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Issue 45 January 2017 ₹50 sustainabilitynext.in

Why India Needs Fewer Cattle Than Cars

India has a third of world's cattle population with nearly one livestock for three Indians. In contrast, only 20 Indians among 1000 own a car. Globally, cattle contribute to between 14% and 18% of harmful gases while automobile contribution is about 14%.

Interestingly, in India, cattle and cars are growing at more or less the same rate at slightly above 10% a year. What's scary is that cattle may be contributing to a third or more of India's greenhouse gas emissions?

What do these numbers mean to India's fight against climate change? While a massive effort is underway for controlling pollution from cars, isn't it high time India came up with a master plan to reduce its cattle population significantly if it's to meet commitments made at the 2015 Paris Climate Summit?

By Benedict Paramanand

The climate change debate is throwing up strange statistics. According to data published by EcoWatch recently, which quotes United States Environmental Protection Agency, cattle produce 14% to 18% harmful carbon-di-oxide and methane while automobile emit about (14%) (http://www.ecowatch.com/which-is-worse-for-the-planet-beef-or-cars-1919932136.html). Will this data, then, move the frontal attack, even if temporarily, away from the automobile sector by the environment lobbies world over to cattle?

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.

Editor **Benedict Paramanand**

Editorial Advisors

Pradeep Kashyap
Founder & CEO, *MART*

Madan Padaki
CEO, *Head Held High*

Vasanthi Srinivasan
Faculty, *IIM Bangalore*

H.S. Ganesh Keerthi
Design

Rishabh Media Network
22, 1st A Main, G M Palya,
Bangalore - 560 075. India
Phone - 91 80 41126557/9880602275
benedict@managementnext.com
www.sustainabilitynext.in

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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If this data is true in an automobile clogged streets and heavy meat diets in the West, the scenario plays out quite interestingly, even differently in India. India has fewer automobiles and many times more cattle while both numbers are growing in double digits.

Although India's cow population increased by more than 10% according to the 2012 census compared to last census in 2007, the number of bulls, has dropped 19%. Overall, the population of cattle other than cows and buffalos – like camels, donkeys, goats fell significantly – by nearly 20%.

India is the fourth largest exporter of beef in the world – behind Brazil, the European Union and China. Despite the stigma attached to beef eating since 2014, India's beef production has gone up and was estimated to be at 4.5 million tons in 2016 compared to less than 4 mt in 2014. It exports more than half that number. Most of it is known to come from buffaloes and the rest from other cattle, according to data from the Department of Animal Husbandry, Dairying and Fisheries.

According to USDA's 2016 data, India has the largest number of cattle in the world at 30.66% followed by Brazil 22% and China 10% and US at 9.4%. With this data on hand, can India come up with a viable strategy to cut methane (23 times more harmful than CO_2) and CO_2 by significantly reducing its cattle population in a sustained manner in the next couple of decades? This is a complex challenge since cattle in India has religious and social significance than just as a source of protein.

Possible solutions

Eliminate stray cattle from cities and towns. They are a huge traffic hurdle and contribute to air pollution in cities as well. This could be done by moving them out to an arid government land outside the city by municipalities. Goshalas or cow shelters are there in many towns but they lack capacity. This way, the dung can be used to generate gas and supplied to nearby villages which in a way can take care of the cost of feeding the cattle. Dead cattle too have economic benefits.

The collateral benefit of a better waste management system in towns and cities is reduction in stray animals such as pigs and dogs – resulting in lower CO_2 emissions.

Increase production efficiency of milk. India is the largest producer of milk in the world but one of the least efficient. An increase in the efficiency of milk production by even 10% could

easily be done with at least 5% fewer cows. Modernization of farming will reduce use of cattle in rural areas for farming. A steady rise in contract farming can reduce small holdings which are resource inefficient.

Reduce meat consumption. This is an easier solution in developed countries as meat is their staple food. In poor countries, meat offers one of the cheapest sources of protein. Efficient ways of meat production, like it is done for exports, is one of the options. Research on meat-like products offers hope.

And the question whether India should engage in meat exports is a tough question that needs to be asked. Is the consumer outside India paying for pollution in India? **Perhaps a pollution tax on meat exporters is needed and the proceeds from that can be used for growing more trees or even funding goshalas.** There is a noticeable drop in non-cow cattle population while cow numbers are going up by more than 10%.

Reducing the size of cattle head doesn't seem to be part of India's fight against climate change. Considering the enormity of the challenge and India's strong commitment to Paris Climate summit targets, a well planned and funded strategy to reduce cattle size will become inevitable soon.

Brazil Thrives on Indian Cattle Breed While It's Sharply Declining in India

Between 1997 and 2012, according to the government's successive livestock census, India's *indigenous* cattle population declined by over 15% from 178 million to 151 million, less than what we began with at the time of independence (155 million), when all cattle were indigenous breeds. Fifty years of sustained white revolution policy interventions to enhance milk production have actively advocated and financed replacement of indigenous cattle with high yielding breeds. Cross breeds like Jersey and Holstein Friesan now comprise some 21% of India's cattle population. But even India's total cattle population, including crossbreds has increased by a mere 23% (from 1951 to 2012) and stands at 190 million.

In stark contrast, Brazil's cattle population – comprising 80% pure Indian cattle breeds (Indicine) or Indian cattle breed crossed cattle – grew by 74% from 56 million in 1965 to 214 million today. The Gir, which is the favoured dairy breed, comprises 10% of Brazil's cattle population. The Ongole (or Nellore), which is the mainstay of beef production, makes up most of Brazil's cattle population. The Ongole of India, however, is a threatened breed in its own homeland.

Source: The Wire (https://thewire.in/13849/why-the-ban-on-cow-slaughter-is-not-just-anti-farmer-but-anti-cow-as-well/)

भारतीय प्रबंध संस्थान बेंगलूर
INDIAN INSTITUTE OF MANAGEMENT BANGALORE
CCGC

Affordable Healthcare

Building India's Future Health Economy

Presented by SustainabilityNext & IIMB CCGC

February 18, 2017, IIMB Campus – 9.30 am to 6 pm

Talking Points

Is affordable healthcare sector in India at an inflection point? If not, how far is it?

What are the pain points that need to be addressed to make affordable healthcare a larger reality?

What business model innovations are at play to enhance the reach of the private healthcare in the affordable space?

How advanced care can be made affordable to larger sections of the population?

What's the scene with healthcare start-ups? Is funding the only constraint?

How an enabling and dynamic eco-system can be created for enriching the affordable healthcare segment in India?

What are the missing links between stakeholders of the ecosystem such as NGOs, investors, start-ups, government departments, policy makers – what are the ways to bridge the gap?

Health insurance cover is improving, but is there enough innovation to make it effective and expansive?

Affordable health services are as important as affordable products. What's the services scene?

How to draw big impact investing into this space? Can there be attractive incentives for investors to get into this space, just like affordable housing?

These and many more questions need to be addressed adequately and deeply so that this space is enriched with more ideas and solutions.

Conclave Curators

Benedict Paramanand – Editor - SustainabilityNext

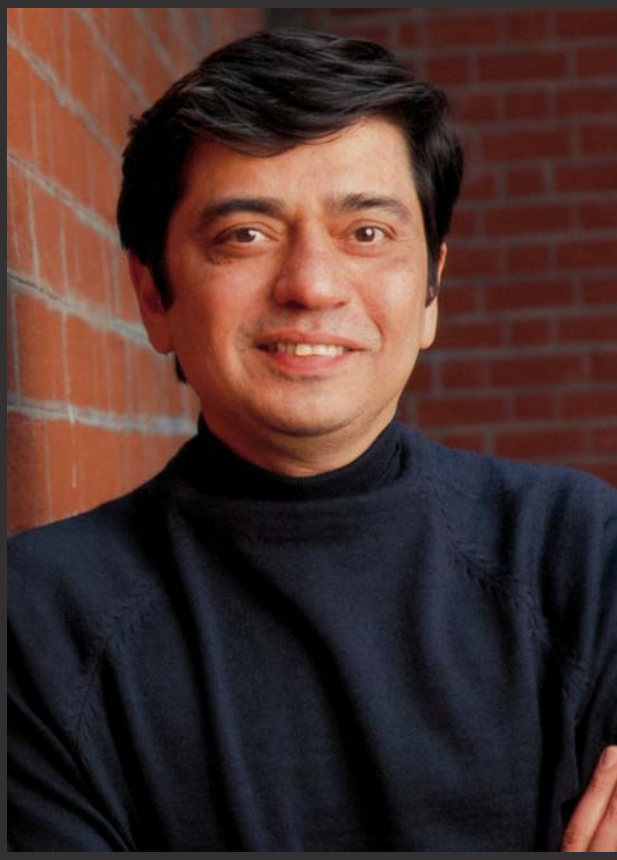
Manoj Chakravarti – COO (IIMB CCGC – Centre for Corporate Governance & Citizenship)

Anil Misquith – Executive Director - Strategic Initiatives, Samhita Social Ventures

For more information, contact: ganesh.keerthi@gmail.com, 9742072913

How Marketing Can Save The Planet

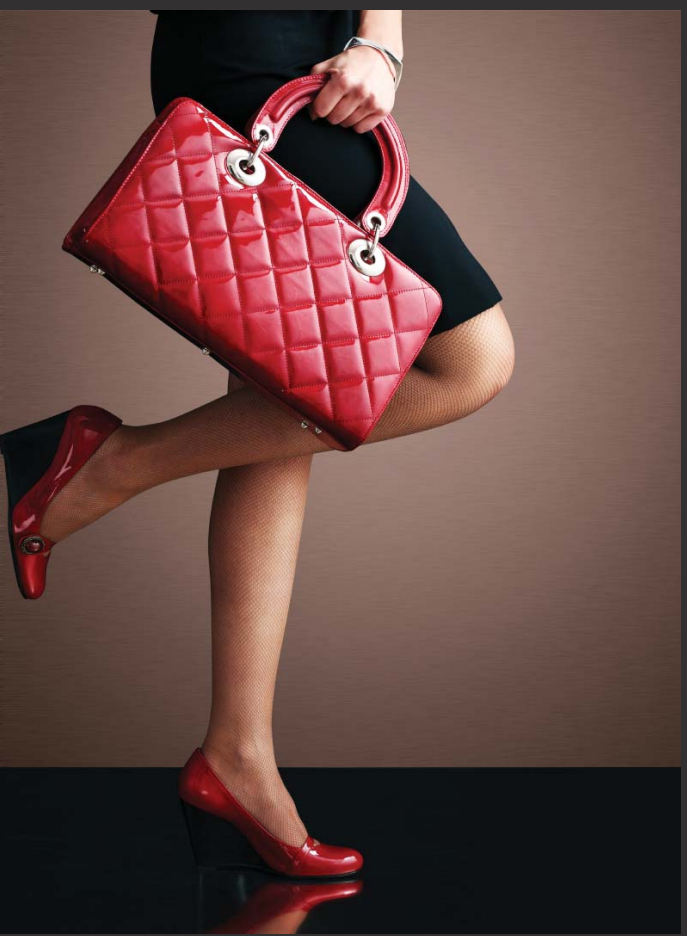
Santosh Desai, MD & CEO, Futurebrands, argues how marketers can use consumption as a force for good in his article titled 'The Wedding Ring & A New Way of Thinking About Brands' published in December 2016 in LinkedIn. Edited excerpt:



Santosh Desai, MD & CEO, Futurebrands

All economies, firms and corporations are in the game of driving unbridled consumption and marketing is the driving force to achieve their growth targets. Even if everyone swears to promote sustainable ways of manufacturing goods and producing farm products, how much can the ecosystem support it before the forests disappear and many animal species are lost and the air is polluted? Half the world of 6 odd billion people is yet to experience even a tenth of what the top 20% take for granted.

Since the world has no convincing answers for these questions, there is an urgent need to redefine some of the basic assumptions. The root of the assumption is that consumption is bad for the environment. Then, can we continue consuming with least impact on the eco-system? It is possible, says Mr. Desai.



It begins with redefining what brands mean to people. Can premium brands be made using as little material resource as possible because the utilitarian difference between low-end and high-end brands is marginal? "Going forward, the real contribution of marketing would be to give us ever richer, nuanced meaning that make us value ourselves even more, but do so without using up too many material resources."

Can consumption be about the power of the idea rather than the quality of the physical resource? "Luxury should mean a rarefied consciousness and not just a rarefied product or experience."

We need to move towards 'meaning rich, resource poor' lifestyle. Organic food is the best example. "It is time to unleash that power and in a small way help make consumption a force for good."

Read full article @ https://www.linkedin.com/pulse/frugal-brand-tool-sustainability-santosh-desai?trk=hp-feed-article-title-comment

GlobalTrend

Car Sharing Picks Up Speed

The Boston Consulting Group (BCG) has put out a trend report estimating car-sharing market size by 2021. Excerpts of the report:

Sharing economy is the unexpected trend in mobility and is likely to pick up speed as cities get clogged and driving is no longer a pleasure. It's good for the environment as well as fewer cars will be on the road, although the growth in the number of cars owned by people may not drop that significantly.

BCG found that although car sharing will expand relatively quickly and widely, it will have only a minimal effect on new-car sales, both because "most drivers will not forgo car ownership entirely and because some share of lost car sales will be partially offset by sales into car-sharing fleets in large urban areas."

"The trend toward car sharing should nonetheless make automotive OEMs consider re-conceiving their mission, at least in part. While continuing to serve as manufacturers and distributors of personally owned vehicles, OEMs should also experiment with providing mobility services and devise new business models accordingly. Manufacturers can set up units to provide vehicles to consumers on an as-needed basis, substituting a stream of fee income for sales revenues. At the same time, this can give them access to potential customers who might buy a car at some point in the future."

Some Numbers

Car sharing is taking hold in large urban areas in both the developed and the developing world. Although the largest market is the Asia-Pacific region (including Australia, China, Hong Kong, Japan, Malaysia, New Zealand, Singapore, South Korea, and Taiwan), with 2.3 million users and 33,000 vehicles, Europe (including Turkey and Russia) boasts the largest service per capita, with 2.1 million users and 31,000 vehicles. North America (including Canada and the United States) brings up the rear, with 1.5 million users sharing 22,000 vehicles. Together the three regions account for 2.5 billion booked minutes per year and €650 million in revenues.

Read full report (https://www.bcgperspectives.com/content/articles/automotive-whats-ahead-car-sharing-new-mobility-its-impact-vehicle-sales/?chapter=3)

Grounded in Communities: People-Powered Alternatives Spark Hope in Kachchh

By Rucha Chitnis

The ancient roots of Kachchh trace to the Bronze Age, where ruins of a Harappan city were found in Dholavira. Kachchh is considered as the cradle of craftsmanship, where an old world meets the new in a tenuous grasp to preserve ancient arts and traditional livelihoods. The Kachchh convening of **Vikalp Sangam,** a platform for collaborating on grounded alternatives at a time of growing inequities and ecological woes, illustrated a rich confluence of possibilities and viable solutions, when ancestral knowledge and appropriate innovations are harnessed by the creativity and wisdom of farmers, pastoral communities, artisans and grassroots groups.

#Voices4Alternatives is the anchoring hashtag to spotlight these grassroots voices and faces that are seeding and amplifying ecological alternatives to promote dignified livelihoods, sustainable agriculture and traditional arts in Kachchh and beyond. Here are some of the powerful takeaways of the Sangam, and how people-powered alternatives are igniting hope in India's largest district.

1) Women are in the Heart of Alternatives

As a young girl, Dina Ben noticed that the male sarpanch (village

head) would customarily hoist the flag on Independence Day. "As a young girl I had this burning dream that one day I would raise the flag in my village," she said. "Later I became busy raising children and managing a home. I had no knowledge about the panchayat." Dina Ben joined **Kachchh Mahila Vikas Sanghatan (KMVS),** a group that holistically empowers the leadership of rural women in social, economic and political spheres of their lives.

Participating in KMVS trainings led to the political awakening of Dina Ben and gave her the courage to contest for elections. "When women stay at home, they say we are inexperienced. When we come out of the home, we are defamed by society and face character assassination," she shared. Fortunately for Dina Ben, her family was supportive and the backing of the women's networks gave her the strength to persevere. "Because I fought for people's rights and entitlements, I won the election in 2011 by 51 votes," she beamed. The Kachchh Sangam also highlighted the vital role of women in amplifying alternatives–from fighting land grabs to advocating for the rights of pastoral communities and rural women.

2) Looking at the Earth Beyond Materialism

"Nature is not just a resource but our mother who sustains us," said Magan Bhai, an organic farmer, who joined the Sangam to share alternatives on sustainable agriculture. Magan Bhai, who has been farming ecologically for 16 years, poetically reminded us that the relationship of farmers with the soil, seeds and the Earth has deep spiritual and cultural resonance. "We depend on the government or the West for solutions. But what about the knowledge of farmers? For thousands of years, our seeds have survived and adapted by farmer innovations. Let's not forget that," he said. "Today farmers feel helpless and lost, because we want short cuts and have stopped using our own intelligence."

3) Networks Foster Collective Liberation

The Kachchh Sangam brought to life the rich web of networks of grassroots groups. Recognizing that working in silos was business as usual, **Kutch Nav Nirman Abhiyan,** a collective of 22 groups with a strong local presence, was founded after a devastating cyclone struck in 1998. Abhiyan harnesses the potential of local knowledge and physical and financial resources to develop Kachchh as a region that is governed by community initiatives. Abhiyan also seeded Urban Setu, an initiative to build a robust urban citizenry to hold local government agencies accountable through participation and advocacy.

Abdul Gani Sama, a maldhari (pastoralist) who is actively connected to the Setu networks, shared how he is advocating for quality education for vulnerable children in rural communities in Khavda through consciousness-raising efforts and outreach. Abdul also shared that his community is fighting for the recognition of grazing rights of pastoral communities that were compromised after the Forest Department seized the land. "We have been here since the seventh century. We are using the Forest Rights Act to fight for our grazing lands. Our knowledge about the land and ecology needs to be respected by the government," he shared.

4) Reciprocity, Not Money, Sustained Artisan Communities

As the cradle of craftsmanship, the Kachchh Sangam illuminated the dazzling abundance of traditional art forms that have been preserved for centuries. The Sangam highlighted the power of reciprocal relationships that were sustained by farmers, pastoral communities, weavers, block printers and other artisans. "Money was not traditionally exchanged," said Vankar Shamji Vishram, an artisan hailing from a multi-generational family of weavers from Bhujodi. Juhi Pandey, Director of Khamir, a nonprofit that promotes the crafts, heritage and cultural ecology of Kachchh, concurred. "There was a robust barter system before currency came into play. Communities were inter-dependent and weaving thrived because of this inter-dependency," she said. "The modern world needs to understand these relationships and stories for traditional arts to survive."

5) Old World Crops are the Fabric of Identity

Shivram Shabhuram Pandya is the director of Aadesar Vistar Khet Utpadan Producer Company Limited, a farmer-driven company that advocates for dignified livelihoods of small producers. Shivram shared about their initiative to revitalize the production of Kala Cotton, an old world cotton that was nearly destroyed by industrialization and mechanization. Weaving kala cotton is not an easy feat; it requires great skill and patience. Groups like Khamir are encouraging sustainable Kala Cotton production to preserve livelihoods of farmers and artisans. Farmers, like Shivram, also exemplified how old world crops, like Kala Cotton, form the fabric of identity of communities in Kachchh. Preserving traditional crops also promotes traditional arts and artisans, who are grappling with cultural survival in the face of staggering pressures of modernization.

The Kachchh Sangam exemplified how a web of connected activism and grassroots voices are amplifying alternatives from preserving traditional arts to promoting the livelihoods of artisans to advocating for the rights of pastoral and farming communities. Groups like **Sahjeevan, Hunnarshala, Arid Communities and Technologies** and **Kachchh Qasab and Arts,** among others, are on the forefront building bridges to make ancient arts and livelihoods relevant in a modern world.

First Published in: http://www.vikalpsangam.org
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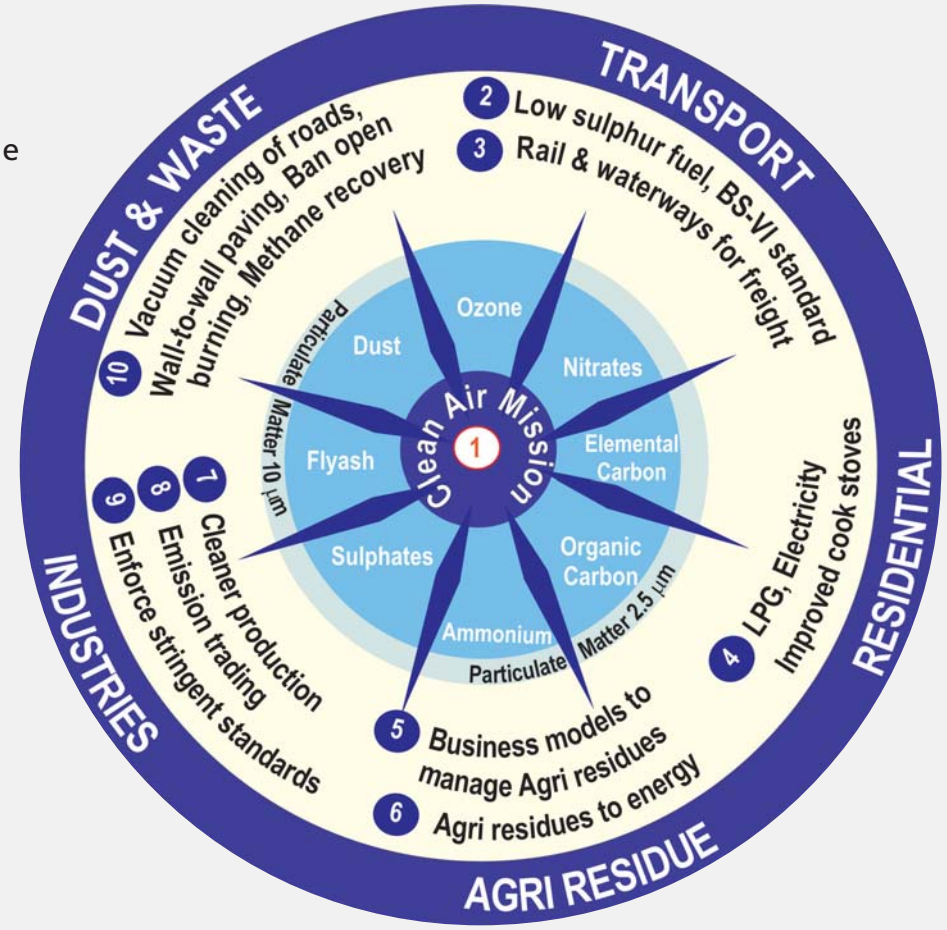
What California Can Teach India on Clean Air

It's interesting to know that many cities of the California state had severe pollution challenge in the 1960s. These challenges are similar to the ones being faced by Indian cities today. With a concerted effort by a team of scientists, technologists, policy makers, and a committed citizenry, California managed to drastically cut its pollution.

This and other practical solutions are listed in a book released by TERI and UC San Diego recently. The free book is titled 'Breathing Cleaner Air - Ten Scalable Solutions for Indian Cities - **A self-organized task force report for the World Sustainable Development Summit, New Delhi, October 2016. The task force chairs were V. Ramanathan, I. H. Rehman and S. Sharma.**



A team of experts from India and California collaborated two years ago and produced twelve steps for reducing pollution from the transport sector, which is captured by the author Ramanathan and others.

Download Report - http://www.teriin.org/files/reducing-air-pollution-report/#p=1

1. Launching a National Clean Air Mission for Multiscale and Cross-sectoral Coordination This Clean Air Mission [CAM-INDIA] should have the mandate to implement government policies for air pollution mitigation across several ministries dealing with transport, power, construction, agriculture, rural development, and environment, as well as across city and state jurisdictions. The targets for the CAM-INDIA are particles referred to as PM2.5 to PM10 and Ozone. The term PM (particulate matter) denotes a collection of difference species of particles in the air, while the 2.5 or 10 refers to the radius of the particle in dimension of micrometer (millionth of a meter). The most important ones are: ammonium sulphates, ammonium nitrates, black carbon (elemental carbon),

organic carbon, fly ash, and dust (mineral and road dust). To emphasize the point about cross-sectoral coordination, the ammonia in ammonium sulphate comes from agriculture while the sulphates come from sulphur dioxide (SO_2) emissions from the power and industrial sector. The per cent contribution of each of these particles to PM2.5 or PM10 differs from one location to another, from month to month and at times from one village or city to the next and even, from one day to the next, implying that the science of monitoring, determination of emission inventories, and modeling is crucial to evaluate the efficacy of policies.

The rest of the nine solutions deal with various sectors that contribute to pollution; the technologies required to implement the nine solutions are listed. Each of these solutions requires auxiliary measures and these are described in more details in the sections.

2. Transport: Switch to low sulphur fuel (10 ppm) and implement Bharat VI (similar to Euro VI) standards for engine emissions which require tail-pipe controls like diesel particulate filters for PM and selective catalytic reduction for NOx. This will also call for engine optimization and technologies like exhaust gas recirculation. The Government of India has already announced these norms and timely implementation of these norms will be important. We further recommend that legacy vehicles that are still in use are retrofitted with these control technologies. This solution will cut down soot (black carbon) emissions by up to 90% and drastically reduce oxides of nitrogen (NOx which is a main precursor for ozone formation), carbon monoxide (CO), and hydrocarbon emissions.

3. Transport: Shift freight transport from road to lower-emission modes such as rail, inland waterways, and coastal shipping. The Government of India places great emphasis on developing railbased and inland waterways freight transport and efforts need to be scaled up. This involves several auxiliary measures as detailed in the subsequent section on solutions. It is relevant to point out that Solutions 2 and 3 will mitigate emissions of primary particles, such as black and organic carbon, and toxic gases such as NOx, CO, and hydrocarbons.

4. Residential: Provide cleaner fuels (LPG, Electricity) and biomass stoves with an efficiency of 50% or more and with a forced draft fan to those who cannot afford LPG. This strategy calls for rapidly expanding the access to clean fuels (such as LPG; Electricity) to households reliant on solid fuels. For those who cannot afford LPG in the near term, market access should be increased to biomass/ biogas stoves that are compliant with emission rates recommended by the World Health Organization (WHO, 2014). There is a need to adopt business models to reward women who mitigate emissions from traditional biomass stoves. This solution has the potential to mitigate emissions of black carbon and organic carbon particles by as much as 90% and CO_2 emissions by more than 50%.

5. Agriculture: Develop business models for collection, transport, and storage of agriculture residues and farm manure. This strategy aims at reducing open burning of agricultural residue, instead, we recomend them to be used as a source of energy. Business models focussing on the economic viability of this strategy are required.

6. Agriculture: Convert agriculture residues and farm manure to electricity for rural power and biomass pellets for women who depend on biomass stoves. This strategy aims at developing and customizing gasification technologies for converting agricultural waste into useful energy. Solutions 5 and 6 will eliminate black and organic carbon particles from open fires and reduce ozone formation by cutting methane, VOCs and CO emissions.

7. Power and other Industry: Adopt cleaner and efficient production technologies such as supercritical technologies in power sector, vertical shaft kilns, hoffman kilns, and tunnel kilns for brick manufacturing. For urban households, it is recomended to improve energy efficiency of room air conditioners. This solution will reduce emissions that produce sulphates, nitrates, and black carbon.

8. Power and other Industry: Deploy National Emission Trading Schemes (ETS) with cap and trade for power generation and other large polluting industries. The government is already experimenting with ETS in three industrial clusters in Gujarat, Tamil Nadu, and Maharashtra, which needs to be scaled up.

9. Power and other Industry: Implement stringent emission standards to control gaseous pollutants (NOx, SO_2) and fine particulate (black carbon and fly ash) emissions from both power plants and big industries.

Solutions 7, 8, and 9 will reduce PM levels due to reductions in sulphates, nitrates, fly ash, and black carbon and will also mitigate ozone formation through reduction of NOx.

10. Dust and Waste: Implement wall-to-wall paving of streets and vacuum cleaning of roads; enforce ban on open burning of solid waste; manage waste and recovery of methane from landfills. Dust and waste burning are major sources of PM in cities and Solution 10 will drastically cut their contributions to city PM levels.

Any Takers for Coconut-Shelled Homes?

Coconut tree is a wonder tree and we thought we have explored all possible uses until Mumbai-based Jayneel Trivedi recently came up with the idea that coconut dried shells can be an excellent ingredient in building affordable homes. It can practically replace wood thereby saving trees from being chopped. He now has a prototype of a home which he is all excited about.

He has started the process of collaboration with government agencies, especially in Mumbai, to turn this into a highly scalable venture. If he succeeds, 90% of the shells that are now wasted can be put to good use. More than that, the cost of owning a home will come down significantly. India is the third largest grower of coconut and the possibilities seem immense.

The dry coconut shells now are a menace. They are not only known to aid mosquito borne diseases, but are difficult to dispose. So, the home project solves twin problems. Excerpts of views and information Jayneel shared with SustainabilityNext

Cost

The material needed for the house mainly consists of scrap metal, scrap wood, PU coating for coconuts, mud plaster and plants. The cost for a typical house of 8' x 8' would be Rs. 15000/-.

Scaling and Collaboration

For implementing this concept on a mass scale, we are proposing to the Government of Maharashtra to use tender coconut shells in its initiative on 'house for all' which will be cost effective and eco-friendly.

For urban use, presently we have already spoken to the Municipal Commissioner of Mumbai for support in procuring and drying of tender coconut shells which can then be cut/processed by automation on a large scale in the city. It can be implemented in other cities as well. This can be easily implemented in the rural areas where land and coconuts are in abundance.

Jayneel Trivedi is an architect who works in the sustainable living space.

He has worked with Govardhan Eco Village project (Mumbai), a 100 acre sustainable farm community and retreat center. This project has won national and international awards like IAA Olive Crown Award, SKOCH Platinum Award, Green Apple Award (UK), Asian Leadership CSR Award (Dubai), Aqua Excellence Award. Jayneel is also associated with Indian Green Building Council (IGBC) that spearheads the green building movement in India.

Prototype

We have made prototype of a 6' x 6' coconut house in which each wall is designed with different concepts. One is an open wall – where we have exposed coconut shells on the partition wall, second one is mud wall – where we have plastered the coconut wall with mud, third one is internal wall – where we have created a transparent partition wall with coconut and bamboo mesh and the fourth one is garden wall – where we have created a vertical garden from coconut shells. The roof can be of traditional style of thatch roof or clay tiles, however, we use coconut shells as part of the roof to reduce heat conduction.

Wider Application

The home can be customized based on individual requirements. **Although the concept is demonstrated for low cost housing, it can also be used for conventional buildings as well.** We can use these tender coconut shells as insulator for walls as well as for the slab. In the technique, inverted coconut shells are laid on the roof and on walls. The spaces formed in between are filled with plain cement concrete or lime concrete or mud.

Process of Building

We used coconut whole and cut it into half. They were then sun dried for more than a week followed by painting and coating. Other materials like metal and wood were purchased from scrap and assembled. We made a metal framework fitted on the ground and we used scrap wood to make wall partition. Later, dried coconut shells were used to make the coconut house in about 12 days.

Coconuts as Insulators

Heat conduction can be lowered in several ways by using insulating materials such as paints, tiles, or by increasing thickness using air cavities. Air being a natural insulator, use of cavities is similar to use of an insulating material. If an air space is left between two layers it acts as a barrier to heat transfer. We used a simple principle of air cavities through coconut shells on the roof and wall surface, to reduce heat which keeps the house naturally cool.

The advantage is that the **temperature is reduced by about 4-5 degrees** which eliminates the need of air coolers and air conditioner which consumes lot of water and energy. Based on the principle of physics - air feel cooler when blown through a small hole and warm through a big one? So we have

taken advantage of the coconut shells to cool the air. One side of used coconut which is cut has a big opening. We made a small opening on the other side of the coconut. When we fit coconut on the wall with the big opening outside and the small opening inside then the air entering from the coconut will automatically reduce in temperature before entering the house which acts as a natural air cooler.

Coconut Mulching

Mulch is a material placed on the soil surface to maintain moisture, reduce weed growth, mitigate soil erosion and improve soil conditions. Waste coconut shells can be a great material which can be used for mulching in an eco-friendly way. Smash the shell into smaller pieces of about 1-2 cm and use it as a ground cover for farming, garden area or even small flower pots.

Groundwater Recharge

Tender coconut shells can also contribute towards recharging the ground water which can help increase the water table. First we need to have a dugout in the ground. We can fill the dugout places with coconut husks/shells and this will retain more water and also the evaporation will be very less. You can also create multiple heightened blocks in your farm so that the water will be absorbed by the soil. This process will ensure you will have adequate water throughout the year. This is just the beginning. We are exploring more ways how we can use these waste coconut shells which can lead us to a greater standard of sustainable living!

Solar Rooftop Should Replace DG Sets

A new Centre for Science & Environment analysis finds solar rooftop power tariff is half the cost of power generated by DG sets.

It has called for a ban on use of DG sets in multi-storied residential buildings and other polluted urban areas, except for essential common area loads and recommended mandatory installation of solar rooftops for all upcoming residential societies to ensure they replace diesel generator sets for back-up power.

CSE recently released a unique online 'rooftop solar calculator' to help consumers design the system themselves based on their electricity requirement.

Findings

The study finds that **the cost of power generation from a DG set, including the capital cost, is Rs 27 to Rs 33 per unit - compared to rooftop solar tariff of less than Rs 10 per unit.**

The CSE study finds that as power outage from the grid reduces, the cost of power generation from DG sets increases and that from solar rooftops with battery storage becomes more financially attractive. Says Priyavrat Bhati, program director, energy, CSE: "DG back-up has become increasingly redundant because of reducing power outages in cities. On an average, many cities now have less than an hour of power cut in a day. We must realize that 'full back-up' was considered a basic need by upscale societies when the outages often lasted several hours a day."

The study concludes that for most societies, solar rooftop would be able to meet the basic load for individual flats ('partial load' in industry parlance which covers lighting, fans and some communication and entertainment appliances) along with essential area loads. "Moving away from the DG set to solar rooftop requires a change in mindset. If power outage is less than an hour a day then the very definition of "full back-up" needs to be changed. For tens of minutes of outage, even for the high end societies "partial load back-up" should be sufficient," adds Bhushan.

CSE researchers have estimated that up to 3 giga-watt (GW) of solar rooftop can be installed on new residential societies over the next five-seven years. This segment can, therefore, be a key to reaching the government's ambitious **target of 40 GW solar rooftop to be achieved by 2022.**

Recommendations to the Government

The report offers a set of recommendations (www.cseindia.org for a detailed pdf version):

- Make installation of solar rooftops mandatory for all upcoming residential societies.
- Ban DG sets in new multi-storied residential buildings except for common area loads in polluted areas.
- Support discoms to encourage them to push solar rooftop.
- Provide subsidy for hybrid solar rooftop systems.
- Increase awareness among RWAs – provide single window information and initiate campaigns.
- Initiate monitoring by regulatory authorities.

One Third of Consumers Prefer Sustainable Brands

A new international study by Unilever reveals that a third of consumers (33%) are now choosing to buy from brands they believe are doing social or environmental good.

- Unilever study reveals a third of consumers are now buying from brands based on their social and environmental impact
- An estimated €966 billion opportunity exists
  for brands that make their sustainability credentials clear

The study asked 20,000 adults from five countries how their sustainability concerns impact their choices in-store and at home. Crucially, it then mapped their claims against real purchase decisions, giving a more accurate picture than ever of what people are actually buying – and why.

Image Source: Wirral Globe

As well as confirming the public's high expectations of brands when it comes to having a positive social and environmental impact, the **study's findings uncover an unprecedented opportunity for companies that get it right.** More than one in five (21%) of the people surveyed said they would actively choose brands if they made their sustainability credentials clearer on their packaging and in their marketing. **This represents a potential untapped opportunity of €966 billion out of a €2.5 trillion total market for sustainable goods.**

The scale of this opportunity is also further borne out by Unilever's own financial performance. Of its

A study by Accenture and Havas Media Group also found that consumers in emerging economies are more engaged on sustainability and expect companies' good purpose efforts to benefit them directly.

hundreds of brands, those such as Dove, Hellmann's and Ben & Jerry's, that have integrated sustainability into both their purpose and products delivered nearly half the company's global growth in 2015. Collectively, they are also growing 30% faster than the rest of the business.

The study also suggests that the trend for purpose-led purchasing is greater among consumers in emerging economies than in developed markets. While 53% of shoppers in the UK and 78% in the US say they feel better when they buy products that are sustainably produced, that number rises to 88% in India and 85% in both Brazil and Turkey.

Keith Weed, Unilever's Chief Marketing and Communications Officer says: "This research confirms that sustainability isn't a nice-to-have for businesses. In fact, it has become an imperative. To succeed globally, and especially in emerging economies across Asia, Africa and Latin America, brands should go beyond traditional focus areas like product performance and affordability. Instead, they must act quickly to prove their social and environmental credentials and **show consumers they can be trusted with the future of the planet and communities, as well as their own bottom lines.**"

The study identifies two probable reasons for consumers' greater focus on sustainable purchasing in emerging economies compared to developed markets. First is direct exposure to the negative impact of unsustainable business practices, such as water and energy shortages, food poverty and poor air quality. And second is the power of social norms. So, while Brazilian, Indian and Turkish people feel pressure from their family, friends and even their children to buy greener, more socially responsible products, this sense of social scrutiny is currently less prevalent in the UK and US.

Diesel Cars are 10 Times More Toxic Than Trucks and Buses

A recent article in The *Guardian* quotes a report which shows that modern diesel cars produce 10 times more toxic air pollution than heavy trucks and buses. "The stark difference in emissions of nitrogen oxides (NOx) is due to the much stricter testing applied to large vehicles in the EU, according to the researchers behind a new report. They say the same strict measures must be applied to cars." NOx pollution is said to be responsible for early deaths of thousands of people in Europe. Diesel cars are known to emit six times more toxic gases on the road than allowed in the official lab-based tests. **"Following the Volkswagen "dieselgate" scandal, the car tests are due to be toughened, but campaigners say the reforms do not go far enough."**

A new report by the International Council on Clean Transportation (ICCT), a research group that played a key role in exposing Volkswagen cheating, compared the emissions from trucks and buses in realistic driving conditions with those of cars. "It found that heavy-duty vehicles tested in Germany and Finland emitted about 210mg NOx per kilometre driven, less than half the 500mg/km pumped out by modern diesel cars that meet the highest "Euro 6" standard. However, the buses and trucks have larger engines and burn more diesel per kilometre, meaning that cars produce 10 times more NOx per litre of fuel."

By September, this year, EU is starting on road texts with mobile devices, called portable emissions measurement systems (PEMS), attached to vehicles as they drive on real roads. Can the car manufacturers come clean on their own on emissions instead of waiting to be caught?

https://www.theguardian.com/environment/2017/jan/06/diesel-cars-are-10-times-more-toxic-than-trucks-and-buses-data-shows?CMP=share_btn_tw

Rainforest Alliance Announces 30-Day Sustainability Challenge

Rainforest Alliance will launch a **direct-to-consumer activation** at the start of the **Follow the Frog** (#FollowTheFrog) campaign to deliver value to collaborating companies, individuals and the Rainforest Alliance, and also to engage consumers in our 30th anniversary celebration. During the Follow the Frog campaign (January 30-February 12) it will invite citizens everywhere to join the 30-day sustainability challenge – representing one day for each of their 30 years of impact – in which they will receive a step-by-step guide and tips on how to "follow the frog" to live a more sustainable life. Citizens register for free and, over 30 days, receive 10 emails each with three simple steps and inspiring ideas.

As an added incentive, each participant will be entered into a drawing for a chance to win a basket of Rainforest Alliance Certified™ goodies, which will be supplied by collaborating companies. Companies participating in Follow the Frog campaign will be spotlighted on a dedicated Follow the Frog page on the Rainforest Alliance website (http://www.rainforest-alliance.org/followthefrog) and in a blog promoting the Follow the Frog company campaigns, and each of the emails to consumers will link to this content. We will also tweet and retweet and leverage social media portals.

There's no time like the present for citizens to reduce their carbon footprint, help protect the world's forests and support thriving communities. We know forests are our best defense against climate change and everyone can be a part of mitigating deforestation. Follow the Frog helps them know how to take action. Companies can learn more and access downloadable graphics here: http://www.rainforest-alliance.org/business/marketing/FollowTheFrog. Website: www.rainforest-alliance.org

Gopalakrishnan Deshpande Centre at IIT Madras

The IIT Madras (IITM) got itself a new centre called Gopalakrishnan-Deshpande Centre (GDC) for Innovation & Entrepreneurship on 11 January 2017, named after its alumni patrons. The centre is the brainchild of tech entrepreneur couple Gururaj Deshpande and Jaishree Deshpande and is co-funded by Kris Gopalakrishnan, co-founder of Infosys Ltd. They will put in half a million dollars each a year for five years.

Kris Gopalakrishnan, co-founder, Infosys Ltd.

The centre's mandate is to provide next generation technology solutions to India's many problems in partnership with the many labs at IITM. The centre's structure is derived from MIT (Cambridge, USA), University of New Brunswick, Canada (The Pond-Deshpande Centre for Innovation and Entrepreneurship), at Queens University, Canada (Dunin-Deshpande Queens Innovation Centre), and in Hubballi, Karnataka, India (Deshpande Center for Social Entrepreneurship). **It will also be part of a robust network of over 100 institutions that are part of the annual Deshpande Symposium for Innovation and Entrepreneurship.**

Gururaj Deshpande

"I am excited and impressed by IITM's commitment to innovation, entrepreneurship and excellence in everything they do and for making it a part of their DNA in the next decade," said Desh Deshpande. Mrs. Jaishree Deshpande added, "It makes me very proud that IITM is embracing such a visionary, bold initiative and a practical approach to be relevant to the 21st century".

Kris Gopalakrishnan said, "The innovation and entrepreneurship ecosystem at IITM will get enhanced by the opportunity to learn from the global network of such centers. Also, the research community will get the opportunity to collaborate with other researchers across the network, including market and funding access."

Prof. Jhunjhunwala, Faculty-in-charge of IITM Research Park and Incubation Cell noted that, "IITM is the front-runner in the nation, driving innovation, excellence in R&D and incubation. This Center will not only help us stay in the front, but get us to do more to solve the problems of the nation."

Mayors To Go To Malaysia to Learn About Clean Cities

The Centre for Science and Environment (CSE) in partnership of Swachh Bharat Mission (SBM), Ministry of Urban Development and National Mission for Clean Ganga (NMCG), Ministry of Water Resources for River Development and Ganga Rejuvenation, Government of India are supporting the "Capacity Building Initiative on Citywide Sanitation for Urban Local Bodies (ULBs) in the Ganga Basin". It is taking a delegation to Malaysia in February 6-9, 2017.

Acknowledging the lack of skilled man power and capacities in urban local bodies, an international field exposure visit to Malaysia is being designed in order to further enhance the knowledge, skills and attitude of city officials for the mainstreaming of reforms and best management practices of septage/ faecal sludge management.

Malaysia has successfully developed policies and implemented best management practices for effective septage management. This offers a great learning experience for Indian cities that face similar challenges. CSE in partnership with National Sewerage Company, Malaysia (Indah Water Konsortium) a wholly government company responsible for planning, designing and successful implementation of septage management in Malaysia. This international exposure visit is a prequel to the third handholding training on CSP preparation. Participants will be provided the opportunity to witness and gain exposure to the BMPs of septage / faecal sludge management in Malaysia. The objective is to:

- To provide the opportunity to interact and gain exposure through beneficiaries and implementers of projects / BMPs implemented in Kuala Lumpur, Malaysia.
- To get exposure on the techno-economic feasibility for planning, designing and implementing BMPs for sustainable septage / faecal sludge management.
- To show cost effective, natural and successfully implemented projects in Kuala Lumpur, Malaysia- across different scales.

Even Municipal Commissioner /Senior Official (Alumni) of target cities and State Special Secretary / Nodal Officer could go along with the mayors.

Solar Ferry Starts in Kerala

India's first solar ferry called 'Aditya' sailed on Kerala's backwaters in November 2016. The 2.5 km Vaikom-Thavanakadavu section in Alapuzha district is ready for commercial operation. The 75-seater solar boat was constructed at a cost of Rs. 2 crore by Navalt, a joint venture of two French companies and a Kochi-based Indian company. The 20 metre-long and 7 metre-wide boat made of fiber glass can cruise at a maximum speed of 7.5 knots. The boat, powered by two 20 KW motors, cruises without any noise and minimal vibration compared to the normal diesel ferries.

"On a bright sunny day it can cruise for over six hours without the need for external charge. It has 78 rooftop solar panels. It has a 700 kg 50 kW lithium-ion battery to store energy for cloudy days or running at night. There is an option to charge the batteries from the grid as well," said 38-year old IIT alumnus Sandith Thandassery, founder of NavAlt Solar and Electrical Boats Ltd. The solar boat can save up to Rs 1.60 lakh a year towards fuel prices when compared to diesel boats and has a life of 15 years. Navalt would provide training to 20 SWTD officials on boat operation and maintenance.

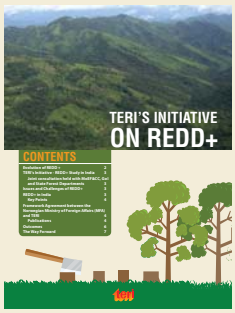
Water Metro

Kerala Transport Minister A.K. Saseendran said the State Water Transport Department (SWTD) is planning to convert its diesel ferries to eco- friendly solar powered. "The government has already started efforts towards this. A memorandum has been submitted to the Centre to allot funds for building 50 solar boats. Further, 14 catamarans under construction will have the solar option too. A fund of Rs. 22 crore has already been allotted for this," the minister said.

"The solar ferry boat can break even in three years. The other advantages are that there is no air, water and noise pollution," Thandassery said.

The water transport departments from West Bengal and other states have evinced interest in the solar ferries. "We've even got inquiries from the Kochi Metro Rail Ltd which plans to deploy 78 boats as part of the 'Water Metro' project," he said. A team of KMRL officials also inspected 'Aditya', docked at Bristol Yard in Aroor.

BOOKSHELF



TERI'S INITIATIVE ON REDD+

"REDD Plus is a financial incentive mechanism for reducing emissions from deforestation and forest degradation, plus signifying positive elements of conservation.

The Energy and Resources Institute (TERI) and the Ministry of Environment, Forest and Climate Change (MoEF&CC), Government of India, has organized many national-, regional- and state-level consultations and has come out, jointly, with many policy briefs on Forest Governance, Methodology for Carbon Assessment, International Architecture on REDD+ and Institutional Mechanism on REDD+. These policy briefs and proceedings of workshops are available on the website of MOEF&CC, GoI.

TERI also assisted MOEF&CC, GoI in the preparation of a reference document on REDD+. On the basis of TERI's efforts on REDD+ and knowledge available from other sources, MOEF&CC, GoI is in the process of preparing policy on REDD+ in India.

REDD+ is a critical and prominent piece of the new global climate goal to achieve net-zero emissions in the second half of this century. The important role of forests in addressing climate change was formally recognized in COP 21.

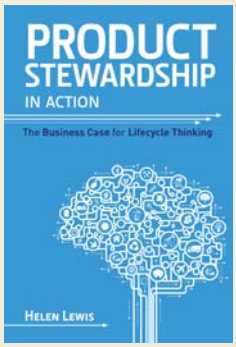
Knowledge Brokerage for Sustainable Development: Innovative Tools for Increasing Research Impact and Evidenced-Based Policy Making

By André Martinuzzi and Michal Sedlacko, Greenleaf Publishing, December 2016

"This book is a rich and valuable contribution to policy making in the context of the Agenda 2030 for Sustainable Development. It supports the scientific, administrative and policy-making communities in the formation of the key questions and answers, and in bringing these sectors together to co-operate in making sustainable development a reality and to co-evolve by mutual learning." Jörg Mayer-Ries, German Federal Ministry for the Environment, Nature Conservation, Building and Nuclear Safety

The menace of a post-truth era challenges conventional policy-making and science. Instead of fighting an uphill battle against populist solutions, those involved in both policy-making and science have to find innovative ways to collaborate, and make use of the vast amounts of knowledge that are already available. Knowledge brokerage, in this context, is more than a simple question-and-answer game: it is a process of co-creating and re-framing knowledge. In addition, the book has to deal with trade-offs and ambiguities, as well as world-views, cultures and the preferences of stakeholder groups.

ANDRE MARTINUZZI is Head of the Institute for Managing Sustainability, Associate Professor at Vienna University of Economics and Business. **MICHAL SEDLACKO** is Research and Teaching Fellow at the University of Applied Science FH Campus Wien.



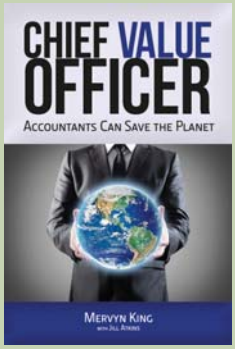
Product Stewardship in Action: The Business Case for Life-Cycle Thinking

by Helen Lewis, December 2016, Greenleaf Publishing

The book describes how and why leading companies are taking responsibility for the environmental impact of their products and packaging. Product stewardship, often referred to as "extended producer responsibility" or EPR, is the idea that everyone that benefits commercially from a product, including manufacturers, distributors and retailers, has a shared responsibility to minimize its environmental impacts.

Written primarily for a business audience, it draws on the knowledge and experience of industry practitioners and other experts to provide a structured approach to product responsibility within firms. This will help those new to the field, as well as more experienced practitioners, to develop an effective response to stakeholder concerns about the environmental impacts of their products and packaging.

HELEN LEWIS has been involved in product stewardship for many years in industry, academic and government roles. She is currently CEO of the Australian Battery Recycling Initiative and an Adjunct Professor at RMIT University.



Chief Value Officer: Accountants can save the planet

by Mervyn King with Jill Atkins, December 2016, Greenleaf Publishing

"This book is a "must read" for every director, every CFO aka CVO, every accountant, as well as all stakeholders with high expectations for tomorrow's companies to create value in responsible and sustainable ways." Olivia Kirtley, President, International Federation of Accountants

Integrated Reporting is having a profound impact on corporate thinking and reporting. Value is being assessed on the basis of the sources of value creation used by an organisation and not through a financial lens alone. In the book Mervyn King, a global corporate governance and reporting leader, challenges some of the systemic issues preventing organisations from managing in an integrated value-creation way.

The shareholder-centric governance model, currently favoured by most companies, will not result in changes to corporate behaviour that can create value in a sustainable manner. The book, therefore, firmly places the accountant in the position of changemaker - the finance professional today should be more of a value officer than a financial officer. Consequently, the Chief Finance Officer should be known as the Chief Value Officer. This book explains this new approach. It encapsulates the essential reasons for adopting integrated reporting, explains its application to date and proposes the next steps needed to achieve change that will improve business, social and environmental sustainability.

MERVYN KING is Chairman of the International Integrated Reporting Council (IIRC) and Chairman Emeritus of the Global Reporting Initiative (GRI). He is also Professor Extraordinaire at the University of South Africa.

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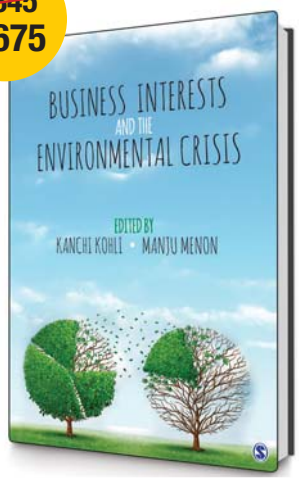
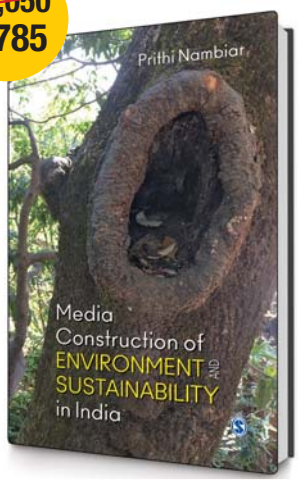


This book highlights the manner in which key aspects in policy discourse—commodity, pricing, ownership, and regulation—have borrowed economic and trade principles to address the environmental crisis and to what effect. It addresses a fundamental issue in environment: if nature is no longer available as a limitless resource, how has the policy discourse on the environmental crisis come to view it, value it, and live with it?

2016 • 284 pages
HB 978-93-515-0860-1

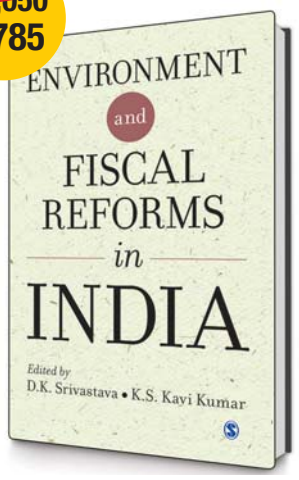
~~₹1,050~~
₹ 785



The book presents a theoretical framework against which the role of media and communication in enabling this meaning negotiation is explored and illustrated through textual analysis and examination of interview data. The uniquely theoretical and practical perspective on the discursive construction of these concepts will be of immense value for policy makers, development and media practitioners, scholars, and students of media and communication.

2014 • 312 pages
HB 978-81-321-1741-4

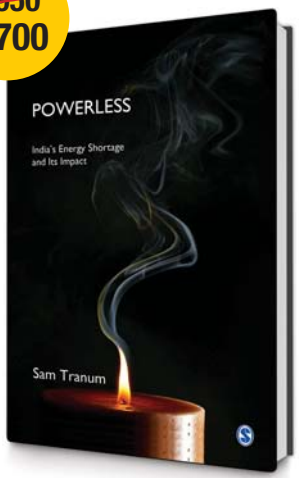
~~₹1,050~~
₹ 785



The current structure of taxation in India, the book underlines, is characterized by inadequacies such as cascading, multiple tax rates and inter-state sales tax, fragmenting the all-India market. The book argues in favour of integrating environmental considerations in the GST regime. It emphasizes the importance of eco-taxes on polluting inputs and outputs.

2014 • 364 pages
HB 978-93-515-0041-4

~~₹950~~
₹ 700



Explains India's energy shortage, how much coal, oil, gas, uranium, and power the country uses, and for what purposes. It discusses how the shortages and resulting imports affect the country's economy, businesses, and residents. It also looks at the environmental and health effects of India's growing energy use and how efforts to mitigate these are likely to affect demand for coal, oil, gas, and uranium.

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http://www.teriuniversity.ac.in/index.php?option=com_program&task=program&sno=33

Advanced PG Diploma (Renewable Energy)

teri university

http://www.teriuniversity.ac.in/apgdre

Send Names & Details About Courses Related With Sustainability to ganesh.keerthi@gmail.com

Events

Workshop on Efficient Energy Management
12th January 2017 at Hotel Park, Chennai
samir@gemba-training.com

International Training Programme on Water Sensitive Urban Design and Planning
January 16 - 20, 2017, Nairobi, Kenya
wamiti@kewi.or.ke

International Training Programme on Water Sensitive Urban Design and Planning
January 16-20, 2017, Nairobi, Kenya
parul@cseindia.org

Meetup on GST(Goods and Service Taxes)
January 18, 2017, NUMA Bengaluru
https://www.eventbrite.com/e/meetup-on-gstgoods-and-service-taxes-tickets-30915362682?aff=ehomecard

PRID Sustainability Research Conference
January 19, 2017, London, UK
http://www.eventbrite.co.uk/

ATREE@20 International Conference
24-25 January 2017
J N Tata Auditorium, Indian Institute of Science, Bangalore

International Training Programme on Water Sensitive Urban Design and Planning
January 23 - 26, 2017, Pretoria, South Africa.
wamiti@kewi.or.ke

Certified Scrum Master Training
January 28, 2017, Bengaluru
https://www.eventbrite.com/e/certified-scrum-master-training-in-bangalore-tickets-26407162534?aff=ehomecard

Design Thinking Workshop
January 29, 2017, Bengaluru
https://www.eventbrite.com/e/design-thinking-workshop-tickets-30402416446?aff=ehomecard

International Conference on Nanobiotechnology for Agriculture: from Research to Innovation
February 2 - 3, 2017, New Delhi
www.teriin.org/events/nanoforagri/

International Exposure Visit
February 6-9, 2017, Malaysia
ridhima@cseindia.org

TERI-ITEC Courses 2016-17 Course VI - Renewable Energy and Energy Efficiency
February 6-24 2017, Gurgaon
dhingras@teri.res.in

Access Masters Tour in Bangalore
February 10 2017, Bengaluru
https://www.eventbrite.com/e/access-masters-tour-in-bangalore-tickets-30323341932?aff=ehomecard

Vh1 Supersonic Festival 2017
February 10-12 2017, Pune
https://in.bookmyshow.com/bengaluru/events/vh1-supersonic-festival-2017/ET00048928

Register for Free VLSI Workshop
February 19 2017, Bengaluru
https://www.eventbrite.com/e/register-for-free-vlsi-workshop-with-maven-silicon-tickets-30217446195?aff=ehomecard

TERI-ITEC Courses 2016-17: Course VII - Natural Resource Security: Governance, Challenges and Opportunities
27 Feb - 17 Mar 2017, Gurgaon
shilpi.kapur@teri.res.in

Green Events & Innovations 2017
March 07, 2017, London, UK
http://www.eventbrite.co.uk/

TERI-ITEC Courses 2016-17: Course VIII - Integrated approach towards sustainable development
27 Mar - 14 Apr 2017, Gurgaon
chubamenla.jamir@teriuniversity.ac.in

Call for Papers: Immiserizing Growth – A Conference
May 26-27, 2017, Toronto, Canada
https://hd-ca.org/events/call-for-papers-immiserizing-growth-a-conference

Sustainability 4.0 Awards 2017
May 26, 2017, Mumbai
http://ww2.frost.com/event/calendar/sustainability-40-awards-2017

Challenging Inequalities: Human Development and Social Change
6-8 September, 2017, Cape Town, South Africa
https://hd-ca.org/

Send Your Events Plan to - ganesh.keerthi@gmail.com