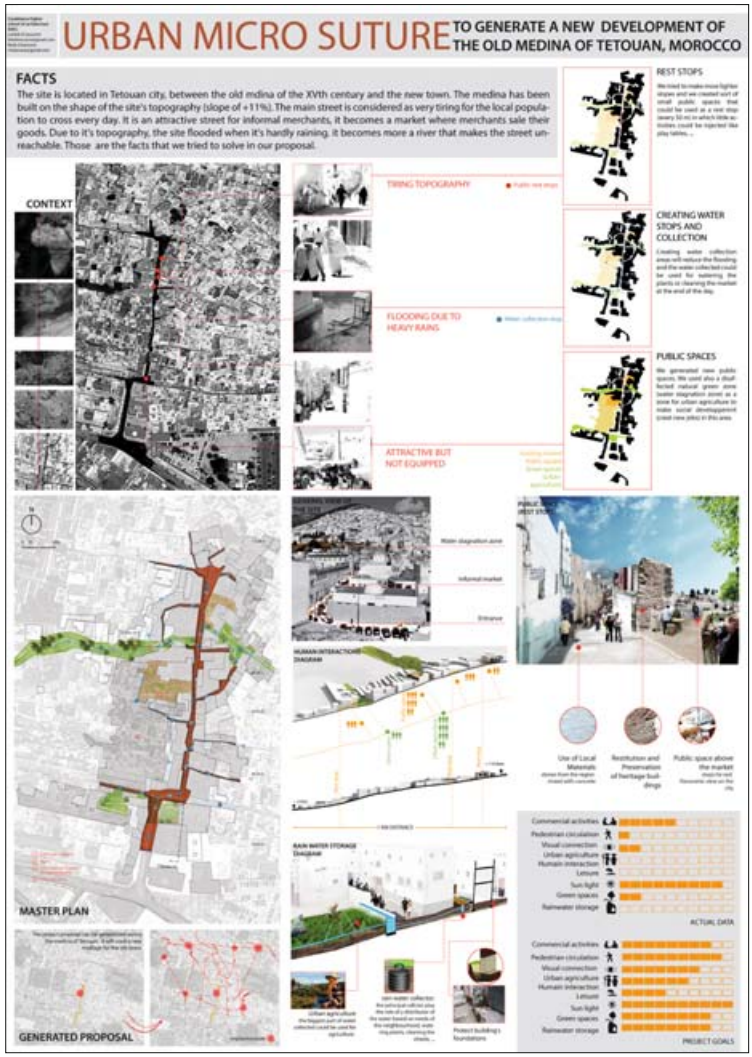
All Forum attendees were asked to cast their vote for the best of the projects presented by the students. Three winners were awarded and two honorable mentions cited.


Holcimforum
Poster_Competition
Student
3rd Prize


Poster Competition
1st Prize

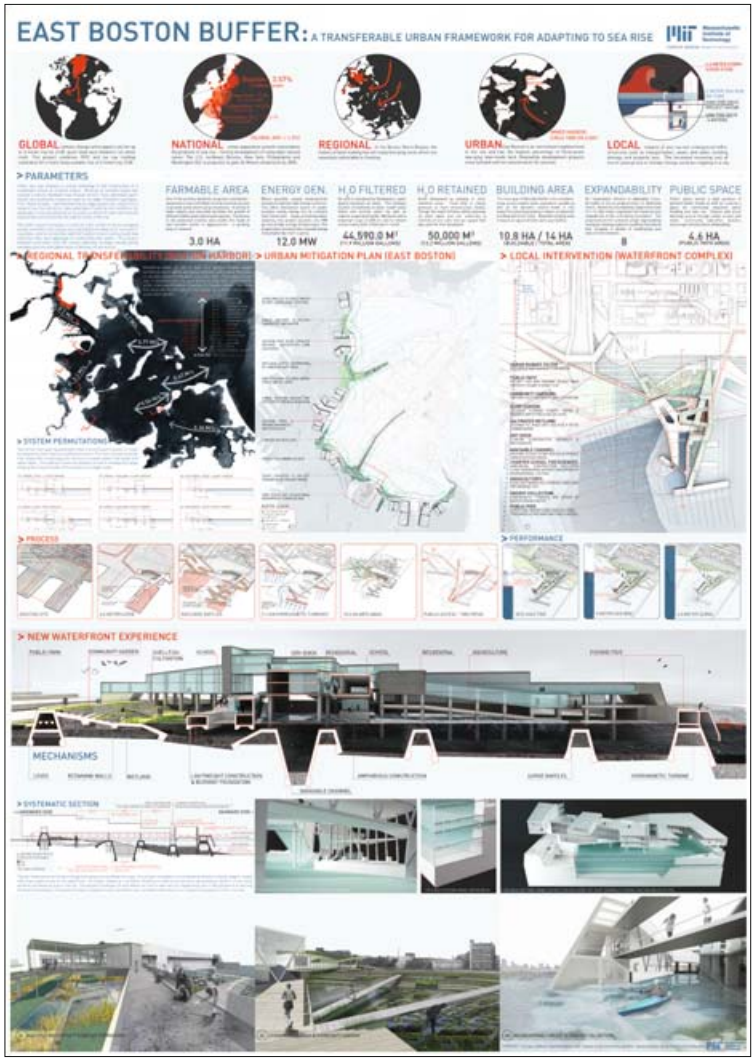
Students from the partner universities of the Holcim Foundation were invited to participate in the Student Poster competition at the 4th International Holcim Forum for Sustainable Construction: Swiss Federal Institute of Technology (ETH Zurich/EPFL Lausanne), Switzerland; Massachusetts Institute of Technology (MIT), Cambridge, USA; Tongji University (TJU), Shanghai, China; Universidade de São Paulo (USP), Brazil; University of the Witwatersrand (Wits), Johannesburg, South Africa; Universidad Iberoamericana (UIA), Mexico City, Mexico; Ecole Supérieure d'Architecture de Casablanca (EAC), Morocco; and Indian Institute of Technology (IIT Bombay), Mumbai, India.

EAC Morocco: Urban micro suture to generate a new development of the old medina of Tetouan



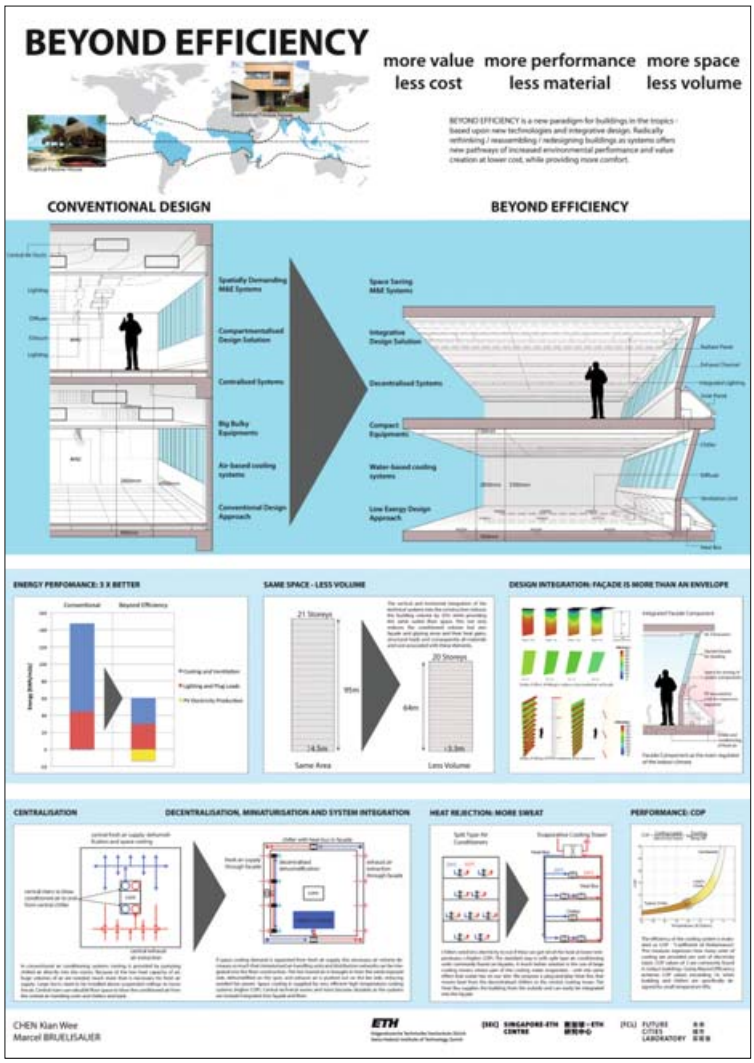
The first prize in the Student Poster competition went to **Reda Channane** and **Lahbib El Moumni**. The two students of the Ecole Supérieure d'Architecture de Casablanca (EAC, Morocco) designed a project to improve the area around a main street through sensitive interventions using local materials and traditional methods. The design controls the risk of flooding of the road by sculpting the slope and by introducing stairs and piazzas. These spaces serve as public meeting places and can be used by merchants.

MIT USA: East Boston buffer – a transferable urban framework for adapting to sea rise



Carolyn Jenkins from the Massachusetts Institute of Technology (MIT, USA) claimed second prize. Her project deals with the issue of sea rise in an urban context as a unique condition related to the construction of a sustainable environment. In developing cities it is often difficult to implement protection measures against rising sea levels. Carolyn Jenkins' answer is a waterfront architecture that is based on a highly durable structural system and that allows for scientific uncertainties.

3rd ETH Zurich, Switzerland: Beyond efficiency



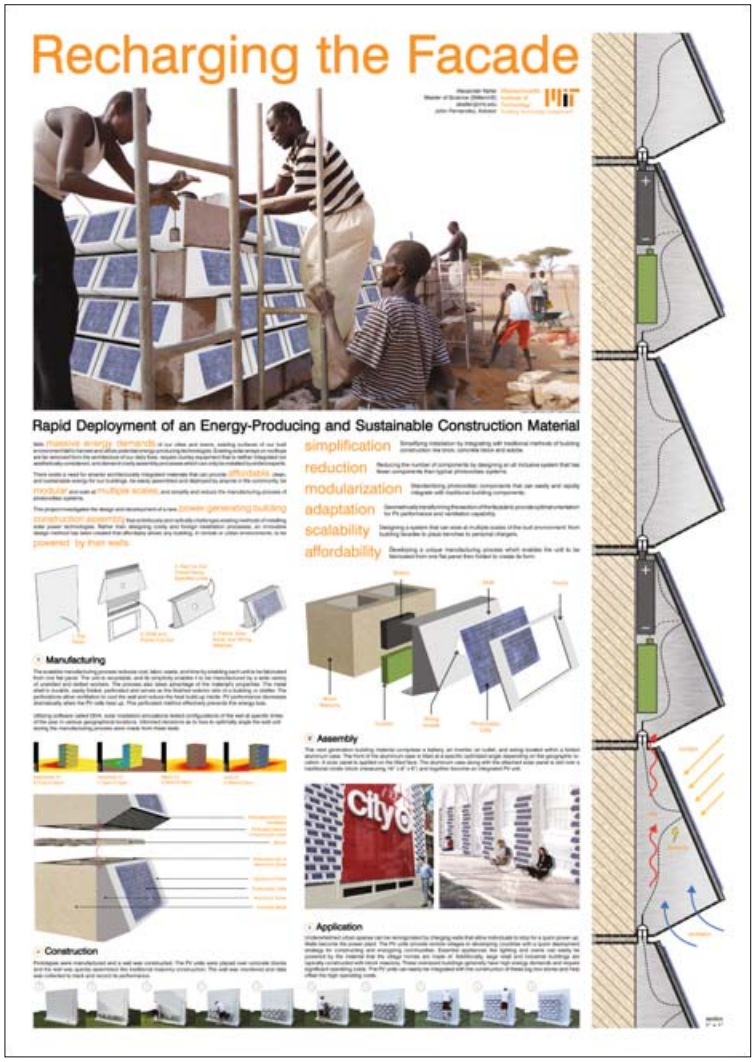
Third prize went to **Kian Wee Chen** and **Marcel Bruelisauer** from the Swiss Federal Institute of Technology (ETH Zurich). Their project presents a new paradigm for tropical buildings based on new technologies and integrated design. By radically rethinking buildings as systems, redesigning them, and assembling them in new ways, new avenues to increased environmental performance are opened. For example, energy performance is increased threefold. The building envelope assumes multiple functions; the indoor climate is optimized.

USP Brasil: Making more cement with less binder – a sustainable way to supply world demand

In his project, **Bruno Luís Damineli** from the Universidade de São Paulo (USP, Brazil) dealt with cement – the most prevalent construction material in the world. He sought solutions to more efficiently use clinker and other binders in the production of cement. His goal: higher production without increased CO_2 emissions.

MIT USA: Recharging the facade

HIGHLY COMMENDED



In his project, **Alexander Keller** from the Massachusetts Institute of Technology (MIT, USA) investigated the design and development of a new power-generating building construction assembly. His proposal could radically change the way solar-power systems are installed on buildings today. His innovative design methods allow the walls of any building to be used to generate power – without any elaborate installations.

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"The Holcim Awards is an incredible opportunity also for young people to come up with different solutions to mutual challenges."

Mario Botta, Principal, Mario Botta Architetto, Switzerland.
Member of the Global Holcim Awards jury 2012.

4th International Holcim Awards for sustainable construction projects. Prize money totals USD 2 million.

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Renowned technical universities lead the independent juries in five regions of the world. They evaluate projects at an advanced stage of design against the "target issues" for sustainable construction and allocate additional prizes for visionary ideas of young professionals and students. Find out more about the competitions at www.holcimawards.org

The Holcim Awards is an initiative of the Swiss based Holcim Foundation for Sustainable Construction. It is supported by Holcim and its Group companies and affiliates in around 70 countries. Holcim Ltd is one of the world's leading suppliers of cement and aggregates.

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