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Volume 2 • Issue 9 • September 2014

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Modi's 'Clean India' Call is Mega Business Opportunity

Prime Minister Narendra Modi has brought broad smiles on the faces of hundreds of entrepreneurs and companies, big and small, in the clean-tech, waste management, smart cities, green energy and a dozen other related businesses. The magnitude of opportunity for Indian and global companies is mindboggling. However, India's execution capabilities will be put to a solid test

By ***Benedict Paramanand***

If you include opportunities related to clean Ganga and other river projects subsequently, the conservative business opportunity could be a minimum of $100 billion or even five times that over ten years. While the Prime Minister mentioned 100

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Volume 2 • Issue 9 • September 2014

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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A Clean Bangalore

smart cities as his goal in five years, he's heard talking of 500 clean cities as well. Considering that most Indian cities, including the metros, have to start the clean-up process almost from scratch the opportunities look even bigger.

The biggest challenge for the government will be mustering top notch project management skills. Its ability to manage scale will be put to a big test. However, the major challenge for the central government is to enlist support from the opposition-ruled state governments and they in-turn from local bodies. (Why is that cleansing Indian politics is not so high on the agenda?)

A 'Clean India' theme is by far the most ambitious call by any Indian government so far. The call from the ramparts of the Red Fort during Modi's first Independence Day speech on August 15th this year, has given some hope to citizens who are apathetic to the way municipalities are being run. Although Indians were taught that 'cleanliness is next to godliness' in school, it has remained a nice quotable quote.

The debate about whether Indians will really measure up and participate in this national movement of sorts or will remain skeptical about the government's sincerity and ability continues. However, the manner in which commuters have cooperated in keeping the metro railways in Delhi, Kolkata and Bangalore spick and span gives hope. What this shows is that if the systems are in place Indians are not that bad in keeping their cities clean.

The 'Clean India' ambition will take off only if governance and transparency structures are put in place and executed earnestly. Even half-hearted measures could derail the whole initiative. Genuine decentralization and breaking up projects into manageable sizes and fixing accountability are key to its success. It helps to know that PM Modi, unlike earlier heads of governments, is an execution freak.

New Sustainable Technologies

It's interesting that the 'Clean India' campaign may also become a very fertile ground for testing several new global and Indian clean technologies. India is known to go in for low-cost-high-return model. Considering the scale of opportunity, technology companies would be forced to become cost competitive on their latest products.

The range of new technologies that could come into play will be wide. It could include almost every activity in agriculture and industrial practices in which Israeli companies are already active; treating effluent and sewage using new enzymes and using every bit of waste to generate energy has huge potential. Already, a few companies are talking about using the humongous filth that will be thrown up after dredging river Ganga to generate energy.

The Clean India ambition will take off only if governance and transparency structures are put in place and executed earnestly

Using incinerators of cement plants to burn city waste without emitting any toxic substance, could revolutionize the way we handle urban solid waste. The possibility of converting sewage water into drinking water, if not for washing –is likely to become a reality if cities' water needs are to be met.

The ripple effect of 'Clean India' campaign on India's services sector will be huge too. This in turn will result mushrooming of thousands of new firms and generation of millions of new jobs.

The impact of a cleaner India on health will be massive. With healthier people, especially the poor, the abysmal productivity of Indian labor is bound to improve. The government's twin agenda of clean and smart will feed on each other.

With 'Clean India' PM Modi would not only add sheen to a backward (in cleanliness) country, he may spruce up its spirit and its economy. He may truly end up bridging the gap between cleanliness and godliness in a country that has so far been loath to seeing the connection between the two.

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Sikkim is First with 100% Sanitation

Sikkim has become India's first state with 100% sanitation coverage, according to a report of the drinking water and sanitation ministry.

One of the eight Northeastern states, has 610,577 residents (2011 census), Sikkim is India's least populated and second smallest state in area after Goa.

"The state has also sensitized people to adopt a holistic approach to improve sanitation and hygiene for a clean environment while accelerating overall development in the state," according to a Sikkim government statement.

The state has constructed 98,043 household latrines, surpassing the target of 87,014. Of these 61,493 latrines have been built for below poverty line (BPL) families.

As many as 1,772 schools have been covered under the total sanitation program. This was done under the central government's Nirmal Bharat Abhiyan sanitation drive.

According to a total evaluation study conducted by the Planning Commission in 2013, Sikkim emerged with the best performing gram panchayats and maintenance of sanitation facilities.

All this is the fruit of Sikkim Chief Minister Pawan Chamling's community-led total sanitation campaign in 1999 for achieving full sanitation in the 7,096 sq km area of the state. To encourage sanitation activities, the state government has instituted Nirmal Gram Puraskar (Clean village award).

Pepperfry.com Gets Customers to Plant Trees

Pepperfry.com, a leading furniture and home products marketplace is enabling planting of least one lakh trees by December 2014 by its customers. It is running a feature on its website to enable customers to make their contribution. Called "Save the Earth-Plant a Tree," this is part of the firm's CSR initiative.

Before the customer interest kicks in Pepperfry.com started the drive by planting 1,000 saplings. The company has tied up with Grow-Trees, a social enterprise that plants trees on government and community lands for Rs.60 per tree to ensure success and facilitate tree plantation.

Pepperfry.com has incorporated an option button for its customers on its website. After customers finalize the order, while checking out they can click on the option of contributing Rs.30 towards planting a tree by clicking on the Grow Trees button. Pepperfry will contribute the balance of Rs.30. Post the completion of checkout, customers will get an e-certificate as confirmation.

Mr. Ashish Shah, COO and Founder Pepperfry.com hopes to extend the initiative beyond one lakh.

Grow Trees plants trees through its planting partners in projects across eight states in India namely Rajasthan, Madhya Pradesh, Odisha, Gujarat, Karnataka, Andhra Pradesh, Maharashtra and West Bengal. Grow Trees is also a planting partner for the United Nations Environment Program's (UNEP) Billion Tree Campaign, an official partner for UNDB and were official partners for WWF's Cities for Forest Campaign. Till date Grow Trees has planted over 682,000 trees.

An App that is Green and Fun

Ecoviate app, available on both iOS and Android, is ready for launch in October this year. It incentivizes people to live more sustainably with monetary discounts from stores and brands.

Here's how it works - Take a picture of something eco-friendly or sustainable (recycling, carpooling, etc.). Post it directly to your Facebook or Twitter account from the app. Redeem discounts from popular stores or brands.

This app tries to address the issue of why young people aren't incentivized to live more sustainably. Built by college students, this app works on a business model where everyone wins: consumers using the app boost both their wallets and their eco-friendly reputations; companies providing discounts promote pre-existing promotions, while allocating their brand to a sustainable initiative.

Ecoviate has partnered with a reforestation organization as well to plant one tree for every download of the app. To make this app a reality, we want to give our users discounts to stores and brands that already have sustainability initiatives in place.

The passionate developers of the app believe that if you do something the right way, with the right intentions, then others will follow. They are passionate about making sustainability economical and fun.

Water ATMs in Rajasthan Villages

Cairn India is revolutionizing safe drinking water distribution in two districts of Rajasthan. Thanks to water ATMs, arid villages have 24X7 access to water at the swipe of a card at 20 litres for Rs.5.

The Jeevan Amrit Project runs kiosks with reverse osmosis (RO) plants in Bhakharpur, Kawas, Guda, Jogasar, Aakdada and Baytu to benefit 22,000 people.

"The project is a good example of a PPP model, where Cairn India has partnered with the Rajasthan government's Public Health Engineering Department (PHED), Tata Projects and the respective village panchayats to provide potable drinking water at the doorsteps of the local community,"

Cairn India CSR head Nilesh Jain told IANS.

Rajasthan, with 10.4 percent of the country's geographical area, 5.5 percent of the population and 18.70 percent of the livestock, has only 1.16 percent of surface water available in the country.

The state is one of the driest states of the country. Rainfall is erratic and there is a large variation in its distribution pattern in the state. The average annual rainfall ranges from 100 mm in Jaisalmer to 800 mm in Jhalawar.

At present, 22 RO plants (17 with the swipe facility) catering to drinking water needs of 22,000 villagers on a daily basis are up and running. The project is expected to scale up in the coming years in terms of number of plants and locations.

The cards come with an initial value of Rs.150 and can be recharged for a similar amount. Plans are afoot to also provide Rs.20 recharges as well.

This makes the dispensers self-sustaining, with the revenue earned used by the village's water committee to meet the running expenses of the RO plant, such as salary of the operator, electricity and maintenance. The surplus money is used to undertake developmental work in the village.

And to maximize its reach, water from the RO plants is transported to the surrounding dhanis (hamlets) through vehicles at nominal charges (Rs.1-2 extra, as decided by the water committee).

Ratna Ram, sarpanch of Sawai Padam Singh village, became a role model after he inspired more than 100 households in his village to utilize safe drinking water and four another village sarpanchs to initiate the "Jeevan Amrit" project in their gram panchayats.

Health and Governance Dividend

The number of water-borne diseases, such as diarrhea in children, has also come down. Cases of joint pain caused by high fluoride content in drinking water have also decreased.

Cairn India funds the cost of the RO plants, which are delivered and installed by Tata Projects, PHED provides the premises and the source water connection and a 15-member village water committee, formed under the panchayat, is responsible for operation and maintenance of the kiosks. Dhara, the local NGO partner for this project, spreads awareness about safe drinking water among locals and hand-holds the water committee for better success.

Apart from providing an innovative solution to a grave problem, these water kiosks have also proved to be a model of good self-governance. The water committees have created an identity for themselves and are looked upon as an effective social group in the villages. Along with efficiently running the RO plants, the committees are also undertaking many developmental projects.

Cairn India is one of the largest independent oil and gas exploration and production companies in India with a market capitalization of $10 billion. It was rated the fastest-growing energy company in the world in the 2012 and 2013 Platts Top 250 Global Energy Company Rankings.

Driving Solar-powered Auto from India to Britain

Rabelli Naveen will soon embark on a trans-national expedition riding on a self-built solar-powered auto rickshaw to Britain to promote a sustainable low-cost alternative transport solution and check air pollution in towns and cities across the country. The objective of this 10,000 km (6,250 miles) adventure through 10 countries is to demonstrate the environmental and economical benefits of using a solar-powered auto rickshaw.

After graduating in B.Tech from Hyderabad a decade ago, Naveen flew to Australia for masters in electronics and worked in Melbourne as a product development engineer long enough to acquire its citizenship and an Aussie passport to travel across countries without hassles.

Rabelli Naveen

Raoul Kopacka, 26, an Austrian automobile engineer and a videographer, will accompany Naveen on the long trip to make a documentary of the expedition to show how road worthy and safe is the solar powered auto with zero emission.

Naveen fancied embarking on this mission inspired by an Austrian team, which drove across the world in a solar powered taxi during 2008-09.

"We had to rebuild the auto from scratch, replacing its diesel engine with a battery operated engine and re-wiring to charge it with electric and solar power," Naveen said.

When fully charged with electrical energy in eight hours and solar power in five hours, the 650 kg auto travels 105 km non-stop at 45 km per hour.

Tool to Estimate Rooftop Solar Power Launched

The Energy and Resource Institute launched the world's first tool named WEB-GIS to estimate the rooftop solar power potential for Indian solar cities. It will be first launched in Chandigarh.

Leena Srivastava, vice chancellor of TERI University and director of the institute, said "We need coping strategies to deal with erratic and ineffective power systems with enabling mechanisms." The initiative is supported by the Ministry of New and Renewable Energy (MNRE).

According to the ministry, the solar city aims at minimum 10 percent reduction in projected demand of conventional energy at the end of five years through a combination of enhancing supply from renewable energy sources in the city and energy efficiency measures.

The basic aim is to motivate the local governments to adopt renewable energy technologies and energy efficiency measures.

8-Hour Solar Power at Home by Tata Power

Tata Power Solar has unveiled a new solar power system to generate one kilo volt-ampere (kva) for providing uninterrupted power supply for eight hours at affordable cost.

"Our latest product - Tata Dynamo -- gives users easy option to switch over to solar energy for at least eight hours of uninterrupted power supply at lower cost," Tata group company chief executive Ajay Goel said.

The intelligent system comprising solar panels, inverter and battery charges itself while powering connected appliances through solar power, which is its primary source of energy.

"In the absence of sunlight, Dynamo automatically shifts to regular electricity. The system provides four-to-eight hours of back-up to appliances such as lights, fans, television and air cooler," Goel said.

As state-run and private utilities are not able to meet the growing energy needs of even households and smaller businesses, forcing many of them to use diesel generators during power cuts, Dynamo could be an eco-friendly substitute for load-shedding.

Studies show that households spend on average Rs.1,500 per month on grid power and additional cost on operating a diesel generator. By investing in Dynamo, its cost can be recovered in 18 months while availing uninterrupted power without extra cost, the company claims.

The product, with 10-year lifespan, also benefits from the 30 percent subsidy the ministry of new and renewable energy provides on solar-based devices to promote green energy.

Designer Solar Oven Makes Salt Water Drinkable

Designer Gabriele Diamanti has created a solar oven he calls the Eliodomestico (household-sun); its purpose is to boil saltwater to produce clean drinking water for people in places where such water is difficult or impossible to obtain. What's unique about the Eliodomestico is that it's been designed in such a way as to be easily built by local people, rather than elsewhere and shipped in. This way, the profits from making and selling the oven remain local.

After the black boiler is filled with salty sea water in the morning the

temperature and pressure force the steam downwards through a connection pipe and collects in the lid, which acts as a condenser, turning the steam into fresh water.

Once Diamanti established the fundamentals, he experimented with a series of concepts for the aesthetic of the object. "My goal was to design something friendly and recognizable for the users," he explains. "The process developed quite naturally to determine the current shape; every detail is there for a reason, so the form, as well as production techniques, represent a compromise between technical and traditional."

One oven is enough, he notes, to serve a family of four for a day.

Western Ghats Ecology Issues to be Based on Kasturirangan Report

The Indian government told the National Green Tribunal that it would pursue the implementation of the Kasturirangan committee report on Western Ghats, not that of its precursor, the Madhav Gadgil panel. This came after the tribunal had warned of strict action if clarity was not provided on the issue, according to a report in Business Standard report.

The environment ministry told the tribunal it had brought about draft notifications, declaring ecologically sensitive areas (ESAs) in Western Ghats, spanning six states. It added it was awaiting objections in this regard. The tribunal sought to know whether the objections would pertain to reducing the size of the ESA alone, or would the government entertain objections seeking an increase in the demarcated area, too.

Mining, thermal power plants, hazardous industries and a few others are banned in ESAs. Yet, States have been demanding reduction in the ESA within their boundaries.

To study the region and the impact of industrialization in the biodiversity hotspot, the United Progressive Alliance government had set up a Western Ghats ecology expert panel, under ecologist Madhav Gadgil. In its report, the panel had sought a radical overhaul of the environmental regulations governing an area of 174,700 sq km and the creation of a three-tiered restrictive regime. It recommended a new Western Ghats expert panel to review development activities in that area, among other functions.

Jog Falls in full flow

As states were up in arms against this, the government set up another panel under K Kasturirangan (then a Planning Commission member) to review the implementation of the report. This group advised bringing about 60,000 sq km under the ESA, keeping human habitation and agricultural areas out of its ambit. Like the Gadgil panel, it put restrictions on mining and other polluting industries in the ESA; however, it didn't recommend an overarching central authority to review projects and development, among other differences. The second report was strongly objected to by Gadgil. These middle-path recommendations were objected to by states, too.

When the UPA government notified the ESA across six states, based on the Kasturirangan panel's recommendations, the matter became a political hot potato for the Congress government in Kerala. Following this, former environment minister Veerappa Moily further reduced the area under ESA in the state. He also promised to do so for any of the other five states that approached it with a similar demand.

At the same time, the UPA government continued to project an uncertain image before the National Green Tribunal. With the National Democratic Alliance government taking charge at the Centre, it has clarified the Kasturirangan panel report will be the basis for decisions on the matter.

Working Conditions Worsen in Non-formal Sector

A recent National Sample Survey Office (NSSO) report said 68.8% of workers across India in 2011-12 neither had a written job contract nor were eligible for paid leave, compared to 63% in 2004-05.

It said more people came out of social security benefits and fewer laborers had a written job contract or provision for paid leave.

In 2011-12, 79 per cent of the workers in these sectors had no written job contract, up from 74 per cent in 2004-05. The proportion of casual laborers without a written job contract remained almost at the same level (95 per cent) but had increased for salaried employees. In 2011-12, 65 per cent of employees getting a regular salary had no job contract in hand, compared to 59 per cent in 2004-05.

The data showed 72 per cent of workers in the non-agriculture in 2011-12 had no social security benefits, such as provident fund, pension, gratuity or health care, against 71 per cent in 2004-05.

Analysts cited a shift from agricultural to non-farm jobs as one reason for this trend. "As people are moving towards non-agricultural jobs, they are getting employed by contractors. Also, industries find it convenient to hire people in the informal sector without offering them a written job contract and, hence, more laborers are deprived of the benefits," said Madan Sabnavis, chief economist at CARE Ratings.

The gap between the average salary of a worker in the informal sector and the all-sector average shrunk between 2004-05 and 2011-12. The average daily earning by a worker in the informal sector stood at Rs 195 a day in 2011-12, about 40 per cent less than the Rs 322 all-sector average. In 2004-05, the differential was 46 per cent.

The Power of Segregation

Shoba Thai used to be a waste picker collecting recyclables from dump sites around Prabhat road in Pune to make a marginal living. Her economic condition improved in 2005 when the Kagad Kach Patra Kashtakari Panchayat (KKPKP), a union of waste pickers, waste dealers and recyclers, launched a pilot program in collaboration with the city's municipal corporation where waste pickers were integrated in door-to-door waste collection (DTDC) work.

This paved the way for the formal institution of SWaCH in 2007; a wholly-owned worker's cooperative as a public private partnership to undertake such work. SWaCH (Solid Waste Collection and Handling or, officially, the SWaCH Seva Sahakari Sanstha Maryadit, Pune) is India's first wholly-owned cooperative of self-employed waste pickers/waste collectors and other urban poor. It is an autonomous enterprise that provides front-end waste management services to Pune residents. The cooperative is authorized by the Pune Municipal Corporation (PMC) to provide DTDC and other allied waste management services.

SWaCH members like Shoba Thai collect garbage from citizen's doorsteps and deposit it at the designated PMC collection points. The interesting part about their work is that they are expected to collect segregated rather than mixed waste. Their waste carts also have a partition to help transport the waste in segregated form. "All the households have been requested to give segregated waste, but few do so. This makes my job harder as I have to segregate dry and wet waste," says Shoba Thai.

Each member collects waste from 150 to 200 households, charging Rs 10 to Rs 40 depending on the area. They can also sell the recyclables. PMC has mandated that at least Rs 10 are collected monthly from each household for service. A citizen's helpline helps

households access the services or lodge complaints. “The members are now enjoying better livelihoods with assured income,” says Manisha of SWaCH. “They also have better working conditions, thanks to improved equipment provide by PMC,” she adds.

The city has 9,000 waste pickers-SWaCH works with 2,300 waste pickers and contracts with 400,000 households in Pune. Hotels and households provide 125 tones of organic waste, and another 50 tones comes from mandis.

Some of the waste goes to the city’s decentralized biogas plants, a brainchild of Sanjay Nandre of Enprotech Solutions who wanted to show municipalities the feasibility of decentralized waste management. He helped Thane Municipal Corporation build a 5-tone per day project for a housing complex in Thane: The Hiranandani housing complex on Gorbhundar Road, Thane, consisted of 10,000 flats at the time of commissioning the plant. Impressed by the Thane project, the Pune municipality, in 2009, decided to set up the city’s first biogas plant in Model Colony.

Segregated Waste

The 17 biogas plants operational in the city today process only wet waste. They require properly segregated waste. The plant takes a small portion of segregated municipal solid waste as feedstock. Hotels, being commercial enterprises, have been instructed to provide segregated waste to the waste collectors. Hotel wet waste is considered to be of good quality for biomethanation. The objective is to be able to feed these plants with municipal solid waste from households, which requires proper segregation at source (see box: A model biogas plant). These plants are set up amid residential areas to reduce the cost of transportation. The plants are usually fenced with high walls; there is little smell outside the plants area and a uninformed passerby would barely even notice a waste processing unit in the vicinity.

The Economics

The municipality has employed public-private-partnership model to set up these plants. PMC provides the capital cost and land to set up the project. In 2010, the project cost Rs. 55 lakh to Rs. 60 lakh, including all physical infrastructure. Currently, the capital costs are pegged between Rs 70 lakh and Rs 90 lakh. Each plant employs four to five persons. The operation and maintenance of plants is contracted for five years, which can be renewed. It costs at least Rs 75,000 per month and annually escalates at 10 to 15 per cent rate depending on the project. These projects cannot be on a revenue based model as they are not financially viable.

On an average, a typical 5 tons per day (TDP) biogas plant occupies 500 to 600 square meters. Such a project produces about 300 cubic meter biogas per day to generate electricity from a 40 kW gas engine. The electricity is not sold to the grid. Instead, it is used to light 145 to 250 streetlights in the neighborhood. The other output is slurry waste which is high in nutrients and is used as fertilizer.

About 80 per cent of the waste that the plants receive can be used for biomethanation. There are rejects in every case. “However, the current level of segregated waste is high compared with other cities in India. This is good for biomethanation projects in Pune. But most of it comes from hotels. We should get more waste from residents,” says Suresh Rege, Chairperson of Mailhem Engineers Pvt Ltd, which offers solutions for treatment and disposal of solid and liquid biodegradable organic waste.

Door-to-door collection of waste and awareness seems to be pushing segregation practices.”We should shove unsegregation waste back to people,” says Rege. PMC, on its part, encourage good disposal practices through

incentives. It gives rebate on properly tax-an annual 10 percent rebate is given if rain water harvesting/solar/ composting is being done by property owners.

A Setback

The work to segregate waste received a setback in June 2013 when the only landfill in Pune was closed as the municipality was looking for sustainable options of treating waste. 'The landfill was set to be fully closed by June 2014," says Sanjay Gawade, Assistant Commissioner, and Solid Waste Management Department of PMC.

At the dumpsite a refused derivative fuel (RDF) plant has been set up, which burns municipal waste to generate electricity. The plant was set up by Hanjer Biotech. According to PMC, the plant is working to its optimum capacity of 1,000 TPD while the company claims to be processing more than 1,200 TPD. The RDF Plant claims to have the capacity to take in mixed waste. Organizations like SWaCH, involved in enabling segregation practice, see this is a setback.

According to a report by Nagrik Chetna Manch, Pune,"As Hanjer is capable of processing mixed garbage; the municipality has neither compulsion nor incentive to ensure segregation at source, mandatory as per current rules and regulation. The capacity of Hanjer plant would go up by about 25 to 35 per cent if it gets only wet segregated garbage."

Residents of nearby areas report of pollution as a result of this plant. The Nagrik Chetna Manch claims to have tested mercury levels in manure from a composting plant also operated by Hanjer. The non-profit claims this is 32 times the acceptable level set under the schedule 4 of MSW (Handling and Management) Rules 2000. The plant continues to operate at the claimed capacity, using more than 65 per cent of Pune's soild waste.

A Model Biogas Plant

In Pune, all biogas plants have the capacity to take in 5 tones of wet waste every day. Waste comes in daily between 10 am and 2.30 pm by hotel and ghanta trucks arranged by the Pune Municipal Corporation (PMC). The trucks empty the waste at collection unit.

The waste is passed on to the shredder with the help of two employees. At this stage, the employees pull out any waste that is unfit for the biomethanation process, such as paper & inedible biodegradables objects like banana stalks and mango seeds, which reduce the quality of the waste.

The shredder turns the solid waste into a semi-solid state. In this state, the waste is passed on to the scum remover where particles that are unfit for processing such as oil are separated. The waste settled at the bottom is sent to the anaerobic digester for building the culture. A culture is prepared in the digester before injecting waste for biomethanation. It is built by adding cow dung and poultry droppings.

The process of anaerobic digestion produces biogas, largely constituted by the methane. After this process, waste in the digester, the slurry material is dried. It is high in nutrient and is used in the PMC gardens; the remaining is sold in the market.

The biogas is transferred to scrubber which helps in the removal of hydrogen sulphide. The clean biogas is now transferred to a to gas balloon, which pumps the gas to the biogas engine whenever power generation is required.

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

Why Indian Industry Should Support Think Tanks

India needs to nurture a strong think tank culture and focus on strengthening the domain of policy making in Indian universities if it has to make better policies, says **Dr. Anshu Bharadwaj,** executive director of CStep. Excerpts from his chat with **Benedict Paramanand**, Editor of **SustainabilityNext**

CStep is a think tank, what is its objective?

CStep is a non-profit organization. We work in technology policy research. Our mandate is to enable technology-enabled policy options for equitable growth. So the key words here are technology, policy and equity. We believe technology is a very powerful medium for impacting society but to harness the full potential of technology, enabling policies are required. Benefit from technology should lead to equitable gain. These are the three cornerstones of CStep.

We work on a whole bunch of areas – energy is a big chunk of our work, urban infrastructure, security, emergency and disaster management and look at new materials. In each of these, the overarching approach is to evaluate technology which is important for our future. In energy we look at energy efficiency – How do we improve the efficiency in manufacturing industries like cement, iron and steel, pulp and paper, textiles, fertilizers, among others. What are the technology options to improve the efficiency to reduce the energy consumption per kg of output produced.

We also look at wind. **We worked on a study in Karnataka and Andhra and found that the wind potential is much more than the earlier estimates** and therefore we made a case at the national level to go for large scale wind power than what has been done so far.

In solar our focus has been tech-economic assessment of emerging solar technologies. Going beyond photovoltaic, we explore niche areas where India can carve out a competitive advantage.

We also do work in geo spatial mapping of wind and solar, we identify zones for large-scale renewable development.

Please throw some light on the support structure India is building so that policy makers can make better decisions

Policy making is a political process. Having said that, the civil service which assists in policy making, is extremely competent. The senior civil servants are extremely smart and have worked in the government in a large number of sectors. They have a very good understanding of what the ground realities are and they also understand the political system very well. So the civil

service is very competent and well positioned in terms of policy-making. Most ministries have a wealth of information about their particular sectors and they have a huge amount of data.

What think tanks can do is to further enrich the process because sometimes ministries require good analytical skills. Suppose they have to come up with an important policy, ministries are occupied in day-to-day work and might not have the time to take up detailed research studies. So that's where think tanks that don't have any vested interests in this process can help.

Think tanks are very good in analyzing data using sophisticated tools and methods for data analysis which can be used to impute policy implications. So think tanks play a very important role in enriching policy.

How's the quality of think tanks in India?

India has a large number of think tanks but only a handful of them are really world class, which is truly objective, truly rigorous, and truly apolitical.

We need a better think tank structure?

Yes, I definitely think so. We need a large number of think tanks who are objective and rigorous. For example, on a particular issue, there can be differing views like climate change. If you ask five think tanks to examine that all of them will come up with five different view points but it is necessary that these view points are on record so that people know that a certain policy was made despite these five views.

How can we strengthen that process?

At the end of the day a high quality think tank needs high quality manpower. It is my endeavor that the most talented, most motivated researchers come to CStep. If such people join CStep naturally it will flourish. How do I ensure such people come to CStep? I have to excite them with projects. I also have to give them stability of tenure. Think tanks require stable support. Where does stable funding come from? There are only two possibilities, government or industry. **I feel the only way vibrant think tanks can survive is if the industry and the government realize their value and offer stable support.**

Isn't Indian Industry supporting independent think tanks?

No. What they have are lobby bodies like CII and FICCI. What they typically support is education and health which are direct impact interventions.

As part of their 2% CSR, can companies also fund think tanks?

We have been trying to make a case. If India has to have a vibrant system of think tanks industry should earmark some funds to support them. They don't do that now. They can follow a very rigorous selective process. Once selected, they should support for four or five years. It is a very difficult task to convince industry.

In contrast, the US has a large number of think tanks. They get support from corporate and the government because they believe in that culture. We haven't reached that point.

Isn't government funding enough?

They do but the amount they provide is very small, it is not at a level where you can acquire high quality people and it comes with all kinds of strings attached.

That's where foreign funding comes into the picture…

It is substantial (foreign funding) but again it's a chicken and egg situation. There are a large number

of Indian institutions willing to do good work but they are fund starved. **Because funding from Indian corporate sector isn't coming and government funding isn't adequate, international money is pouring in to support the think tanks.**

Key levers of policy-making are one is think tank providing them data and that needs to be beefed up in India. The other key levers for better policy making are:

The university system needs to be strengthened because the discipline of policy research is not very well taught in our universities. We still go for engineering, management schools which is probably much more lucrative but the discipline of policy research is very important and should be taught. If we do that a large number of policy analysts will come out who understand how to do rigorous policy analysis.

Who can take this cause?

I would say industry because we can't expect government to do everything and it has its own constraints. If industry realizes that investing in these sectors may be beneficial tomorrow, it may have a longer term impact

Dr. Anshu Bharadwaj has worked as a principal investigator in the energy domain. He holds a PhD from the Departments of Engineering and Public Policy, and Mechanical Engineering, Carnegie Mellon University.
He also is a BTech in Mechanical Engineering from the Indian Institute of Technology, Kanpur and PGDM from the Indian Institute of Management, Calcutta. He is a former member of the Indian Administrative Services and has worked with Government of Karnataka in various capacities.
His interests are in emerging technology and policy options for India's low carbon inclusive growth. He specialises in computational modelling of energy systems.

Learn from Beijing

The game of pollution cannot be won with small incremental steps but only by leaping ahead with stringent measures. The situation can worsen in future if Indian cities do not follow clean pathway that is precautionary and preventive, says **Anumita Roychowdhury,** executive director, research and advocacy and head of the air pollution and clean transportation program, campaigns for clean air and public health, at Centre for Science & Environment (CSE), in a chat with **SustainabilityNext**

The problem of air quality will get worse as urbanization gets rapid and governance standards don't keep pace. Can you give a sense of what the situation could India be 5, 10 years down the line?

To answer this question we need to understand our learning curve. Even though air quality management has taken roots, urban air pollution has grown rapidly in India. A vast majority of cities fail to meet the clean air standards. Delhi mirrors this dilemma. It has taken some tough steps – relocated its polluting industries, converted two out of its three power plants into natural gas, implemented the largest CNG based public transport system, improved emissions standards, among others. Initially this helped to improve air quality but the levels are rising again. The initial euphoria is ebbing. This is our lesson.

Most of India's problems are governance related. What major reforms do you suggest?

This is a complicated challenge. Clean air management is a new generation governance challenge but our institutional and legal framework is not designed to help cities meet clean air targets in an integrated manner. For example,

the Air Act that is administered by the environment departments and state pollution control boards keeps vehicular pollution outside its ambit by convention.

Emissions standards for vehicles

are notified under the Central Motor Vehicle Act that does not address air quality and health objectives in cities. The mobility strategies including public transport, walking, cycling, and parking needed to cut vehicles miles traveled and pollution are often not included in urban air quality management policies. **There is no unifying legal and institutional framework to link all these strategies for the big solution.**

Yet, inadequate executive powers, lack of autonomy and fragmented decision making cannot be an excuse for lack of action. Our environmental laws including the Environment Protection Act have strong sweeping powers, if wielded, can supersede all other laws to meet the sustainability objectives in all sectors including transportation sector. But this is seldom done in practice. Even Air Act has powers to take action on vehicles but this is not done.

Yet there are precedents in Delhi where under the Air Act the government has evoked polluter pay principle to charge an extra cess on diesel fuel sold in Delhi to create a dedicated fund for pollution control. **Autonomy and power are part of the story but not the entire story.** We also need right policy objectives and sustainability principles to guide action. So many times Judiciary has stepped in to give land mark judgments on clean air and public health and other environmental issues by evoking the rights and provisions of the Constitution and the laws of the land – the same powers are also available to the executive to act.

Let institutional reforms evolve and continue. But also craft innovative approaches to leverage the current efforts. For instance, several cities including Delhi are working on clean air action plan. These need clear targets to be achieved in a time bound manner with monitorable and accountable action plan and earmarked budget. The plan needs to link all solutions and departments with adequate statutory back up.

Look at examples from other parts of developing Asia. Beijing's new clean air action plan sets the target of reducing PM2.5 by 25 per cent to achieve the level of 60 microgram per cum by 2017; it has earmarked USD 123 billion for it and made departments and officials directly accountable for compliance. We also need precision in our targets, stringency, discipline, and accountability in implementation. India's 12th Five year plan has asked cities to meet clean air standards by 2017 but there is no clear legal or fiscal mechanism to make this happen.

Similarly, funding is a constraint because principles of its allocation are not clear. For instance, the National Urban Transport Policy asks for action to meet the mobility needs of people and give priority to public transport, walking and cycling. Yet more than 73 per cent of the funding under JNNURM transport sector funding was spent on roads, road widening and flyover – mainly for convenience and speed of vehicles. This needs to change and combined with other fiscal strategies to mobilize funding for sustainable solutions.

Owning a car in India is more for prestige and less for use, so can CSE work to change this behavior through some smart campaigns?

We will have to do a lot more to deepen policy and public understanding of dangers of automobile dependency and the risk of building cities that depend

on personal transport. This is a difficult campaign as it hits at the aspirations around the car. But it is possible to change and modify aspiration as noticed in other parts of the world where social premium attached to high level of health protection, quality of life and livability have influenced social values and investment priorities.

Look at Copenhagen and Amsterdam. These rich cities have increased bicycle share significantly, much more than car use. India has a better chance of doing this as most of us still walk, cycle and use public transport.

Our lesson from clean air campaign is that people respond very well when they understand how their ill health is linked with air they breathe. But the link between the problem and the range of solutions are not yet clear to many. That action is needed not only in the way we make vehicles and refine fuels but also the way we travel, design our roads and public spaces and cities and tax our vehicles.

We need strong advocacy energy to communicate, build public, policy and professional engagement, ensure people's involvement, sharpen public opinion, build societal stake in right principles, and show change on ground. Not doing this is not an option.

What the book is about

The book presents the evidence of change in Indian cities - however small they may seem today. This captures actual policy decision and action in cities for clean air, public transport, walking and cycling, intermediate public transport, and car restraint initiatives like parking and fiscal measures. The challenge now is to learn from these experiences and to upscale the practices so that we can have the great leapfrog - move from cars to no cars, from pollution to clean air.

Used Tyres Make Great Furniture

After stupendous success with promoting bamboo, Bamboo House India, a Hyderabad-based social enterprise, established by Aruna Kappagantula and Prashant Lingam in 2008, is trying its luck with making used tyres an alternative furniture material. They are using innovative designs and colors to make it attractive. **Prashant Lingam** shares his experience with **SustainabilityNext**

We recently came across an incident where we saw tyres being burnt and when inquired the owner said he had no other solution to discard scrap tyres. The idea for utilizing scrap tyres for making furniture and other value added products originated here.

Being a social enterprise working on green livelihoods, we decided to collect waste tyres in an efficient, environmentally sound and socially responsible manner and address the big issue of tyres entering waste stream and landfills.

Discarded tyres are ideal breeding ground for mosquitoes and other disease carrying insects. With no easy disposal options, discarded tyres are burnt openly emitting deadly and dangerous smoke which contains toxic compounds.

Discarded tyres are also thrown in landfills, their hollow and round shape takes up valuable land space, and tyres just don't stay buried in the ground, they release methane and ripping through landfill liners through the process.

Today lots of new applications are being found to address the issue of scrap tyres. Our challenges are:

* Scouting for right kind of tyres is very tough as only discarded scrap tyres are used in our furniture making process.
* And the bigger challenge is to cut the tyres which is quite hard.
* Shaping the tyres into furniture components and designing the right product is further more difficult as we have no one to guide us.
* **Apart from furniture we are working on to develop bags, slippers, pots, baskets, trunks, mirrors, planters, belts, buckets and what all possible we can make with scrap tyres.**
* Use of tyres in construction process is also something we are exploring.

We are targeting GARDEN FURNITURE segment, outdoor segment, as they are all weather proof, no rusting, no termite, can withstand sun and rain and will last a lifetime.

We are also developing indoor range of tyre furniture too. We hope corporate clients and government bodies will respond to this new use of tyres.

Through this new initiative, we are able to provide livelihoods at the local level. We are right now exploring the option of using tyres as dust bins as well.

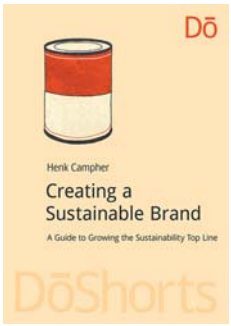
Affordable Alternative

A very simple rocker would cost Rs.500/- and the costliest of tyre furniture set will cost Rs.15,000/- , we are developing entire range to cater to all segments.

Common people can use discarded tyres very effectively without any expert help. All they need is a bit of patience, time and explore ideas.

They can easily make dust bins, storage bins. These items are very easy to make with the help of a drill machine and few nuts and bolts. You can color the tyres and these could go into kids' rooms.

www.bamboohouseindia.com



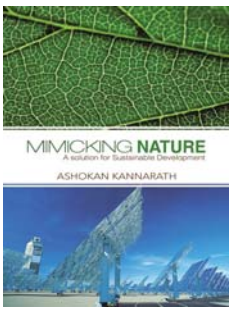
Creating a Sustainable Brand: A Guide to Growing the Sustainability Top Line

By Henk Campher

DoShorts, April 2014

Sustainable brands may have started as 'doing less harm' and shaving costs off the bottom line. But brands today, supported by over a decade of phenomenal changes in sustainability, are looking for the holy grail of sustainable business -- a fusion of products and branding that can actually drive sustainability and grow the business top line.

This guide by sustainable brand expert Henk Campher is the model for creating a sustainable brand that people can trust, buy and above all, advocate for. Campher cuts through the myths and noise to offer an experienced expert's 101 for creating an irresistible brand, clearly setting out: what makes a product or service sustainable the basic elements of sustainable branding strategy and a deep understanding of how consumers connect with a brand an original model for assessing the sustainability of your brand, and a host of examples of sustainable brands, drawing on the author's firsthand experience as part of the team at Edelman and Oxfam and founder of the Nelson Mandela initiated Proudly South African campaign.

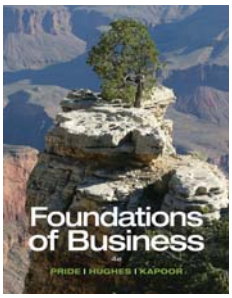


Mimicking Nature: A Solution for Sustainable Development

By Ashokan Kannarath

Partridge India, January 2014

This book is specially designed to get a basic idea about biomimicry as a solution for sustainable development, how animal and plant models become an ideal natural teacher to construct and design modern man's requirements without causing pollution.

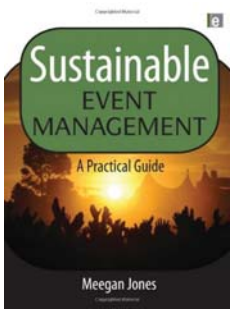


Foundations of Business

By William M. Pride, Robert J. Hughes and Jack R. Kapoor

Cengage Learning, January 2014

FOUNDATIONS OF BUSINESS, 4E gives readers the comprehensive preparation they'll need to succeed in today's competitive business world. By providing a brief survey of business, including management and organization, marketing, social media and e-business, information systems, accounting, and finance, this text introduces the reader to core business practices. In addition, the authors address other important concepts such as ethics and social responsibility, forms of ownership, small business concerns and entrepreneurship, and international business. This edition is filled with cutting-edge content, including up-to-date information on the economic crisis, social networking, competition in the global marketplace, and the green movement, as well as suggestions on how to manage a business in the midst of economic ups and downs.



Sustainable Event Management: A Practical Guide

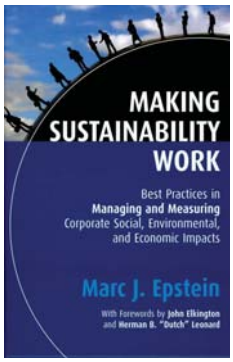
By Meegan Jones

Routledge; July 2014

Gatherings of people for a purpose always have and always will be a part of the human story. Those staging these events have a social and environmental responsibility to manage their impacts and enhance their positive lasting legacies. Written by a leader in the field, this book is a practical, step-by-step guide taking readers through the key aspects of how to identify, evaluate and manage event sustainability issues and impacts - for events of any style and scale, anywhere in the world.

This updated second edition includes a detailed review of the new international standard *ISO 20121 Event Sustainability Management Systems* along with other recent standards and certifications. It expands detail on measuring and reporting event sustainability performance outcomes with explanation of the Global Reporting Initiative Event Organizers Sector Supplement performance indicators.

This is the indispensable one-stop guide for event professionals and event management students who want to adjust their thinking and planning decisions towards sustainability, and who need a powerful, easy to use collection of tools to deliver events sustainably.



Making Sustainability Work: Best Practices in Managing and Measuring Corporate Social, Environmental, and Economic Impacts

By Marc J. Epstein and Adriana Rejc Buhovac

Berrett-Koehler Publishers, April 2014

Most companies today have some commitment to corporate social responsibility, but implementing these initiatives can be particularly challenging. While a lot has been written on ethical and strategic factors, there is still a dearth of information on the practical nuts and bolts. And whereas with most other organizational initiatives the sole objective is improved financial performance, sustainability broadens the focus to include social and environmental performance, which is much more difficult to measure.

Now updated throughout with new examples and new research, this is a complete guide to implementing and measuring the effectiveness of sustainability initiatives. It draws on Marc Epstein's and new coauthor Adriana Rejc Buhovac's solid academic foundation and extensive consulting work and includes best practices from dozens of companies in Europe, Asia, North America, South America, Australia, and Africa. This is the ultimate how-to guide for corporate leaders, strategists, academics, sustainability consultants, and anyone else with an interest in actually putting sustainability ideas into practice and making sure they accomplish their goals.

Greening Health Care: How Hospitals Can Heal the Planet

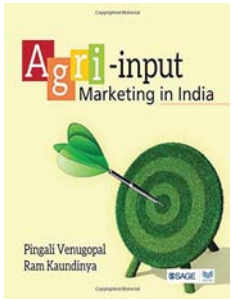
By Kathy Gerwig

Oxford University Press, August 2014

The relationship between hospitals and the environment is defined by a glaring contradiction: as health care facilities deliver care at any cost, their environmental footprint -- pollution, waste production, unsustainable food services -- contributes to harming community health.

Greening Health Care examines the intersections of health care and environmental health, both in terms of traditional failures and the revolution underway to fix them. Authored by one of the pioneers in health care's green movement, it presents practical solutions for health care organizations and clinicians to improve their environments and the health of their communities. Topics include: making food services sustainable, managing hospital waste, and relevant impacts/mitigating measures related to climate change.

As environmental protection grows into an imperative for all aspects of society, *Greening Health Care* offers an historical and practical approach to sustainable health care delivery.



Agri-input Marketing in India

By Pingali Venugopal, Ram Kaundinya

Sage Publications, July 2014

Agri-input companies have played a significant role in transforming the post-Independence "ship-to-mouth" Indian economy, dependent on food grain imports, into a self-sufficient economy. Though agricultural productivity is declining and environmentalists are questioning the use of agri-inputs, Indian agriculture cannot do away with agri-inputs. This book, after understanding the past policy environment, agri-input marketing, and promotion strategies of both the government and private companies, suggests frameworks for agri-input marketing companies to align their strategies to the new objective of sustainable agriculture.

The book will serve as a text for students in the agribusiness management programmes and also as a guide for practicing managers and policy makers.

Advanced Training Programme on Energy Efficiency

Sep 25- Sep 26, 2014, Sun & Sand, Maratha hall, Pune, Maharashtra

http://www.cii.in/

CII – Training on CSR Management @ Chennai

Sep 26, 2014, HOTEL HILTON, Chennai

http://www.cii.in/

4th International Green Manufacturing Summit Leadership through Technology and Innovation

Sep 30, 2014, Shangri- La, New Delhi

http://www.cii.in/

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

CII Karnataka Conference on Infrastructure and Technology Opportunities in Smart Cities

7th October 2014, Vivanta by Taj, M G Road, Bangalore

http://www.cii.in/

National Conference on Environment and Biodiversity of India

4th to 5th October 2014, New Delhi, Delhi, India

http://www.neceer.org.in/2013/12/ebi-2014.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

India Renewable Energy Summit

9th & 10 October, Gujarat

http://www.indianrenewableenergysummit.com/

3rd International Conference on "Energy Technology, Power Engineering & Environmental Sustainability"

18th to 19th October 2014, New Delhi

http://www.krishisanskriti.org/energy.html

Bio Energy 2014, Summit

Oct 15, 2014, Hotel Shangri La, New Delhi

http://www.cii.in/

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

Invitation to the 'Training Course on Solar Powered Pumping Systems Sustainable Solution for Drinking Water Supply- Focus on Planning, Designing, Quality Control and Installation'
IPHE & WatsanCAD Solution, Bhopal
http://www.indiawaterportal.org/events/invitation-training-course-solar-powered-pumping-systems-sustainable-solution-drinking-water

Training programme on SOCIAL IMPACT ASSESSMENT
http://www.cseindia.org/content/training-programme-social-impact-assessment-0

Solar Energy Course
https://www.edx.org/course/delftx/delftx-et-3034tu-solar-energy-1996#.U61J7LHNk69

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/

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/

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

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
Symbiosis Institute of International Business
http://www.siib.ac.in/programmes.aspx