A compilation of stand-out eco practices from the world over shared by Wiproites.

A part of Wipro’s Sustainability Report 2008-09
This compilation of twenty eight eco practices is a contribution by Wiproites. They are some fine examples of green practices from across the world, carefully handpicked from a large number of entries. These stories have been so chosen because they stand-out in our trying times - they inspire us, they trouble us, but importantly, telling us what more can and should be done. They tell people about the hard work and efforts put in by communities and countries to bring about eco awareness and in some cases a more conscious way of living. These practices have been brought to life especially for this report by some very real and soul-searching illustrations by Wiproites and a few amateur student artists from some of Bengaluru's finest art institutions. For an easy understanding of the stories we have categorized them into the following five sections. These sections all meet to form a common mosaic but different elements shine in the forefront of each: Communities at the forefront; Conservation at its best; Green innovation; Sustainable agriculture and Sustainable cities.

Preamble
This section comprises inspiring stories of individuals or communities that have always put the environment before themselves, bringing about a sea change in the attitudes and mindsets of people and helping them live a better life.
The Bishnois are a nature-worshipping community from the Marwar region of Rajasthan, India. They were founded by Guru Jambheshwar (b. 1451) after a severe drought in the Marwar region of Rajasthan in India. The Guru formulated 29 principles to lead a harmonious life with nature, and these principles are still practiced by the Bishnois. One of the most important principles is the ban on killing animals and the felling of trees. Even today, the Bishnois live by this principle and consider trees and animals as sacred beings.

No wonder they have emerged as the true champions of nature conservation. So strong is their conviction to protect their trees and animals, that they would go to any extent to achieve that; even take on an empire to save their trees. Such is the conviction of the Bishnois from Rajasthan - a community of nature worshipers, whose stories of nature conservation are now legendary.

Her young daughters were not daunted and offered their heads too. Seldom will you come across a community that so strongly believes in living in harmony with nature, that they would go to any extent to achieve their convictions and save their trees, even at the cost of their own lives.

The story of Amrita Devi is one such example. The story goes back to 1730, when Amrita Devi, a Bishnoi woman was at her home with her three daughters, Asu, Ratni and Bhagu Bai. She learnt that a number of people had descended on their otherwise sleepy village of Khejarli, named after the 'Khejri' trees (Prosopis Cineraria) found in abundance in their village. The people were the men sent by Maharaja Abhay Singh, the ruler of the Kingdom of Jodhpur. Their mission was to fell the green Khejri trees to burn lime for the construction of the Maharaja’s new palace.

Amrita Devi swore to protect the trees with her life. She hugged a tree as she protested against the Maharaja’s men, but in vain. The axe that was brought to cut down the tree, severed her head as well. Her young daughters were not daunted and offered their heads too. Seldom will you come across a community that so strongly believes in living in harmony with nature, that they would go to any extent to achieve their convictions and save their trees, even at the cost of their own lives.

This stand-out green practice contribution was shared by P S Narayan* Bengaluru, India
In Uttaranchal, the Dev Vans are classic examples of participatory management. The Dev Vans are sacred groves, as the name itself suggests, and they are offered to the local deity to conserve the resources. The Dev Vans in various parts of Uttaranchal are of immense importance and exhibit a broad typology and socio-religious mechanism of regulating the use and conservation of resources.

The Dev Vans in some of the villages here are magnificent examples of deep ecological insight of the traditional societies and their conservation practices. It appears that unlike other parts of India, the need for sacred groves is associated with a resource crisis and the fear of deity's curse. The need for sacred elements in conservation seems to be associated with a resource crisis. It is observed that generally those forests which are victims of over-exploitation, are offered to the deity. While offering the forest, the community first holds a meeting to decide how much area has to be offered and what type of sanctions will be imposed. It is worth noticing that Dev Vans are offered to deities who have a significant place in the socio-religious life of the local people and the fear of these deities prevails among the villagers, preventing them from entering the forest to destroy it. Untimely death, epidemic, famine, wild animal attacks, etc. are considered as the deity's curse if the sanctions are violated. This also reveals how a community imposes a ban on its members to conserve the forest.

Dev Vans are ecosystems in themselves as they perform all ecological functions, nutrient cycling, water recharging, conservation of bio-diversity, prevention of soil erosion and in mountain areas, often prevent landslides besides harboring many key species. Dev Vans not only contribute to the green cover, they also help conserve bio-diversity without any financial burden on the communities.

In the institution of sacred forests or Dev Vans, local communities dedicate patches of forests consisting of many species or a clump of trees to their local deities or ancestral spirits. It is estimated that over 50,000 sacred groves have so far been reported from different parts of the country.

Today, the main challenge in the Himalayas is to conserve the rich vegetation wealth and biological ecological balance using human skills and traditional wisdom in an ethical way. Degradation of forests in many places has reached a stage from where recovery is difficult. In such situations, forests can be conserved and rights can be restored to the villages to help them protect their resources.

This stand-out green practice contribution was shared by Sudipta Ghosh* Kolkata, India
Sahyadri Nisarga Mitra (SNM) is a leading non-government organization (NGO) in India engaged in conservation, education and research on nature. The organization has been instrumental in bringing about a sea change in the way people think about conservation. The very people who engaged in selling hatchlings for petty gains today have become their protectors and conservationists!

As an organization, SNM has been involved in conservation along the Western Ghats. Their commitment to protect some of the most endangered species in the country has been achieved through innovative ideas and through involvement of the local community at every stage of the project. Some of the projects involved by SNM  include:

- The conservation of Marine Turtles
- The study of White Rumped Vultures
- The conservation of Indian Swiftlets
- The study and conservation of White Bellied Sea Eagles

But what really catches the imagination is their ongoing project on Marine Turtle conservation in the entire coastline of the State of Maharashtra in Western India.

The Marine Turtles have been threatened with extinction in most parts of the world. Maharashtra was no exception. The coastlines here too faced similar issues like all the coastlines across the world. The debate between development and ecology was fierce. People had been harvesting Marine Turtles and their eggs for livelihood. The accidental mortality associated with shipping, trawling and other fishing operations is too high. Poachers and traders were selling hatchlings for petty amounts, but worst of all was the total insensitivity of the local community towards these animals.

SNM started Marine Turtle conservation in Maharashtra on the 1st of October 2002. In the very first year, they protected 50 nests of Olive Ridley (Lepidochelys Olivacea) and released 2,734 hatchlings at Velas in Ratnagiri district of Maharashtra. In the next 3 years, this project was extended to the entire 720 km coastline of Maharashtra. From 2005 onwards, 152 nests have been protected and 7,610 hatchlings were released into the sea.

Awareness programs were also arranged along the entire coastline. This project has remarkable achievements; most important being the change in the way the local community has adopted conservation as one of their own.

They created a source of income for the locals by getting them to participate in the project, which included the Annual Turtle Festival. One of the high points of this festival is the release of hatchlings from nests that have been protected by local volunteers in the area.

This stand-out green practice contribution was shared by Kirti Azad.

*A note from the editor:* This article is an excerpt from the book "The Green Revolution in India," which explores the impact of various environmental initiatives in India. The book highlights the importance of community involvement in conservation efforts and the role of NGOs in driving positive change. The excerpt focuses on the work of Sahyadri Nisarga Mitra in protecting Marine Turtles along the Western Ghats of Maharashtra, showcasing how community engagement and innovative conservation strategies can lead to significant ecological and social outcomes. The story emphasizes the transformation of local communities from poachers to protectors, exemplifying the power of education and partnership in the preservation of endangered species and their habitats.
WATER IS THE REAL WEALTH
The DHAN community action.

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DHAN, a New Delhi-based NGO working with the farmers in Tamil Nadu, India, to create water-users associations.

Illustration - Tushar Barman

DHAN is a New Delhi-based NGO working with the farmers in Tamil Nadu, India, to create water-users associations.

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If the nearly 39,000 tanks that recharge the groundwater in Tamil Nadu, more than one-quarter of them are small minor irrigation tanks. The health of water in these tanks is dependent on the rigor of the users. Thus, developing the skills of the farmers to manage them is crucial, as well.

There was a ray of light in the lives of farmers dependent on these small tanks and lakes for their agricultural needs, when C R Shanmugam, a civil engineer who had retired from Anna University came to their aid. Along with PRADAN (Professional Association for Development Action), a Non-Governmental Organization based out of Delhi, C R Shanmugam began motivating villagers to revive the age-old system of farmers managing the tanks themselves. He began organizing farmers into water-users associations. “We are only facilitators, motivating the people and training them in water management, improved agricultural practices, loans and techno-managerial support”, says the professor.

With nearly 20,000 tanks to undergo renovation at a cost of $6 thousand per tank, the funds needed worked out to around $13 thousand. The villagers contributed about 25% of the project cost. PRADAN insisted that the people must have a share in every aspect of the work. This was despite the government’s willingness to fund the entire project.

The work involved removing encroachments, which frequently entailed legal complications, besides desilting feeder canals and tank systems. To help smoothen this process, DHAN (Development of Humane Action), an offshoot of PRADAN, took over the project. DHAN has so far formed 175 water-users associations, benefitting about 7,000 to 8,000 small or marginal farmers. It also provides funds for community wells - at a cost of $4 thousand - which supplement tank water and provide conjunctive use of surface and groundwater.

Today, the program is fast expanding into a movement. The success of the program has been extraordinary as the people do not leave any task unfinished. They realize that their contributions will ensure their right to own and manage the system. This will also guarantee that the quality of output is high, that agricultural practices are diversified and production is enhanced. Farmers believe that it will make their children happy and provide them with better opportunities in life. Today, the program is fast expanding into a movement. The success of the program has been extraordinary as the people do not leave any task unfinished. They realize that their contributions will ensure their right to own and manage the system. This will also guarantee that the quality of output is high, that agricultural practices are diversified and production is enhanced. Farmers believe that it will make their children happy and provide them with better opportunities in life.

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Hivre Bazaar, a small village of about 217 households in the Ahmednagar District of Maharashtra, India, until 1989 was just another non-descript village which had all the trappings of an unproductive life. All that changed, when the villagers decided to get the most educated man in the village - Popat Pawar, to contest elections for the post of sarpanch. Despite opposition from the family, he contested and became the sarpanch for a year. During that period, he worked to improve the 'moral environment' of the village as he believed that was the only way forward. Due to the 'bad reputation' of the village, teachers deputed to the village school often considered it as a punishment posting. The village needed to change that image desperately, hence a request for good teachers was made to the district administration. This was their first step in the right direction. The following years saw concrete steps being taken to improve the standards of education and the environment.

Today, the village has emerged as a role model. The recognition has spread far and wide - DRDA is extending financial assistance for the construction of a training center for the sarpanches. Maharashtra got its first National Productivity Award due to the work done in Hivre Bazaar.

However, the most remarkable change one can see in the village is the environmental awareness among the villagers. In the popular Ganpathy Utsava, instead of each family buying an idol of Lord Ganesh, which is the usual practice, today the entire village gets together to buy one idol. This has resulted in huge savings and also gets the community one more reason to get together.

One other instance where we can see the change in the mindset of the people of Hivre Bazaar is during the ‘Samodayik Kheti’. Since finding labor was a big problem, the villagers came up with the idea of helping out each other by working collectively in each other’s lands. This not only solved the problem, but also created an environment of social cohesion, where people readily come together and work together.

The stand-out green practice contribution was shared by Veena Padmanabhan*
Gurgaon, India
SHABDO
A merger of land and hearts spreads light.

Children in the village of Shabdo have just learnt a new lesson, from a cluster of houses at war with one another, Shabdo has been transformed into a community. Collective farming has increased wheat production by at least 25%. Earlier, the rich and powerful captured the limited water in the ahar, a pond that is part of an ancient water management system in the region. Now, whatever is cultivated is shared proportionately. There is a smile on every child’s face. They all wear the same color to the school. Even the farmers have a uniform. There are no piles of garbage in the lanes of this village of 40 homes. Their cattle will now be kept at a common shed, which is under construction. The story of Shabdo, in the middle of the highly sensitive Naxalite area on the Bihar-Jharkhand border, is a rare tale of people’s will overcoming state apathy.

Shabdo is among the 40 villages on a 45 km long, centuries-old, defunct canal system. The ahar - paine system, believed to be a 4th century BC invention, connects village ahars (tanks) to a river or stream through a paine (canal) and small branch canals. During the monsoons, the river water flows into the tanks — as there is no dam across the river. From the ahars, water is carried to the farms according to the needs. In the 18th century, Vidhata Singh, a landlord in the village of Patna’s Taranpur, is said to have adopted it. It soon spread in the entire region but had been defunct for the last 60-70 years, until a couple of activists opened their eyes to it. Land in Shabdo was infertile and the villagers worked hard to revive the canal. They added more land and crops to their farming over the last three years. When the Zilla Parishad gave them Rs. 22 lakhs, they donated the land to build a community center, Anganwadi and a playground. In a place where no one trusted anyone, building material for the entire project was raised on credit from local shops. As trust and collective interest grew, they broke the boundaries between their farms.

The village of Shabdo has no boundaries, any longer. Farm boundaries and sometimes alcohol had been the source of all problems and fights here. People were killed over the grass grown on the boundary or over sharing water. But Shabdo, instead, has transformed into something truly spectacular, a merger of land and hearts.

The change is palpable and the villagers are happy. Every evening, men and women gather at the community center to discuss what amount of land should be marked for potatoes, the next week’s roster and immunizing children. Most of the villages are now alcohol-free. The villagers use one man to manage the irrigation channels. Earlier, everyone would be doing it and squabbling,” says Bhushan, a villager.

The stand-out green practice contribution was shared by Sudipta Ghosh, Kolkata, India.
This section deals with stand-out stories of conservation of nature’s precious bounty. Some of the stories are about the exemplary passion and grit of communities and people, while others illustrate the power of age-old practices that have stood the test of time.
FUROSHIKI
The art of wrapping a world of goodness.

Furoshiki derives the name from the Edo period practice of using wrapping cloth to bundle clothes while at the sentô or public baths. Originating from Japanese culture, where it promotes caring for the environment and reducing waste; Furoshiki is the eco-friendly wrapping cloth. Using techniques similar to Origami, it can be used for gift wrapping, grocery shopping or simply as decor available in a wide variety of sizes and designs. Furoshiki's versatility can actually help reduce the impact on our environment.

Furoshiki became popular due to its flexibility when it came to wrapping odd-sized gifts. Besides, these gifts also needed to be secure during transportation. Hence Furoshiki became the preferred choice of wrapping gifts, clothes or other goods. Its versatility allowed it to be used not just for wrapping, regardless of shape or size. The result was a revolutionary new way to carry and handle clothes. Eventually, Furoshiki's usage extended to serve as a means for merchants to transport their wares or to protect and decorate a gift.

Modern Furoshiki is made of a variety of cloths, including silk, chiffon, cotton, rayon, and nylon. Furoshiki are often decorated with traditional designs. It’s lightweight and strong, allowing it to be folded and transported easily. Despite its roots dating back to ancient times, Furoshiki has seen a recent surge in popularity due to growing interest in consumers to buy more eco-friendly goods. Furoshiki has been adopted not just in Japan, but also in many parts of the world. Recently, the Japanese Minister for the Environment, Yuriko Koike, created a Furoshiki cloth to promote its use in the modern world.

There are scenes traditions that can be recognized for centuries without losing their essence and appeal. Furoshiki is such a tradition that has its own renewable and modern form. This stand-out green practice contribution was shared by Veena Palanikkar.

In contemporary usage:
Furoshiki has been used extensively to produce traditional Japanese 'bento' boxes or lunch boxes. They are used gladly to make handles for travel bags, leisure bags and even umbrellas, either in the original form or in the form of a derived material. Even after hundreds of years, it remains one of the most commonly used materials in Japan.

Other uses of Furoshiki are in the making of textile fabrics, such as 'Tenugui', a thin Japanese hand towel; and even 'Yukata', a Japanese summer garment.

*Furoshiki draws its name from the filo method of using a wrapping cloth to bundle objects inside without the use of pins or clips.*
An accidental stumble by Mohammed Dilawar on the declining numbers of house sparrows in Britain led to one of the most dogged struggles to save the house sparrows in India.

The house sparrow was once so ubiquitous across India that it appears in folktales and songs. In 2005, when Dilawar stumbled upon a study of the declining population of house sparrows in Britain, he suspected that India was heading the same way, especially in fast-growing urban areas. As Dilawar realized, the fate of the diminutive bird was a portent of larger problems. “The sparrow is to urban ecosystems what the canary was to mines,” he explains. “That it is dying out, means our cities are in trouble.” Dilawar scoured journals and libraries for studies to confirm his inkling, but found only one — a report by the Indian Council of Agricultural Research recording a dramatic drop in sparrow population in southern India. So he determined to remedy what he calls a “criminal lack of scientific aptitude,” starting out by conducting a nationwide survey of the sparrow population — an ambitious project that will take years to complete.

In the meantime, Dilawar is doing what he can, to protect the tiny birds. There is, it seems, a lethal combination of reasons for the sparrow’s decline. Modern architecture and shrinking gardens and parklands have rendered sparrows homeless, since they like to nest in nooks and crannies. Meanwhile, use of pesticides has killed the bugs the bird needs, to feed its young.

Among India’s tiger-obsessed conservationists, Mohammed Dilawar is an oddity. The former lecturer in environmental studies once turned down an offer to work with tigers, dedicating himself instead to saving the sparrow. Using his own money, from his home in Nasik, Dilawar runs a project to preserve what he believes is one of India’s most threatened birds.

SAVING THE INDIAN SPARROW

It’s happening at Nasik, India.

Dilawar has taken the bird’s plight to heart. “One day, I saw a sparrow building its nest in the switch box of a telephone pole,” he says. “I thought I should try to give a little help to this hardy little resident.” And so from then he began to bring telephone switch boxes. After experimenting at home, he started manufacturing and selling them on a non-profit basis. In less than three years, he sold more than 1,000 of these ‘nests’ and bird feeders.

Dilawar concedes that this is just a tiny step. “We need to involve the government and the scientific community,” he says. “We need grants and funding for research.” He says that his biggest problem is lack of funds and coordination. He believes that the government and the scientific community must do more. “We need to plant hedges and trees — we need to use chemical pesticides near our homes. But our children must know the value of these birds.”

Dilawar says that his project is just a step. “We need to involve the government and the scientific community.” He says, “We need grants and funding for research.” He says that his biggest problem is lack of funds and coordination. He believes that the government and the scientific community must do more. “We need to plant hedges and trees — we need to use chemical pesticides near our homes. But our children must know the value of these birds.”

This stand-out green practice contribution was shared by P S Narayan.* Bengaluru, India.
Johads are ingenious traditional methods of collecting and storing water and replenishing ground water levels in the Aravalli region of Rajasthan. In the night of October 2, 1985, when I got down at the last stop of the bus at Bheekampura with four of my friends, we had only one single agenda, which was ‘to fight injustice against the people’. And we only knew one way to do it, by spreading literacy in the villages. So we promptly started a literacy drive. But the people were suffering from a severe scarcity of water. The region that once sustained the eco-system of the ‘Arvalli’ had become barren.

One day, Mangu Patel, the wise old man of this village told me, “we do not want your literacy, we want water.” But where was the water? Mangu Patel explained to me about the rich tradition existing in this region of building Johads, an inexpensive way to recharge groundwater levels. Johads are simple mud barriers, concave shaped, built across the slope to arrest the rainwater run-off with a high embankment on three sides while the fourth side is left open for the water to enter.

Water collected in a Johad during monsoon penetrates into the sub-soil. This recharges the groundwater and improves the soil moisture in vast areas, mostly downstream. The advantages of this structure are that apart from arresting and storing rainwater, it checks soil erosion, mitigates floods, and ensures water availability in wells. Also, during the dry season when the water gradually recedes in the Johad, the land inside the Johad itself becomes available for cultivation. This land would have been barren and dry during the dry season and that shows growing crops without any irrigation.

By 2001, nearly 9,000 water harvesting structures were built, in more than 1,000 villages. When the work started, this area was classified by the government as a ‘dark zone’, which means ‘with severe water shortage and the water level had receded to difficult depths’. The same area after 10 years was classified as a ‘white zone’, which means ‘underground water levels are satisfactory and it does not need attention from the government’.

Prosperity returned to the region, agriculture became prosperous and due to availability of fodder, cattle rearing started, resulting in increased productivity of milk. Higher water levels also meant less money on the diesel for pump sets.

(This is an excerpt from an article written by Rajendra Singh, who is the winner of the 2001 Ramon Magsaysay Award for Community Leadership. Rajendra Singh has also been widely appreciated and recognized for his work on water harvesting.)

This stand-out green practice contribution was shared by Sudipta Ghosh.

Kolkata, India.
Found in most parts of Southeast Asia, the banana is an integral part of many cultures and many cuisines.

If there is one tree that has a thousand uses, it has to be the banana tree. Bananas come in a variety of sizes and colors when ripe, including yellow, green, purple and red. Bananas can be eaten raw, though some varieties are generally cooked first when raw. The flesh can vary in taste from starchy to sweet and texture from firm to mushy. Unripe or green bananas and plantains are used for cooking various dishes such as vegetables to accompany rice, kheer or banana pudding and is the staple starch of many tropical populations. Banana sap is extremely sticky and can be used as a practical adhesive. Sap can be obtained from the fruit peelings, or from the fruit flesh.

Local sale is mostly of green bananas and plantains, as ripe bananas are easily damaged during transportation to the market. Even when transported only within the country of origin, ripe bananas suffer a high rate of damage and loss.

In addition to the fruit, the flower of the banana plant (also known as banana blossom or banana heart) is used in Indian, Tamil, Bengali and Burmese cuisines. In a tray, bunches of green bananas surrounding a green coconut is a popular offering to the Buddha and the Nats. In India, ripe banana flower is used in the red-blooded banana (Musa balbisiana), a large, flexible and waterproof leaf that is used in many ways, as umbrellas and to wrap food for cooking or storage. Banana leaves are also used to serve food (to eat from as a plate) in India and other Asian countries.

In Indonesia, banana sap is extracted from the tender core and used as a diuretic. The sap is also used to extract the juice from the corm and used as a home remedy for jaundice, sometimes with the addition of honey. A local practice contribution was shared by Bableen Johal, Bengaluru, India.
The Silent Valley in Kerala is one of the few places in India devoid of human habitation. The total area of the Valley is 90 sq km, and is surrounded by high ridges. It is one of the few places in India with no human habitation. Silent Valley has always been difficult to reach, even on foot, and the total area of the Valley is 90 sq km. It is home to the world’s largest population of the endangered Nilgiri Tahr, which is one of the few places in India with no human habitation. Silent Valley was declared a National Park in 1985 — which meant that no project could come up in the area. Silent Valley was declared a National Park in 1985 — which meant that no project could come up in the area. The Government of India advised the state to abandon the project. Silent Valley was declared a National Park in 1985 — which meant that no project could come up in the area. Silent Valley was declared a National Park in 1985 — which meant that no project could come up in the area. 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Vedantangal is a thriving bird sanctuary situated just 90 km from Chennai. It is situated in the Kanchipuram district of Tamil Nadu, about 90 km from Chennai, the Vedantangal Bird Sanctuary is the oldest bird sanctuary in India. For over 200 years, the villagers around the district have zealously protected the winged visitors to this sanctuary. They know that the large numbers of birds translate into droppings. This in turn means they have plenty of guano - one of the finest natural fertilizers. The birds in the process also devour many of the harmful insects, pests and rodents.

It is amazing to note, this symbiotic relationship has been in existence for over 200 years here. Consequently, the fertility of the land, as well as the crop yield per hectare in and around the Kanchipuram area is high, thanks to the villagers' protection of the birds here. This is a many ways symbiosis - the recognition which is the recognition of mutual benefit. Archival records of the area show that towards the end of the 18th century, local villagers complained to the then Collector, Lionel Place, about the indiscriminate shooting of birds by British soldiers. The Collector issued a 'firman' (order) prohibiting any shooting of the birds in the entire district. The East India Company recognized the villagers' right and renewed the order in the year 1858. Subsequently, in 1936, the lake was first recognized as a sanctuary under the Madras Forest Act. Ten years later, the entire lake was declared a Wildlife Sanctuary under the Wildlife Protection Act. Today, the villagers protect the birds with the same care. They help the villagers, who live here, and enjoy the fruits of their conservation efforts. They know that their lifestyle has meant better for the birds and their habitat.

A recent bird census put the count of birds who visit the area at 50% more than last year and much more than the numbers during the past several years. The sanctuary comprises of a grove of Barringtonia, Acacia, Nilotica trees in a large tank. In addition, there are evergreen scrubs and thorn forests. It is during the monsoons, that the sanctuary comes alive as the rains bring in a new lease of life to the main lake, to the small ponds lining its periphery and adjoining paddy fields. Suddenly, there is greenery, fresh tender leaves and a proliferation of aquatic prey, making it the most ideal sanctuary for the birds.

Not very often will you come across a story where people of a village change their lifestyles to suit the comfort of their winged visitors. In fact, people living around Vedantangal go to the extent of having silent marriages and extremely muted celebrations during the breeding months. They know the value of silent meetings and extremely muted celebrations are shared by Narasimhan P L L, Chennai, India.
Innovations, common sense and plenty of hope: that’s what one can expect from this section. Featuring stories of grit and determination, these green practices are definitely an inspiration for all of us.
RAJASTHAN
Building the world’s biggest solar kitchen.

According to a BBC World Service TV program, during the intense summer months in Rajasthan, India, the output of the solar cooker has been sufficient to cook 38,500 meals per day.

The goal was to build a 20,000 seat auditorium, dining facilities and simple accommodation for 15,000 people. In order to maximize output, a new design concept was developed jointly by Wolfgang Scheffler and Eco Center. Both organizations had also worked on the first system at the Academy, together with the World Renewable Spiritual Trust’s Department of Renewable Energy. The improved parabolic concentrators are oval in shape and each has a reflective surface area of 9.2 sq mt. Each concentrator reflects sunlight with an optical reflection rate close to 93%. Each disc has a maximum output of 400 KW solar radiation reaching temperatures up to 800°C at the focal point.

The system works on the thermo-siphon principle so that each concentrator’s well-insulated header pipe itself acts as a steam reservoir, obviating the need for a separate steam generator, heat exchanger or electrical back-up for circulation pumps, and thereby increasing efficiency and preventing disruption by power cuts. The day-to-day operation and maintenance of the system is easily handled by a team of three local residents.

Features incorporated in the system include a water-softening system to prevent salt formation in the header pipes and receivers, a pressure reducer station to maintain consistent steam flow and a high-efficiency diesel-fuelled back-up system for days of low solar radiation or extra demand, to ensure round-the-clock steam availability. The only time that the back-up is put to full use is during the monsoon season, when a period of about eight weeks, it is not feasible to rely on solar functionality. The system is protected against excessive pressure by safety valves and an automatic shutdown mechanism, while temperature and pressure meters and a computerized six-channel data logger monitor the status of the system as a whole.

Installation was completed in January 1998 and the system, through all six of its modules, can generate 3,500 kg of steam per day, which is then recycled, water softened, and fed to the cooking processes. Figure 1 shows the layout of the system. In an extreme case of low solar radiation, the system can supply sufficient steam to meet a minimum of 20,000 meals per day. Although originally designed to cater to 20,000 meals per day, during periods of peak solar radiation the system’s output has been sufficient to meet a maximum of 38,500 meals per day. Supported and approved by the MNES, the system attracts considerable attention and was described in the BBC World Service TV program as the largest solar cooker in the world.

This stand-out green practice contribution was shared by Mahathi Nethi.* Hyderabad, India.
The Eden Project is the world's largest greenhouse, housing plants from all around the world and an extremely popular visitor attraction in the United Kingdom.

The Eden project is built in many phases. Phase 1 - the Visitors' Center - is built on the apex of the 15 hectare site, offering dramatic views down into the former clay pit. It functions as the 'gateway to Eden', housing ticketing halls, shops, restrooms and educational galleries.

Phase 2 - the project refers to the ‘biomes’, a sequence of great transparent domes that encapsulate vast humid tropic, warm temperate regions and the building which links them together. The exact location of the biomes on site has been determined by Solar Modeling, a sophisticated technique that indicates where structures will benefit most from passive solar gain. The architects have capitalized upon this gain by cladding the biomes with ETFE (Ethylene Tetra Fluoro Ethylene) foil. ETFE is highly transparent to a wide spectrum of light. As a lightweight material, it is capable of covering wide spans supported by the most minimal of structures. This ensures that the maximum amount of daylight filters through the biomes' skin to nourish the plant life within and as the foil is triple-layered within the frame of each hexagon, its heat is retained. There is an active heating system in place to fine-tune the biomes, but this is supplementary to the natural solar system. Similarly, ventilation and water strategies have been devised, with the aid of advanced Computational Fluid Dynamic Studies, to simulate natural systems. Illustrations are recorded in transformation. A few ground water sources, up mineralized problems in the biomes, have been identified. These have been utilized to augment the natural systems. Passive solar gain is being harnessed within the biomes for irrigation purposes. The Eden Project guarantees about 4% of all rainwater. Experience has shown that about 45% of all rainwater is collected and 75% of all rainwater is stored. It is estimated that the project will also create around 1,700 full time employment (FTE) jobs to other local businesses that have benefitted from the success of Eden in terms of increased turnover and profitability. Phase 3 - the Eden Foundation - was completed in 2003. The Core, which is part of the fourth phase of development, officially opened in September 2005. A third biome (dedicated to the Dry Tropics) is in planning.

The Eden Project, a $77 million showcase for global biodiversity, is one of the most monitored and high profile environmental projects. It is the largest plant endeavor in the world and its development represents a significant environmental improvement for the site - a landfilled china clay pit - and the surrounding landscape.
Camanchacas or fogs occur in the arid coastal areas of Peru and Chile, South America.

**BELLA VISTA FOG**

How to gather hundreds of gallons of fresh water from fog?

When people from rural Peru move into Lima, the capital, they often choose to live on steep hill slopes high above the city. These people have to climb up and down the steep hill and carry heavy loads of food and other supplies every day.

**Fog Collection**

Fog collection works not by condensation, which is what happens when water vapor hits a cold surface and transforms into a liquid. In fact, the water in fog is already in liquid form - as very tiny droplets. The fog collectors look like giant volleyball nets, 13 feet tall and 26 feet wide. The nets are made of nylon mesh and are attached to a pair of wooden poles. The top of each net is 18 feet above the ground. The nets catch the tiny droplets of water as they pass through the fog. As the droplets stick to the net, they clump together and form drops that eventually fall into a gutter. From there, the water flows through tubes into two brick tanks and a pool which together hold more than 25,000 gallons of water.

The village of Bella Vista with a population of about 200 people was founded seven years ago in the hills, 10 miles south of downtown Lima. Villagers have had to buy water for everything - cooking, cleaning and drinking. From trucks that drive up the steep hill every week. The residents pay two times as much as people farther downhill, who are connected to the municipal supply. A family of four pays up to $7 - 10 a week for water. For a family with an annual income of about $40 a week, this means that the family spends a huge part of its income on water resources.

When the Bella Vista fog-catcher project began in 2006, people from the village did all the heavy lifting and digging. They had to carry 44 pound bags of sand about 800 feet up the steep hill to stabilize the nets and build pools to gather water collected by the fog catchers. Some of these men thought the idea sounded a little crazy.

The village of Bella Vista has a stand-out green practice contribution was shared by Venkata Prakash Gudipudi* Hyderabad, India.
Seawater greenhouses have been successfully used to produce fresh water and cultivate crops on the Canary Island of Tenerife and on Al-Aryam Island in Abu Dhabi in the United Arab Emirates. By combining natural processes, simple construction techniques and mathematical computer modeling, the Seawater Greenhouse offers a sustainable low-cost solution to the problem of providing water for agriculture in arid, coastal regions and a sustainable approach to desalinization. The greenhouses are built of timber on a galvanized steel frame with polythene cladding, pipe-work and cardboard evaporators. All materials are available locally, at low cost, and can be completely recycled. Air entering the greenhouse is cooled and humidified by an evaporator which provides good climatic conditions for crop growing. As the air leaves the growing area, it passes through a second evaporator which has hot seawater flowing over it, heated from the greenhouse roof canopy. Fresh water condenses out of this hot and steamy air stream when it is cooled by water circulated through a condenser. The volume of fresh water is determined by air temperature, relative humidity, solar radiation, and the airflow rate.

Choosing the project as one of the three finalists from 265 entries in the 2007 contest, the St. Andrews Prize for the Environment noted that this technology provides pure distilled water and food which could benefit more than the countries with arid coastlines near the sea, as well as areas of the world that face drought, salt infected soil, high temperatures and scarce water supplies. The greenhouses also provide a new income stream for local communities, with the compost from local waste being used to generate energy for the greenhouses. This stand-out green practice contribution was shared by Venkata Prakash Gudipudi of Hyderabad, India.
The most influential of modern architects, Laurie Baker has left an indelible impression on young architects and the Kerala Tourism industry, India.

Laurice Wilfred ‘Laurie’ Baker was an award-winning British-born, Indian architect, renowned for his initiatives in cost-effective, energy-efficient architecture and for his unique space utilization and aesthetic sensibilities. During the course of his career, he made a name for himself both in sustainable as well as in organic architecture. For his efforts in popularizing low cost, eco-friendly architecture, in 1990, the Government of India awarded him the Padma Shri in recognition of his meritorious service.

By stressing on locally available material and innovative techniques that draw on tradition – unplastered brickwork, bamboo instead of iron rods as reinforcement for concrete, discarded bottles in lieu of stained glass, arches, frameless doors and windows - Baker has helped hundreds save precious rupees. But more importantly, he has spawned a generation of architects who have spread the message of cost-effective buildings. Many examples can be seen in several of Kerala Tourism’s projects, including the pioneering cottages at Ponmudi.

The Center for Development Studies building in Thiruvananthapuram, built during his heydays, has become a must-see destination for aspiring architects and students. It is a case study of socio-environmental organization and a beacon of social advancement and innovative problem-solving. Baker’s architectural method is one of improvisation, in which initial drawings have only an idealistic link to the final construction, with most of the design choices being made on-site. His respect for nature led him to let the idiosyncrasies of a site inform his architectural improvisations. Rarely is a topography line marred or a tree uprooted. This saves construction cost as well, since working around difficult site conditions is much more cost-effective than clear-cutting.

Baker’s architecture is thus a true manifestation of Indian philosophy.
Green consciousness doesn't necessarily have to apply only to urban areas. When it is practiced by farmers and agriculturists, the results can be very encouraging and highly infectious. This section features a few such awe-inspiring stories from across the world.

Sustainable agriculture.
Inga alley cropping is a technique of agro forestry that is saving the Brazilian rainforests from decertification. Before Inga alley cropping, the farmers in South America used a form of cultivation known as slash-and-burn. In this technique, the farmers would fell trees to clear land for growing subsistence crops. Within one or two years, the soil would be fertile and the farmers would return to the same place to plant their next crop. This continuous cutting and clearing of land ensured that the soil would be fertile for crops to grow. However, now with this new way of cropping, the farmers have stopped cutting down trees of the rainforest.

Alley cropping is not a new way of growing food, it has been tried in Africa for many years. Mike Hands, a British tropical ecologist, pioneered the Inga alley cropping in the rainforests. In this method, an agricultural crop is grown in rows made by rows of planted trees like oak or walnut. This was a long term crop and couldn’t provide any income, which was therefore compensated by the sale of other crops while the tree crop matured. Mike Hands used an Inga alley cropping method in order to conserve soil fertility by allowing nitrogen-fixing plants like Guama (Inga Edulis) to grow alongside the agricultural crops. Guama is a large fast-growing species that provides shade to the main crop, eliminating weeds, maintaining humidity, conserving nitrogen and providing fuel wood. Crop yields increase when soil fertility improves, negating the reason to chop down trees for farming. It has also led to a fixed farming culture among the South Americans.

The farmers of Sarstun in Guatemala and Olanchito in Honduras, Brazil have given up their traditional way of cultivation to follow the more environment friendly Inga alley cropping method.

Inga Alley Cultivation
The Americans learn to save the rainforests.
MADIREPALLI FARMERS
Share more than water with their neighbors.

Madirepalli, a small village in the Anantapur district of Andhra Pradesh, India is also known for its groundnuts. It is a common sight to see bullock carts loaded with groundnuts. It is also common to see women working in the fields and the proud farmers pouring in heaps of yellow groundnuts on the banks of their farm yards. In 2009, there has been a bumper harvest, not only due to good rains but also because of the community’s unique water management. This was not the situation a few years ago, when the bore wells of Madirepalli started failing and most of the old wells went dry.

Farmers in their desperation went about digging more wells only to find them dry. That’s when the field workers from Rural Integrated Development Society (RIDS), a local NGO, came up with an unusual idea of farmers sharing water from existing wells with their neighbors. Perhaps, it was the tradition and experience of sharing water in the Gonchi system which helped convince the farmers about the new idea. But still, giving away water from one’s well to a neighbor without compensation was rather an unusual way of water management, especially in a world where everything has a price tag. It took long hours of discussions to raise awareness levels and in the end a few farmers agreed. But since the situation has changed and today nearly everybody in the village participates in the program.

Siva Reddy shares water from his well with his neighbor, Pedda Obulesu, whose well has been dry for several years. Obulesu pays Rs. 600 per year to the bore well owner as a contribution towards maintenance and repairs but nothing for the water he receives. They even share the sprinkler system which was introduced after the NGO told the farmers about the benefits. The farmers’ own contribution for the equipment is just 20% of the cost, of the remainder 20% is covered by the NGO, while the major amount is given by the government, which else provides the equipment and the pipes.

So has this unusual idea solved the problems of the farmers of Madirepalli? It seems so. Distress migration has decreased and livestock population has increased. Now they can irrigate up to three times more land than before. There is a harvest every year and even in the dry season there is a harvest thanks to very good rains. But the farmers of Madirepalli would pray for the day when the canal brings in additional water, allowing irrigation on all their lands. Then they would be able to save the groundwater reserves in and around the village.
Masanobu Fukuoka, a Japanese microbiologist, was one of the pioneers of no-till grain cultivation and his system is referred to as Fukuoka Farming. Fukuoka's efforts paralleled the organic farming and gardening movement led by pioneers like Lady Eve Balfour, Sir Albert Howard, and J.I. Rodale that was sweeping Europe and the US in the 1940s. It was the realization that excessive use of chemical fertilizers kills the ability of soil to support life and spoils the natural ecosystem that provided the spark to the movement towards more ecologically beneficial and sustainable agricultural practices.

The essence of Fukuoka’s method is to reproduce natural conditions as closely as possible. This technique is usually used for growing fruit trees, vegetables, and grains like rice and barley. It is founded on the four principles of ‘no cultivation’, ‘no fertilizer’, ‘no weeding’, and ‘no pesticides’.

Since it is natural for soil to swell and grow more porous with each passing year, Fukuoka Farming does not involve ploughing, which breaks up the soil eventually causing it to become harder and denser. Creation of deep and fertile soil is the basic strategy for achieving long-term, totally fertilizer-free cultivation on a natural farm.

The principle of ‘no weeding’ or ‘weed utility’ emphasizes the positives of maintaining diversity. Weeds are also considered as part of the ecosystem. By studying and making use of the properties of weeds, they can be used to drive out a large number of other weeds. If the farmer were to grow grasses or green manure crops that take the place of undesirable weeds and are beneficial to him and his crops, then he would no longer have to weed. This would, in addition, prevent the runoff of silt. For example, growing a ground cover of white clover under the grain plants, will improve the nitrogen content of the soil. Weeds can also be used as a source of fresh fuel and wood, for they not only provide firewood but their ashes also improve the nutrient content of the soil. One of the biggest means that organic farmers use to prevent infestation – soil and water conservation – is just a few of the consequences of using pesticides. Fukuoka Farming is dependent on the presence of pests that help to pollinate crops, provide natural pest control, be useful for crop rotation, and improve soil fertility. Many farmers are finding that the use of pesticides only leads to the creation of super-pests.

Barley and rice can be grown successfully using this method. The seeds for the next season’s crop are sown before the previous one is harvested, the stems from the previous crop are allowed to remain in the soil. This technique has been practised successfully by farmers in different pockets across the world and they are enjoying a reasonable and healthy harvest every season. After all, who is a better caretaker than Mother Nature herself? Her supremacy is undeniable and insurmountable.

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This stand-out green practice contribution was shared by Teena C H*, Kochi, India.
Enabavi, a small village in the Warangal district of Andhra Pradesh has created history of sorts by becoming the first village in the country to go fully organic. This village of about 150 families, with a population of around 700 people, spread over 300 acres has become totally free of pesticides, chemical fertilizers and genetically-modified crops, standing as an oasis of hope in the midst of a dark picture of agriculture debts, meager returns and increasing input costs.

The accomplishment was no sudden incident or miracle. It took three years of determined efforts by Center for Rural Operation Programmes Society (CROPS) and tireless cooperation from the gritty farmers of the entire village. Initially it was a little difficult for CROPS to change the mindset of farmers, who believed in pumping in a lot of chemicals and growing genetically modified crops in order to gain higher yields. But the past records of CROPS in dealing with the devastating attacks of Red Hairy Caterpillars and the incessant motivation at the grass root level by Mr. Ponnam Mallaiah of the same village, helped gain the confidence of the villagers. Starting with 10 convinced farmers on the side of CROPS, the success roped in all of the 55 farmers.

The rest, as they say, is history, or shall we say, organic history. Until 2001, the farmers of Enabavi village, akin to others across India, were in deep debt to local money lenders. Today, they are free to invest on agriculture inputs without borrowing. Rice, tobacco, cotton, pulses, coarse grains, chillies and vegetables are grown in the village using locally available manure like cow dung, cattle droppings, decoction of tobacco and neem. Initially, the productivity fell marginally but has since started to pick up again.

Imagine a world that’s totally free of pesticides, chemical fertilizers and genetically-modified crops. Imagine how beautiful and serene that world would be. This utopia is no longer restricted to our imagination; in fact a little hamlet in Andhra Pradesh has earned this distinction of becoming the first village to go fully organic.
Terra preta is a mixture of charcoal, bone and manure, a dark, fertile anthropogenic soil found only in the Amazonian Basin. Terra preta owes its name to the high charcoal content, made by adding a mixture of charcoal, bone and manure to the otherwise relatively infertile Amazonian soil over many years.

Terra preta soil can be dated back to the pre-Columbian days between 450 BC and 950 AD. The soil’s depth usually reaches about 2 meters. Thousands of years after its creation, it has been reported to regenerate itself at the rate of about 1 cm per year by the local farmers and Caboclos in Brazil’s Amazonian Basin who seek it out for use and for sale as valuable compost. Terra preta soil is mainly found in Amazonia, where it is estimated to cover 0.1 to 0.3% of the Amazonian land or 6,300 to 18,900 sq km of low forested Amazonia.

Terra preta soil is found among various climatic, geological and topographical conditions. Their distribution either follows main water courses, from East Amazonia to the Central Basin of Amazonia, or is located on interfluvial sites, mainly of circular or lenticular shape and of a smaller size averaging about 1.4 hectares.

William I. Woods (a soil biologist/archaeologist at the University of Kansas) estimates that around 10% of the original terra comum appears to have been converted to terra preta. According to William Balée (an anthropologist at Tulane University, New Orleans), the spread of tropical forest between the Savannas could be mainly anthropogenic—a notion with dramatic implications worldwide for agriculture and conservation.

The processes responsible for the formation of terra preta soil are:
1. Incorporation of wood charcoal
2. Incorporation of organic matter and nutrients
3. Role of micro-organisms and animals in the soil

According to a research team of the Bayreuth University, tropic soil can be turned into terra preta by adding one part crumbled charcoal and one part condensed smoke. This can easily be done in the lab and/or in the field by mixing the ingredients and adding water. Efforts to recreate these soils have already been undertaken by many organizations. In India, the use of charcoal to create soil horizons similar to the terra preta is being done at Indian Agricultural Research Institute (IARI), New Delhi, and at several of India’s forest conservation initiatives. The use of these practices is the proposed that if forested areas were used for soil improvement, it will also help globally significant amounts of carbon sequestration, mitigating global warming.

The processes responsible for the formation of terra preta soil are:
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3. Role of micro-organisms and animals in the soil

Biochar is the main ingredient in the formation of terra preta nova. One focus of these researchers is the prospect that if biochar becomes widely used for soil improvement, it will involve globally significant amounts of carbon sequestration, mitigating global warming.

This stand-out green practice contribution was shared by P S Narayan* from Bengaluru, India.
The callous attitudes of people in the urban centers towards the environment, the disdain with which we lead our lives are all too well documented. But in all this insensitivity, there are stories which ignite our minds, guiding us with clear, radical examples of change that leave us with hope and optimism. Here are a few such stories.
Curitiba is the capital city of the Brazilian state of Paraná and according to some, the best place to live in Brazil. The bus system of Curitiba, Brazil, exemplifies a model Bus Rapid Transit (BRT) system and plays a large part in making this a livable city. The buses run frequently - some as often as every 90 seconds. The stations are convenient, well-designed, comfortable and attractive. Consequently, Curitiba has one of the lowest rates of congestion, far below that of neighboring cities. Traffic congestion, fare collection prior to boarding, quick passenger loading and unloading, fare collection prior to boarding, quick passenger loading and unloading - but it is above ground and visible. Curitiba's bus system is composed of a hierarchical system of services. Minibuses routed through residential neighborhoods feed passengers to conventional buses on circumferential routes around the central city and on inter-district routes. The backbone of the system is composed of the Bus Rapid Transit, operating on the five main arteries leading into the center of the city like spokes on a wheel hub.

The popularity of Curitiba's BRT has affected a modal shift from automobiles to public transportation. Over 27 million people travel in Curitiba per day and a reduction of about 27 million auto trips per year, saving about 27 million liters of fuel annually. In particular, 28% of BRT riders previously traveled by car. Interestingly, compared to eight other Brazilian cities of its size, Curitiba uses 30% less fuel per capita, resulting in one of the lowest rates of ambient air pollution in the country. Today about 1,100 buses make 12,500 trips every day, serving more than 1.3 million passengers - 50 times the number from 20 years ago. This stand-out green practice contribution was shared by P.S. Narayan of Bengaluru, India.

Bus systems provide a versatile form of public transportation with the flexibility to serve a variety of service needs and short-range of locations throughout a metropolitan area. The essence of a Bus Rapid Transit is to improve the operating speeds and reliability on arterial streets by reducing or eliminating various types of delay.
Chennai, the capital of Tamil Nadu, has long been water-scarce. Yet, this has ever-lossed battle played out with surprising success on many occasions. The Tamil Nadu Government realized that depending on others for water is going to be a futile effort and so made rainwater harvesting mandatory. Today, the city is going through a period of unprecedented rainfall.

When Jamuna Raman bought a house in Villivakkam, a suburb in the temple city of Chennai, little did she realize, her life would be an endless struggle for water. Buying water on a daily basis for all uses was not going to be the solution. She needed something more practical and something that would not make her dependent on others to meet her chores. So she decided to dig a borewell, after going deep down and sinking in a significant amount of money, all she was left with was saline water.

Not one to give up easily, Jamuna decided to take matters in her own hands. She took the initiative and installed rainwater harvesting systems in her home. Her building unit has a simple network of pipes that collect the rainwater and store it for future use. On further investigation, Jamuna discovered that rainwater harvesting was indeed a simple solution to tap the potential of nature. She and her neighbors then decided to go in for rainwater harvesting systems as a measure against the monopoly of the water lobby.

The results of the compulsory rainwater harvesting are indeed encouraging. A recent study shows that even after the installation of rainwater harvesting systems, Chennai now gets about 690 mm of rainfall as compared to its normal of 1,200 mm. The average groundwater level, which was below 7 to 8 meters in most areas of the city during November 2004, has grown up by 3 to 5 meters. Similarly, the water quality in several areas has improved. The sustained normal rainfall since 2004 and the proper maintenance of rainwater harvesting systems in most households have been the principal reasons for dramatic improvements. Following the drought period in 2003, when Chennai received only about one-fifth of rainfall as against its normal of a record amount. The average groundwater level, which was below 7 to 8 meters in most areas of the city during November 2004, has grown up by 3 to 5 meters. Similarly, the water quality in several areas has improved.

This stand-out green practice contribution was shared by Narasimhan P L L* Chennai, India.

RAINWATER HARVESTING
A simple and effective method of water conservation for our cities.

Chennai, another part of Tamil Nadu, has long been water-scarce. Yet, this has ever-lossed battle played out with surprising success on many occasions. The Tamil Nadu Government realized that depending on others for water is going to be a futile effort and so made rainwater harvesting mandatory. Today, the city is going through a period of unprecedented rainfall.

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This stand-out green practice contribution was shared by Narasimhan P L L* Chennai, India.
FUKUOKA
A water conservation conscious city.

There are great stories about great cities from around the world. But when you come across a story of a city that is determined to take the cause of water conservation to every household, it no longer remains a story; it becomes an inspiration for the rest of the world.

In 1979, Fukuoka city in partnership with the citizens and private sector launched various initiatives promoting a ‘Water Conservation Conscious City’. Under this scheme, several innovations and measures were implemented. Water-saving apparatus were introduced and currently approximately 96% of users have water flow reducing devices installed in their faucets. Water savings have been realized with an average family saving up to 1,000 liters per month. Water conservation consciousness amongst residents is promoted through ‘Save Water Campaign’ held annually in June. Guidelines on saving water are distributed to homes and educational materials to primary schools. More than 85% of citizens are involved in some kind of effort to conserve water.

Fukuoka has the lowest water leakage rate of Japan and it was under 2.7% in 2001. The city is also actively promoting reuse of treated waste-water. Using the Wide-Area Circulation System and Individual Circulation System for large buildings, used and treated water is utilized to flush toilets and watering plants. The amount of water conserved by this approach is about 7,000 cubic meters a day. The city is also employing the desalination system by converting sea water into fresh water daily. Other measures include an integrated water distribution monitoring system to ensure efficiency. The city has also embarked on protecting water sources through tree planting campaigns. Currently, per capita water consumption in Fukuoka city is less than it was before 1978, despite a 30% increase in population. Fukuoka city consumes approximately 20% less water than other comparably sized cities.

This stand-out green practice contribution was shared by
Fukuoka City Water Bureau
and P S Narayan
Bengaluru, India
FREIBURG
A model for car–free living.

Freiburg im Breisgau is a city in Baden-Württemberg, Germany. Located in the extreme South-West of the country, Freiburg straddles the Dreisam River, at the foot of the Schlossberg.

The Vauban project is a wonderful experiment in green urban living where 2,000 new homes on a former military base, have put into practice many ideas that were once dismissed as eco-fantasy. It is an idea some would call a bit far-fetched; an offer for families with kids to live without cars.

It is meant to counter urban sprawl – urging families not to move out to the suburbs by giving them the same, if not better quality of life. There are numerous incentives for Vauban’s 4,700 residents to live car-free: Car-poolers get free yearly tramway passes, while parking spots - available only in a garage at the neighborhood’s edge - go for €17,500 ($23,000). 40% of residents have bought spaces, many just for the benefit of their visiting guests. As a result, car-ownership rate in Vauban is only 150 per 1,000 inhabitants, compared to 430 per 1,000 inhabitants in Freiburg proper. In contrast, the US average is 640 household vehicles per 1,000 residents.

In the 1970s, the city became the cradle of Germany’s powerful antinuclear movement after local activists killed plans for a nuclear power station nearby. The battle brought energy-policy issues closer to the people and increased involvement in local politics. With a quarter of its people voting for the Green Party, Freiburg became a political counterweight in the conservative state of Baden-Württemberg. At about the same time, Freiburg, a city of 216,000 people, revolutionized travel behavior. It made its medieval center more pedestrian-friendly, laid down a lattice of bike paths and introduced a flat rate for tramways and buses.

Environmental research also became a backbone of the region’s economy, which boasts Germany’s biggest solar-research center and an international center for renewable energy. Services such as installing solar panels and purifying waste water, account for 3% of jobs in the region, according to city figures.

In 1998, Freiburg bought land from the German government and worked with Delleske’s group to lay out a master plan for the area, looking to rival the world-renowned, social-economic and cultural ‘green city’ of Copenhagen. Funds were raised from several sources and a new entity managed the entire project, with a mix of public and private investment. The result: a neighborhood that is designed to be low-impact, low-cost, and friendly to children.

In 2007, the city was awarded the European Union’s Urban Greening Award, and in 2008 the Freiburg kindergarten was honored as one of the world’s most innovative projects. In 2009, the city was named one of the top 10 greenest cities in the world.

The Vauban project is an example of how cities can be designed to be low-impact, low-cost, and friendly to children. It’s a model for car–free living.
Helsinki, the capital of Finland is keen on building an energy efficient system that makes optimum use of the heat and energy produced by the District Heating System. Like most cities in the Scandinavian countries, Helsinki in Finland too has a District Heating System that relies on a technology that combines the production of electricity and heat. Heat obtained by generating electricity is now used for heating the city instead of being dumped in the sea. Operating on market terms since its inception, the system currently serves more than 91% of all Helsinki’s buildings. The efficiency of energy supply has been raised from 40% up to 80% in Helsinki. The specific heat consumption in buildings connected with the District Heating Network has also decreased from 65 kWh/m3a to 44 kWh/m3a due to the energy saving information, which has been disseminated, to the customers. District heating has necessitated replacing chimneys of individual buildings with higher chimneys of heating plants where the emissions can be more easily controlled. The coal-fired power stations in Helsinki have been equipped with desulphurisation plants reducing the sulphur and nitrogen dioxide content in the air to levels below World Health Organization air quality guidelines. The by-products of the coal-powered stations are recycled and used as by-products for cement and for strengthening geo-technically weak areas during construction of civil engineering structures. Helsinki, the capital of Finland is keen on building an energy efficient system that makes optimum use of the wind and energy produced by the District Heating System.

With the power plant in Helsinki’s Vuosaari and a new significantly larger Combined Heat and Power plant, the portion of natural gas of the Helsinki power production has exceeded 50% and the emissions per kilowatt-hour of output energy were further reduced. Development of District Heating Network: The new natural gas support is connected to the consumption areas with a new 20 km long underground tunnel. This tunnel enables the use of natural gas, with high efficiency, in combined production, to a reliable fuel for the consumers. Altogether, there are one large line of district heating pipelines in Helsinki. Helsinki Energy is testing Helsinki’s first working plant and District Cooling System at the Salmisaari power plant. In cooling production, the district plants for the best results both for the consumers and for the environment by converting the waste heat of the co-generation process that remains unutilised.

Altogether, there is a large demand for cooling in Helsinki. Helsinki Energy is testing Helsinki’s first working plant and District Cooling System at the Salmisaari power plant. In cooling production, the district plants for the best results both for the consumers and for the environment by converting the waste heat of the co-generation process that remains unutilised.

It is amazing, how we in the cities take so many of the things for granted. A little more attention and a little more concern perhaps, can mean a lot more, not only for our cities but also for the planet. This is one lesson we all can learn from the city of Helsinki.

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EAST KOLKATA WETLANDS
A flourishing resource recycling system.

Not all water treatment plants cost you the earth. The East Kolkata Wetland Ecosystem is one such obvious example. It is a marvel of ingenuity and has been globally recognized as a flourishing resource recycling system based on traditional knowledge and practice. Since November 2002, it is regarded as a Ramsar site (Ramsar sites are wetlands of international importance designated under the Ramsar Convention).

So what has all this resulted in? To begin with, food security. Over a third of Kolkata’s daily fish requirement comes from its Bheris and 15,000 metric tons of rice is produced annually from its paddy. Secondly, sanitation; according to the Indian Statistical Institute, the wetlands save the West Bengal Government at least Rs. 400 crores (US$ 4 billion) on construction costs by treating around 1,000 million liters of city’s sewage every month. This is besides providing livelihood to over 8,500 people directly and 150,000 overall. But most important of all, is the preservation of biodiversity. These wetlands are today home to many endangered species including Indian Mud Turtle, the rare Marsh Mongoose, Palm Civet and Small Indian Civet and more than a 100 plant species and 40 species of birds like Egrets, Jacanas, Shag, Cormorant, Coot and Kingfishers.

This stand-out green practice contribution was shared by Mehala Kumar* Bengaluru, India.
Conservation at its best.

**Story Name:** A merger of land and hearts spreads light.
**Author/Location/Country:** Varsha Deshikar - Greater Noida, India

**Illustrators:**
- Varsha Deshikar
- Kirti Azad - Greater Noida, India

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**Story Name:** Communities at the forefront.
**Author/Location/Country:** BISHNOIS - Madhya Pradesh, India

**Illustrators:**
- P S Narayan - Bengaluru, India
- Anusree Ganguly - Kolkata, India
- Venkata Prakash Gudipudi - Hyderabad, India

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**Story Name:** RAJASTHAN - Building the world’s biggest solar kitchen.
**Author/Location/Country:** Mahathi Nethi - Hyderabad, India

**Illustrators:**
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**Story Name:** RAJASTHAN - Building the world’s biggest solar kitchen.
**Author/Location/Country:** Uttarakhand - Pauri Garhwal, India

**Illustrators:**
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**Story Name:** RAJASTHAN - Building the world’s biggest solar kitchen.
**Author/Location/Country:** Uttaranchal - Pauri Garhwal, India

**Illustrators:**
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**Author/Location/Country:** Madhya Pradesh - Pauri Garhwal, India

**Illustrators:**
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**Author/Location/Country:** Pauri Garhwal - Pauri Garhwal, India

**Illustrators:**
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**Illustrators:**
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**Author/Location/Country:** Pauri Garhwal - Pauri Garhwal, India

**Illustrators:**
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- Venkata Prakash Gudipudi - Hyderabad, India

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Author/Location/Country: P S Narayan - Bengaluru, India
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