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$ 1.6 Trillion Clean-Tech Opportunity Awaits SMEs

Much of the emphasis on climate change has so far been about avoiding environmental catastrophe, today, it's also about the mega business opportunity emanating from it, especially for SMEs

By ***Benedict Paramanand***

A new World Bank Group report, published in September 2014, for the first time, has quantified significant opportunities for small and medium-sized enterprises (SMEs) in developing countries from providing solutions to local climate challenges.

This new report, "Building Competitive Green Industries: the Climate and Clean Technology Opportunity for Developing Countries," frames responding to climate change as an extraordinary economic opportunity, particularly in developing countries. The report, published byinfoDev, a global innovation and entrepreneurship program in the Bank Group's Trade and Competitiveness Global Practice, recommends actions by the public and private sectors to foster the growing market for SMEs in the clean technology sector.

In just the last decade, clean technology has emerged as a major global market. Over the next 10 years, an estimated $6.4 trillion will be invested in developing countries. Of the total market in developing

Inside

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Purpose To excite Indian businesses, SMEs, executives and students about the immense business opportunity in not only adopting Sustainability as Strategy in their companies but also inspire them to the possibilities of a big market for innovative sustainability products and services.

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Information in this publication is drawn from a variety of sources, including published reports, interviews with practicing managers, academia and consultants. While doing so utmost importance is given to authenticity.

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The report provides policymakers with a range of practical instruments that help support SMEs in clean technology sectors such as innovative finance, entrepreneurship and business acceleration, market development, technology development, and the legal and regulatory framework.

Fostering home-grown clean-tech industries in developing countries can create a sustainable and wealth-producing sector of the economy while simultaneously addressing such urgent development priorities as access to clean and affordable energy, clean water and climate-resilient agriculture.

Anabel Gonzalez - Senior Director, World Bank Group Trade and Competitiveness Global Practice

countries, some $1.6 trillion will be accessible to SMEs, the report adds. China, Latin America and Sub-Saharan Africa are the top three markets in the developing world for SMEs in clean technology, with expected markets of $415 billion, $349 billion and $235 billion, respectively for sectors such as wastewater treatment, onshore wind, solar panels, electric vehicles, bioenergy, and small hydro.

To unlock this environmental and economic potential, more can be done to support green entrepreneurship. Clean technology SMEs face daunting challenges, particularly in accessing early and growth stage financing. Countries can help by creating targeted policy incentives to encourage their own clean technology sectors. The report provides policymakers with a range of practical instruments that help support SMEs in clean technology sectors such as innovative finance, entrepreneurship and business acceleration, market development, technology development, and the legal and regulatory framework.

The report also highlights clean technology market opportunities that can **have great social impact.** Clean technology jobs compare favorably to jobs in other sectors, requiring more skill and delivering better pay and on-the-job safety. The move towards a lower carbon and more resource-efficient economy is expected to yield a double-dividend in terms of employment and environmental improvement.

So far, technology transfer has been from the developed world without regard to local industry involvement. Now, there is an opportunity for developing countries to pursue a complementary approach - building the capabilities of local firms to participate in the business opportunities surrounding climate change. Climate change therefore represents an opportunity for developing countries to build local green industries that can drive sustainable economic growth and provide environmental benefits.

It's interesting that clean technology investment is shifting towards developing economies in the near term. This accelerating shift from the developed to the developing world is driving innovation.

Read full report http://www.infodev.org/infodev-files/green-industries.pdf

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New York Climate Summit

Audacious Optimism, Finally

On September 23, 2014, more than 125 heads of state, 100 top CEOs and senior executives of 1,000 companies, the largest-ever climate meeting in New York clearly showed that the health of the Planet Earth is at last being taken seriously. A global climate agreement end of next year now seems likely. Major decisions taken include:

Net zero gas emissions by mid-century. Cutting the rate of natural forest loss in half by 2020 and eliminating it altogether by 2030; recreating 150 million hectares of degraded landscapes by 2020 and an additional 200 million hectares by 2030. Strengthening forest governance, transparency, and local and indigenous rights.

For example, major palm oil companies Wilmar, Cargill, Asian Agri, and Golden Agri Resources, made a pledge, facilitated by the Indonesian Chamber of Commerce to protect Indonesia's remaining forests and peatlands, ensure community rights are better respected, and advocate for other companies and legal reforms to support and expand such commitments.

Big Companies Take the Lead

GreenBiz.com reported how companies signaled their support for putting a price on carbon pollution. Big names among them were Nestlé, Unilever, and Philips committed to take that message three steps further. They will price carbon internally to accelerate investments that reduce their own greenhouse gas emissions. They will advocate publicly for policies that price carbon in their markets around the world. Finally, and importantly, they will be reporting their progress towards meeting those commitments.

It was heartening to see dozens of developing countries announcing ambitious actions of financing themselves

IKEA and a dozen other companies said they are headed towards using 100 % clean energy. But a major boost came from Google, following Microsoft's position earlier this year, that they were cutting ties with the American

Legislative Exchange Council, a rightwing lobby group, because the council's climate policy was inconsistent with their company policy. More companies are expected to join the list.

Compact of Mayors

A Compact of Mayors said it aims to consolidate and amplify cities' commitments to reduce emissions. More than 200 cities with existing voluntary emissions-reduction commitments are already on track to reduce emissions by 454 megatons by 2020. This is an encouraging progress, given that cities currently emit 70 percent of global greenhouse gases. They are also making new efforts to unlock the finance necessary to make **low-carbon urban development** a reality.

The launch of the City Climate Finance Leadership Alliance aims to enable stronger private and public investment in climate-smart infrastructure around the world. Signatories on this include the World Bank, UN-Habitat, Citibank, Bank of America, Bank of West Africa, Japan International Cooperation Agency, the United States Government, and the Agence Française de Développement.

It was heartening to see dozens of developing countries announcing ambitious actions of financing themselves. For example,

Cutting the rate of natural forest loss in half by 2020 and eliminating it altogether by 2030

Bangladesh highlighted the nearly $400 million it has already spent to adapt to climate change

South Korea and Mexico also pledged. Other countries now need to step up by the end of the year to reach a target of at least $10 billion in order to make progress toward an ambitious international climate agreement in Paris in 2015.

Low Carbon Rail

The International Union of Railways launched the Low-Carbon Sustainable Rail Transport Challenge to increase rail use for freight transport, meet efficiency targets, and reduce emissions by 75 percent by 2050.

More than 110 public transport groups made commitments leading up the Summit under the International Association of Public Transport Declaration on Climate Leadership. UITP's objective is to double the market share of public transport around the world by 2025.

The global climate summit end of 2015 appears to be heading for a major milestone in the world's fight to protect itself from the harmful effects of climate change.

Traffic Jams Cost Beijing $11.3bn

According to China Daily USA, Beijing's annual bill for traffic congestion amounts to 70 billion Yuan ($11.3 billion), a recent study has found.

According to a 2014 survey conducted by Peking University's National Development Research Institute, 80 percent of total loss relates to time wasted waiting, 10 percent to gas and 10 percent to environmental damage.

Statistics drawn up by Beijing Department of Transportation shows that in 2013, the capital's average daily congestion time came to one hour and 55 minutes, 25 minutes longer than in 2012.

The waste in gas is increasing rapidly as more and more cars hit the road. In 2013, 21.98 million vehicles were sold in China, up by 14 percent over 2012.Idling time also adds to Beijing's already-bad environmental problem via increased emissions.

The city started tackling the problem years ago. In 2011, it introduced a lottery system to rein in the number of vehicles people buy. It also launched a policy to ban private cars one work-day a week based on the last digit of the number plate. Beijing has put restrictions on the number of vehicles from outside the city and raised parking fees in urban areas. However, such measures have done little in reducing congestion.

What's worse, traffic jams have also become a problem for third- and fourth-tier cities, a report jointly issued by China Central Television, National Statistics Bureau and the Postal Service revealed.

Sustainable Firms Perform Better

Analysis of S&P 500 companies finds that corporations with sustainability strategies outperform others on the index.

A report from CDP finds that S&P 500 companies with sustainability strategies are outperforming the other companies on the index. A new report by nonprofit CDP, released recently, provides some of the first evidence of a link between business leadership on climate change and a company's profitability.

S&P 500 companies that build sustainability into their core strategies are outperforming those that fail to show leadership. Specifically, corporations that are actively managing and planning for climate change secure an 18% higher return on investment (ROI) than companies that aren't – and 67% higher than companies who refuse to disclose their emissions.

The findings could help answer the long-debated industry question of whether sustainability undermines or improves financial results.

Business leaders from companies that are taking significant steps to lower their climate impacts have long complained that the resilience they are building into their businesses is not recognized by investors and, therefore, does not get reflected in their share prices.

Worse than that, the failure to recognize the importance of taking action now to secure future stability makes it difficult for companies to justify longer term investments, and makes it more attractive to go for short-term – but relatively ineffective – easy wins.

CDP hopes the evidence it has compiled will prove that there is an investment opportunity in climate change resilience and mitigation and that this will start to shift investor opinions, which will in turn drive more money into areas such as renewable energy.

Four industry groups stood out in securing a strong ROI: transportation, consumer durables, apparel and health care equipment.

Beyond that, those companies investing in carbon reductions achieved a 50% lower volatility of earnings over the past decade and 21% stronger dividends than their low-ranking peers.

The CDP report concludes that those companies that achieve a strong financial performance are setting ambitious emissions reduction targets, using internal carbon pricing and putting in place strong governance and risk management of climate change

Paul Simpson, CEO of CDP, says: "We answer the number one question US investors ask CDP about climate change data, which is whether there is evidence of a link to financial performance. The answer is a resounding yes.

"There is only upside for corporations acting in a prudent way to address the challenges of climate. At the very least, this will put to rest the common misconception that taking action on climate change exacts a cost to profitability."

Apple, which has gone from laggard to leader, said that it is making a conscious decision to be more transparent and expansive in its sustainability efforts, including those directly related to climate change. The report shows that just three years ago, less than a third of companies achieved what CDP calls its "high performance bands" but this rose to nearly half in 2014 despite tougher criteria.

Heineken Unveils UK's Largest Green Brewery

Heineken has taken its sustainability strategy to the next level by becoming the first major brewer in the UK to implement a **large-scale solar panel installation** on the roof of one of its flagship production sites in North Yorkshire.

John Smith's Brewery in Tadcaster is set to power up over 4,000 solar panels that cover its huge corrugated iron roof; generating more than 876MWh of electricity each year which will be used to power the brewery's bottling and canning departments.

"When laid out side by side, the panels would cover an area equivalent to five Olympic-sized swimming pools," said Tadcaster's Brewery Manager Martin Kochl. "We are really proud that Tadcaster is now home to the biggest solar panel installation at any brewery in the UK.

"Sourcing the power we need to make our beers and cider from renewable energy sources like solar energy helps us to reduce the environmental impact of our business and forms a key part of our sustainability program.

China to Turn Schools into Solar Energy Generators

With support from the World Bank, Beijing is implementing a large project to install 100 megawatts of rooftop solar PV systems in 800 primary and middle schools - the largest of such initiatives in the country so far.

The "Sunshine Schools" program is designed to achieve multiple benefits: generating clean energy for schools to meet their electricity needs, providing blue skies and healthier air for Beijing residents, serving as a tool for raising green awareness among young students, and contributing to the country's efforts to expand use of renewable energy and to address climate change.

99 % of Sweden's Waste is Reused

There's a "recycling revolution" happening in Sweden – one that has pushed the country closer to zero waste than ever before.

Less than one per cent of Sweden's household garbage ends up in landfills today.

The Scandinavian country has become so good at managing waste; they have to import garbage from the UK, Italy, Norway and Ireland to feed the country's 32 waste-to-energy (WTE) plants.

"Waste today is a commodity in a different way than it has been. It's not only waste, it's a business," explained Swedish Waste Management communications director Anna-Carin Gripwell in a statement.

By Swedish law, producers are responsible for handling all costs related to collection and recycling or disposal of their products. If a beverage company sells bottles of pop at stores, the financial onus is on them to pay for bottle collection as well as related recycling or disposal costs.

Plastic Banned in Udaipur

To save Lake City from plastic waste, the administration has imposed a complete ban on storage and use of disposable plastic cups, plates and glasses.

Lake Palace on Lake Pichola, Udaipur, India

Disposable plastic cup have become an indispensable item over years for serving tea/coffee at most of the shops in Udaipur city, despite the fact that the usage of such cups are harmful to human health as well as a threat to the health of the lakes and water bodies. Recently, during monsoon, a significant amount of plastic cups had ended up at the drainage channels, affecting free flow of waste water and water logging.

Public Consultation on Green laws

ESG Demands Greater Transparency

The Modi government has started an extensive consultation exercise in variou\s parts of India with the objective of reviewing environment and climate change laws that have slowed down clearances for projects. The high level committee is headed by T. S. R. Subramanian, former union cabinet secretary.

MoEF High Level Committee interacting with the Public in Bangalore

According to the Bangalore-based Environment Support Group (ESG – www.esgindia.org), the exercise in Bangalore recently didn't achieve much either because the committee was in the 'get over with the exercise' mode or the people representing various organizations were expecting a more substantial and engaging conversation. The meeting ended abruptly with Subramanian calling the meeting a 'joke.' Here's an excerpt of a petition submitted by several members representing various civil society and green groups to make the exercise more meaningful:

- The Environment Ministry must first come out with a white paper discussing the nature of the reforms that it proposes in environmental, forest conservation and pollution control laws.
- On the basis of such a paper, an accessible committee must be constituted that would hear peoples responses across the biologically, culturally and linguistically diverse country and also from various sectors equally.
- The membership of the committee should be so constituted that it would reflect diverse concerns and sectors, and not merely by ex-bureaucrats or members of the legal fraternity.
- The process of the consultation to be followed has to be meaningful and conform with Principle of Prior and Informed Consent, even if this is not a consenting process.
- The timeline for the Consultation mechanism for such a critical review has to be reasonable as laws sought to amended, or tweaked, fundamentally affect the Right to Life and Livelihoods, and Right to Clean Environment.
- The entire process has to be transparent, all meetings must be recorded publicly, none of the deliberations must be *in camera* (as it appears to be the case now), and all proceedings, submissions, minutes and reports must be in the public domain.
- Adequate facilities must be made to ensure that anyone interested can participate with dignity.

World Bank Offers Action Plan for 24x7 Power to India

The World Bank has submitted a detailed action plan which could result in the availability of power 24x7 in India. The focus is on bringing down distribution losses, improving infrastructure and expanding solar power.

The proposal includes a state-wise turnaround plan for the key seven or eight states that together account for about 80% of the $20 billion (Rs 1.2 lakh crore) annual power distribution losses.

Officials said the Bank has identified Delhi, Andhra Pradesh, Rajasthan, Uttar Pradesh and the six north-eastern states of Assam, Mizoram, Manipur, Meghalaya, Tripura and Nagaland for the 24x7 plan with 6 ultra mega solar power projects (in excess of 500 MW) and large-scale decentralized rooftop solar projects of 100 MW.

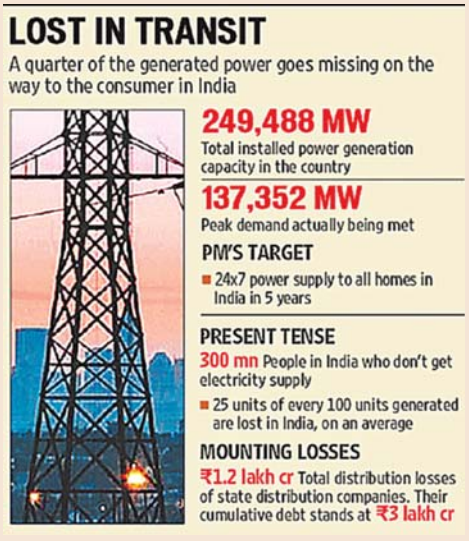
"The Bank will help the states undertake the required, difficult turnaround actions and will evaluate and implement state-specific programs by providing... long-term rupee bonds or credit enhancement products," a government official said.

"For Delhi, the Bank will help by partnering with the state transmission utility, Delhi Transco, and address transmission

bottlenecks caused by years of underinvestment in the network," the official said.

The Bank's plan also talks of setting up large-scale 100 MW rooftop solar projects. The solar rooftop policy was rolled out by Prime Minister Narendra Modi when he was Gujarat chief minister. Solar panels were set up on the roofs of houses and institutions, and connected to a smart grid to supply clean electricity

The Bank also mentions a long-term partnership with state-owned Solar Energy Corporation of India, to set up ultra mega solar power plants. A 750-MW project in Madhya Pradesh would be followed by five solar parks of 500 MW and above in Gujarat, MP, Telangana, Andhra and Karnataka.



ECOPHIT® Named Green Product of the Year

ECOPHIT®, a remarkable radiant ceilings product of SGL Lindner GmbH of Germany was been awarded the prestigious Green Product of the Year Award by Green Cities India. The Green Cities Forum 2014 was held in Pune. It is designed to engage and promote the efforts of experts and influencers driving the Green building movement in India.

The award was granted to this eco-friendly carbon-based radiant cooling system for the way it was successfully applied in a ceiling construction, using ECOPHIT® panels, achieving multiple green benefits. The award also recognizes the material's significant contribution in earning credits towards both the DGNB® and LEED® certifications.

For example, the Green Towers project in Frankfurt became one of Europe's most prominent green building renovations as the 121,522 m2 building was also the first renovated LEED® certified high-rise building in the world. The result: two skyscrapers designed to use 55% less energy and 74% less water than before, reducing its CO2 emissions by almost 90%. ECOPHIT® is now available in India.

Dr. M P Narayanan Former Chairman, Coal India Ltd. and President, Elets Technomedia Pvt. Ltd. together with Richa Thakker of SGL Group at the Green Cities Award ceremony

Radiant ceilings neither warm nor cool the ambient air. They radiate their energy directly to the person. In effect this means that the desired temperature is achieved without draughts and dust swirls. Moreover, the indoor climate is perceived as markedly more pleasant.

Online Kabadiwala

Anurag Asati, an IT engineer from Bhopal has started a revolutionary portal called Online Kabadiwala. People can book a slot and get their waste collected and get paid for it.

Asati found support from Kavindra Raghuwanshi, his professor in college and also the co-founder and mentor with the venture. His guidance has helped Asati shape the idea and both of them had put in the initial seed capital.

Through advertising on hoardings, distributing pamphlets to spread awareness, ads on Facebook, Asati has, in a year, and with 8 delivery boys, been able to rope in 10,000 plus people to give away their waste via their website

"I wanted to create an impact and waste management is a huge problem all over. Belonging to Bhopal, I thought of doing something about it and internet gave the power to implement," he says.

Bangaloreans Unite to Save Lakes

Many NGOs have also been running campaigns and seminars to bring awareness about reviving lakes in Bangalore. There has been some success but with the civic agencies apathy continuing about 16 bodies decided to come under one banner called **"One Bengaluru for Lakes (OBL)"**. They expect to apply greater pressure on the government to implement their key demands.

One agency for lake rejuvenation: All lakes should be under one government agency which should have full responsibility for an integrated and holistic approach to development of lake eco-system and be fully empowered to discharge their duty.

Adequate budget for lake rejuvenation: The Government should allocate adequate budget for lake rejuvenation and maintenance at a much faster rate than what is being currently provided.

A mechanism for handling of lake-related issues: The government should set up a mechanism for people to report issue or concern that will be taken up and followed in an integrated and holistic manner, with citizens' involvement.

Stop dumping of debris and remove encroachments: There should be a clear and time-bound roadmap for removing encroachments from lake beds, raja-kaluves and their catchment areas. All lakes should be surveyed as soon as possible, and such maps should be made public.

Use Storm Water Network, free of sewage, for lake interconnectivity: Sewage should be completely separated from storm water network which, together with raja-kaluves, should

be used for interconnecting lakes and carry rain water to lakes.

Include citizens in lake rejuvenation planning & execution: There should be a legal mandate to include citizens in the planning and execution of lake rejuvenation activity through public consultation and social audits. A lake should remain freely available to local communities and traditional users.

The OBL campaign will run from September 2014 to March 2015 and has three clear course of actions during this period.

At the end of the campaign, in mid-March, there will be a mega-rally of all lake teams, supporters and concerned people to submit the petition to the Chief Minister. The OBL team aims to reach out to every Bangalorean with the message to join the movement.

Rooftop Solar PPPs in Gujarat

A visitor to Gandhinagar, capital of the Indian state of Gujarat, is likely to notice the glint of the sun reflecting off solar panels on the city's rooftops. Some sit atop schools, other on hospitals. Many are perched on residential buildings. Altogether, the panels generate about 5 MW of electricity, providing better access to power for an estimated 10,000 people.

The greatest success of Gujarat's solar rooftop program, playfully referred to as 'rent-a-roof project,' lies in its explicability. Launched in 2010 with the help of International Finance Corporation (a World Bank body), two private firms, Azure Power and SunEdison, each won 25-year concessions to install solar photovoltaic panels on the rooftops of public buildings and private residences and connect them to the grid.

How does it work

Gujarat, a state of 80 million in western India, enjoys about 300 sunny days a year. To harness this energy, private solar companies selected through a competitive bidding process lease rooftop space from government buildings and private residents, who receive Rs 3 ($0.05) per unit produced. The operators are responsible for installing the panels and connecting them to the grid. They in turn receive a feed-in-tariff of Rs 11.21 ($0.18) under a 25-year concession.

The concept sounds simple. But to make it work, numerous technical issues had to be addressed, including connectivity issues, selecting the solar panel system (e.g. concentrated solar power vs. photovoltaic solar panels), and resolving connectivity issues. The optimal terms of the lease and power purchase agreements also had to be determined in light of existing regulations and business conditions.

Vadodara, a city of two million, became the second municipality in Gujarat to adopt the solar rooftop concept. In June 2014, Madhav Solar Private Limited won a 25-year concession for a 5 MW solar rooftop PPP based on the one in Gandhinagar. It is expected to attract $8 million in private investment, provide 9,000 people with better access to power, and reduce greenhouse gas emissions by 6,000 metric tons.

The Vadodara project clearly benefited from the lessons of Gandhinagar's solar rooftop PPP experience. Many of the obstacles faced in the pilot project had already been addressed and resolved. The results were proven. Consequently, the Vadodara PPP took less time to implement.

Buoyed by two important successes, IFC is helping four other cities in Gujarat – Bhavnagar, Mehsana, Rajkot, and Surat – with rooftop solar PPPs of their own. It is also drawing on its experience to improve the policy framework to encourage replication of the concept.

Kolkata Goes Green With Organic Festival

The Earth Day Network (EDN) hosted a first-of-its-kind Green Puja Bazaar at Kolkata's South City International School cafeteria recently, keeping the imminent festive fervor in mind. Stressing on its ongoing "Go Organic" campaign, Neela Majumdar, the project development manager of EDN ascribed the exhibition as part of the same awareness drive. "The idea was to focus on the merits of a diverse range of natural and organic products and to deepen the general consciousness about it," she said.

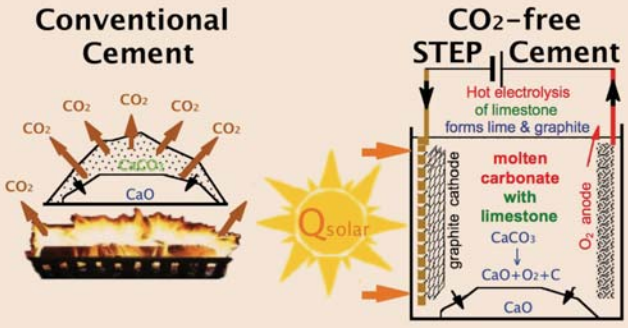
The brand displayed a row of valuable organic spices like turmeric, cumin seeds, coriander, ginger, garam masala and curry powder, besides generous amounts of brown rice, amla candy, jaggery and honey.

"The immediate benefit of organic eating is that it immensely improves digestion, eliminates the unwanted toxins and retains the full nutritional value of food when consumed, which is otherwise eroded by a chunk of certain synthetic elements mixed with the edibles.

Three IITs Develop Cement Low on Carbon

Scientist at IIT Delhi, IIT Bombay and IIT Madras and an environmental NGO called Development Alternatives (DA) have developed a low-cost cement that emit 20% to 30% less carbon than regular cement. For every tonne of cement produced, about 0.82 tonnes of CO_2 is emitted.

The new cement uses just 40%-50% clinker. When and if the new variety become commercially viable, it could have a major impact on India's limestone reserves that are soon depleting. Since this technology requires less limestone, the reserves will last us longer," said Shashank Bishnoi, faculty at the department of civil engineering, IIT Delhi.



"We found that the new cement is almost as strong as regular cement. The quality has been tested at IIT-D and Development Alternatives' laboratory too. In fact, we have built a two-storied building in Jhansi using the cement,"
Bishnoi said.

However, it will still take a few years before the cement is made commercially available. It needs a Bureau of Indian Standards (BIS) certification and standardization before it can be used on a large scale. Such standardization often takes up to ten years but industry bodies and scientists are keen that the shift be made within five years. The project is funded by Ecole Polytechnique Fédérale de Lausanne, Switzerland.

Demystifying Sustainable Development

CSTEP
CENTER FOR STUDY OF SCIENCE, TECHNOLOGY & POLICY

By ***Sujata Byravan***

Notions of sustainability have long been part of indigenous communities in different parts of the world, from Indians in the Americas to forest dwellers in Asia. In the US, beginning in the early 1960s, Rachel Carson's Silent Spring gradually spawned an environmental movement.

Discussions related to social ecology and political economy of environment slowly became part of public discourse, but they were not always referred to as sustainability. The book *Limits to Growth* published in 1972 explored how economic and population growth would interact with limited resources, thus raising issues that we refer to as sustainability.

It's the Brundtland Commission, which in its 1987 report Our Common Future, used the term "sustainable development" (SD) and made it popular. It has since then been used extensively in the charter of a number of United Nations (UN) and other organisations, in numerous studies and in various reports. It has been redefined, interpreted, argued over and served as a proxy or a catchall phrase to denote a general state of well-being of people, the environment and economies. More than anything, the phrase has given us language to think about issues relating to the environment along with development.

The Brundtland report's definition is the one most widely used these days; it explains SD as "development that meets the needs of the present without compromising the ability of future generations to meet their own needs." The term is generally used to understand economic growth without compromising on equity, natural resources, and environment and pays attention to the carrying capacity of ecological systems.

But what is SD anyway? Is it a goal or a path, what does it look like in different places and what must we do to achieve it? What are the problems in reaching SD?

These are the sort of questions that continue to be asked in different arenas in the current context of global challenges. One might ponder on how to grow food for an expanding population with minimal chemical inputs and in sync with local ecologies, or think about how to plan cities so that all people can take advantage of the benefits of urban services with good sanitation, waste management, etc., all of which are questions related to sustainability or SD.

Anthropocene

In this era, the *Anthropocene,* a period of geological time when

humans have had a transformative effect on the earth's systems and discussions on the challenges posed by global warming are taking place in every nook and corner, the term 'sustainable development' resonates even more with our problems. It can be used to speak about luxury emissions from the rich and the need for inclusivity of the poor in sharing the benefits of development and economic growth. It has become a convenient and very useful affirmative *mantra* of the late 20th and 21st century.

At the turn of the millennium, countries across the world agreed on eight development targets that they would reach by 2015 — the Millennium Development Goals (MDGs) (for a more detailed description of the MDGs see, http://www.un.org/millenniumgoals/). These are related to SD, and served as a catalyst for action across the world, and developing countries tried to do their best to prioritise them. We are a year away from the completion of the MDGs and while all the goals have not been attained, many have seen enormous progress over the past two decades; some such as primary education have seen radical improvements even in very poor countries.

There is an SD solutions network, headed by Jeff Sachs that aims to identify and integrate solutions that already exist on the ground and provide a global platform for them.

Heartened by the progress made in achieving the MDG's and with the desire to retain the momentum they offered, the UN is now planning a Post-2015 agreement on Sustainable Development Goals, which countries would agree to at a global summit in September 2015.

Adopting SD goals as indicators for the next phase of globally attainable development goals is indeed an excellent idea. For one thing, the entire world needs SD goals, not just developing countries. There are numerous SD indicators that have been selected at this stage in the global process so as to gather ideas from across the world and integrate them for the summit next year.

There is an SD solutions network, headed by Jeff Sachs that aims to identify and integrate solutions that already exist on the ground and provide a global platform for them. The year 2015 will see a series of meetings that later culminate at the 21st COP to the UNFCCC in Paris. That is the meeting at which countries of the world would have to decide how exactly they are going to reduce their greenhouse gas emissions in a world with limited carbon space, while continuing to develop and how they can do this while making sure that the poor are not left behind — all questions that point directly to the heart of sustainable development.

Sujata Byravan

is an Advisor at CSTEP on Climate Change Adaptation. She works in the broad area of science, technology and development. She has been a recipient of a training fellowship from the Rockefeller Foundation in leadership, environment and development. Her interests lie in the areas of biotechnology policy, innovation, gender, and science and sustainability.

Tamil Nadu Panchayat's Tryst with Wind Energy

Odanthurai Panchayat in Tamil Nadu's Coimbatore district had a taste of green energy back in 1996 when it installed solar street lighting. So when its ever-increasing population required bigger energy plants, it could take the next step in 2006: invest in a wind mill, even through this was not something panchayats are known to do.

Odanthurai could do it because of three reasons. One, its president had an exposure to developments in the renewable energy sector through energy fairs and training programs. Two, government advisers readily guided it on the use of renewable energy. Three, the Tamil Nadu Electricity Board offered power banking option. The major drive towards renewable energy happened between 2001 and 2009, under the leadership of its Panchayat president, Rangaswamy Shanmugam.

Odanthurai is located close to the wind farm regions of Tamil Nadu. Shanmugam decided to take advantage of this. He formed a committee consisting of Panchayat members and advisers from the government to advice on utilization of solar and wind energy on large scale.

The Panchayat committee initially planned to install hybrid systems of solar and wind energy because a government scheme provided 90 per cent subsidy to the hybrid systems. As the system was withdrawn, the Panchayat decided to invest in wind mill.

Shanmugam

Wind power company Suzlon had built a wind farm near Maivadi, 140 km from Odanthurai. **In India's wind farm regime/ turbine manufacturers take care of all aspects of wind farm development- starting from land acquisition, commissioning to operations and maintenance.**

Willing Bank, Enterprising Borrower

Odanthurai Panchayat purchased one of Suzlon's windmills of 350 kW capacities. It cost Rs 1.55 crore. The Panchayat pooled in Rs 40 lakh. The rest was obtained as a commercial loan from the Central Bank of India. The loan is paid from the earnings from sale of electricity to the Tamil Nadu Electricity Board.

The panchayat's windmill produces about 0.67 million units of electricity a year. This power is purchased by the

electricity board at Rs 2.90 per unit. So the revenue generated from the sale of power is about Rs 19.6 lakh per annum.

The state electricity board allows banking of power produced by wind mills. The power produced by the wind mills is fed to the grid and is credited to the power producer's account, which can be availed later. Hence the Odanthurai Panchayat can avail their banked power as per their requirement. The remaining unutilized power can be sold to the grid. The Panchayat estimated it would repay the loan in six-seven years. After paying back the loan, Odanthurai Panchayat could earn close Rs 8 lakh per year after meeting its own public electricity requirements.

Today, Odanthurai is a role model of self-sustained development, attracting the attention of policy makers and renewable energy enthusiasts. But it is a model yet to be emulated by others.

Odanthurai Panchayat Windmill Facts

Located near Mettupalyam town in Karamadai block of Coimbatore city.

Wind Mill

350 kW wind turbine developed by Suzlon.

Concept behind investment

Wind turbine would feed power to the grid. Panchayat would avail banking and net metering facility provided by TNEB.

Cost - Rs 1.55 crores

Source of fund

Rs 40 lakhs from Panchayat savings. Rs 1.15 crores through a commercial loan from Central Bank of India at 8.5%interset.

period 2006 – 2013 directly went to bank as repayment of loan.

Post loan repayment

Panchayat self electricity requirement 4.5 lakh units/year. Remaining 2.25 Lakh units of power sold to the board at Rs 2.90 generating revenue of Rs 6.525 Lakh rupees a year.

Reprinted From: State of Renewable Energy in India: A Citizen's Report Center for Science and Environment http://www.cseindia.org/

India Begins Innovation to Zero

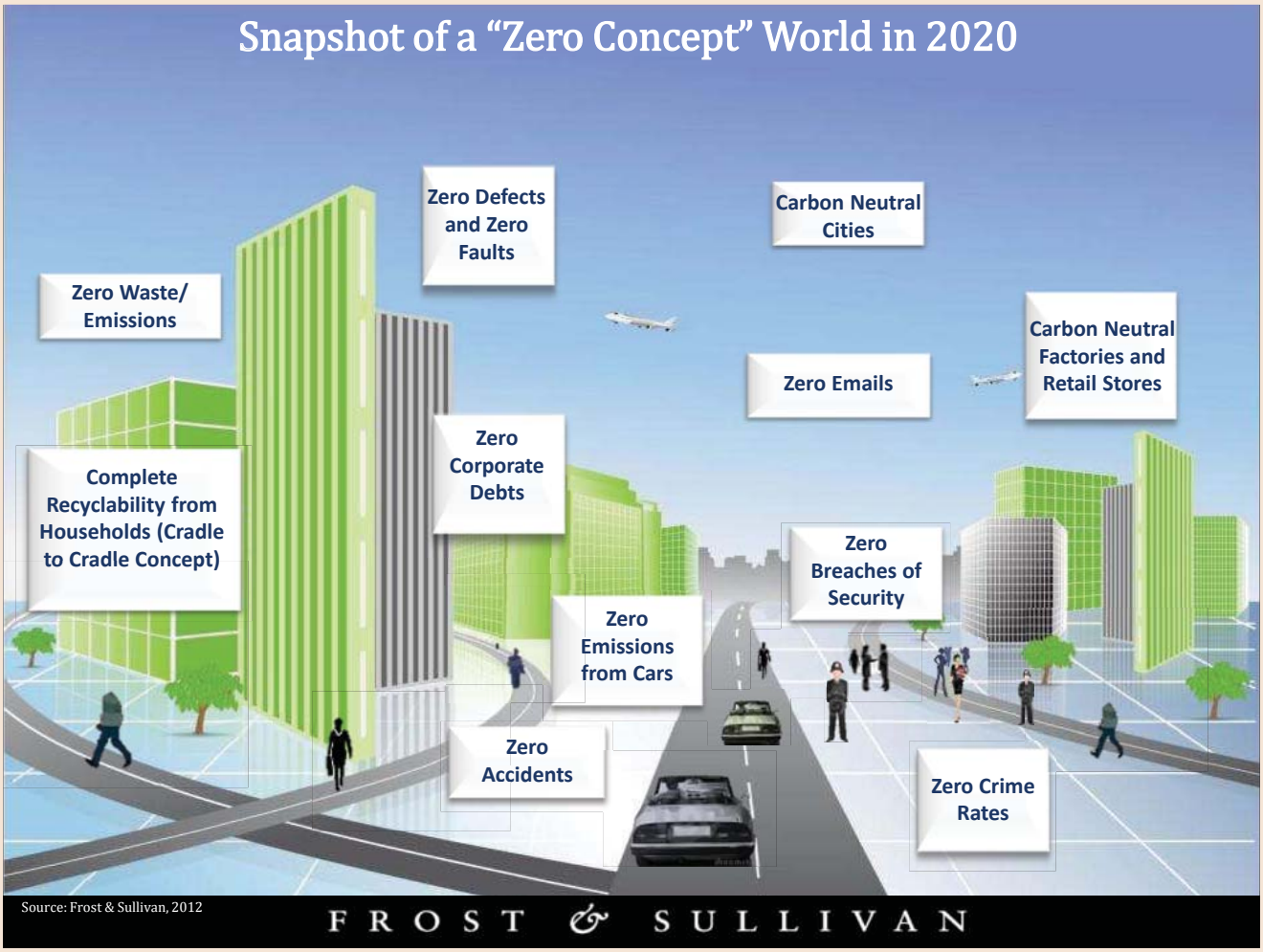
'Innovating to Zero' is one of the fancy concepts to emanate from the climate change and green economy brigade. The primary basis of this concept is that the race to zero waste should become faster if we have to save the planet. It appreciates the efforts to even get closer to zero.

India has made a good start. Its success of eliminating polio from the country a few years ago is considered a big achievement using innovative supply chain and people management practices. The other near zero success is elimination of iodine deficiency through campaigns and fortifying it with table salt.

Britannia, India's major biscuit maker, has pledged to achieve zero iron deficiency at least among its consumers. The company also distributes iron-fortified biscuits to school children in India through an affordable delivery mechanism.

But India is far away from achieving larger goals like zero illiteracy, zero death due to malnutrition and starvation. But the figures are reported to have improved significantly.

Among the Indian large businesses, ITC has announced zero effluent discharge through treating and recycling of all wastewater and harvesting of rainwater on its properties. **For the third successive year, ITC said it remained a 'Water Positive Corporation'.** Rainwater harvested exceeded the total consumption of water by all the units of the company.



Fix Governance Issues First

K Jairaj, former commissioner, Bangalore Corporation, warns people against getting carried away by "the spirit of the moment" and lose focus of problems of cities on the ground. Excerpts from a talk at TERI, Bangalore, on 'Bengaluru Needs Sustainable Solutions to Become a Smart City'

If you are going to create hundred cities which are smart in the context of sustainability, are they going to be de-novo examples or is it going to be within the context of the city itself. If it is within the context of the city, how are you going to tackle the problems that already exist and simultaneously move to a new order of things?

I have a number of worries; **my first worry is how we amalgamate the different stakeholders, government, business and society into making this possible.** We need to focus on capacity issues in government, especially in the context of urban government.

The question is - how do we create the kind of capacities that can take us to a new order of thinking and a new order of execution. I think we haven't thought about these issues because we are carried away by the spirit of the moment. The ground level issues need to be addressed in greater detail.

The third is about **financial constraints,** as it is in large cities like Bangalore. Large sections of the public do not have access to water, housing and transport. **So where is the financial well being that will ensure sustainability & smart cities embedded in the way we do things?**

How are we going to raise the resources? Is it only from the government or also from the private sector? If it is from the latter how are we going to embed profit motive so that the private sector will also be forthcoming.

> *Even in a city like Bangalore, we haven't got the governance structure right as yet*

Then it is the **challenge of political risk.** Across the world opinion leaders have said that there is no escape from sustainability but is it shared by our politicians? Do they also subscribe to the belief that today the environment can no longer stand that kind of exploitation that has happened in the past?

What is the kind of governance structure needed for a city that wants to be smart? Even in a city like Bangalore, we haven't got the governance structure right as yet. So if we have to move towards smartness, what is the governance pattern, what is the distribution of powers between various sections of society, various political institutions that can lead to smartness?

This dialogue is absolutely required. I also would like to think we have a lot of introspection not just on sustainability but how to get there and how to make it a concerted movement.

Smart Transport Key to Smart City

TERI's Rajendra Kumar Pachauri shares his views on India's quest to build smart cities. Excerpts of his recent talk at a seminar titled 'Bengaluru needs sustainable solutions to become a Smart City'

If we are going to develop smart cities then it's obvious that the government has a paramount role but the larger role is of business, civil society and the average person on the street. One of the reasons why buildings are not constructed as energy efficient or efficient in the use of water unfortunately because those who are buying these buildings seldom ask an architect or a builder give me choices, show me what type of building is more efficient then what is generally the norm. Therefore if people are sensitized and made aware of the kinds of implications, different kinds of designs or construction of buildings we would be far more demanding of those who are responsible.

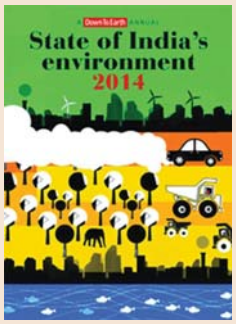
When we talk about smart cities it's just not buildings, you have to create a complete ambiance, transport and infrastructure, its use becomes intelligent

When we talk about smart cities it's just not buildings, you have to create a complete ambiance, transport and infrastructure, its use becomes intelligent. If we add smart transport systems we will be able to optimize fuel consumption and ensure efficient and sustainable systems

Transport systems have to be designed intelligently right from the start. Unfortunately, we see a complete absence of policy and innovation as far as transport is concerned. Everybody uses a car simply because it's a fashion and it has become the only choice in the absence of good reliable public transport. If we are going to create smart cities then the transport sector should be the one that ensures high levels of sustainability.

There is the element of human behavior which is connected to the philosophy of designing our cities. If there is evidence of appearance and the actual application of smart concepts then I think that would affect our behavior. Winston Churchill said **"We shape our buildings, and afterwards our buildings shape us and I think that's true.**

I also highlight the fact that **smart cities will lead to smarter human beings as well** because all the systems, the very concept of being smart, then it will surely affect the way you think. This is an extremely exciting challenge. Just think about the spillover effect of these smart cities, I think there will be clamor for every city wanting to be a smart city. It will be a movement where every town or city will want to be a part of.



Down To Earth - Annual Issue

By Anumita Roychowdhury & Avikal Somvanshi, Centre for Science and Environment, 2014

It's not the first or last word on the year gone by, but it certainly is the only one of its kind. The State of India's environment 2014 – A Down To Earth annual, comes from one of India's foremost environmental think tanks, Centre for Science and Environment. It brings together a set of well-reasoned and crisply-written analyses, reportages, reviews and overviews on some of the most significant developments of 2013 in fields ranging from water, mining and agriculture to governance, forests and climate change.

The Sustainability Mindset: Using the Matrix Map to Make Strategic Decisions

By Steve Zimmerman and Jeanne Bell, Jossey-Bass; October 2014

The Matrix Map—a powerful tool for nonprofit strategic decision-making Nonprofit sustainability lies at the intersection of exceptional impact and financial viability. *The Sustainability Mindset* offers nonprofit professionals and board members a step-by-step guide to move your organization towards this intersection. As outlined in the bestselling book Nonprofit Sustainability, "The Matrix Map" is an accessible framework that combines financial and programmatic goals into an integrated strategy. In this next-step resource, the authors detail a rigorous process to develop a meaningful Matrix Map and engage leadership in setting an organization's strategy.

Nonprofits that thrive in today's environment are adaptable with a clear understanding of their impact and business model. This book offers nonprofit boards and staff a framework to do so. Drawing on their in-depth experience, the authors provide an easy-to-follow process complete with tools and templates to help organizations visualize their business model and engage in strategic inquiry. The book provides a variety of illustrative examples to show how the Matrix Map works for all types of organizations. Nonprofit executives and board member are sure to benefit from The Matrix Map analysis.

Offers step-by-step guidance for creating a Matrix-Map, a visual representation of an organization's business model. Helps organizations assess how each of their programs contributes toward their desired impact and their financial bottom-line.
Filled with compelling examples of how The Matrix Map helps nonprofits with strategic decision-making

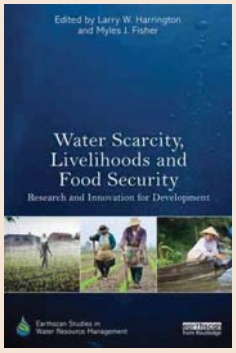
Written by the coauthors of the groundbreaking book Nonprofit Sustainability
This comprehensive resource will give any nonprofit the framework they need to make decisions for sustainability and the templates and tools to implement it and help leaders address the challenges inherent in balancing mission impact with financial viability.

Corporate Social Responsibility and Sustainability: Emerging Trends in Developing Economies

by Gabriel Eweje and William Sun, Emerald Group Publishing Limited, September , 2014

There is growing public interest and concern regarding the sustainability of communities. This volume offers a critical review of current trends around Corporate Social Responsibility (CSR) and sustainability activities in developing and emerging economies. The book makes three main contributions. First, it argues that while CSR and sustainability are global concerns, they are embedded in institutional contexts. Second, it suggests that these are not merely business issues; other stakeholders can and should play an important role in societal and environmental sustainability and development. Third, CSR and sustainability are not isolated from business and can be integrated in business strategy and corporate governance structures.

The book offers a conceptual paradigm and empirical evidence as to how businesses and other stakeholders in developing and emerging economies can ensure their activities make a positive contribution to the communities and countries in which they operate. With topical and current issues discussed, it is a 'must have' for business practitioners, policy makers, experts in supranational organizations, academics and students.



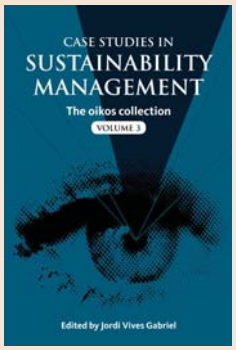
Water Scarcity, Livelihoods and Food Security: Research and Innovation for Development

By Larry W. Harrington and Myles J. Fisher, Routledge, September 2014

This volume reviews the evolution of ten years' learning and discovery about water scarcity, livelihoods, and food security within the CGIAR Challenge Program on Water and Food. It draws on the experiences of over 100 projects conducted in ten river basins in the developing world.

The book describes how the program's design evolved from an emphasis on water scarcity, water productivity, and water access to an emphasis on using water innovations to improve livelihoods and address development challenges in specific river basins. It shows how the research was used to foster change in stakeholder behavior, linking it to improved knowledge, attitudes, and skills, which were fostered by stakeholder participation, innovation, dialogue, and negotiation.

The authors describe development challenges, their drivers and their political context, how to address them through technical, institutional, and policy innovations; and the consequences of change at different scales, time frames on equity, resilience, and ecosystem services. Overall, the work represents a major synthesis and landmark publication for all concerned with water resource management and sustainable development.



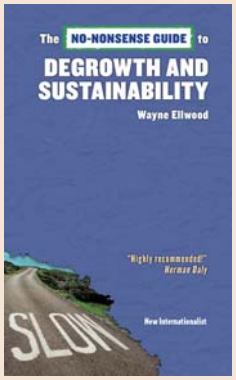
Case Studies in Sustainability Management: The Oikos Collection

By Jordi Vives Gabriel, Greenleaf, April 2014

With the rapidly growing importance of sustainability and corporate responsibility in a globalized world, management schools are increasingly integrating long-term economic, environmental and social issues into their teaching and research. Climate change, poverty, labor standards and human rights are among the many topics that future decision-makers will need to face in their careers. Business education needs to reflect this new reality and provide a broadened understanding of value creation in order to create economic capital while developing social and preserving natural capital.

Case studies can be important tools for creating learning processes on different levels – students are forced to struggle with exactly the kinds of decisions and dilemmas managers confront every day. This can be especially valuable in the context of sustainability management – organizations are now continually forced to value the different aspects of sustainability and their interrelations: How do social issues impact the economic bottom line? How can an environmentally sound strategy create a positive impact on employee motivation and thus have measurable impact on economic performance? What comes first and why?

This third collection of oikos case studies is based on the winning cases from the 2010 to 2013 annual case competition. So what makes an excellent case in sustainability management? These cases have been highly praised because they provide excellent learning opportunities, tell engaging stories, deal with recent situations, include quotations from key actors, are thought provoking and controversial, require decision-making, provide clear take-aways.

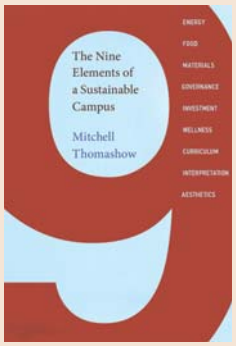


The No-Nonsense Guide to Degrowth and Sustainability

by Wayne Ellwood, New Internationalist, April 2014

The world's addiction to economic growth continues with barely any recognition that this is a problem. Indeed, in a Western world currently dominated by austerity measures and ducking in and out of recession, growth is seen even by progressives as the only possible solution for our economic and social woes.

No-Nonsense Guide looks deeper into the idea of economic growth – to trace its history and understand why it has become so unchallengeable and powerful. And then it goes beyond that to present the alternative – how we can kick our dirty habit, how degrowth can be turned into a positive and how we can arrive at a new levels of environmental sustainability without having to turn the clock back to the Dark Ages.



The Nine Elements of a Sustainable Campus

by Mitchell Thomashow and Anthony Cortese, The MIT Press, February 2014

A college campus offers an ideal setting for exploring and practicing sustainability. Colleges and universities offer our best hope for raising awareness about the climate crisis and the dire threat it poses to the planet. They provide opportunities for both research and implementation; they have the capacity to engage students, staff, and faculty in collaborative enterprises that inspire campus transformation; they take the idea of legacy seriously. But most college and university administrations need guidance on the path to sustainability.

In *The Nine Elements of a Sustainable Campus*, Mitchell Thomashow, a former college president, provides just that. When Thomashow became president of Unity College, a small environment-focused college in Maine, in 2006, he decided to focus his leadership on sustainability. Drawing on his experiences at Unity, Thomashow identifies nine elements for organizing a sustainability agenda: energy, food, and materials (aspects of infrastructure); governance, investment, and wellness (aspects of community); and curriculum, interpretation, and aesthetics (aspects of learning).

Thomashow describes, among other things, how Unity built the first platinum LEED-certified college president's residence in North America; installed solar panels, wind turbines, and other renewable energy generators all over the campus; became a center for local food growing; reconsidered the college's capital assets and investment strategy in light of sustainability; revitalized the curriculum; and made the entire campus a canvas for sustainability-inspired public art. Connecting his experiences to broader concerns, Thomashow links the campus to the planet, reminding us that local efforts, taken together, can have a global impact.

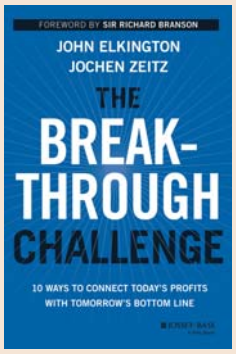
Building sense: Beyond the Green Facade of Sustainable Habitat

By Anumita Roychowdhury & Avikal Somvanshi, Centre for Science and Environment, 2014

India is in a frenzy of construction. Buildings, townships and housing complexes are coming up at break-neck speed – and we're still not there yet: a staggering two thirds of the buildings that will stand in India in 2030 are yet to be built!

How we choose to design these buildings and live can have a profound impact on our resource use and environment. We have begun setting the 'green' terms for construction and operation of buildings in India, but it remains a relatively new area of governance.

India needs appropriate regulations to benchmark energy and water use, minimise waste, and develop monitoring and compliance strategies. Also needed is a deeper public understanding of what works and what does not.



The Breakthrough Challenge: 10 Ways to Connect Today's Profits With Tomorrow's Bottom Line

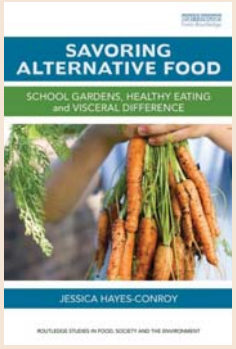
by John Elkington, Jochen Zeitz and Sir Richard Branson, August 2014

The world's most forward-looking CEOs recognize the real challenge facing business today: a fundamental shift in the nature of commerce. While sustainability programs, government action, and nonprofits are all parts of the solution, CEOs and other leaders must focus on social, environmental, and economic benefit—not only because it will make the world a better place, but because it will ensure lasting profitability and success in the business climate of tomorrow.

The Breakthrough Challenge is both an inspiring call-to-action and a guide for this transformation, based on the work of The B Team, a major initiative uniting leaders in sustainability. As a founding advisor and member of The B Team, John Elkington and Jochen Zeitz map out an agenda for change. The most important goal for businesses must be redefining the bottom line to account for true long-term costs throughout the supply chain. To achieve this, leaders must rethink everything: what counts on balance sheets, how to incentivize performance, who does what in the C-suite, and even what inspires us.

The Breakthrough Challenge draws on over 100 exclusive interviews to show this shift in action, sharing the pioneering work of leaders such as Paul Polman, CEO of Unilever; Arianna Huffington, founder and CEO of *The Huffington Post;* Peter Brabeck-Letmathe, chairman of the Nestlé Group; and Linda Fisher, pioneering Chief Sustainability Officer at DuPont, among many others.

Change-as-usual strategies are not enough to move business from breakdowns to breakthroughs. *The Breakthrough Challenge* shows leaders how to achieve a true transformation and refocus the definition of profitability on the lasting wellbeing of people and planet—for the lasting success of their business.



Savoring Alternative Food: School Gardens, Healthy Eating and Visceral Difference

By Jessica Hayes-Conroy, Routledge, September 2014

Advocates of the alternative food movement often insist that food is our "common ground" – that through the very basic human need to eat, we all become entwined in a network of mutual solidarity. In this challenging book, the author explores the contradictions and shortcomings of alternative food activism by examining specific endeavors of the movement through various lenses of social difference – including class, race, gender, and age.

Overall the book demonstrates the importance of moving beyond a promotion of universal "shoulds" of eating, and towards a practice of food activism that is more sensitive to issues of social and material difference.

Energy Efficiency Summit
29 October – 1 November 2014, Hyderabad
www.cii.in

Greenco Best Practices Award and Waste Management Summit 2014
20-22 November 2014, Pune
www.cii.in

National Conference on Environment and Biodiversity of India
Oct 4 - Oct 5, New Delhi
http://www.ebiconference.com/#sthash.uRohmm2V.dpuf

National Conference on Environment and Biodiversity of India
4th to 5th October 2014, New Delhi, India
http://www.neceer.org.in/2013/12/ebi-2014.html

3rd International Conference on "Energy Technology, Power Engineering & Environmental Sustainability"
18th to 19th October 2014, New Delhi
http://www.krishisanskriti.org/energy.html

Fourth International Conference on HYDROLOGY AND WATERSHED MANAGEMENT with a Focal Theme on Ecosystem Resilience - Rural and Urban Water Requirements
29th October to 1st November 2014, Hyderabad
http://www.ichwam.org

Global Agro Meet
Nov 06, 2014- Nov 07, 2014
Adlux International Convention Centre, Cochin, http://www.cii.in/

2nd International Conference on Improving Water Use Efficiency in the Urban Sector to Address Climate Change
Nov 14, 2014
Jacaranda Hall; India Habitat centre, New Delhi, http://www.cii.in/

CII Agro Tech 2014 - INDIA'S PREMIER BIENNIAL AGRO TECHNOLOGY & BUSINESS FAIR
22 - 25 November 2014, Parade Ground, Chandigarh, India
http://www.cii.in/

Tropical Ecology Congress-2014
10th to 12th December 2014, New Delhi,
http://www.jnu.ac.in/conference/tec2014/

International Conference on Energy, Environment, Materials and Safety
10th to 12th December 2014, Kochi
http://iceems.cusat.ac.in/index.php

International Conference on Environment & Energy
15th to 17th December 2014, Hyderabad
http://www.icee2014.in

Training Programme on Clean Air and Sustainable Transportation Strategies for Livable Cities
November 10 – 12, 2014
http://www.cseindia.org/content/training-prog-clean-air-sustainable-transport-strategies-liveable-cities

Training Programme for Environmental Managers
November 10-14, 2014
http://www.cseindia.org/content/training-programme-environmental-managers

One Week Advanced Training Program on Pollution Monitoring Techniques and Instrumentation
November 17 – 21, 2014
http://www.cseindia.org/content/one-week-advanced-training-program-pollution-monitoring-techniques-and-instrumentation

Training Programme on Urban and Industrial Wastewater Treatment
November 24-28, 2014
http://www.cseindia.org/content/training-programme-urban-and-industrial-wastewater-treatment

CSE's short-term EIA training programme on EIA of road and highway projects
November 10, 2014
http://www.cseindia.org/content/cse%E2%80%99s-short-term-eia-training-programme-eia-road-and-highway-projects

Science and Management for Sustainable Living
www.bhoomicollege.org

Post Graduate Diploma Course in Sustainable Development (PGDM-SD)
http://bimtech.ac.in/

M.Sc. in Sustainable Development - Distance learning Course + information
The Global Open University
http://nagaland.net.in/

Post-Graduate Certificate in Sustainable Enterprise
Indian Institute for Sustainable Enterprise
http://theiise.net/pgcertinse.html

Postgraduate in Sustainability Management
Silver Bright Institute of Management
http://www.htcampus.com/college/silver-bright-institute-management-sbim

Post Graduate Diploma in Sustainability (Distance learning)
Chhattisgarh University
http://www.cguniversity.com/

Post Graduate Diploma
IGNOU- Indira Gandhi National Open University
http://www.ignou.ac.in/

MBA in Environmental Science
School of Management & Infrastructure and Development Studies
http://www.minds-india.org/

Master of Architecture (Sustainable Architecture)
Bharati Vidyapeeth Deemed University
http://www.bharatividyapeeth.edu/Campuses/Pune/default.aspx

MBA and MA in Sustainability Management
TERI University
http://www.teriuniversity.ac.in/

M Tech, MSc Environmental Science
Thapar University
http://www.thapar.edu/

PG Diploma
Entrepreneurship Development Institute of India
http://www.ediindia.org/

M Tech in Environmental Engineering
The National Institute Of Technology, Tiruchirappalli
http://www.nitt.edu/home/

Advanced Diploma in Bio Degradable & Solid Waste
Vellalar College for Women
http://www.vellalar.com/Arts/carrer-oriented-programmes.php

PhD in Environmental Science
Gauhati University
http://www.gauhati.ac.in/

MSc in Environmental Science
Dr Babasaheb Ambedkar Marathawada University
http://www.bamu.net/dept/environment/

Advanced Diploma in Energy
Vidya Prasarak Mandals Polytechnic
http://www.vpmthane.org/polywebnew/courses.html

BSc in Environmental Science
University of Calicut
http://www.universityofcalicut.info/

PhD in Environmental Science
Punjab University
http://puchd.ac.in/

MSc in Environmental Science
Bharathiar University
http://www.b-u.ac.in/

MA in Environmental Economics (Distance Learning Course)
Annamalai University
http://www.annamalaiuniversity.ac.in/

PhD in Environmental Bio-Technology & Solid Waste Management School of Environmental Sciences
Jawaharlal Nehru University
http://www.jnu.ac.in/main.asp?sendval=SchoolOfEnvironmentalSciences

MBA in Energy & Environmental Science
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