



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

A part of Wipro's Sustainability Report 2008-09

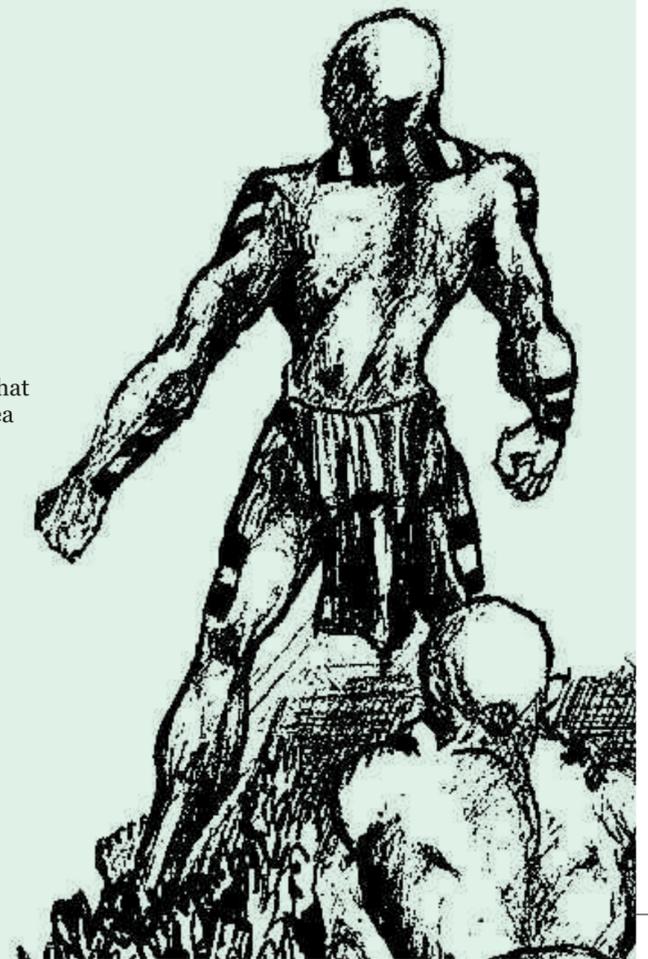


## Preamble

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 be 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.

# Communities at the forefront.

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

A community  
that took on an  
empire for their  
trees and animals.

The Bishnois are a nature worshipping community  
from the Marwar region of Rajasthan, India.



Illustration - Lianna Dias

*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 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.*

The Bishnois are a sect founded by the holy saint Guru Jambheshwar (b. 1451). The story goes that after a severe drought in the Marwar region of Rajasthan in India, the Guru formulated 29 principles to lead a harmonious life with nature. Thus was born a community of people who began to live life by these principles and came to be known as the Bishnois. One of the most important in the principles was the ban on killing of 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 will stand in the way of anybody who tries to destroy them and this has been the case since time immemorial. The case of Amrita Devi is testimony to this fact. 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 axes that were brought to cut down the trees, severed her head as well.

Her young daughters were not daunted and offered their heads too. This news spread like wildfire. The Bishnois of Khejarli then summoned their counterparts in 83 villages in the vicinity. It was decided that for every green tree to be cut, one Bishnoi volunteer would sacrifice his/her life. As soon as the Maharaja heard of the turn of events, he ordered the felling of trees to be stopped at once. By that time, 363 Bishnois had already become martyrs. Honoring the courage of the Bishnoi community, Maharaja Abhay Singh apologized for the mistake committed by his officials and issued a royal decree stating cutting of green trees and hunting of animals within the revenue boundaries of Bishnoi villages were strictly prohibited.

This ardor of the Bishnois towards animals and trees hasn't died even today. Recently, they even got a leading Hindi film actor convicted on charges of killing a black buck! Such is the passion and zeal of the Bishnois.

This stand-out green practice contribution was shared by  
**P S Narayan\***  
Bengaluru, India





{ Uttaranchal or Uttarakhand is the 27th state of the Republic of India, carved out of the state of Uttar Pradesh.

# DEV VANS

A cultural device to conserve the ecology in Uttaranchal.

Illustration - Sylvester Pradeep

*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.*

In Uttaranchal, the Dev Vans are classic examples of participatory management. The Dev Vans' spread across the state' 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.

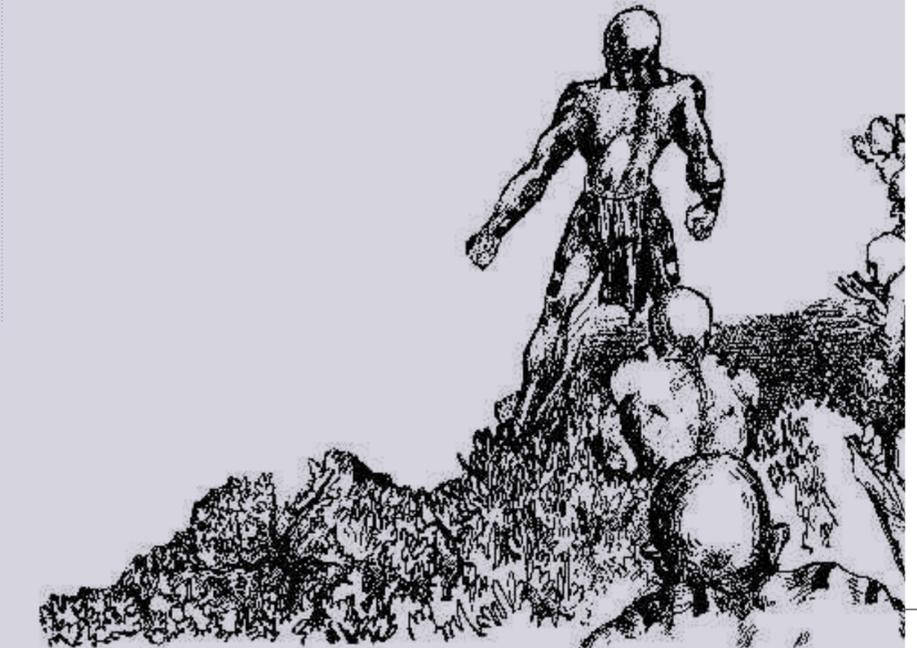
It appears that while in other parts of India, the need for sacred groves is entwined with man's desire to worship nature but in Uttaranchal, the need for sacred elements in conservation seems to be associated with a resource crisis. It is observed that generally the forest patches, where the biotic pressure is severe or 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 would 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 itself and how the fear of a deity compels them to follow the simple rule of the thumb to conserve the dedicated forest.

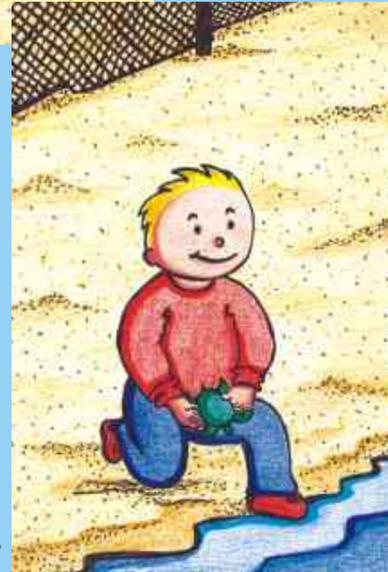
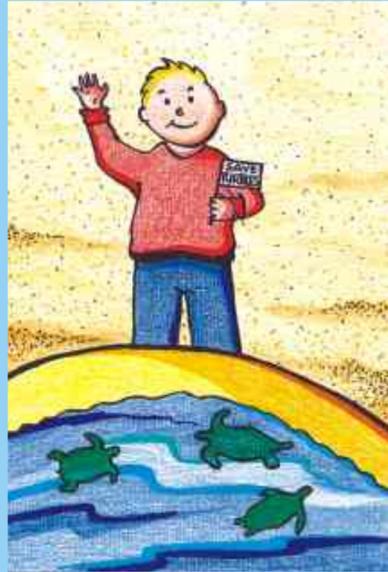
Dev Vans are ecosystems in themselves as they perform all ecological functions, nutrient cycling, water recharging, conservation of bio-diversity, prevention of soil erosion and in mountain areas, often prevent landslides besides harboring many key species. Dev Vans not only contribute to the green cover,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

Now the ecologists have also started appreciating these resource management methods of traditional societies.

Today, the main challenge in the Himalayas is to conserve the rich vegetation wealth and maintain ecological balance using human skills and traditional wisdom in an ethical way. Forests are facing immense anthropogenic pressure for subsistence living. Degradation of forests in many places has reached a stage from where recovery is difficult. In such situations lessons can be learnt and strategies can be evolved from folk wisdom to help conserve nature.

This stand-out green practice contribution was shared by **Sudipta Ghosh\*** Kolkata, India





## SAHYADRI NISARGA MITRA Protecting endangered species.

Sahyadri Nisarga Mitra is an NGO working on the conservation of many endangered species in the Western Ghats and along the coastlines of Maharashtra, India.

Illustration - Varsha Deshikar

*How does one strike a balance between daily livelihood and ecology? How do you convince a community making a living out of selling turtle eggs and small animals to join a conservation movement? But when you do, they become the biggest champions of the cause.*

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 and the breeding biology of some bird species. 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 as a livelihood. The accidental mortality associated with shipping, trawling and other fishing operations too was 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 thousands of newly born hatchlings to the sea by nature lovers.

This stand-out green practice contribution was shared by **Kirti Azad\***  
Greater Noida, India



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

Illustration - Tushar Barman

## WATER IS THE REAL WEALTH

The DHAN community action.

*Of the nearly 39,000 tanks that recharge the groundwater in Tamil Nadu, more than 20,000 of them are small minor irrigation tanks. The level of water in these tanks is dependent on the vagaries of the weather, thereby putting the lives of the farmers who depend on these tanks for crops, at peril.*

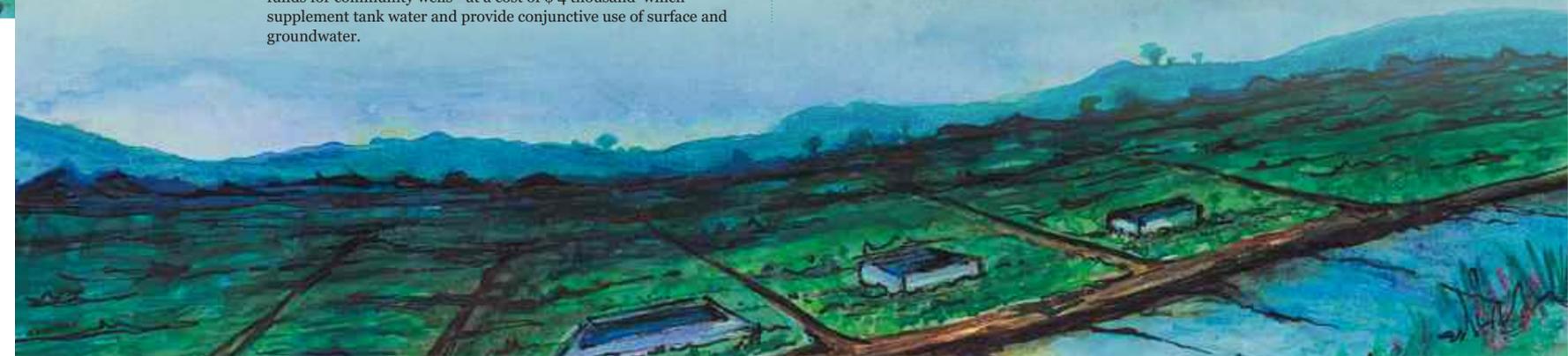
There was a ray of light in the lives of farmers dependent on these small tanks and lakes for their agricultural needs, when C R Shanmugam, a civil engineer who had retired from Anna University came to their help. Along with PRADAN (Professional Association for Development Action), a Non-Governmental 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 de-silting 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.

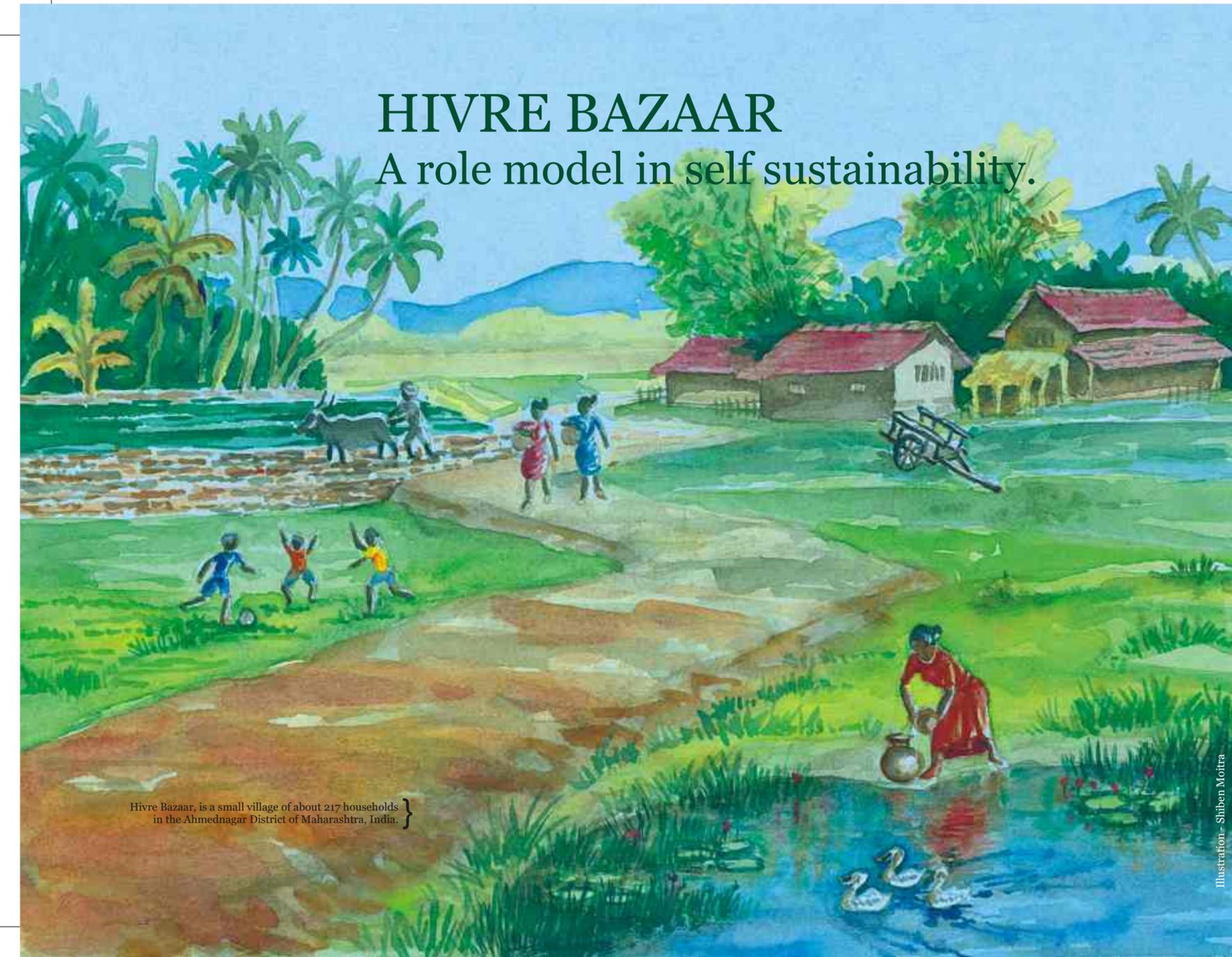
Today, the program is fast expanding into a movement. The success of the program has been overwhelming as the people do not leave any task unfinished. They realize that their contributions will ensure their right to own and manage the system. This will also guarantee that the distribution of water from the tanks will be equitable, timely and productive. Krishnaswami Rajvan and Anand, District Collectors of Madurai and Ramanathapuram Districts, speak highly of the work done. They say, "Shanmugam is really working for the villagers and the improvement of their lot." "However," says Shanmugam, "DHAN is instrumental in this transformation and I am only a cog in the wheel." Shanmugam plans to cover all the districts gradually "since quality cannot be sacrificed for the sake of speed". He intends to provide more training programs not only for the farmers, but also leadership training for association and federation office-bearers.

This stand-out green practice contribution was shared by **Venkata Prakash Gudipudi\*** Hyderabad, India



# HIVRE BAZAAR

## A role model in self sustainability.



Hivre Bazaar, is a small village of about 217 households  
in the Ahmednagar District of Maharashtra, India. }

Illustration - Shilben Motra

*Hivre Bazaar village in Nagar taluka of Ahmednagar district 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.*

Until 1989, Hivre Bazaar 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 situation has changed dramatically in Hivre Bazaar. Out of 217 households in the village, only 12 remain landless. The total geographical area of 976 hectares in the village is divided into three micro watersheds. Of this, 70 hectares have been earmarked as forest land, which has been developed in close cooperation with the forest department. At present, the entire management of this forest land is in the hands of the villagers. The department does not even have a guard to protect the reserves and this is proof enough that the Joint Forest Management (JFM) program initiated with the forest department has become a success.

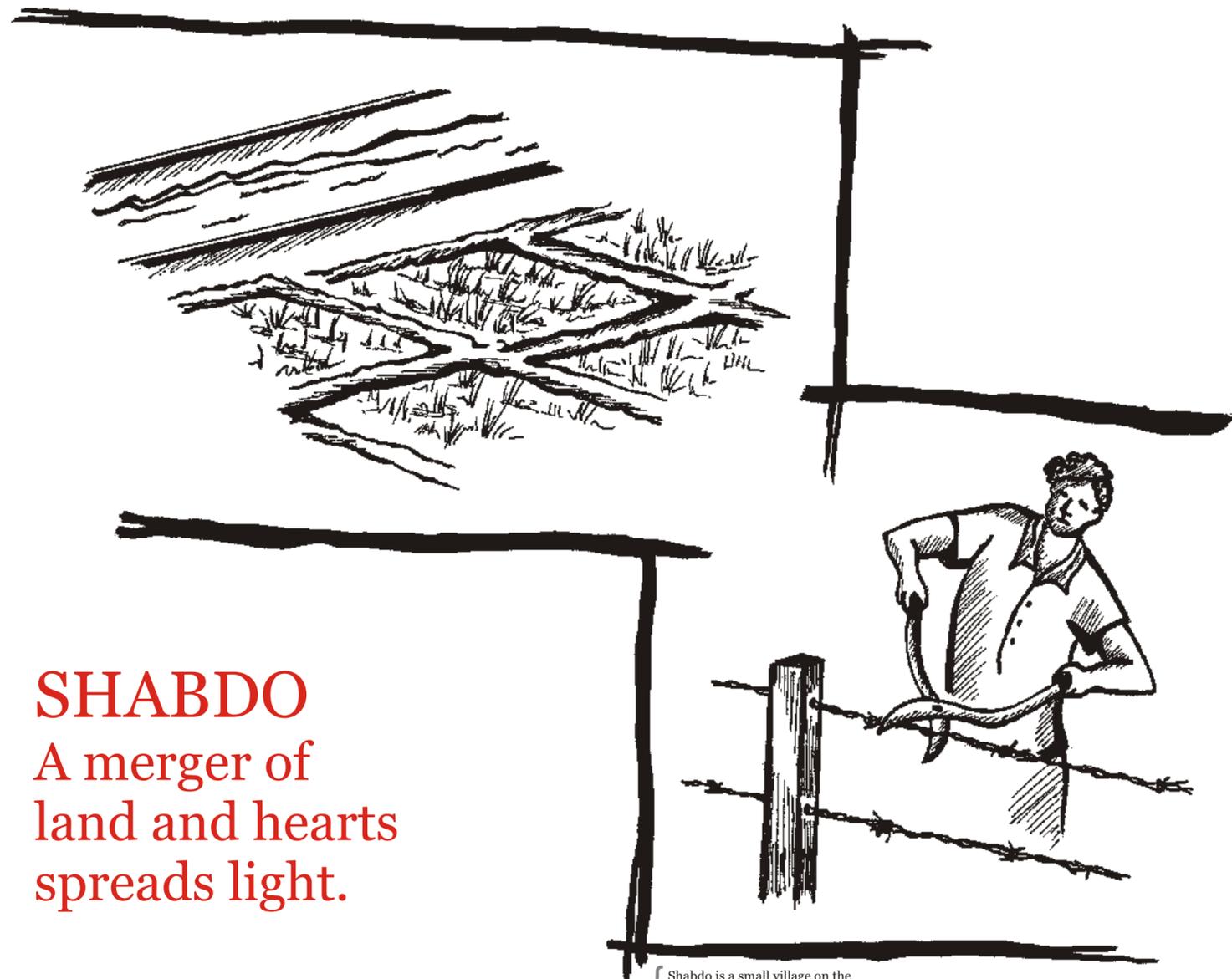
Crops like jawar, bajra, wheat, onion, potato and vegetables are now grown here along with flowers, giving birth to a thriving floriculture base. The dairy sector too has registered a remarkable improvement. In 1995, the daily milk production in the village was about 250 liters and today well over 2,600 liters are produced every day!

However, the most remarkable change one can see in the village is the environmental awareness among the villagers. During 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 has also given 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 of labor, but also has created an environment of social cohesion, where people readily come together and work together.

This stand-out green practice contribution was shared by  
**Veena Padmanabhan\***  
Gurgaon, India

# SHABDO

A merger of  
land and hearts  
spreads light.



Shabdo is a small village on the Bihar-Jharkhand border, India.

Illustration - Varsha Deshkar

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

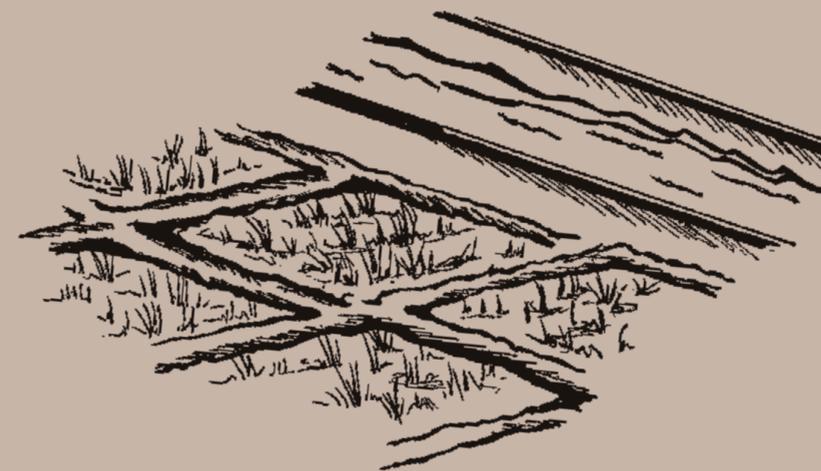
Children in the village of Shabdo have just learnt a new lesson, from a cluster of houses at war with one another, Shabdo has been transformed into a community. Collective farming has increased wheat production by at least 25%. Earlier, the rich and powerful captured the limited water in the ahar, a 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.

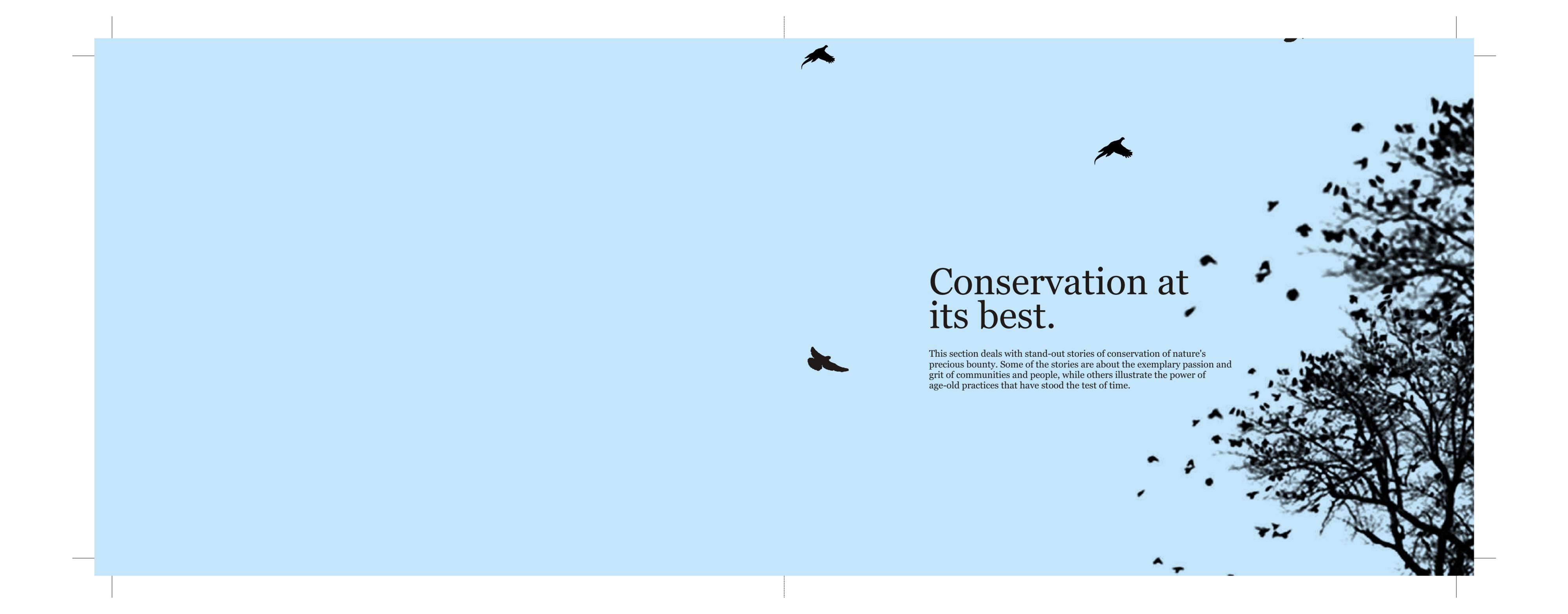
Shabdo is among the 40 villages on a 45 km long, centuries-old, defunct canal system. The ahar - paine system, believed to be a 4th century BC invention, connects village ahars (tanks) to a river or stream through a paine (canal) and small branch canals. During the monsoons, the river water flows into 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 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 potato, the next week's roster and immunizing children. Most of the villages are now alcohol-free. "We have avoided duplication of work. For instance, it takes only one man to manage the irrigation channels. Earlier, everyone would be doing it and quarrelling," says Bhushan, a villager. The crop is shared according to the amount of land they owned.

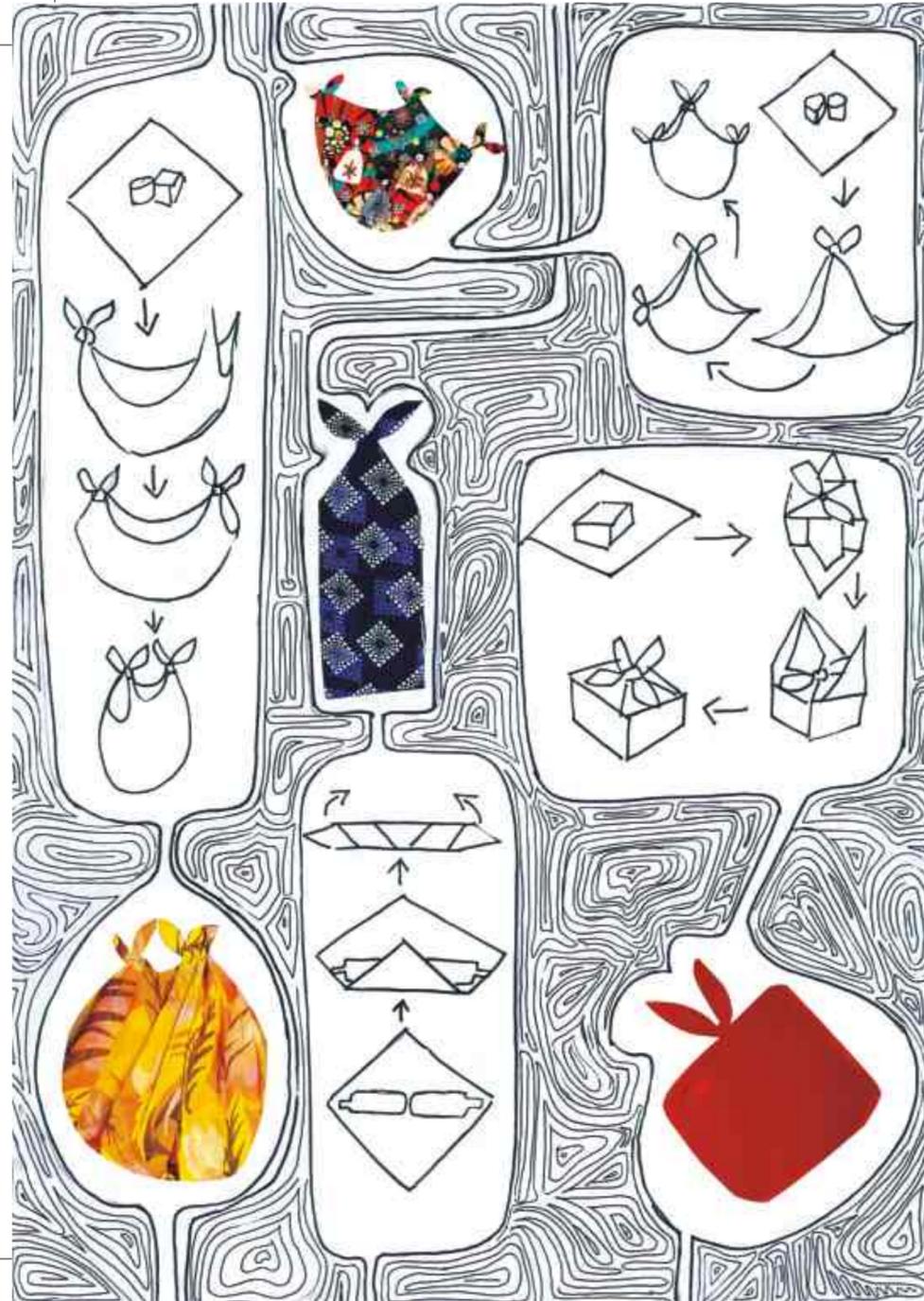
This stand-out green practice contribution was shared by **Sudipta Ghosh\***  
Kolkata, India





# Conservation at its best.

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 sentō or public baths.

Illustration - Lianna Dias

*There are some traditions that can be wrapped for centuries without losing their value or appeal. Furoshiki is one such tradition that has in fact seen resurgence in modern times. This fine art of wrapping has indeed caught the imagination of the world, thanks to its creativity and being extremely environment friendly.*

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 that complement today's lifestyle, art forms like Furoshiki 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 popular choice of wrapping gifts, clothes or other goods. Its versatility allows you to wrap almost anything, regardless of shape or size. The word itself means 'bath spread', deriving from its early use as a cloth to bundle 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, chirimen, cotton, rayon, and nylon. Furoshiki are often decorated with traditional designs or by Shibori. There is no one set size for Furoshiki; they can range from hand-sized to larger than bed-sheets. Despite its roots dating back to ancient times, Furoshiki has seen a recent surge in popularity due to growing concerns over the environment and more significantly the proliferation of plastic in many parts of the world. Recently, the Japanese Minister for Environment, Yuriko Koike, created a Furoshiki cloth to promote its use in the modern world.



In contemporary usage:

Furoshiki has been used extensively to produce traditional Japanese 'bento' boxes or lunch boxes.

They are used globally to make handles for travel bags, leisure bags and even suitcases, 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 material for wrapping.

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

This stand-out green practice contribution was shared by **Veena Padmanabhan\*** Gurgaon, India



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.

Illustration - Kawal Vijayendra

## SAVING THE INDIAN SPARROW

### Its happening at Nasik, India.

*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.*

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.

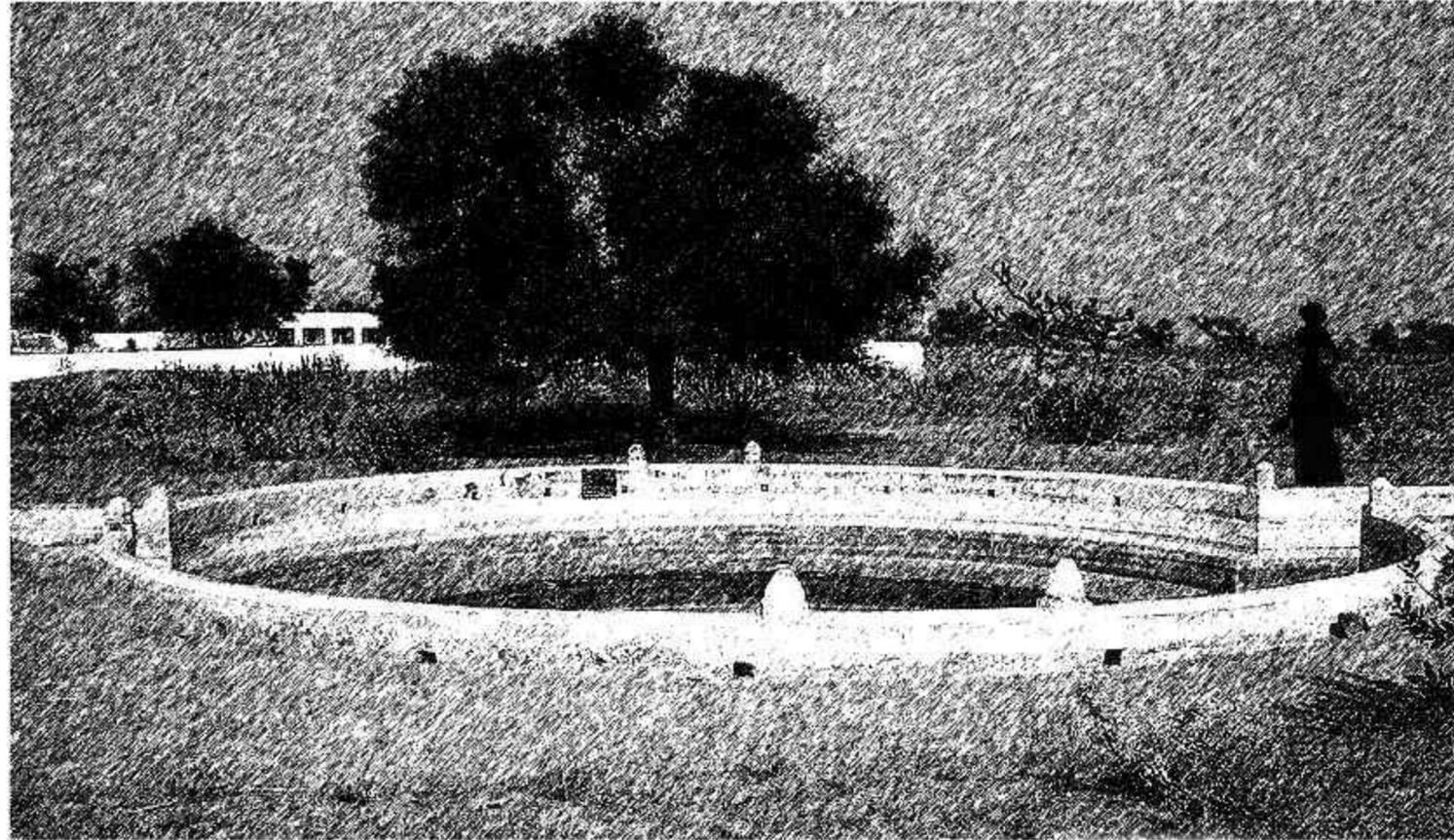
In the meantime, Dilawar is doing what he can, to protect the tiny birds. There is, it seems, a lethal combination of reasons for the sparrow's decline. Modern architecture and shrinking gardens and parklands have rendered sparrows homeless, since they like to nest in nooks and crannies. Meanwhile, use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

Dilawar has taken the bird's plight to heart. "One day, I saw a sparrow building a nest in the switch box of a telephone pole," he says. "I decided then and there to give a little help to this hardy little creature." And so it was then that he began to design wooden nesting 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. "It's heartening," he says, "to hear back from families that their children are thrilled to watch chicks hopping about, being fed by the mother."

Dilawar concedes that this is just a tiny step. "We need to involve the government and the scientific community," he says. "We must plant hedges and trees ... must stop using chemical pesticides near our homes." But securing funding for such a plain, un-exotic creature isn't easy. "In India, we only think of the glamorous tiger," he says. "But if we don't act now to save the house sparrow, our children may only hear of sparrows in stories and never get to see one."

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.

Illustration - Varsha Deshkar

## JOHAD REVIVES WITH WATER

### An age-old practice comes to the rescue.

*Due to consistent neglect, the traditional ways of water collection and storage in the Aravalli region of Rajasthan had become barren. The very region that once sustained the eco-system here had become infertile and unproductive. Lack of vegetation led to soil degradation; monsoon run-off washed away the topsoil. This is the story of a total turnaround.*

On 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 'Aravalli' had become barren.

It was difficult to find young people in the villages, all of them had fled in search of employment, women trudged long distances to fetch a mere pot full of water. Crops failed regularly, lack of vegetation led to soil degradation; monsoon run-off washed away the topsoil. I remember, there was not a single blade of grass in the region and we often stumbled on the carcass of cattle. Barely 3% of cultivable area was irrigated. Life was difficult and hardship endless.

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 receives periodically good silt and moisture, and that allows 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', it 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 productive and due to availability of fodder, cattle rearing started, resulting in increased production 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 rainwater 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.

Illustration - Kunal Vijayendra

## THE BANANA TREE

### The marvel of South Asia.

*To some it is a staple diet, to many others this is more than a fruit. Sometimes exotic, sometimes mandatory and irrespective of whether you like it or not, you cannot ignore it. The humble banana is omnipresent in Southeast Asia and is perhaps, one tree with a thousand uses; practically every part of the tree has been found to be useful.*

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.

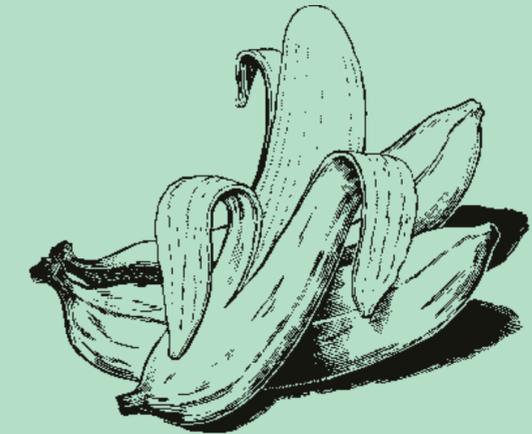
In addition to the fruit, the flower of the banana plant (also known as banana blossom or banana heart) is used in Southeast Asian, Indian (Andhra, Tamil Nadu, Bengal and Kerala) cuisine, either served raw with dips or cooked in soups and curries. The tender core of the banana plant's trunk is also used in South Indian and Bengali cooking and notably in the Burmese dish 'Mohinga'. Bananas fried with batter are a popular dessert in India, Malaysia, Singapore, and Indonesia. They are served with ice cream and custard as well.

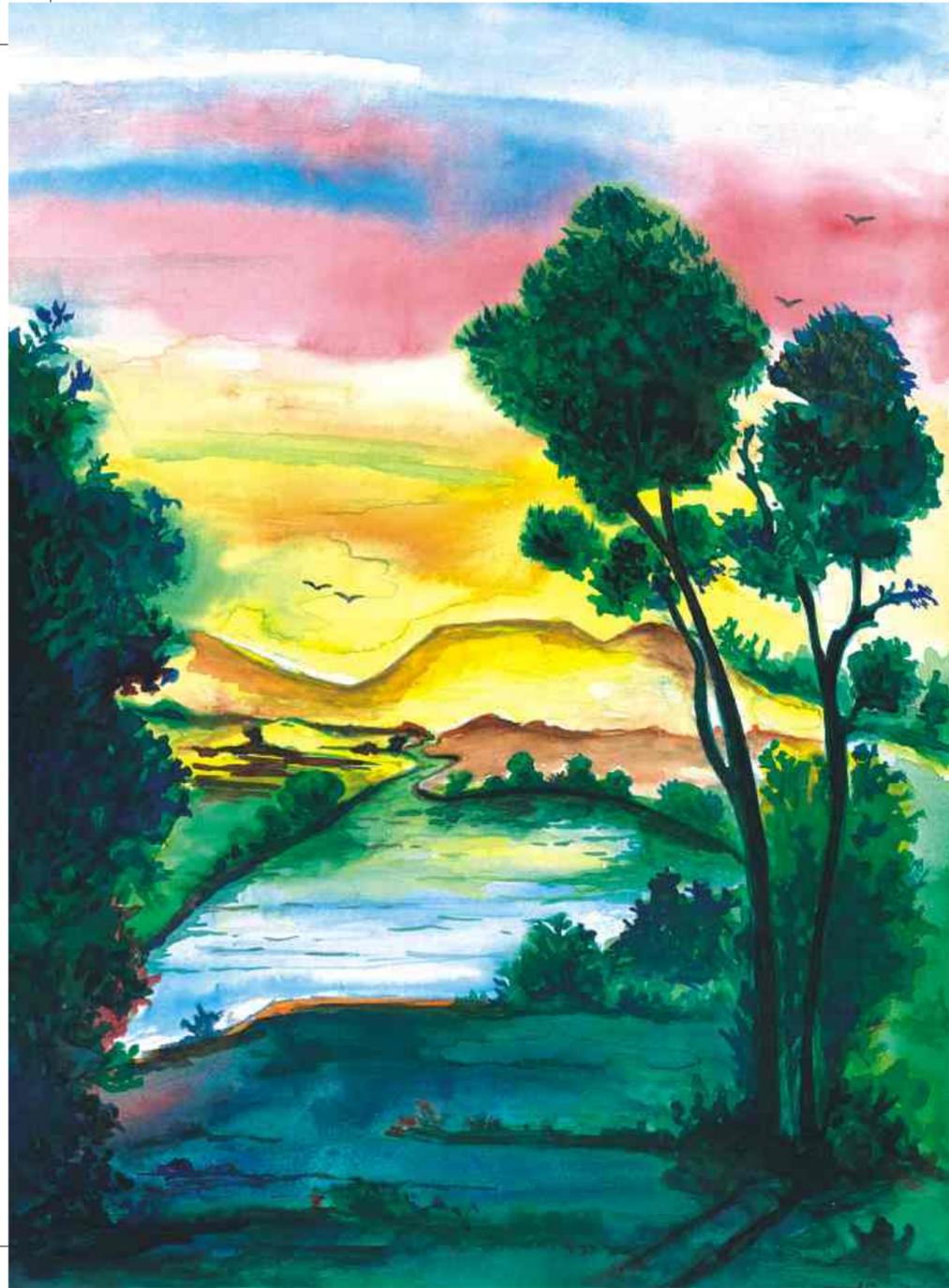
In Burma, bananas are eaten deep-fried, baked in their skin in a split bamboo, or steamed in glutinous rice, wrapped in a banana leaf. Bunches of green bananas surrounding a green coconut in a tray form an important part of traditional offerings to the Buddha and the Nats; ripe banana is also part of the traditional offering at temples in India. The juice extract prepared from the tender core is also used to treat kidney stones.

The leaves of the banana plant are large, flexible and waterproof. They are 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.

Banana chips are a snack produced from dehydrated or fried banana or plantain slices, which have a dark brown color (when ripe bananas are used) and an intense banana taste or yellow when made from raw ones. Bananas have also been used in the making of jam. Unlike other fruits, it is difficult to extract juice from bananas because when compressed, a banana simply turns to pulp. Seeded bananas (*Musa Balbisiana*), the forerunner of the common domesticated banana, are sold in markets in Indonesia, India and most of Southeast Asia. Another local practice is of its juice extracted from the corm and used as a home remedy for the treatment of jaundice, sometimes with the addition of honey.

This stand-out green practice contribution was shared by **Bableen Johal** \*  
Bengaluru, India





## THE SILENT VALLEY

### Conservation versus development?

{ The Silent Valley in Kerala is one of the few places in India devoid of human habitation.

Illustration - Tushar Barman

*Romulus Whitaker, founder of the Madras Snake Park and the Madras Crocodile Bank, was probably the first person to draw public attention to the small and not-much-known area in Kerala called Silent Valley. This remote valley triggered off one of the fiercest environmental disputes the country has known.*

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. Because Silent Valley has always been difficult to reach, even on foot, it had remained a well-preserved forest. It all began with an innocent enough proposal put forward by the Kerala State Electricity Board (KSEB) to build a dam across the Kuntipuzha River and then use the impounded water to generate electricity. The issue came up before the then Prime Minister Indira Gandhi, who appointed a Committee in 1980 to look into the feasibility of the project.

Around this time, a group of school teachers and others, who constituted the Kerala Sastra Sahithya Parishat (KSPP), became involved in the Silent Valley. Their arguments, based on academic knowledge and reasoning, did not appeal to everybody. The idea of conserving a virgin forest for its flora and fauna seemed irrelevant to the people living near the proposed dam. The KSEB on its part, tried to convince people about its stand. Their argument focused on the high unemployment rate and the absence of industries in the state, leading to the high rates of out-migration. Industrialization, for which electric power was a must, was seen as the only solution.

At this stage, another actor made a dramatic appearance on the stage—the Lion-tailed Macaque, one of the most threatened species

of monkeys in the world. It is found only in the southern half of the Western Ghats. The survival of the monkey became an issue contested by the pro and anti Silent Valley dam campaigners. Questions were raised about the importance given to the monkey over the benefits that would accrue to humans by building the dam.

As the debate grew more heated, a joint Expert Committee under the chairmanship of Prof. M G K Menon studied the pros and cons of the project and found that the construction of a dam in the Silent Valley would cause irreparable damage to the ecology of the forest ecosystem.

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.

But no battle in the field of conservation is ever final, and there is no guarantee that the Valley will remain silent for all time to come. There have been faint rumblings in recent years to revive the Silent Valley project. But should the need arise, the people of Kerala with a well-planned strategy and dogged determination, will undoubtedly be able to achieve what they did in the past.

This stand-out green practice contribution was shared by  
**Gopi Govinda Acharya\***  
Kochi, India





{ The Vedantangal Bird Sanctuary in the Kanchipuram district of Tamil Nadu, India is a thriving bird sanctuary situated just 90 km from Chennai.

Illustration - Stripad Kulkarni

# VEDANTANGAL

A great example of symbiosis with nature.



*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 nearly silent marriages and festivals during the breeding season so that the birds have a peaceful time.*

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 knew 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. Besides, the crops grown here are free of artificial fertilizers and insecticides. This in many ways symbolizes true conservation which is the recognition of mutual benefits. 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. Later in 1962, it was accorded the legal status of a reserve forest under the Madras Forest Act. Ten years later, the entire lake was declared a Wildlife Sanctuary under the Wildlife Protection Act. Today, generations later, the villagers protect the birds with the same zeal. The 3,000 odd villagers, who live here, avoid any kind of noisy activity near the sanctuary, particularly during the breeding months. They have even resorted to silent marriages and extremely muted celebrations around these months. Such is the resolve of the people in the Vedantangal area.



A recently done bird census put the count of birds who visit the area at 75,000; i.e 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 60 odd ponds in the vicinity 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.

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



# Green innovation.

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 the output of the solar cooker in Rajasthan, India has been sufficient to cook 38,500 meals per day.

Illustration - Varsha Deshikar

*What do you get when you work on a 25 hectare plot, with 84 parabolic concentrators, shell type receivers and large diameter header pipes which can serve the dual purpose of treated water storage, as well as steam reservoirs? Well, to begin with, you get the world's biggest solar kitchen and an achievement which is etched in history.*

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 4 KW solar radiation reaching temperatures up to 800°C at the focal point.

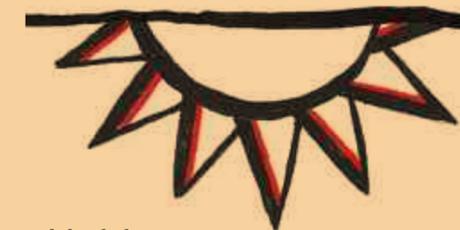
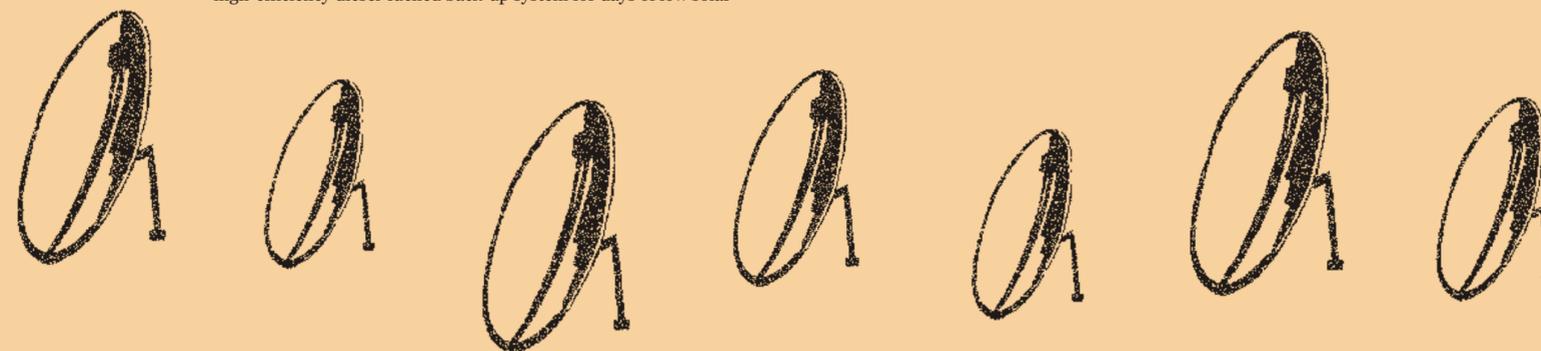
The system works on the thermo-siphon principle so that each concentrator's well-insulated header pipe itself acts as a separate steam generator, heat exchanger or electrical back-up for circulation pumps, and thereby increasing efficiency and preventing disruption by power cuts. The day-to-day operation 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, for a period of about ten weeks, it is not practical 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 used for cooking, water sterilization and preparing hot drinks. 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 cook a maximum of 38,500 meals per day. Supported and approved by the MNES, the system attracts considerable attention and was described in a 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

## Green agriculture & farming.

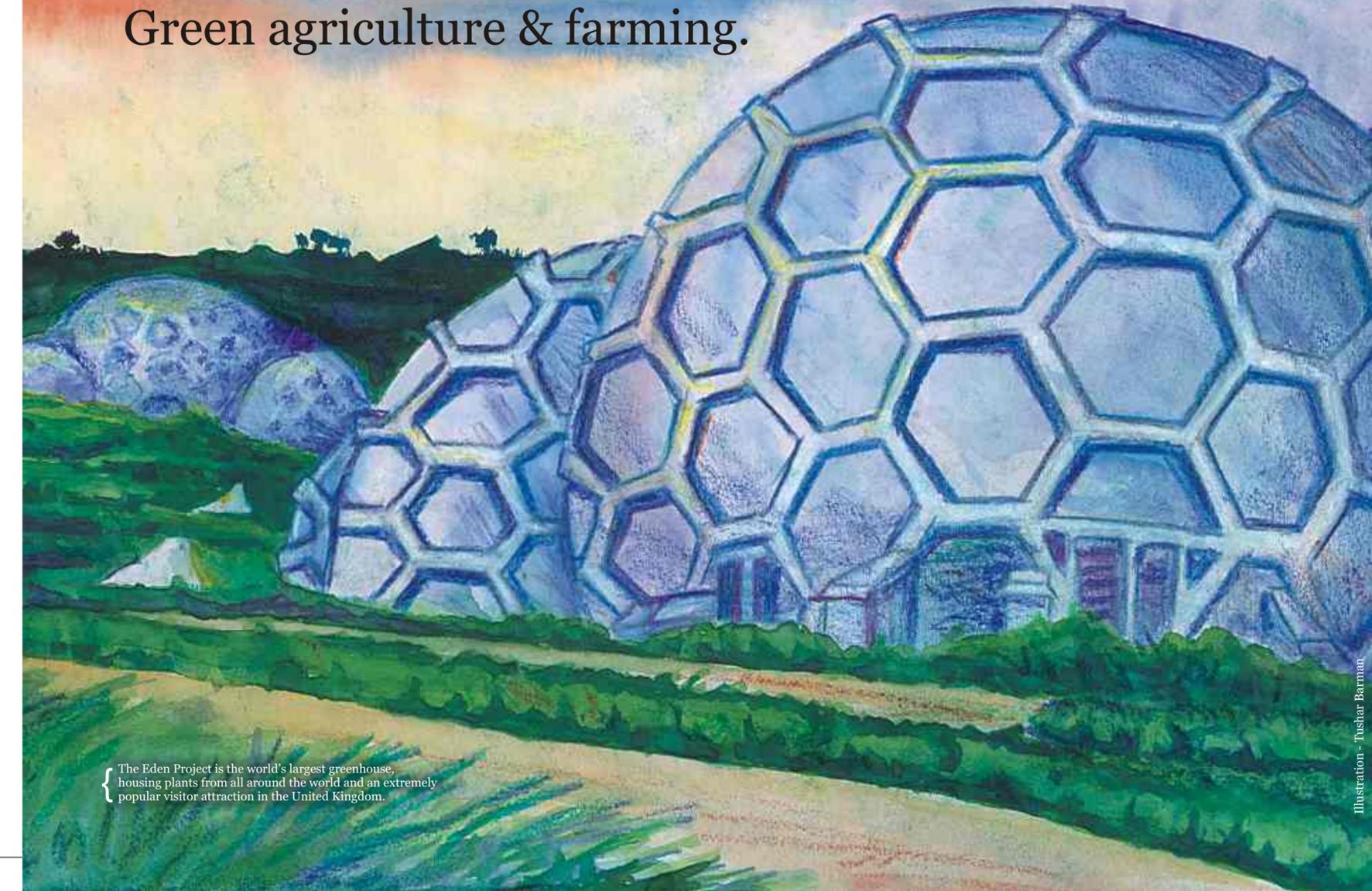


Illustration - Tushar Barman

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, a \$ 77 million showcase for global biodiversity, is one of the most innovative and high profile millennium projects. It is the largest plant enclosure in the world and its development represents a significant environmental improvement for the site - a 'worked out' china clay pit - and the surrounding landscape.*

**T**he 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.

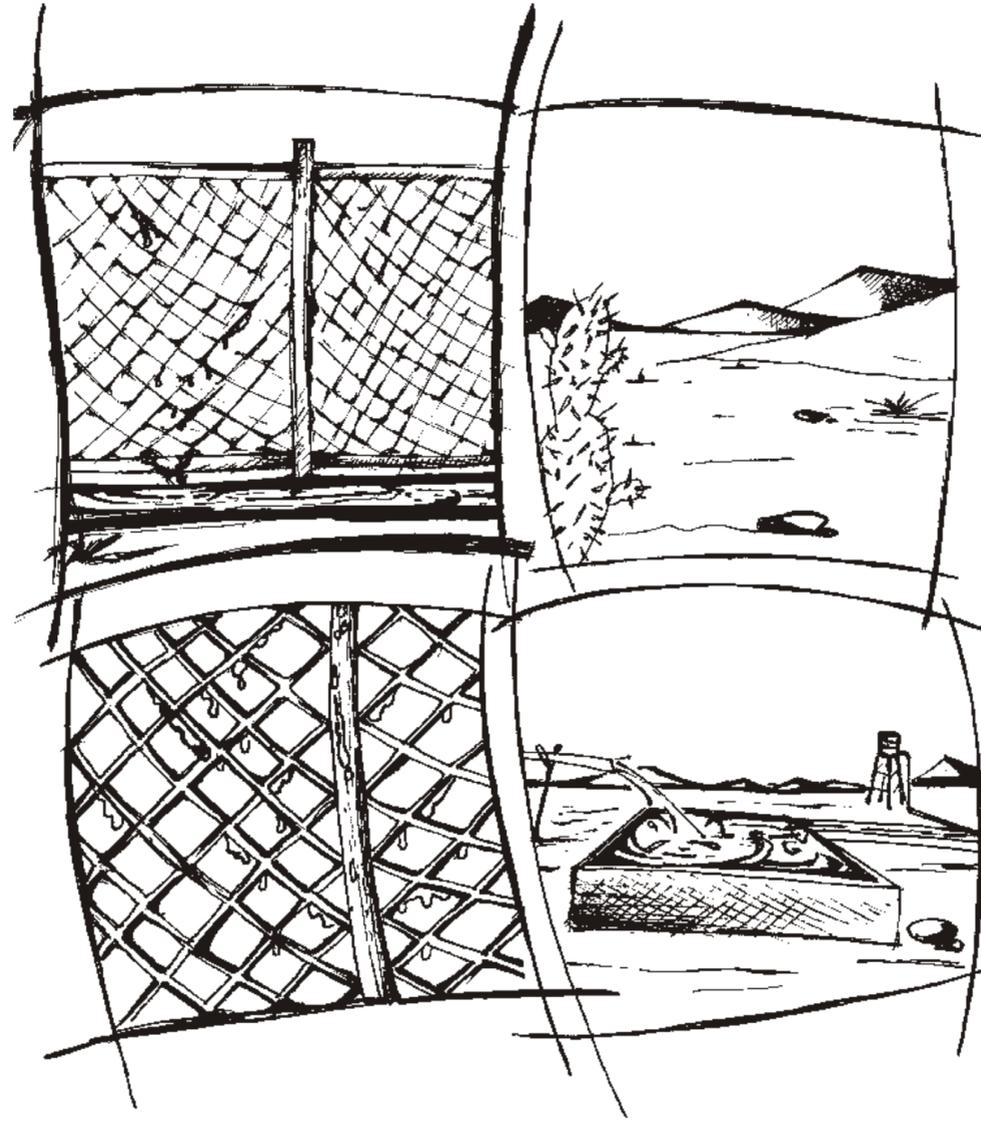
The exact location of the biomes on site has been determined by Solar Modeling, a sophisticated technique that indicates where structures will benefit most from passive solar gain. The architects have capitalized upon this gain by cladding the biomes with ETFE (Ethylene Tetra Fluoro Ethylene) foil. ETFE 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 in the biomes, but this is supplementary: a means of fine-tuning the natural passive system. Similarly, ventilation and water strategies have been devised, with the aid of innovative Computational Fluid Dynamic Studies, to minimize natural wastage. Rainwater is recycled for humidification. Even ground water seepage, a potential problem in other circumstances, has been transformed into a positive resource, being distributed within the envelope for irrigation purposes.

The Eden Project currently employs about 500 permanent staff, 95% of whom were recruited locally and 75% of whom were previously unemployed. It is estimated that the project will also create around 1,700 full time employment (FTE) jobs in 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 forms part of the fourth phase of development, officially opened in September 2005. A third biome (dedicated to the Dry Tropics) is in planning.

This stand-out green practice contribution was shared by **Venkata Prakash Gudipudi\*** Hyderabad, India



Camanchacas or fogs occur in the arid coastal areas of Peru and Chile, South America.

Illustration - Chetan C K

## 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 are many times forced to live in the cheapest areas; high on hills, on the edge of the city, where landslides are common and water is scarce. But these people have an ace up their sleeves; with special nets they scoop water directly from the air.*

Even though serious work on collecting fog started about a hundred years ago, it is now that people are realizing its potential. Newcomers to Lima typically build plywood shacks on unclaimed land on the steep hill slopes. If the residents stay long enough, they can obtain the title to the land from the government. One of the requirements for getting the title is to plant trees upslope. Earthquakes are common around Lima and trees help stabilize the land and guard against landslides. But trees have needs too; mostly water. How do you provide for the trees when people themselves don't have enough water?

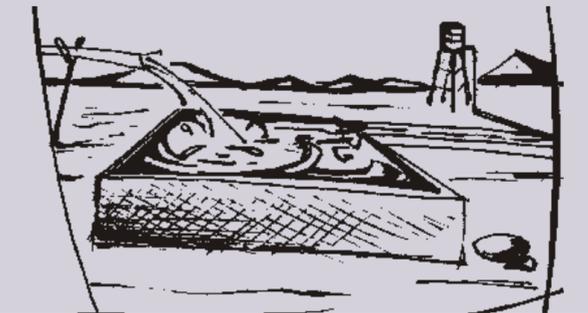
The village of Bella Vista with a population of about 200 people was founded seven years ago in the hills, 10 miles south of downtown Lima. Villagers here had to buy water for everything - cooking, cleaning and drinking - from trucks that drive up the steep hill every week. The residents pay ten times as much as people farther downhill, who are connected to the municipal supply. For a family of four, water bills could be as high as \$ 7 - 10 a week - a huge sum in a village where family income might average about \$ 40 a week.

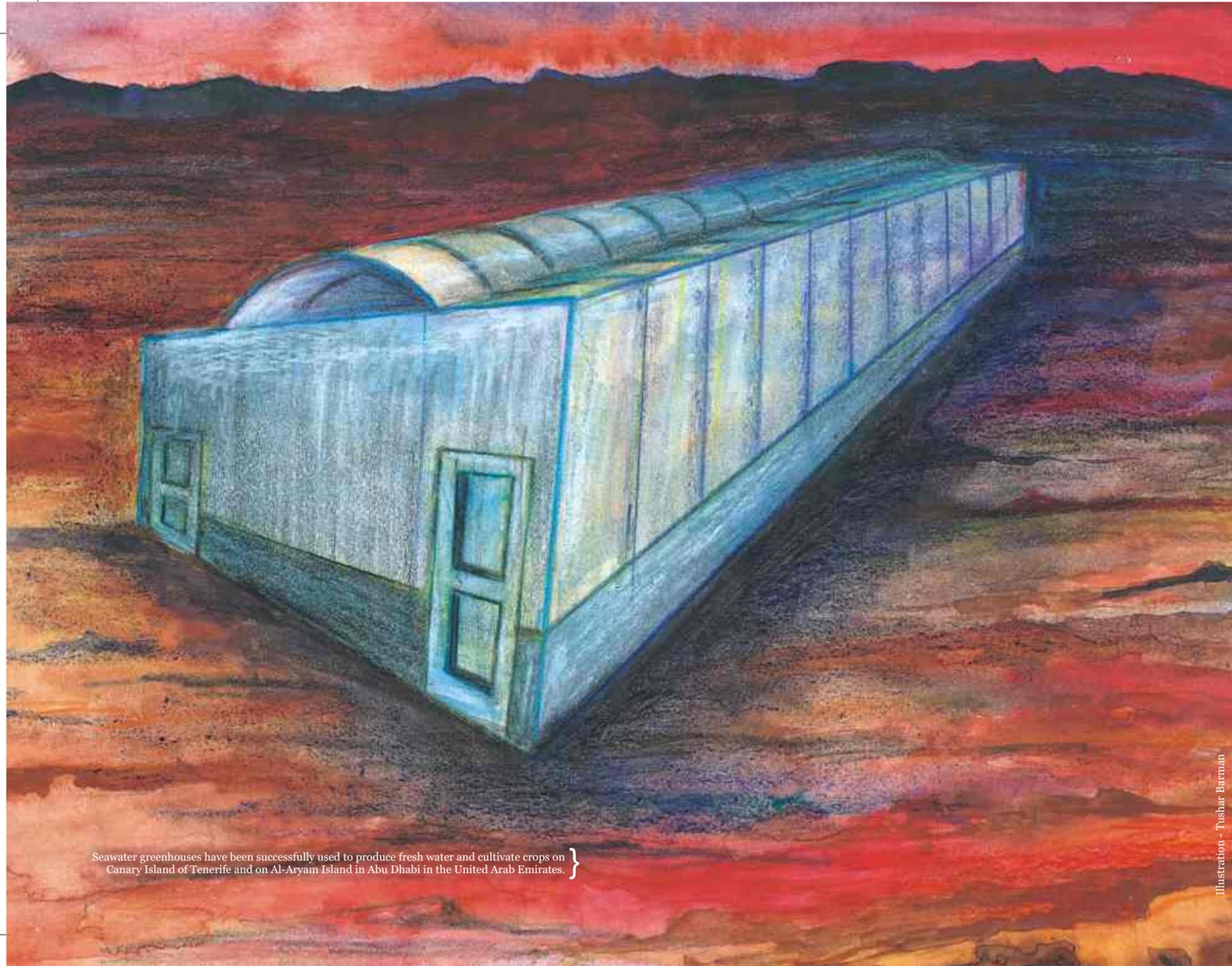
When the Bella Vista fog-catching project began in 2006, people from the village did all the heavy lifting and digging. They had to carry 94 pound bags of sand about 800 feet up the steep hill to stabilize the nets and build pools to gather water collected by the fog catchers. Even though they worked hard to build the fog catchers, some of these men thought the idea sounded a little crazy.

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, perpendicular to the prevailing wind, stretch between pairs of wooden poles. The top of each net is 18 feet above the ground. As wind blows through the heavy fog, tiny droplets stick to the coarse woven mesh, made of a kind of plastic netting that is designed to shade young fruit trees.

As more and more tiny droplets stick to the net, they clump together and form drops and eventually gravity pulls the drops down into a gutter. From there, the water flows through tubes into two brick tanks and a pool which together holds more than 25,000 gallons of water.

This 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 Canary Island of Tenerife and on Al-Aryam Island in Abu Dhabi in the United Arab Emirates.

Illustration - Tushar Barman

# SEAWATER GREENHOUSE

## A viable, sustainable option and an environmental breakthrough.

*The Seawater Greenhouse uses seawater to cool and humidify the air that ventilates the greenhouse and sunlight to distill fresh water from seawater, enabling year round cultivation of high value crops that would otherwise be difficult to grow in hot, arid regions. This innovative project that turns the normal function of greenhouses upside down has been garnering many environmental awards.*

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 desalination.

The greenhouses are built of timber on a galvanized steel frame with polythene cladding, pipe-work and cardboard evaporators. All material is 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 Environment noted that this technology provides pure distilled water and food which could

benefit more than 80 countries with arid regions near the sea, as well as areas of the world that face drought, salt infected soil, high temperatures and increasing shortages of groundwater.

Grimshaw's architects believe biomimetic principles can be taken further, to generate new income as well as reduce running costs and resource use. They have designed a completely carbon-neutral indoor botanical garden that could be built on an existing landfill site. For most of the year, the hothouse would be heated by solar heating through a glazed roof; in winter, additional heating would come from the landfill biomass. Biodegradable waste, deposited in large vertical composting units flanking the building, would generate heat for the indoor garden, and could earn as much as \$ 14 million a year by substituting for a landfill site - and the compost could be sold for agricultural use.

Similar greenhouses were built in 1992 on the Canary Island of Tenerife and in 2000 on Al-Aryam Island in Abu Dhabi in the United Arab Emirates. The quality and quantity of crop production has been excellent in both cases, and the greenhouse has supplied more water than was needed for irrigation.

This stand-out green practice contribution was shared by **Venkata Prakash Gudipudi\*** Hyderabad, India



# BAKER'S ARCHITECTURE

Laurie Baker's sustainable,  
organic architecture.

The most influential of modern architects, Laurie Baker has left  
an indelible impression on young architects and the Kerala Tourism industry, India.

Illustration - Varsha Ponnankar

*Perhaps, one of the most influential architects of our times, Laurie Baker's work on eco-friendly architecture and space utilization has been a benchmark and an absolute inspiration for a generation of architects. Surprisingly, his efforts in popularizing cost-effective architecture have had an indirect but positive effect on the booming tourism industry of Kerala.*

Laurie 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 Ponnudi.

The Center for Development Studies building in Thiruvananthapuram, built during his heydays, has become a must-see destination for aspiring architects and students. He is a symbol of multi-culturalism, experimentation and is 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. Resistant to 'high-technology' that addresses building

environment issues by ignoring natural environment, at the Center for Development Studies, Baker created a cooling system by placing a high, latticed, brick wall near a pond that uses air pressure differences to draw cool air through the building. His responsiveness to never-identical site conditions quite obviously allowed for the variation that permeates his work. Many of his writings are available through COSTFORD (The Center Of Science and Technology For Rural Development), a voluntary organization that is dedicated to carrying forward ideals he espoused throughout his life.

We are going through an era where an integrated approach is soon replacing the fragmented one of the yesteryears. There can no longer be a division between ideals and practice, man and nature, beauty and utility. This can be witnessed in all spheres of work. Baker's architecture is thus a true manifestation of Indian philosophy.

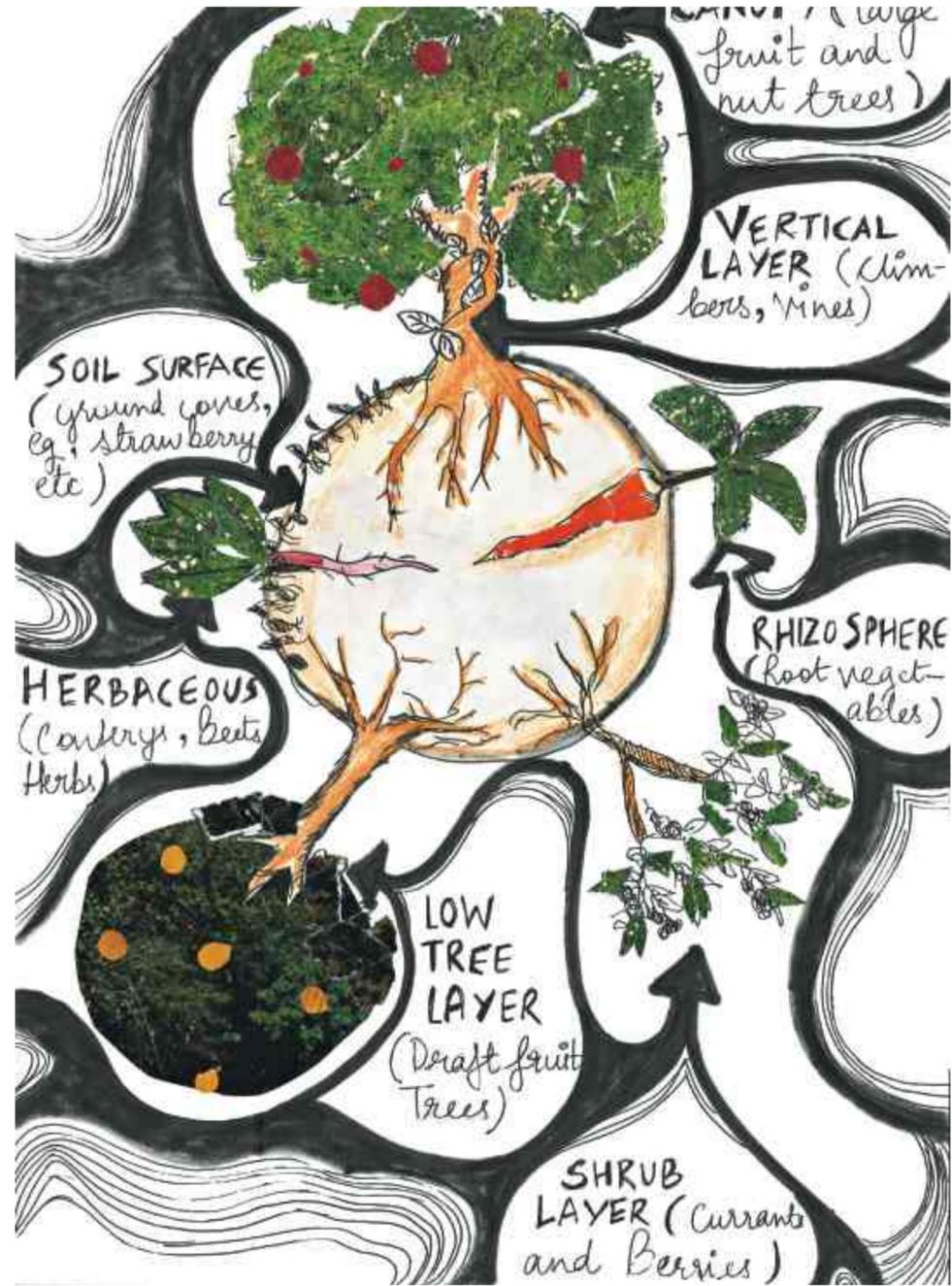
This stand-out green practice contribution was shared by  
**Ullas Ponnadi Pushpakam\***  
Kochi, India



# Sustainable agriculture.

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.





## INGA ALLEY CULTIVATION

### The Americans learn to save the rainforests.

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

Illustration - Lianna Dias

*Until recently, farmers in the hilly regions of Sarstun in Guatemala and Olanchito in Honduras used the slash-and-burn method of cultivation. But in this method, the soil lost its fertility pretty soon forcing the farmers to move to the next chunk of forest land. But all this has changed in the past few years.*

Inga alley cropping is a technique of agro forestry that is saving the Brazilian rainforests from decertification. Before 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 lost its fertility and the farmers would move to the next chunk of forest land to continue cutting trees for their farmland. Keeping the land fallow allowed the fertility to be restored when the trees grew again. 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 successfully in Africa but has only recently seen favorable results in America when Mike Hands, a British tropical ecologist, pioneered the Inga alley cropping in the rainforests. In alley cropping, an agricultural crop is grown in alleys 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 the other crop, while the tree crop matures. Mike Hands used this technique 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.

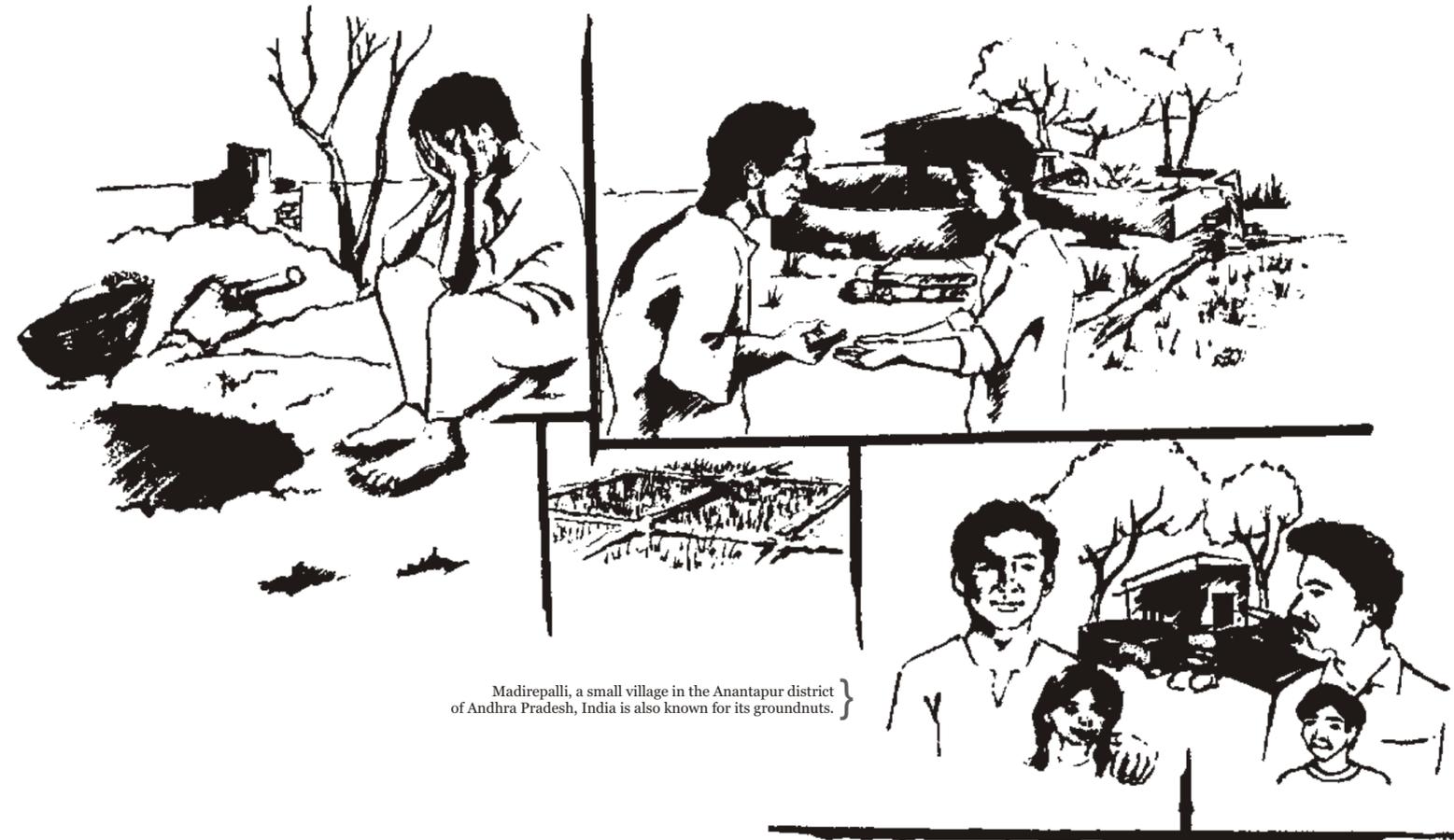
The benefits to the farmers are immense. Firstly, input is practically nothing; only Inga seeds and knowledge of operating the system, that is; the farmer must know how far to plant the trees from the agricultural crop, when to cut the mature tree and how to cover the ground with the mulch. This allows debt-free farming. Inga alley cropping is also a very profitable way of cultivation as proved by the Central American farmers like Victor Coronado. He not only grew grains but cash crops too, like pepper or vanilla. His wife tackled the cultivation of the pepper which she sells in the market, giving them additional cash and income security. Again, the fact that this farming method maintains the rainforest by mimicking nature and since soil fertility is restored by tree cuttings, fertilizers are totally done away with. This happens to create another channel of sale, i.e., through fair-trade co-operatives for organic farming. Last but not the least, the farmers are allowed a stable family life from fixed farming, unlike the migratory slash-and-burn method.

This stand-out green practice contribution was shared by **Anusree Ganguly\*** Kolkata, India



# 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.

Illustration - Sendil C

*When the farmers in Madirepalli discovered that ground water can be pumped out through bore wells, they went on an installation spree. Free electricity made it cheap to pump out the water. But soon groundwater levels went down and the wells began to dry up, leaving the farmers with debts, instead of water.*

Madirepalli, a small village in Andhra Pradesh is famous for its groundnut seeds. 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 bore wells went dry.

Farmers in their desperation went about drilling 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 them convince the farmers about the new idea. But still, giving away water from one's well to a neighbor without compensation in cash or in kind 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 bore well another 20% is covered by the NGO, while the

major amount is given by the government, which also provides the sprinklers 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 even in the dry season and not to mention, this year, the farmers have had a bumper 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. This way they would be able to save the groundwater reserves in and around the village.

This stand-out green practice contribution was shared by **Venkata Prakash Gudipudi\*** Hyderabad, India



# FUKUOKA FARMING

Returning to nature.



{ Masanobu Fukuoka, a Japanese microbiologist was one of the pioneers of no-till grain cultivation and his system is referred to as Fukuoka Farming.

Illustration - Varsha Deshikar

*The terms 'Natural Farming', 'Fukuoka Farming' and 'Fukuoka Method', all refer to a unique small-scale sustainable farming technique which owes its credit to a Japanese microbiologist Masanobu Fukuoka, who was skeptical about the wisdom of modern agricultural science from the very beginning of his research career.*

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, which 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 in the nature of 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, 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, one weed 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 erosion of soil. 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 periodically cut and allowed to lie on the surface, so that the nutrients they contain return to the soil.

One of the biggest issues that plague farmers is pest-infection. Measures taken to control pests often prove to be counterproductive – soil and water contamination, soil infertility, health hazards are just a few of the consequences of using pesticides. Fukuoka advocates a 'do nothing' approach to control crop diseases and insect pests, because doing anything is likely to have consequences even worse than the disease or pest damage.

Barley and rice can be grown successively using this method. The seeds for the next season's crop are sown before the previous one is harvested. The straw from the previous crop is also strewn so as to replenish the soil. This technique is being practiced 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 care-taker than Mother Nature herself? Her supremacy is undeniable and insurmountable.

This stand-out green practice contribution was shared by **Teena CH\*** Kochi, India



**NATURAL FARMING.**



{ Enabavi, a small village in the Warangal district of Andhra Pradesh has created history of sorts by becoming the first village in India to go fully organic.

## ENABAVI The blueprint for an ideal world.

Illustration - Varsha Deshikar

*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.*

**E**nabavi, a little hamlet 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 55 families, with a population of around 200 people, spread over 300 acres has become totally free of pesticides, chemical fertilizers and genetically-modified crops, standing as a ray of hope in the midst of a dark picture of agriculture debts, meager returns and increasing input costs.

The accomplishment was not any 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. Ponnammallaiah 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 once again.



There is pride in Enabavi villagers, when they explain to the stream of visiting scientists and other visitors, as to why their village is an island of prosperity in Warangal, which is notorious as the heartland of heavy pesticide use and farmer suicides. In the last five years, they have stopped using pesticides and chemical fertilizers and are now growing fully organic crops. What is more important is that they have declared that they won't grow genetically modified crops either. The villagers are all free from the stranglehold of money lenders; there is no migration in search of work and not a single farmer suicide in the village.

This stand-out green practice contribution was shared by **Venkata Prakash Gudipudi\*** Hyderabad, India



Terra preta is a mixture of charcoal, bone and manure, a dark, fertile anthropogenic soil found only in the Amazonian Basin.

Illustration - Lianna Dias

## TERRA PRETA

### The rich anthropogenic soil of Amazonia.

*Terra preta also known as 'Amazonian dark earth' or 'Indian black earth' refers to the vast expanses of dark, fertile anthropogenic soil found in the Amazon 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.*

**T**erra 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.

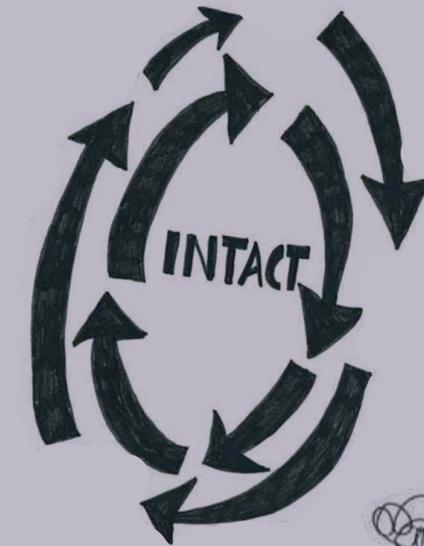
Terra preta soil is found among various climatic, geological and topographical conditions. Their distribution either follows main water courses, from East Amazonia to the Central Basin of Amazonia, or is located on interfluvial sites, mainly of circular or lenticular shape and of a smaller size averaging 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: a) incorporation of wood charcoal b) incorporation of organic matter and nutrients c) role of micro-organisms and animals in the soil.

According to a research team of the Bayreuth University, tropic soil can be easily enriched to terra preta nova by the addition of crumbled charcoal and condensed smoke. Efforts to recreate these soils have already been undertaken by many organizations. In Brazil, the use of carbonized biomass to create soil horizons similar to the terra preta are going on at Embrapa Amazônia Ocidental, Embrapa Solos and at Instituto Nacional de Pesquisa da Amazonia (INPA). Biochar is the main ingredient in the formation of terra preta. 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, remediating global warming.

This stand-out green practice contribution was shared by **P S Narayan\*** Bengaluru, India



## Sustainable cities.

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

## A runaway success in eco-friendly transport system.



Curitiba is the capital city of the Brazilian state of Paraná and according to some, the best place to live in Brazil.

*Bus systems provide a versatile form of public transportation with the flexibility to serve a variety of access needs and unlimited 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.*

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 most heavily used, yet low-cost, transit systems in the world. It offers many of the features of a subway system - vehicle movements unimpeded by traffic signals and congestion, fare collection prior to boarding, quick passenger loading and unloading - but it is above ground and visible. Around 70% of Curitiba's commuters use the BRT to travel to work, resulting in congestion-free streets and pollution-free air for the 2.2 million inhabitants of greater Curitiba.

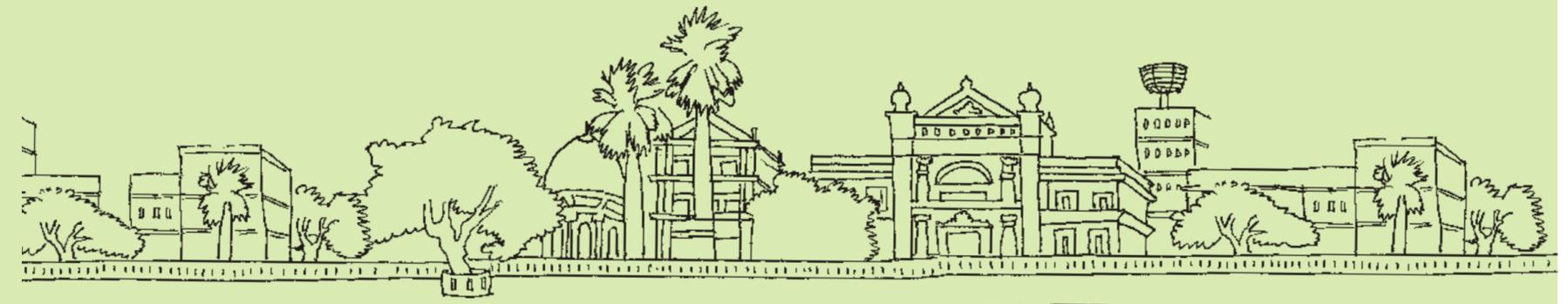
Thirty years ago, Curitiba's planners integrated public transportation into all the other elements of the urban planning system. They initiated a system that focused on meeting the transportation needs of people - rather than those using private automobiles and consistently followed through with a staged implementation of their plan. They avoided large-scale and expensive projects in favor of hundreds of modest initiatives.

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 effected a modal shift from automobile travel to bus travel. Based on 1991 traveler survey results, it was estimated that the introduction of the BRT had caused 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. Best of all, Curitibaanos spend only about 10% of their income on travel which is much below the national average.

This stand-out green practice contribution was shared by **P S Narayan\***  
Bengaluru, India

Illustration - Shibhen Moitra





## RAINWATER HARVESTING

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

{ Chennai is the capital city of Tamil Nadu and possibly one of the earliest cities in the country to have made rainwater harvesting mandatory.

Illustration - Lianna Dias

*Chennai, like other parts of Tamil Nadu, has severe water scarcity. In fact, this has even led to bitter quarrels with neighboring states on many occasions. The State Government realized that depending on others for water is going to be a futile effort, and so made rainwater harvesting mandatory. Today, the idea is paying rich dividends.*

**W**hen 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 bore well. After going down 150 feet, 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. Around that time, the State Government had made it mandatory for citizens to build rainwater harvesting systems in their homes. Every building had to have a simple network of pipes that collected the rain water and stored them for future use. On further investigation, Jamuna discovered that rainwater harvesting was indeed a simple way 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 ever since the installation of the rainwater harvesting in about 500,000 households was made mandatory five years ago, there has been a 50% rise in the water levels. According to the Metro Water officials, over the last five years, the water level across the city has gone up by 3 to 6 meters. Similarly, the water quality in several areas has showed improvement. The sustained normal rainfall since 2004 and the proper maintenance of rainwater harvesting structures in most households have been the principal reasons for dramatic improvements. Following the drought period in 2003, when

Chennai received only about 690 mm of rainfall as against 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 gone up by, between 3 and 5 meters in November 2007.

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





{ Fukuoka is situated on the island of Kyūshū, Japan and is known for its green spaces in a metropolitan setting.

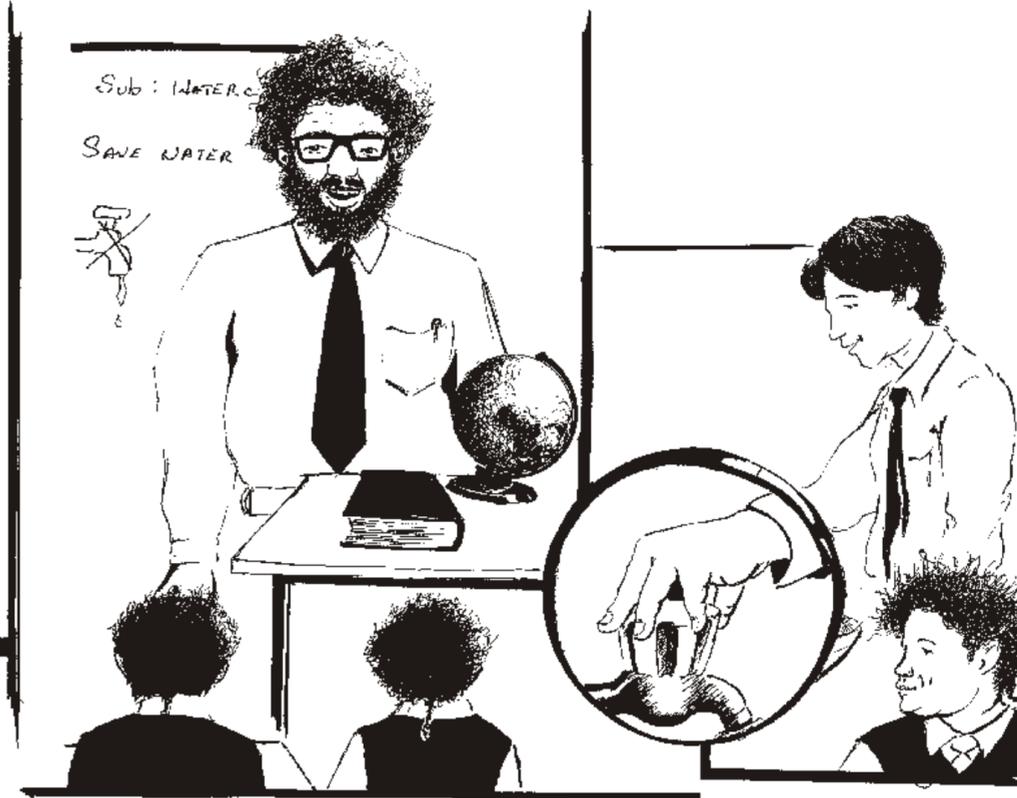


Illustration - Sendil C

## 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.*

**L**ike most best practices, effective water demand management in Fukuoka was born from a crisis. There was a great drought in 1978, forcing the city government to curb water supply for 287 days in a year. Without abundant water resources and subject to serious periodic droughts, Fukuoka faced an enormous challenge in securing a stable water supply to serve a population of over 1.3 million. To respond to this alarming situation, Fukuoka city in partnership with the citizens and private sector launched various initiatives promoting a 'Water Conservation Conscious City' in 1979.

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.

The Fukuoka City Water Bureau has been addressing water leakage by replacing old pipes with new ones. Through such efforts,

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 supplements its fresh water supplies by converting sea water into fresh water, using the Reverse Permeability System, to produce 50,000 cubic meters of fresh water daily.

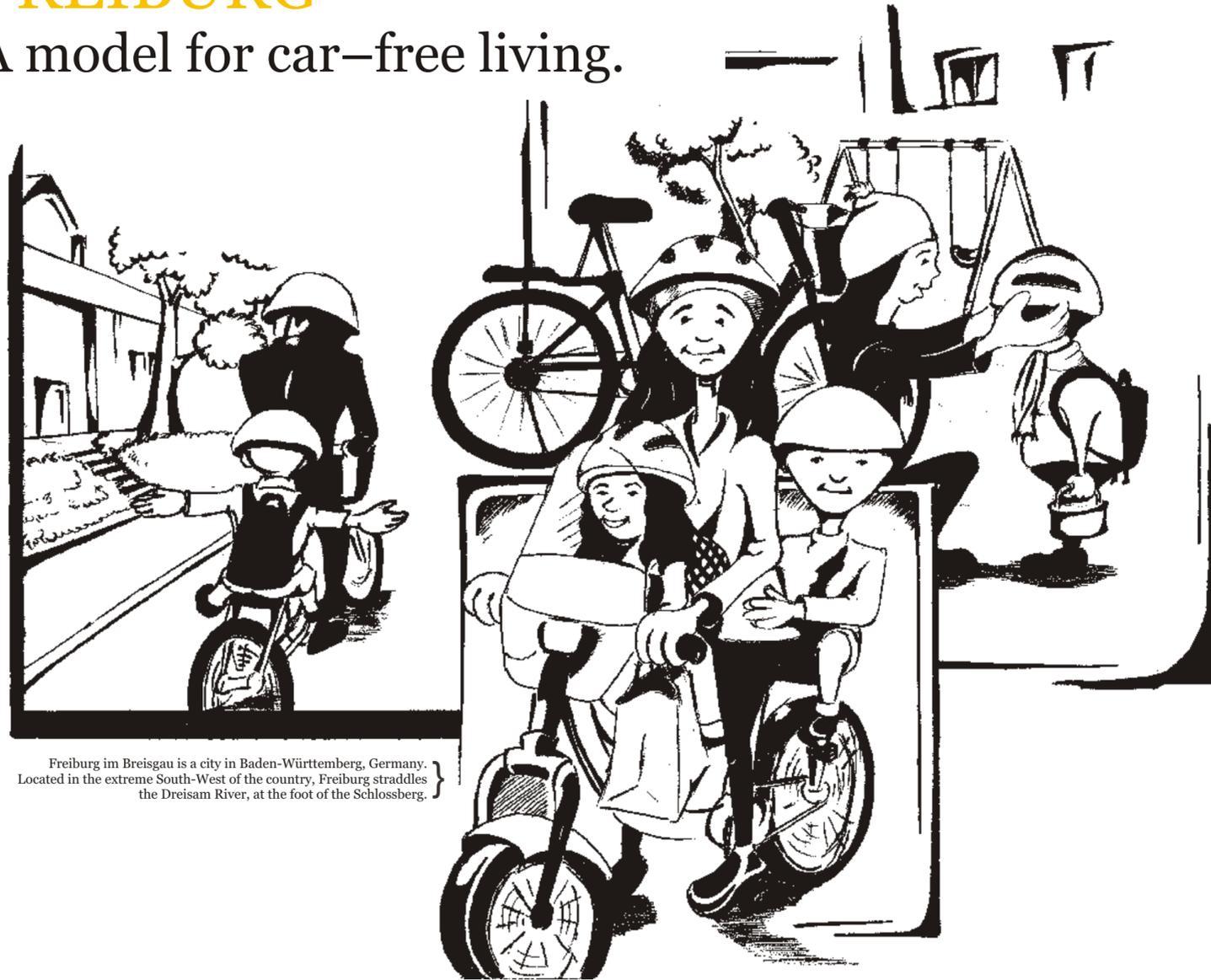
Other measures include an integrated water distribution monitoring system to ensure efficiency. The city has also embarked on protecting water sources through tree planting campaigns. Currently, per capita water consumption in Fukuoka city is less than it was before 1978, despite a 30% increase in population. Fukuoka city consumes approximately 20% less water than other comparably sized cities.



This stand-out green practice contribution was shared by **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.

*It's pickup time at the Vauban kindergarten at the edge of the Black Forest, but there's not a single minivan waiting for the kids. Instead, is a convoy of helmet-donning moms, with bicycle trailers in tow, who pedal up to the entrance. Welcome to Germany's best-known environmentally friendly neighborhood experiment in green urban living - the Vauban project.*

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.

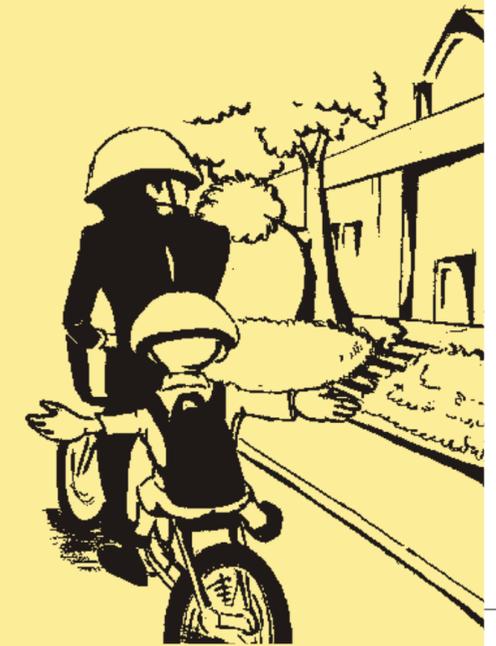
There are numerous incentives for Vauban's 4,700 residents to live car-free: Car-poolers get free yearly tramway passes, while parking spots - available only in a garage at the neighborhood's edge - go for € 17,500 (\$ 23,000). 40% of residents have bought spaces, many just for the benefit of their visiting 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 of Germany's largest 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, keeping in mind the ecological, social, economic, and cultural goals of reducing energy levels while creating healthier air and a solid infrastructure for young families. Rather than handing over the area to a real estate developer, the city let small home-owner cooperatives design and build their homes from scratch. Today, rows of individually designed, brightly painted buildings line streets that are designed to be too narrow for cars. There are four kindergartens, a Waldorf school, and plenty of playgrounds.

This stand-out green practice contribution was shared by **P S Narayan\***  
Bengaluru, India





## HELSINKI The energy efficient city.

{ 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.

Illustration - Lianna Dias

*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 save 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.*

**L**ike 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 wasting it by dumping it 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/m<sup>3</sup>a to 44 kWh/m<sup>3</sup>a 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 plant 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.

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 fuels exceeded 50% and the emissions per kilowatt-hours of output energy were further reduced.

Development of District Heating Network: The new natural gas capacity 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, in a reliable way for the consumer.

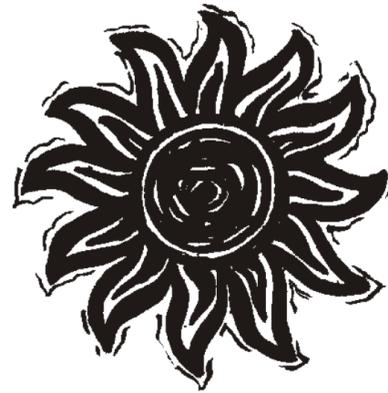
Altogether, there are over 1,000 km of district heating pipelines in Helsinki. Helsingin Energia is testing Finland's first cooling plant and District Cooling System at the Salmisaari power plant. In cooling production, the utilized energy (i.e. the heat required by the absorbing apparatus) is acquired from the waste heat of the co-generation process that remains unutilized.

This stand-out green practice contribution was shared by  
**P S Narayan\***  
Bengaluru, India



# EAST KOLKATA WETLANDS

## A flourishing resource recycling system.



{ East Kolkata Wetlands, India is a complex world of natural and man-made wetlands.

Illustration - Varsha Deshkar

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

The price we pay for modernization and industrialization is quite mind-boggling. In our enthusiasm to get ahead, we forget basic hygiene and usually end with a lot more waste than anticipated. But if we apply ourselves, we can come up with ingenious solutions that the world will take notice of. Just like in this case, at the eastern edge of Kolkata, West Bengal, India, is a largely man-made wetland ecosystem that serves the dual purpose of naturally treating sewage and reusing waste.

It is one of those rare examples which is a combination of environmental protection and development management, where a complex ecological process has been adopted by the local farmers by mastering the resource recovery activities.

A network of about 250 ponds constitutes the world's largest resource recovery system that provides three basic securities - food, sanitation and livelihood, to the people in this belt, while also supporting the biodiversity and serving as a carbon sink. This wetland ecosystem, has saved the city of Kolkata not only many millions of dollars by not constructing and maintaining a waste water treatment plant, but also has kept the city from polluting the river Kulti Gong.

Here is an outline of how the system works. Kolkata's untreated sewage flows into the pond network where it is kept standing in the sun. This results in biodegradation of wastes through an algae-bacteria symbiosis. Then water hyacinth is used to absorb heavy metals. The sewage is then cleansed at one-third the cost of a treatment plant. The sewage is fed to fish farms (Bheris) and also used to irrigate paddy fields. It finally flows into the Kulti Gong without its original contaminants.



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 (\$ 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

## Communities at the forefront.

<b>Story Name:</b>	BISHNOIS A community that took on an empire for their trees and animals.
<b>Author/Location/Country:</b>	P S Narayan - Bengaluru, India
<b>References:</b>	<a href="http://en.wikipedia.org/wiki/Bishnois">http://en.wikipedia.org/wiki/Bishnois</a>
<b>Illustrators:</b>	Lianna Dias - Bengaluru, India
<b>Story Name:</b>	DEV VANS A cultural device to conserve the ecology in Uttaranchal.
<b>Author/Location/Country:</b>	Sudipta Ghosh - Kolkata, India
<b>References:</b>	<a href="http://www.activeremedy.org.uk/pages/files/other/Dev_Vans_for_conserving_ecology.pdf">http://www.activeremedy.org.uk/pages/files/other/Dev_Vans_for_conserving_ecology.pdf</a>
<b>Illustrators:</b>	Sylvester Pradeep
<b>Story Name:</b>	SAHAYADRI NISARGA MITRA Protecting endangered species.
<b>Author/Location/Country:</b>	Kirti Azad - Greater Noida, India
<b>References:</b>	<a href="http://www.ioseaturtles.org/UserFiles/Image/SeaTurtleConservation_India_chapter1.pdf">http://www.ioseaturtles.org/UserFiles/Image/SeaTurtleConservation_India_chapter1.pdf</a>
<b>Illustrators:</b>	Varsha Deshikar
<b>Story Name:</b>	WATER IS THE REAL WEALTH The DHAN community action.
<b>Author/Location/Country:</b>	Sudipta Ghosh - Kolkata, India
<b>References:</b>	<a href="http://www.indiaenvironmentportal.org.in/node/2201">www.indiaenvironmentportal.org.in/node/2201</a>
<b>Illustrators:</b>	Tushar Barman
<b>Story Name:</b>	HIVRE BAZAAR A role model in self sustainability.
<b>Author/Location/Country:</b>	Veena Padmanabhan - Gurgaon, India
<b>References:</b>	<a href="http://www.rainwaterharvesting.org/Rural/Hirve.htm">http://www.rainwaterharvesting.org/Rural/Hirve.htm</a>
<b>Illustrators:</b>	Shiben Moitra
<b>Story Name:</b>	SHABDO A merger of land and hearts spreads light.
<b>Author/Location/Country:</b>	Sudipta Ghosh - Kolkata, India
<b>References:</b>	<a href="http://www.indianexpress.com/oldStory/34087/">http://www.indianexpress.com/oldStory/34087/</a> , <a href="http://www.time.com/time/specials/packages/article/0,28804,1841778_1841782_1841791,00.html">http://www.time.com/time/specials/packages/article/0,28804,1841778_1841782_1841791,00.html</a>
<b>Illustrators:</b>	Varsha Deshikar

## Conservation at its best.

<b>Story Name:</b>	FUROSHIKI The art of wrapping a world of goodness.
<b>Author/Location/Country:</b>	Veena Padmanabhan - Gurgaon, India
<b>References:</b>	<a href="http://en.wikipedia.org/wiki/Furoshiki">http://en.wikipedia.org/wiki/Furoshiki</a>
<b>Illustrators:</b>	Lianna Dias
<b>Story Name:</b>	SAVING THE INDIAN SPARROW It's happening at Nasik, India.
<b>Author/Location/Country:</b>	P S Narayan - Bengaluru, India
<b>References:</b>	<a href="http://www.time.com/time/specials/packages/article/0,28804,1841778_1841782_1841791,00.html">http://www.time.com/time/specials/packages/article/0,28804,1841778_1841782_1841791,00.html</a>
<b>Illustrators:</b>	Kunal Vijayendra
<b>Story Name:</b>	JOHAD REVIVES WITH WATER An age old practice comes to the rescue.
<b>Author/Location/Country:</b>	Sudipta Ghosh - Kolkata, India
<b>References:</b>	<a href="http://www.rmaf.org.ph/Awardees/Citation/CitationSinghRaj.htm">http://www.rmaf.org.ph/Awardees/Citation/CitationSinghRaj.htm</a>
<b>Illustrators:</b>	Varsha Deshikar
<b>Story Name:</b>	THE BANANA TREE The marvel of South Asia.
<b>Author/Location/Country:</b>	Bableen Johal - Bengaluru, India
<b>References:</b>	<a href="http://www.indianetzone.com/4/banana_tree.htm">http://www.indianetzone.com/4/banana_tree.htm</a>
<b>Illustrators:</b>	Kunal Vijayendra
<b>Story Name:</b>	THE SILENT VALLEY Conservation versus development?
<b>Author/Location/Country:</b>	Gopi Govinda Acharya - Kochi, India
<b>References:</b>	<a href="http://en.wikipedia.org/wiki/Silent_Valley_National_Park">http://en.wikipedia.org/wiki/Silent_Valley_National_Park</a>
<b>Illustrators:</b>	Kunal Vijayendra
<b>Story Name:</b>	VEDANTANGAL A great example of symbiosis with nature.
<b>Author/Location/Country:</b>	Narasimhan P L L - Chennai, India
<b>References:</b>	<a href="http://www.auroville.org/journals&amp;media/avtoday/jan_2002/nature_watch.htm">http://www.auroville.org/journals&amp;media/avtoday/jan_2002/nature_watch.htm</a>
<b>Illustrators:</b>	Sripad Kulkarni

*\* original references for the eco-stories*

## Green innovation.

<b>Story Name:</b>	RAJASTHAN Building the world's biggest solar kitchen.
<b>Author/Location/Country:</b>	Mahathi Nethi - Hyderabad, India
<b>References:</b>	<a href="http://www.inhabitat.com/2008/03/17/world%e2%80%99s-largest-solar-kitchen-in-india-can-cook-upto-38500-meals-per-day/">http://www.inhabitat.com/2008/03/17/world%e2%80%99s-largest-solar-kitchen-in-india-can-cook-upto-38500-meals-per-day/</a>
<b>Illustrators:</b>	Varsha Deshikar
<b>Story Name:</b>	EDEN PROJECT Green agriculture & farming.
<b>Author/Location/Country:</b>	Venkata Prakash Gudipudi - Hyderabad, India
<b>References:</b>	<a href="http://en.wikipedia.org/wiki/Eden_Project">http://en.wikipedia.org/wiki/Eden_Project</a>
<b>Illustrators:</b>	Tushar Barman
<b>Story Name:</b>	BELLAVISTA FOG How to gather hundreds of gallons of fresh water from fog?
<b>Author/Location/Country:</b>	Venkata Prakash Gudipudi - Hyderabad, India
<b>References:</b>	<a href="http://news.nationalgeographic.com/news/2009/07/090709-fog-catchers-peru-water-missions/">http://news.nationalgeographic.com/news/2009/07/090709-fog-catchers-peru-water-missions/</a>
<b>Illustrators:</b>	Chetan C K
<b>Story Name:</b>	SEAWATER GREENHOUSE A viable, sustainable option and an environmental breakthrough.
<b>Author/Location/Country:</b>	Venkata Prakash Gudipudi - Hyderabad, India
<b>References:</b>	<a href="http://en.wikipedia.org/wiki/Seawater_Greenhouse">http://en.wikipedia.org/wiki/Seawater_Greenhouse</a>
<b>Illustrators:</b>	Tushar Barman
<b>Story Name:</b>	BAKERS ARCHITECTURE Laurie Baker's sustainable, organic architecture.
<b>Author/Location/Country:</b>	Ullas Ponnadi Pushpakam - Kochi, India
<b>References:</b>	<a href="http://en.wikipedia.org/wiki/Laurie_Baker">http://en.wikipedia.org/wiki/Laurie_Baker</a>
<b>Illustrators:</b>	Varsha Deshikar

## Sustainable agriculture.

<b>Story Name:</b>	INGA ALLEY CULTIVATION The Americans learn to save the rainforests.
<b>Author/Location/Country:</b>	Anusree Ganguly - Kolkata, India
<b>References:</b>	<a href="http://www.rainforestsaver.org/what-is-it-all-about/what-is-inga-alley-cropping/">http://www.rainforestsaver.org/what-is-it-all-about/what-is-inga-alley-cropping/</a>
<b>Illustrators:</b>	Lianna Dias
<b>Story Name:</b>	MADIREPALLI FARMERS Share more than water with their neighbors.
<b>Author/Location/Country:</b>	Venkata Prakash Gudipudi - Hyderabad, India
<b>References:</b>	<a href="http://www.cwsy.org/Watershed.asp">http://www.cwsy.org/Watershed.asp</a>
<b>Illustrators:</b>	Sendil C
<b>Story Name:</b>	FUKUOKA FARMING Returning to nature.
<b>Author/Location/Country:</b>	Teena C H - Kochi, India
<b>References:</b>	<a href="http://fukuokafarmingol.info/">http://fukuokafarmingol.info/</a> <a href="http://en.wikipedia.org/wiki/Masanobu_Fukuoka">http://en.wikipedia.org/wiki/Masanobu_Fukuoka</a>
<b>Illustrators:</b>	Varsha Deshikar
<b>Story Name:</b>	EENABAVI The blueprint for an ideal world.
<b>Author/Location/Country:</b>	Venkata Prakash Gudipudi - Hyderabad, India
<b>References:</b>	<a href="http://www.crops.co.in/enabavi.html">http://www.crops.co.in/enabavi.html</a> <a href="http://www.downtoearth.org.in/default20090115.htm">http://www.downtoearth.org.in/default20090115.htm</a>
<b>Illustrators:</b>	Varsha Deshikar
<b>Story Name:</b>	TERRA PRETA The rich anthropogenic soil of Amazonia.
<b>Author/Location/Country:</b>	P S Narayan - Bengaluru, India
<b>References:</b>	<a href="http://en.wikipedia.org/wiki/Terra_preta">http://en.wikipedia.org/wiki/Terra_preta</a>
<b>Illustrators:</b>	Lianna Dias

*\* original references for the eco-stories*

## Sustainable cities.

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<b>Story Name:</b>	CURITIBA A runaway success in eco-friendly transport system.
<b>Author/Location/Country:</b>	P S Narayan - Bengaluru, India
<b>References:</b>	<a href="http://en.wikipedia.org/wiki/Curitiba">http://en.wikipedia.org/wiki/Curitiba</a>
<b>Illustrators:</b>	Shiben Moitra
<b>Story Name:</b>	RAINWATER HARVESTING A simple and effective method of water conservation for our cities.
<b>Author/Location/Country:</b>	Narasimhan P L L - Chennai, India
<b>References:</b>	<a href="http://www.chennaietrowater.tn.nic.in/rwh/rainwaterwhy.htm">http://www.chennaietrowater.tn.nic.in/rwh/rainwaterwhy.htm</a>
<b>Illustrators:</b>	Lianna Dias
<b>Story Name:</b>	FUKUOKA A water conservation conscious city.
<b>Author/Location/Country:</b>	P S Narayan - Bengaluru, India
<b>References:</b>	<a href="http://www.bestpractices.org/bpbriefs/watesan.html">http://www.bestpractices.org/bpbriefs/watesan.html</a>
<b>Illustrators:</b>	Sendil C
<b>Story Name:</b>	FREIBURG A model for car – free living.
<b>Author/Location/Country:</b>	P S Narayan - Bengaluru, India
<b>References:</b>	<a href="http://bruteforcecollaborative.wordpress.com/2010/02/21/freiburg-a-model-of-sustainability/">http://bruteforcecollaborative.wordpress.com/2010/02/21/freiburg-a-model-of-sustainability/</a>
<b>Illustrators:</b>	Sendil C
<b>Story Name:</b>	HELSINKI The energy efficient city.
<b>Author/Location/Country:</b>	P S Narayan- Bengaluru, India
<b>References:</b>	<a href="http://www.c40cities.org/bestpractices/energy/helsinki_heating.jsp">http://www.c40cities.org/bestpractices/energy/helsinki_heating.jsp</a>
<b>Illustrators:</b>	Lianna Dias
<b>Story Name:</b>	EAST KOLKATA WETLANDS A flourishing resource recycling system.
<b>Author/Location/Country:</b>	Mehala Kumar - Bangalore, India
<b>References:</b>	<a href="http://www.wwfindia.org/about_wwf/what_we_do/freshwater_wetlands/our_work/ramsar_sites/east_calcutta">http://www.wwfindia.org/about_wwf/what_we_do/freshwater_wetlands/our_work/ramsar_sites/east_calcutta</a>
<b>Illustrators:</b>	Varsha Deshikar

*\* original references for the eco-stories*