



# Pathways to Green India

Innovative Ideas from Students

Volume I





**EARTH DAY NETWORK**

October 15, 2016

Dear Reader

Growing out of the first Earth Day (April 22, 1970), our organization Earth Day Network now works with over 50,000 partners in 196 countries to broaden, diversify and mobilize the environmental movement. More than one billion people participate each year in Earth Day activities making it the largest civic observance in the world.

Today marks World Students Day.

In keeping with our conviction that Earth's future relies on developing environmental learning opportunities for youth of all ages and backgrounds so that they can be wise stewards of the environment that sustains us today, and for the future, Earth Day Network, India, has put together this eBook. It showcases innovative ideas students have adopted to green India. Many of these are related to waste and water management, others to increasing the green cover, and more.

We invite you to read about these novel methods that have been adopted. All are replicable in your areas as well. We have provided the contact information for each of the persons written about so that you can touch base with them to get additional details about the technicalities involved.

We hope you enjoy reading the 22 case studies. Many more have come in, which we will keep for subsequent volumes. In fact, if you know of others, do have the persons contact us at [earthdayindia@earthday.org](mailto:earthdayindia@earthday.org).

We are very grateful to the many people who sent in material and to those that helped with editing. We would also like to thank Wysiwyg Creative Arts that so readily came forward to design the book for us as part of their Corporate Social Responsibility program.

Regards,

Denis Hayes  
Chairperson  
(Emeritus)

Kathleen Rogers  
President

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# INDEX

SI No	Innovative Green Initiatives by Students	Page No
1	<b>A Music Room of Tetra Paks</b> <i>St Mary's School, New Delhi</i>	04
2	<b>And Out Poured Water</b> <i>Ashram Pathshala, Sabag</i>	07
3	<b>Back to Our Roots</b> <i>Eco-Reserve Attapaddy, Attapaddy</i>	10
4	<b>Does the Planet Notice?</b> <i>Seth MR Jaipuria School, Lucknow</i>	13
5	<b>Earth Murals</b> <i>Sri Sri Academy, Kolkata</i>	16
6	<b>Eco-Friendly Festival</b> <i>Seth Jyoti Prasad Vidyalaya, Daund</i>	19
7	<b>Empowering the Less Fortunate</b> <i>Shaheed Sukhdev College of Business Studies, Delhi</i>	22
8	<b>e-Waste</b> <i>Lioness Karnavati MH Hindi Higher Secondary School, Ahmedabad</i>	25
9	<b>Flora Draws Back Students</b> <i>Government High School Dhalwari, Una</i>	28
10	<b>For the Students, By the Students</b> <i>Digital School, Visakhapatnam</i>	31
11	<b>Have You Seen the Trees?</b> <i>Indraprastha College for Women, University of Delhi, Delhi</i>	34

SI No	Innovative Green Initiatives by Students	Page No
12	<b>Mr Cool Calculator</b> <i>Bharat Mata English Medium Higher Secondary School, Bilaspur</i>	37
13	<b>Project 1600</b> <i>Shree Vasishtha Vidhyalaya, Surat</i>	40
14	<b>Rare Gangetic Dolphins</b> <i>Dolphin Conservation Education Program, Varanasi</i>	43
15	<b>Respect for Mother Earth</b> <i>St Mary's School, Kota</i>	46
16	<b>Saniya's DuniYa</b> <i>Loreto House, Kolkata</i>	49
17	<b>Tackling a Burning Issue</b> <i>Hargovandas Lakshmichand College of Commerce, Ahmedabad</i>	52
18	<b>Through the Camera's Eye</b> <i>Dhulagori Adarsha Vidyalaya, Dhulagori</i>	55
19	<b>Towards A Greener Education</b> <i>National Public School Koramangala, Bengaluru</i>	58
20	<b>Transforming a Cesspool Into a Garden</b> <i>Rajeshwari Karuna Higher Secondary School, Rajnandgaon</i>	61
21	<b>Video Pledges</b> <i>Paryavaran Mitra, Ahmedabad</i>	64
22	<b>Zero Waste Himalaya</b> <i>Zero Waste Himalaya, Gangtok</i>	67

# A Music Room of Tetra Paks





# A Music Room of Tetra Paks

Aditya Bali is an alumnus of St Mary's School, New Delhi. He fondly remembers his school days, in particular, the music room and the happy hours he spent there. He recalls how one would be immersed in playing the scales on an instrument or trying out one's vocals when there would be that invariable knock on the door and a teacher would say 'Please lower the tone, my students are getting disturbed,' or 'Sssh, exams are going on. Practise at another time.'

'This was frustrating. One had to constantly tiptoe one's talent around others getting disturbed. No full-throated renditions, as my schoolmates and I saw divas present and so wanted to emulate, nor those instrumental dynamics where decibels went from soft to loud and even louder,' Aditya says.

On a visit to his alma mater, Aditya was eagerly looking forward to a changed scenario. Sadly, things were just the same. Full volume practice sessions in the music room were still a no-no. 'Soundproofing is just too expensive,' the administration explained. Music lessons continued to have the caveat 'No one else should get disturbed.'

Something had to be done. Aditya was eager to find a solution that could contain sound within the music room and at the same time be good for the community, the environment, and the world. Possible? It amazingly was! After much research, Aditya came up with an innovative but simple plan. He would add a soundproof layer to the walls of the music room and (hold your breath) this was to be constructed entirely out of trash—Tetra Paks discarded after their contents had been enjoyed. His studies confirmed that using these could effectively minimize the acoustics at a very low cost. No raw material was to be purchased. Just throw-outs collected. The environment would also benefit as reusing discarded items would reduce the already heavy burden on landfills.

Aditya says the collection and mobilization of resources were the main challenges he faced. Hence, the first thing he did was to draw in a large number of student volunteers to organize drives to collect discarded Tetra Paks. Tetra Pak vendors and St Mary's School authorities also came forward and the number swelled to around 80 people. 'The NGO Swechha also lent major support,' Aditya says.

In the first phase, 7,500 Tetra Paks were collected from five schools. These were then thoroughly washed. The water used in the cleaning process had its pH balance tested and neutralized and then reused to water the school lawns, thus not wasting it. 6,750 of the packs collected

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were found to be usable. These formed the first 'bricks' in the innovative construction. Each Tetra Pak was filled with a combination of sawdust and Neem (*Azadirachta indica*) leaves. Aditya had carefully chosen these materials after much consideration. The innate cellulosic quality of sawdust makes it an effective natural sound absorber. Its maximum air gaps provide a synergistic effect that isolates sound. Sawdust is also readily available where cutting, grinding, and drilling of wood takes place. Aditya says, packing it into the Tetra Pak 'bricks' had another big benefit—it helped reduce respiratory diseases and other severe health hazards that result from sawdust freely flying around. Including Neem leaves in the 'bricks' assured good prevention against termite infestation, as the leaves are traditionally recognized as natural insecticides.

Finally, the finished Tetra Paks were fixed onto the walls and the roof of the music room. To ensure that soundproofing was optimized, an irregular surface was created on the walls by lining them with an additional layer of empty egg cartons. Lining the windows and the floor with old blankets further blocked out the sound.

It was now time to test if the newly fabricated music room was indeed soundproof. Using the software Reaper Daw, there was confirmation that the noise level was around 17 percent lower outside the room as compared to inside. Guitars, drums, and bass could now be played with great amplification. The oft-heard refrain 'Please, you are disturbing us,' was no longer heard and the students now had a music room where they could practice to their hearts' content.

Why wouldn't the results be amazing? After all, with the meticulous planning and concerted efforts, success was assured. Aditya Bali was recognized for his 'Tetra Traps Timbre—Constructive Reuse of Tetra Paks' project with an 'Influence Fellowship' from Swechha.

'The International Award for Young People,' constituted by the Duke of Edinburgh and British Council, followed, as did several others.

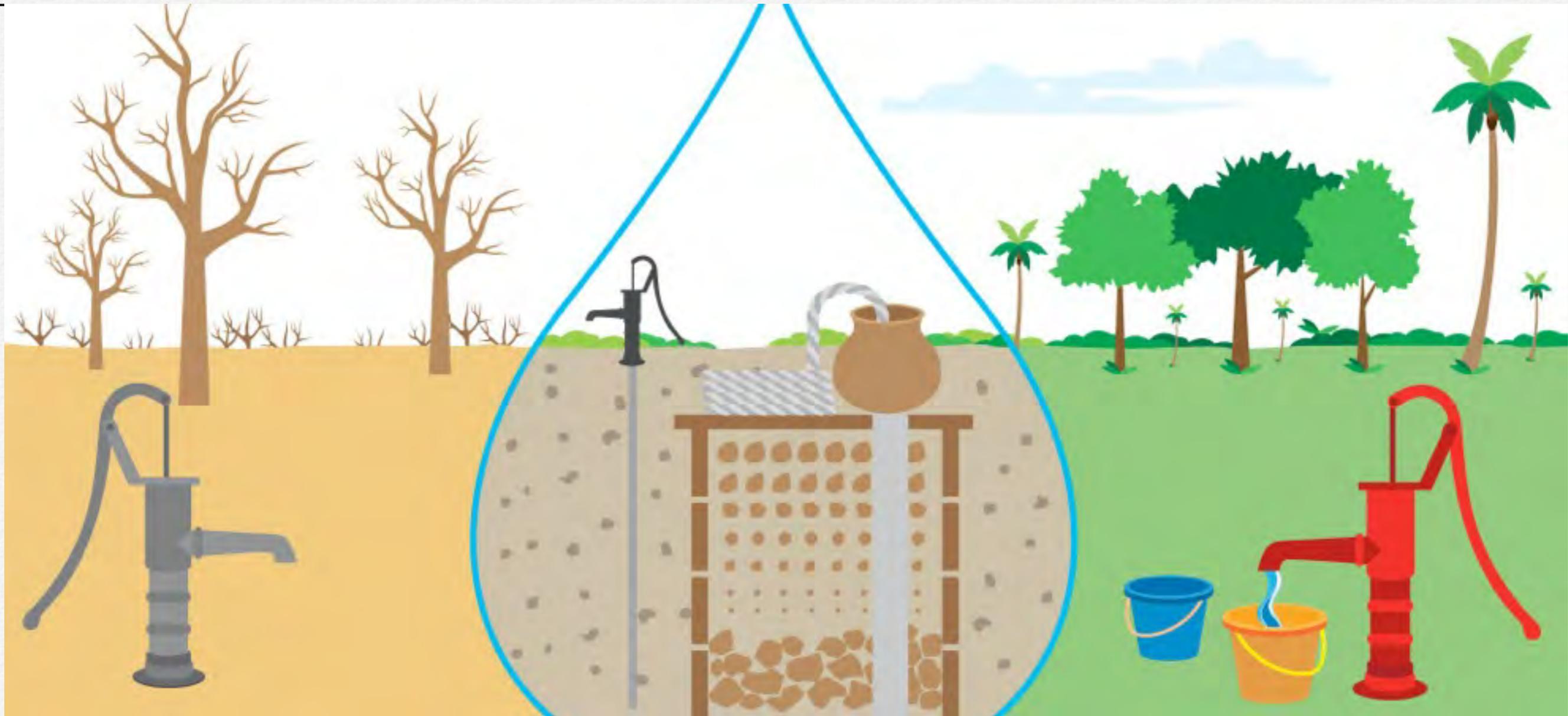
Aditya's story confirms that solutions to problems don't always need pots of money. A brilliant idea works. He is pleased that St Mary's now has a soundproof music room and proud that the project is benefitting the environment as trash finds a valuable use. 'I hope that others will also be inspired by believing, as I do, that our environment is the cradle of life and one should work towards protecting it,' Aditya says.

Aditya is now working to develop a full-scale entrepreneurship venture that could expand the soundproofing technique he has developed for use in factories, conference rooms, and performing arts spaces.

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# And Out Poured Water



# And Out Poured Water



Sabag is a village in Chhattisgarh State. It is a water scarce area where year-by-year, the water table levels are dropping lower and lower as more and more bore wells are dug. The severity of the problem hit a group of students from Ashram Pathshala on the day they cranked the hand pump at school and not a drop flowed out. They had heard of tube wells running dry in other schools but now reality was hitting home.

The school's tube well running dry was a serious issue, since the municipal corporation supplied water for just two hours a day. Something had to be done. The school authorities called in contractors to develop soak pits around the existing tube well so that water could permeate down and recharge it. However, all the cost estimates they received were way beyond what the school could afford. The authorities shared their helplessness with the students and asked them to bear with them till such time as when funds could be collected. But patience

is not usually a trait youth have. They live in a world where 'now' is most important. This need for quick action actually proved useful for their water-deficient school. The students put their heads together to find a feasible solution. They spoke to their elders and discovered that there was an indigenous method to make soak pits at a much cheaper cost, and that too, within a short time of just six hours. The method was to dig a 5x5x5 feet hole in the ground close to the defunct tube well and line it at the bottom with a layer of bricks, ensuring that a hole was left exposed. Over this, construct a layer consisting of pebbles, rocks, broken pieces of bricks and some sand. Then place an earthen pot with some jute rope inserted in it. Lastly, use brick pieces to wedge in the pot and rope so that the rope remains vertical and the pot doesn't move.

Once all these stages were completed, the soak pit was ready for use. With bated breath, everyone waited to see what would happen when the tube well's handle was cranked. Would a miracle take place before their very eyes? It indeed did. The pump that couldn't provide a single drop of water a couple of days ago, sprung into benevolent mode again. There were shouts of joy as out poured water. A trickle, to begin with, that slowly gathered force and turned into a sizeable flow. Soon reports started coming in that tube wells in the periphery also had water.

Many were skeptical and wondered if it was just a brief lucky strike that would last a couple of days. People couldn't believe that such a simple method could give results. The students anxiously waited for the monsoon rains to arrive to prove they were right. And they were. A careful monitoring of the soak pit showed that it could absorb 500 liters of water per day. Experts estimated that the soak pit would continue to provide water for the next 5–6 years.

What a boon this has been for the students who earlier went thirsty and didn't have enough water for washing their hands, nor for the toilets in the school. The students understand how precious water is and so have helped construct similar soak pits for others as well. Till date, 350 soak pits have been dug across the state in places such as Ambikapur, Balrampur, Bastar, Bilaspur, Raipur and Raigarh. Students gather around each soak pit and sing a song, the lyrics of which build awareness about the need to save water. Even those who don't know all the words join in the chorus that eulogizes water.

Each time the people of Sabag hear the gush of water, they bless the students for bringing so much relief to them. Proud beneficiaries now loudly use the new salutation 'Jal Ho, Jai Ho' (may there be water, may there be victory) when they greet each other. 'Now everyone is eager to save each and every drop of water. We are happy that our project has brought about behavioral changes among people,' the students say.

Inspired by the success of the project, and with local administrative and municipal bodies now supporting it, plans are in place to construct 1,000 more soak pits. 240 schools have expressed interest in being a part of the project. With all of these institutions participating, it is estimated that around 86,000 students will turn Stewards for Water.

This work by students to conserve water has got wide acclaim. Commendations include those from the Okayama City Award, in Japan. The Office of the President of India has communicated to them that the Hon'ble President of India would like to meet with the students. The project has also been shortlisted for the international 'Water and Sustainability' competition organized by UNEP to be held in Paris in October 2016.

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# Back to Our Roots



# Back to Our Roots



Attappady is in Kerala State. Some time ago, a vibrant rainforest of abundant growth stood here. It included plants that the locals turned into efficacious herbal medicines. Three gushing rivers meandered through Attappady.

Over the years this once sylvan area has been negatively transformed. Today the eye sees more built-up spaces and less green ones as thousands of trees have been cut down to make room for the demands of expanding infrastructure development. Doing away with trees has brought about a change in the prevailing weather conditions. A drier climate for one, as fewer trees are there to attract rain clouds to drench the land. With reduced vegetation to absorb heat generated by human activities, average temperatures are increasing. Two of the rivers have

dried up and the remaining one is just a narrow strip, with no resemblance to its former voluminous self.

‘The Society of Jesus,’ a Roman Catholic order of priests and brothers, commonly referred to as ‘The Jesuits’ run educational institutions in Attappady. Wherever they go, the Jesuits aim to provide holistic education. In Attappady they examined ways to transform degraded land into a verdant one. A 23-acre barren plot, where earlier a rainforest stood, was identified and purchased. The idea was not to develop systematized farming but to let nature spring back unhindered. ‘Could these stark acres be turned into a forest of abundant trees, bushes, and herbs?’ That was the question the Jesuits asked.

The first step was to identify flora that the people of Attappady remembered as traditionally growing there. The locals, many of who are indigenous people, whose forefathers believed in living in harmony with nature, were asked to try and recollect the names of the plants that their elders spoke about. That was before urban development overran the space and the tie with nature was snapped. A preliminary list of species, based on majority agreement was put together. As climate and soil conditions had altered over the years, expert botanists were called in to confirm whether the area remained conducive to the growth of all the species mentioned, or would some not survive in the changed conditions.

Once a final selection was agreed upon, ‘Eco-Reserve Attappady’ was established in the 23-acre plot.

To ensure that the younger generation connected with nature and carried the mantle of responsibility for it, youth were encouraged to take on an

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active role. All students were invited to be a part of Eco-Reserve Attappady—not just those from the institutions that the Jesuits ran, but any that expressed interest. Meetings were arranged where the youth shared their views on best strategies. Experts helped the youth understand why it was in their interests to plant, protect and conserve the green cover: after all, they had the larger stake as they had so many more years to live.

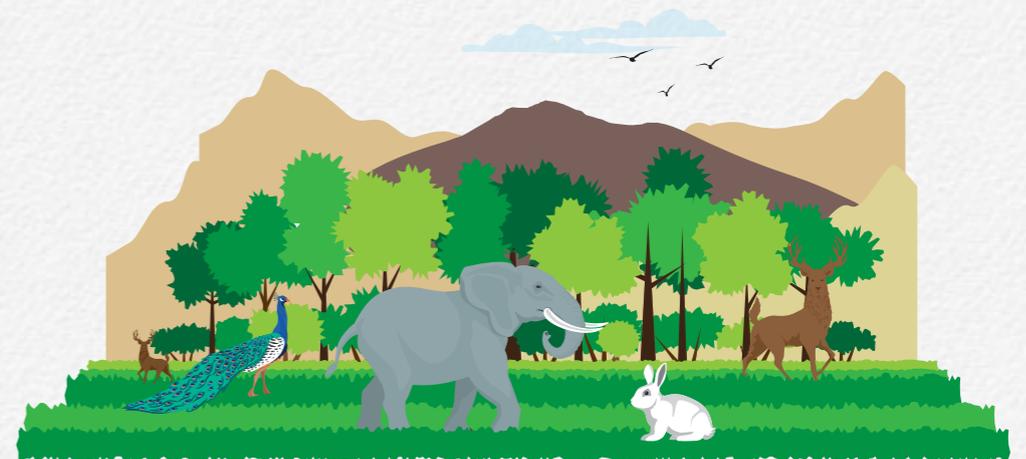
As we speak, hundreds of students from several government and private academic institutions around Attappady are actively participating in 'Eco-Reserve Attappady.' They come from 40 schools, 2 colleges, 1 Polytechnic, and 1 Industrial Training Institute. The students have free access to the space and work in teams, or even individually, to grow back the forest. To strengthen their bond with nature, periodic camps are held within the developing forest. Many students camp there and get a chance to touch, smell, see and experience nature in all its glory. Many teachers use the forest as a laboratory to provide hands-on learning and regularly bring their charges during school and college hours for a first-hand experience of the wild. Formal lectures and seminars are organized to further expand understanding about the correlation between increasing the green cover and reducing climate change. One of the notable results of Eco-Reserve Attappady has been the revival of the festival of Kambalam. This used to be a regular celebration of nature's bounty. For years, it had stopped for, 'Where was the bounty?' Now students have helped revive it. Along with the traditional thanksgiving rite for the harvest, there is also joyous singing and dancing.

Fr Lenin Antony, SJ, Director, Eco-Reserve Attappady says 'The establishment of Eco-Reserve Attappady has been challenging, but

rewarding at the same time, as the area gradually turns greener and greener. It is wonderful to see this 23-acre land now visited by deer, wild boars, peacocks, rabbits and many other animals that stroll in from the adjacent forest reserve. Leopards and elephants also come by. Elephants usually stomp in to quench their thirst during summer months. Once they damaged some pipelines in their search for water. To avoid this, we have constructed open tanks that serve as watering spots for the elephants.'

'If the people of Attappady can turn around denuded area, why can't others?' Fr Antony asks. His recommendations for success include a well-defined plan that is backed by strong commitment and the enthusiastic support of youngsters.

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# Does the Planet Notice?



# Does the Planet Notice?



A group of students from the Seth MR Jaipuria School in Lucknow, Uttar Pradesh, were amazed when they realized that adults were not taking climate change as seriously as the issue warranted. The students had learned in school that climate change knows no boundaries and affects all life forms—from the smallest algae cells floating in the oceans, to large mammals. No place on earth provided a safe haven from its potential impacts. They wondered if adequate strategies to mitigate it were in place. Looking at the changing weather conditions, rising sea levels, melting glaciers, increased precipitation, they concluded that the answer was definitely 'no'.

Imagining the horror of environmental tragedies that could unfold, the students decided to take action. 'Earth is huge. Would the planet benefit by our small efforts of not using plastic bags, or carpooling to school or would these be acts too minuscule to make a difference?' they wondered. Inspiration came by reading the book 'But Will the

Planet Notice?' that called upon all humans to act against climate change. Every act counts, no matter how small, was what they now understood. The decision was taken. The students would not sit back and let things slide but do their bit to help reduce one of the main scourges that bring about climate change—carbon footprints.

The students say 'We formed a group and named it 'Takrab,' for no particular reason. Understanding that we needed some baseline data to work on, we started the tedious job of going from door-to-door to conduct a survey to tabulate people's carbon footprints. Sometimes, we thought of giving up as doors were banged in our faces. Many people also questioned our ability to undertake such a mammoth task. Timing was also a problem as we were free only after school hours and that time, our parents thought, should be better spent in completing homework or interacting with the family. Nevertheless, we plodded on. With all those we met, we conversed about the urgent need to reduce carbon emissions. We also shared with them simple and practical solutions that didn't warrant major lifestyle changes, and yet would help them tread more lightly on planet earth. We were convinced that on hearing about the harm climate change caused, people would be immediately galvanized into taking action and would incorporate at least some of the suggestions in their daily lives. But that was not to be. The follow-on survey we conducted after a month indicated dismal results. Less than 10 percent of the people had reduced their carbon footprint, while the majority just carried on with life as usual.'

There was much disappointment and the students wondered where Takrab had gone wrong? 'Why didn't people change in spite of knowing that irreversible environmental damage was just waiting to happen?'

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they wondered. Another brainstorming session was called to pinpoint the reasons for the failure. After much discussion, the students decided on a new approach based on the concept of 'reinforcement of idea.' This they said, essentially worked on the premise that the greater number of times you tell someone to do something, the higher the chance of them remembering to do so. A Six Stage Plan emerged. Six interventions, via six outreach programs, spread over one year. Easy to follow suggestions shared six times. Data collected six times.

'The magic of six worked, as our next survey indicated,' say the students. 'This time, of the 142 households we had worked with, 40 percent had reduced their carbon footprint by some amount, resulting in a carbon footprint reduction of 125 metric tons. The main area in which carbon footprint was reduced was in energy consumption. People adopted simple measures such as unplugging the power cord when not in use, increasing the temperature setting on air conditioners, switching off computers when idle, among others. Reducing waste was another area where a minimization of the carbon footprint was seen. Many people began to make a conscious effort to print on both sides of paper, segregate kitchen waste and then compost it. A beginning toward the efficient use of fuel was made with more opting to share rides to and from school.

The students were elated. 'This was great! We had achieved something concrete by repeating the same message a number of times,' the students said. Naturally, they wanted to share their successful methodology with their peers. They got a chance to do this when they were chosen to electronically connect with students from across the globe at a special event at the UN Conference of Parties (COP 21) in Paris, December 2015.

'We have a very long way to go but right now, it gives us some comfort to know that we are on the right track and that things are finally changing,' the members of Takrab say.

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# Earth Murals





so different from their regular art classes where you leaned over flat surfaces.

A 1,500 square foot space on the boundary wall was cleared of posters and weeds. This was the canvas on which the worked-out designs would be depicted. Berger Paints India Limited provided the special paints required free of cost. Two shifts were slotted to ensure that each artist didn't spend too many hours working in the summer heat. The students enjoyed the exercise so much that they often stayed beyond shift hours to help their schoolmates complete the work. To protect against the harsh summer sun, students climbed atop ladders and shaded the artists as they worked. The teams' efforts were spurred on by the thought that they were putting together a huge surprise for all to see when school reopened after the vacations.

The end result was a wall painting that was a delight for the eyes. The vibrant colors and the beautiful illustrations compelled all who passed it to stop and look at it for a couple of minutes. Enough time for the mural's message to be comprehended.

'Earth Murals has indeed added another dimension to Sri Sri Academy's green activities,' is a comment often heard. The wonderful part is that the students have ownership of something they have created. The locals are so delighted with the beautification of the wall that they keep a strict vigil against anyone littering or urinating there. The depiction of wondrous nature has awakened an interest in things natural among the passersby. Living in the crowded city, with minimal green spaces around, many had forgotten how beautiful nature is. This newfound re-discovery of earth's treasures has inspired people to think about ways to care for it. Even if that means they plant just one sapling, or making sure they don't litter, or have their leaky tap repaired, Earth Murals has achieved its goal.

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# Eco-Friendly Festival





# Eco-Friendly Festival

In India, *Ganesh Utsav* is traditionally a ten-day-long festival that celebrates the birthday of the elephant-headed god *Ganesh*. It begins with the installation of thousands of idols of *Ganesh*, and concludes as the idols are immersed with much fanfare.

Students of the Seth Jyoti Prasad Vidyalaya Eco Club in Daund, Maharashtra, a city located on the River Bhima, were very much a part of these festivities. They observed that over the years, what began as a ceremony in people's homes had now grown to be several large-scale public events. As the festival grew, the small, traditional *Ganesh* idols molded using clay changed to monoliths of Plaster of Paris. Earlier, the clay idols were immersed in nearby water bodies, thus giving the clay back to nature. The immersion of modern idols made with non-biodegradable materials was the opposite. These polluted the waters as Plaster of Paris took months, if not

years, to dissolve and is known to lower the oxygen level in the water, thus harming aquatic species. Natural colors used to paint the idols had been replaced by toxic, chemical ones and everyone knows how the mercury and lead in these paints can permeate into and contaminate the waters in which these are immersed. Plastic and other such materials became the popular choice of adornments for *Ganesh*. These don't naturally degrade but continue to exist for years and years. Large idols when immersed also block the natural flow of the water bodies leading to several other problems. In addition, the larger the idol, the greater the quantity of the *Nirmalya* (garlands, flowers, grass etc used during the festival) immersed with the idol.

It was no wonder then that the modern idols were causing harm to the environment and to humans who live amidst it.

The Eco Club members decided that a revival of traditional clay idols was called for. Such idols would definitely reduce the pollution load on the precious water bodies. With this in mind, they organized training workshops in the school where the art of making idols out of clay was taught. Once the skill was acquired, groups were formed. One had the responsibility of mixing clay to the right consistency, while another engaged in casting the idol. The third used their artistic talents to decorate the idols using natural colors. As adornments, flowers and other flora were used.

Students' parents, women from different *Mahila Bachat Gat* (Women Self Help) groups, and representatives of Non Government Organizations were encouraged to join the workshops. The Eco Club

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was happy to see many people came forward to learn the art of making traditional, eco-friendly idols. The students generously gifted the extra idols made to citizens of Daund who couldn't attend the workshops. In this way, these people also had the pleasure of owning eco-friendly *Ganesh* idols. As an alternative to immersing idols in water bodies, Eco Club members arranged for big pots and small tanks and cylindrical drums for performing the traditional immersion rite. The dissolved clay was collected and open spaces in the campus sprinkled with it in preparation for the planting of trees. Composting of the *Nirmalya* was encouraged, as against dumping it in the river. To facilitate this, Eco Club members went from door-to-door collecting *Nirmalya*.

This was truly giving back to nature.

Aside from the workshops, the Eco Club members also organize competitions to select and award eco-friendly *Bal Ganesh Mandaps*. These are temporary ceremonial structures built to house large idols. The mandap committees began to look for ways to ensure their structure was the greenest. Installing sound-proof generators, Light Emitting Diode bulbs, solar panels, receptacles for trash were some of the changes made.

'Initially people were reluctant to revert to the traditional clay *Ganesh* idols. However, continued awareness about the negative impacts to the environment of using material that is slower to degrade, of paints that have harmful chemicals, of large quantities of *Nirmalya* and huge idols that clog waters, has paid rich dividend,' the students say. 'More and more people now celebrate the *Ganesh Utsav* in an eco-friendly

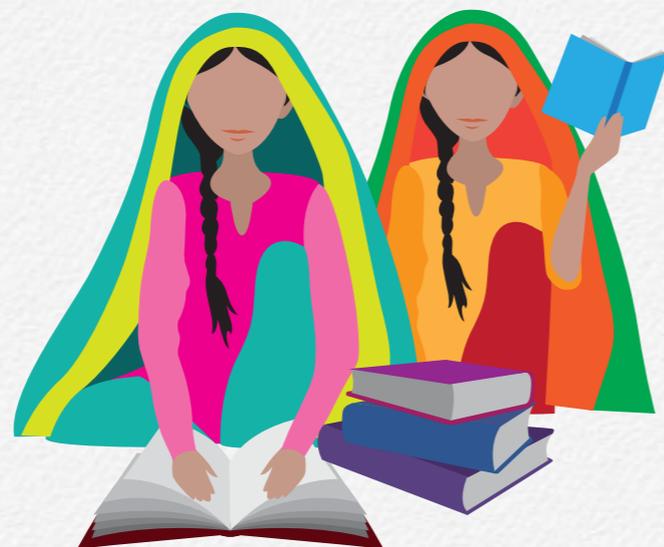
manner. In the last few years, over 2,000 clay *Ganesh* idols have been the favored choice. This has kept some 10,000 kg of Plaster of Paris from polluting rivers. 5,500 kg of *Nirmalya* has been collected and composted,' they added.

The initiative by Seth Jyoti Prasad Vidyalaya has gained popularity. More and more institutions are inviting the students of the school's Eco Club to conduct similar workshops in their campuses as well. The National Green Corp, a major initiative of the Indian Ministry of Environment, Forest and Climate Change is also helping widen awareness about ways to commemorate *Ganesh Utsavs* in an environment-friendly manner.

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# Empowering the Less Fortunate





# Empowering the Less Fortunate

Enactus is an international non-profit organization that is dedicated to inspiring students to improve the world through entrepreneurial action. Their name reflects their aim—ENTrepreneurial ACTion for others creates a better world for US all. The Shaheed Sukhdev College of Business Studies, Delhi, is a member of Enactus. Its 40 Enactus members aim to empower the less fortunate, such as the socially prejudiced, economically disadvantaged, and those with special needs.

Take the case of the physically challenged. Enactus members wondered how many of the around 25 million such persons in India were gainfully employed. The members conducted a survey to get a clearer picture and were saddened by the dismal results. Educational

facilities were limited for such persons, and job openings even less. Very few educational institutions were there to cater to those with special needs. The high fee structure further aggravated the problem and kept out those from the lower economic strata. This lack of education put persons with special needs at a disadvantage when competing for jobs. Even those fortunate to have gone to schools or studied in colleges saw no light at the end of the tunnel. Most establishments were hesitant to employ them as offices lacked arrangements to ensure ease of mobility for persons with special needs. Even a simple ramp for a wheelchair was missing in many locations.

Enactus members were also concerned about dwindling natural resources and the lack of waste management. Their research showed that just a quarter of the 12 million tons of waste paper generated annually in India gets recycled. As segregation at source is not the usual practice, the waste paper gets mixed with other garbage and thus becomes unusable for recycling. Instead, it ends up clogging landfills or lies strewn around.

‘Could both these issues be simultaneously addressed with a viable project?’ the members wondered. After much thought, a way was found and ‘Project Akshar’ was born.

Project Akshar currently has 16 entrepreneurs, each of whom earns around ₹10,000 per month. This is achieved by providing training to those with limited physical abilities on ways to convert discarded paper into environment-friendly notebooks. Enactus volunteers identify companies, educational establishments and residential societies willing

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to recycle their waste paper. Collection boxes are set up in schools, colleges and corporate houses and a schedule for collection chalked out. Once collected, the paper is further sorted and is now ready as the 'raw material' for the entrepreneurial ventures. Blank sheets, and also those used only on one side are shared with women with hearing impairment. The recipients bind the loose sheets together to form notebooks. The remaining waste paper is recycled into usable white sheets by India Recypa Pvt Ltd. This end product is provided to those who are physically challenged from the waist down. They manually use machines to produce attractive, low-cost, eco-friendly notebooks.

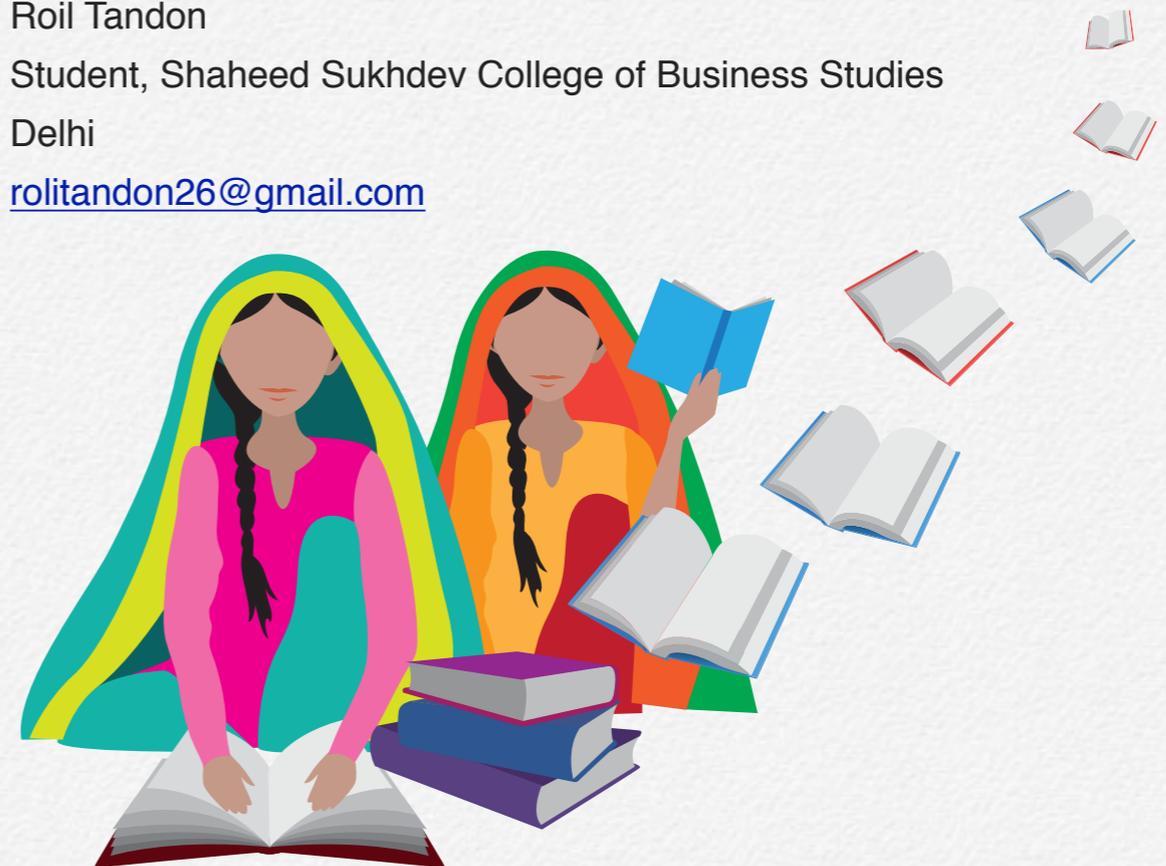
Both sets of notebooks are sold in schools, colleges and even at corporate houses. As part of Enactus's consistent effort to improve primary education, for every three notebooks sold, the proceeds of one is donated toward that goal.

Areas of concern for Project Akshar include the need to sustain a steady supply of raw material (waste paper in this case), as well as ways to ensure continued demand for the notebooks. With the extensive market outreach conducted by the members and the sensitization drives to help people understand the environmental and social advantages of supporting the project, these challenges have been overcome. Today, 31 colleges, 8 schools and numerous corporate houses in the National Capital Region regularly supply waste paper. Others such as Bain and The Smart Cube are assured customers for the notebooks.

Enactus is proud to say that the project has saved approximately 140 tons of carbon footprint, 300,000 liters of water, 38,000 liters of oil, 2,000 trees, and 574,000 kilowatt-hours of electricity.

To upscale Project Akshar, Enactus aims to include ragpickers who will be paid for the waste paper they recover and provide. Enactus members are also researching to identify improved technologies and training methods to upscale current production and add additional items. A pan-India expansion is envisioned. Operations have already begun in Mumbai and Chandigarh. More cities will be added shortly.

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# e-Waste



# e-Waste



It all started while educating students of Lioness Karnavati MH Hindi Higher Secondary School, Ahmedabad, Gujarat about ways to manage waste by reducing, reusing and recycling.

When asked what the students did with their old mobiles, keyboards, gadgets and other electronic items, the majority of the students answered 'We sell it to *kabadiwalas* (ragpickers) or just chuck these away. 'And what do these *kabadiwalas* do with the electronic waste?' was the next question to which the response was 'absolutely no idea.'

Of even greater concern was the fact that most students didn't know that all those computer monitors, motherboards, cathode ray tubes, printed circuit boards, mobile phones and chargers, compact discs, headphones, white goods such as liquid crystal displays, plasma televisions, air conditioners and refrigerators unceremoniously

flung out or sold in the informal sector to *kabadiwalas* really need to be disposed of properly, otherwise these cause great harm to the environment and to the health of those who handled the castoffs. Dismantling discarded electronic items releases toxic substances such as lead, mercury, cadmium, gases and heavy metals. These, if not properly disposed of, permeate air, soil, and water. Non-biodegradable parts such as those made of plastic need to be professionally recycled as well, else these continue to pollute the planet for endless years.

India is one of the largest generators of e-waste. Annually, 1.8 million metric tons of e-waste is generated in the country. Just a tiny fraction of this (2.5 percent) is safely disposed of or recycled without harming humans or the environment. The numbers for e-waste are projected to swell by 30 percent per year so the problem is going to grow rapidly. While India does have e-waste management rules in place, the emphasis on recycling by consumers is still ambivalent.

Think of the millions of people in India who scavenge e-waste from garbage dumps, or buy it for small sums of money, take out the parts they need and then dump or burn the rest. They know no better, but to earn just a few rupees, cause themselves immense harm as they breathe in poisonous fumes emanating from the blaze of unwanted items or expose themselves to toxicity when handling e-waste. No wonder around 30 percent of the income of e-waste handlers is spent on medicines. And, their life expectancy is limited to less than 50 years!

The school saw this as a serious issue and decided to educate their students about the dangers of the random disposal of e-waste. The first

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step taken was organizing awareness programs to educate the students about the harm caused by improper disposal of e-waste. Once the students understood the seriousness of the issue, a collection drive was begun. E-waste disposal bins were placed all over the campus. It was made mandatory for the students to drop all unwanted electronic items into the designated bins. Within a period of two months, each student had to collect a minimum of ten defective, useless electronic gadgets to place in the bins. It was an assignment for which marks would be given. This helped to motivate the students and frantic searches were made to find useless e-waste items to place in the bins. It was a happy scene to see many faculty members and guardians come forward to support the students by giving them their e-waste to also dump in the bins.

Selling to *kabadiwalas* was banned. Instead, every bit of e-waste collected would be dealt with in a proper manner.

To ensure that guardians understood the significance of what the students were doing, meetings were arranged and presentations made on the ills of toxic materials spilling out from e-waste. Some attendees questioned the need for their wards to spend time away from studies collecting, e-waste. However, once they understood the bigger picture, all objections were dropped.

To widen and deepen awareness about the hazards of improper e-waste disposal, the students were provided training to hone their skills in effective communication. Sessions were also held to help them customize strategies to reach different groups: friends their age, to elderly relatives; those who were well educated, to those who had minimal exposure to learning.

Annually, the school collects around 200 kg of e-waste. This has increased, and in the last few months alone, 310 kg were collected. The e-waste is sent to the Self Employed Women's Association (SEWA), an organization that has a tie-up with authorized collectors and trained disposers of e-waste. SEWA pays the school some money in exchange for the e-waste. These funds are used by the school to help the lesser privileged develop entrepreneurial ventures and thus get financially independent.

The project which began with 240 students is making ripples not only in Ahmedabad, but in the entire state of Gujarat. The Lioness Karnavati MH Hindi Higher Secondary School was also chosen to be a part of Microsoft's 'Create to Inspire' campaign.

Next time you throw away an electronic item, pause to consider whether your method of disposal assures that it would be properly dealt with. Don't just randomly fling it out. Instead, find a reliable e-waste collector who will use the correct methods of disposal.

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# Flora Draws Back Students





# Flora Draws Back Students

Government High School Dhalwari in Una, Himachal Pradesh, is situated in the vicinity of the *Mata Chintpurni Devi* temple. Pilgrims come from far and wide to seek the blessings of the much-revered goddess. These visits, however, began to take a toll on school attendance. It became a regular feature for students of the school to skip classes and instead, earn some ready money from the pilgrims. Boys opted to play the *dhol* (drum) in the traditional escort provided to pilgrims as they got down at the bus stand and then proceeded to the temple precincts. For young girls, sitting for the *kanyapooja* (prayers to young girls) was a method to get some cash. It was no wonder then that there was poor attendance in the school.

The teachers in the school rued the fact that rather than attending classes, their students ran off to earn some quick bucks. No amount of explaining to the students that studies are necessary for a better future, worked. The lure of immediate money in hand was far more

attractive. Something had to be done. In 2010, the school authorities decided to make use of nature to attract students back to school. They made it compulsory for each student to enroll in the school's 'Tulsi Eco Club'. Members were divided into groups of three and assigned flower-beds that were newly created. Each group was responsible for tending their designated plots. Lectures were given on methods to grow plants—best season, quantities of fertilizer required, how much to trim, when to expect blooms etc. And, here was the incentive—the all too proverbial 'marks'. Each month, an examination of the health of the plants under the team's care would be made and marks awarded.

As Himachal Pradesh is endowed with diverse and rich flora, a variety of saplings of flowering and medicinal plants were available. The students were encouraged to plant saplings initially in pots and once a little growth took place, transfer these to the prepared beds. Pictures of what the seedling would look like upon maturing encouraged the students to care for the tiny green plants, those wonders of nature that had the potential to bloom into things of beauty if carefully tended. Some would produce roses, others, crotons of different hues, aromatic herbs...the possibilities were many. 'You can pluck some *Tulsi* (Holy Basil) from your own bush or some coriander to share with your mother,' the teachers told the students.

Over the months the plants bloomed: alongside developed in the students, a sense of pride. Achievements were there before their eyes to see and, in some cases, for the olfactory senses to pick up. They felt so important when viewers remarked on the flourishing natural beauty. With pride came dignity and the niggling thoughts. 'Perhaps our teachers

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are right. Perhaps it is better to attend school rather than spend time away to earn quick money from activities that really don't do much for intellectual growth or groom us for jobs.' To sustain this new realization and ensure that students continued to be interested in attending school and caring for their plots, flower and herb shows and competitions were organized each year. The best teams were awarded cash prizes. Certificates were also given to all those who took part.

Once the flowers were out in their glory, a problem arose. Passersby began plucking the flowers to place as offerings at the *Mata Chintpurni* temple. To resolve this issue, the students of the Tulsi Eco Club decided to set up a nursery of seasonal plants in the school and distribute the saplings to the villagers. They were even happy to use their newly acquired skills and go out and plant the seedlings in people's homes. The result was amazing. People had their own flowers to pluck from their own gardens. Ownership also brought along a sense of responsibility. No longer were flowers randomly plucked without careful consideration of what was actually needed—'just the right amount, no more' was now the mantra. For the pilgrims that visited the area, marigolds, the favorite flower of *Mata Chintpurni Devi* were planted along the boundary of the school. Visitors were permitted to pluck the flowers and place these as offerings before the goddess.

Another issue that cropped up was the lack of adequate water supply during the summer months. Initially, each student brought two bottles of water from their home to water their saplings with. However, more sustainable steps were needed. Understanding this, the school authorities built a rainwater harvesting tank in the school that ensured

a regular flow of water. To deal with the issue of lack of funds to purchase fertilizer, bins were placed around the school and the biodegradable waste composted.

The Government High School Dhalwari is acknowledged as an example to emulate. It has ensured that the outreach of education is widened beyond classrooms and at the same time, steps are taken to have nature grow in abundance.

Today, students from remote Una are recognized as 'Stars of Himachal Pradesh.' Accolades have come in many ways. The Himachal Pradesh Education Department has arranged for the students to visit academic institutions across the state and make presentations there on their successes. The school's team was invited to present a report on the innovative use of nature at the National Children's Science Congress.

Perhaps the best outcome is the headmaster happily noting 'not only is there an increase in attendance but more and more children now want to enroll in our school.'

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# For the Students By the Students



# For the Students, By the Students



‘Is your school creative and innovative?’ ‘Are your students eager to learn new and exciting ways of communicating?’ ‘Do your students want to put together talk shows, radio dramas and discussion sessions on topics that interest them?’ These are a few of the questions that the website of ‘School Radio’ asks.

Experts at Digital School immediately affirmed with a ‘yes’. The enterprise operates out of Visakhapatnam, Andhra Pradesh, and works at developing communication technologies that aim to hold the attention of target audiences. With youngsters hooked to the radio for endless hours, they knew that radio had phenomenal potential. Just as much as it was a source of entertainment, it could equally be a useful platform for students to voice opinions about important issues. Going a step further, ‘Could there be a novel use of radio to help young minds grow from being just passive listeners, to taking more active roles as producers and broadcasters?’ Digital School experts asked themselves.

In search of answers, they met with heads of educational institutions. School administrators were amenable, but wondered whether the students, overburdened as they were with studies, would want to take on an additional activity. A brainstorming session with students

was organized. What emerged was that the youth wanted to go a step further and develop and run a radio studio all by themselves, rather than just participate in radio shows. They would identify topics that concerned them most, develop attention-catching scripts, do the background research, select broadcast quality voices, work on dramatization—in other words, take responsibility for every part of the broadcast. The role of the teachers to be limited to rechecking facts for correctness and that of Digital School experts, to provide training on basic production techniques, they suggested.

The first hurdle had been crossed when another question came up. ‘Would there be enough interested listeners for a radio station manned by amateurs, or would youth just continue tuning into their favorite, professionally-run radio programs?’ To gauge the level of interest, Digital School announced an environment-related broadcast. Students were invited to record their voices speaking, reciting or singing about an environmental issue that most concerned them. Once done, they needed to send the recording to Digital School to prepare it for broadcast. Prizes were announced for best efforts. Many entries came in. Some recounted stories that the students believed would help listeners focus on some environmental issue. ‘It was memorable recording our voices as we had never gone on air before,’ was the majority reaction. ‘The exercise helped us recognize our skills in communication and built our confidence in public speaking,’ was expressed by others. Many wrote in to say how much they enjoyed the program and eagerly awaited the next broadcast. With such an endorsement, no time was wasted and Digital School set up ‘School Radio’, a radio station for the students and by the students. Digital School provides the school students with a

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‘How To’ handbook. This has information on ways to develop programs such as news broadcasts, reporting live from the sports field, interviews, announcements etc. The book also explains ways to hold the attention of listeners by juxtaposing jingles and one-liners between programs. Students are provided a three-day hands-on training course that is conducted by Digital School experts. After that, students are encouraged to record their podcasts and email these as MP3 files to School Radio in Visakhapatnam. The raw data is edited by the in-house team of student editors and is then ready for broadcast.

The radio program is available online at [www.schoolradio.in](http://www.schoolradio.in). It runs throughout the day and can be accessed with internet connectivity on desktops, laptops, and on smartphones. The environmental topics covered so far include sustainable development, solar energy, and water conservation.

Some students expressed interest in hosting discussion forums on social issues such as child labor and tribal welfare. Keeping in mind that the students would need to study the pros and cons of the social issues and the feasible solutions to bring about positive change and that conducting such an exercise would help them become responsible citizens from a young age, it was decided to include such issues in School Radio broadcasts.

Presently programs are aired in Telugu, Hindi, and English. The vision is to ultimately run programs in all of India’s many regional languages. ‘It has not been roses all the way,’ Digital School authorities say. Revenue generation is a key factor for any start-up. School Radio was no exception. In the beginning, Digital School considered charging

institutions for the training they provided. However, there was reluctance to pay for something that management viewed as not compulsory to the school curriculum. In the end, Digital School just went ahead and conducted orientation workshops for free. ‘Things are better now as some Non Resident Indians have adopted some School Radios,’ the management of Digital School says. ‘Collaborative agreements with both the government and with non-government organizations to develop and sustain School Radio are in the process of being formalized,’ they add.

School Radio has been a runaway success. Many students have participated in the training programs and gone on to setting up radio stations in their schools. Some have even used vacation time to come in from other states to attend sessions. To date, 950 students have received training. As and when a request is made, the Digital School team visits other parts of the country as well to facilitate training on radio broadcast production in schools, colleges, and universities.

School Radio has brought about in-depth learning in a fun-filled way on topics the students broadcast. It has also helped build confidence in students who were initially too shy to face the mike. The teamwork that has resulted, and the awareness built that they need to be responsible in broadcasting correct information, has helped build strong citizenship from a young age.

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# Have you seen the Trees?



# Have you seen the trees?



Have you ever visited a college campus and marveled at the way students appear to be in perpetual motion as they rush around, eyes glued to their watches, racing to make it in time for the next activity? Their immediate thoughts are perhaps fixated on assignments to complete, upcoming exams, and what grades they hope to get. With such a rhythm, where is the time to appreciate nature's bounty around them, or the lack of it for that matter?

Students of Indraprastha College for Women in Delhi are no different. They are privileged to have a campus that is green and rich in biodiversity. So many trees stand tall, some even decades old. Birds of varied sizes and hues perch on branches chirping and warbling away, happily exercising their vocals. Yet, how many students have a spare minute to pause and admire the vista or cock their ears to listen to the birdsong? 'No time, too busy, wish I could,' is what they say. Even the few lucky ones who can snatch a moment to stop and gaze, do so in a perfunctory manner. 'Nice but I really am overburdened now with assignments. Maybe, once I graduate, I will have time to read about the varieties of trees, herbs and shrubs in the campus, and of the biodiversity present.' If they have no time for what

is before their eyes, it was difficult to imagine them exploring and evaluating ways to expand the greens. They were just too busy.

The college decided it had to draw the attention of its students to the natural treasures in the campus. The best method they reckoned was to have the students conduct a Green Audit. Such an exercise, it was visualized, could have many positives. It would open the eyes of the students to the wonderful natural world around and expand their knowledge by learning about the different types of trees. It would inspire the students to be environmentally-sensitive citizens, who help conserve, protect and preserve the abundant biodiversity of the college. The audit report would also provide management guidelines for future infrastructural expansion in the college. Architects would need to take cognizance of the placement of trees and design to build around the trees so as to not harm them.

The audit required the enumeration of the trees, identification of their species, and labeling of each with both its common and scientific names. This was a massive task. Groups of students were formed and duties assigned. Students were provided training on basic identification techniques. They photographed each tree and loaded the snapshots into the internet for more information. Students conferred with the college malis (gardeners), many of whose fathers and grandfathers had also tended the campus gardens. The gardeners had so many stories to recount. 'That tree I am told was planted when so and so principal was there. This one, I heard, stood tall even before India's independence. And this one is over a hundred years old.' There was so much to hear.

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The students soon realized that the trees stand as reminders of the selfless nature of the people who earlier resided in the campus and had left an inheritance for the future students, staff, and faculty. The groves and the individual trees were very much a historical part of the college and needed to be sustained to continue being so.

With guidance from the gardeners, the popular names by which the trees were referred to were first noted. An expert plant taxonomist was then called in to verify the names and to identify some of the rare trees that could not be recognized by the project teams. Much had to be researched before documentation could take place. The students learned that the common Peepal tree's scientific name is *Ficus religiosa*. Neem is *Azadirachata indica*, while the official name for the Kadamb tree is *Neolamarckia cadamba*. Other trees that were found in abundance in the campus included the Ashoka (*Saraca indica*), Amaltas (*Cassia fistula*), Chamrod (*Ehretia laevis*) and Putranjiva (*Putranjiva roxburghii*).

The next step was to learn about the characteristics of each species. Did each flower or bear fruit, were they evergreens or did they shed their leaves, what types of birds and insects did the trees attract... and so much more.

The audit results showed that there were 518 trees in the campus. In terms of diversity, 62 different species of trees were found. Several were fruit trees. These included Amla (*Phyllanthus emblica*), Jamun (*Syzigium cumini*), Shahtoot (*Morus rubra*), Goolar (*Ficus racemosa*), Katthal (*Artocarpus heterophyllus*), Mango (*Mangifera indica*) and Papita (*Carica papaya*). A few trees of the invasive species Vilayati

Keekar (*Prosopis juliflora*) were also observed. This was noted for monitoring to ensure that these trees didn't increase in number.

The next step was to develop name plates for labeling. The labels were crafted out of reused plastic sheets that are durable and resistant to natural wear and tear. An important point kept in mind while placing the labels on the trees was that hammering a nail was a no no as it is against the law and in any case, a cruel thing to do. The project team tied the nameplates around the trees using galvanized wire. This meant that regular inspection of the labels became essential to ensure none got loose and fell off. A follow-up, monitoring plan for the next one year was therefore also included in the project.

Once the tree census and labeling exercise was completed, the project team organized tree walks for their peers, so that more and more students learned to appreciate the beauty and the rich diversity that had always been there, but perhaps ignored even though they encountered it every day that they came to college.

Moving forward, the students are working on photographing and recording the avian diversity found nestling in the many trees. The birds now have appreciative audiences for their concerts and the college has knowledgeable students who can identify the feathered friends by listening to their song.

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# Mr Cool Calculator





# Mr Cool Calculator

Soumik Karmakar of the Bharat Mata English Medium Higher Secondary School in Bilaspur, Chhattisgarh, says that his teachers taught him about global warming and how this could lead to irreversible changes in the delicate balance between our planet's climate and its ecosystems. His teachers told him that this was becoming a growing crisis with likely huge implications on mortality, health, economics and security. The teachers encouraged Soumik and his peers to do something right now to hold back climate change.

Soumik thought about it and then zeroed in on energy use as the topic he would address. He acknowledges that today we live in a world where energy use is the norm, but wondered whether there could be a way to encourage people to lower their consumption. 'Low Carbon Lifestyles' was a phrase that he had often heard, 'But how does one encourage youth to adopt it?' he wondered. If his peers would reduce their carbon footprint, it would help toward

reducing global warming, even if it was in a small way, as everyone knows that the emission of carbon dioxide (CO<sub>2</sub>) and global warming are correlated, Soumik thought.

Since you can't manage what you don't measure, Soumik decided to put together presentations that clearly depicted ways to calculate carbon footprints. So was born 'Mr Cool Calculator', a name he uses to present himself. Normally, calculators are used for mathematical computations. Soumik's calculator, however, is different. It measures the carbon emissions released in the environment by different activities. He matches that by recommending easy adoptable methods to reduce carbon emissions. Soumik has taken a pledge to spread this message of environmental conservation to 50,000 students of 100 schools.

Soumik goes from school to school making presentations. Did youth know that one 60 watt Incandescent Light (ICL) bulb uses 76.65 kilowatt hours (kWh) units of electricity annually when used for 3.5 hours daily and emits 62.85 kgs of CO<sub>2</sub> in the atmosphere? On the other hand, a Light Emitting Diode (LED) bulb uses only 8.94 kWh units of electricity and emits 7.33 kgs of CO<sub>2</sub> annually, when used for the same duration. Any 180 liter fridge with 2 Star BEE (Bureau of Energy Efficiency) rating consumes 340 kWh units of electricity and emits 278.80 kgs of CO<sub>2</sub> annually, whereas a 180 liter fridge with 5 Star BEE rating uses 217 kWh units and emits only 177.94 kgs of CO<sub>2</sub>. A 1.5 ton split air conditioner with 2 Star BEE rating, consumes 2,048 kWh of electricity every year to run 1,200 hours and emits 1,679.69 kgs of CO<sub>2</sub> annually. The same air conditioner with a 5 Star BEE rating only uses 1,808 kWh units and emits 1,482.89 kgs of CO<sub>2</sub>, with all other parameters remaining the same.

The interest of his youth audiences was piqued by hearing all this. It was time now to find something that they could relate to. Accepting that in today's age the preferred channel of communication for youth was electronic (emails, Facebook, Twitter are so popular), he focused on the use of the 25 computers in his school. Soumik and his peers checked the default brightness settings of all the computers and found these were not optimized for conserving energy as they were set at 100 percent brightness. If the brightness level was reduced, it would save electricity, they knew. Soumik and his peers researched to see what would be an acceptable setting, one that would be comfortable for the eyes. 100 percent was certainly not required, as doctors also confirmed. They found that going down to 55 percent is adequate. With this figure in hand, Soumik used the strategy of 'Each one, Teach one' to motivate his peers to lower the brightness of their computer monitors and thereby save power.

The principal and faculty of the school came out in full support for the program. However, it was not easy to implement as most students were hesitant to make a change. 'Why should I turn the brightness down? Why should I keep turning off my computer if I am leaving the room for just a short while?' was a question many asked. It was a challenge to get the students to leave their comfort zones, and shift to something that was good for them in the long run—a reduced load of carbon emission. He explained to the students that although individual efforts may appear to be mere drops in the vast ocean, multiplied by the efforts of many would result in a significant contribution towards a more climate-friendly environment on earth. Soumik never gave up but was willing to explain the need to reduce one's carbon footprint umpteen times. He just never got tired and in the end, success was there. Now all the computer monitors in the school

are set at 55 percent brightness. By doing so, the school has saved 22.5 kg of carbon emission annually. Just a small act but what a tremendously positive effect it will have on the environment!

Soumik Karmakar

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# Project 1600





# Project 1600

Students of Shree Vasishtha Vidhyalaya (SVV), Surat, Gujarat, run Project 1600 that aims to help sustain marine ecosystems. Gujarat has the longest coastline of any Indian state. It has more than 20 percent of India's 7,500 km of coastline. Situated on the south bank of the Tapi River, about 14 km from the sea, Surat has always attracted traders and merchants from afar.

The students of SVV were of the opinion that although there was such a large coastline in the state, often not enough attention was paid to the problems of the coastal ecosystems. Increasing degradation was happening at an accelerating pace. They had learned in school about the many benefits of the rich mangrove vegetation that historically grew along the coast but wondered whether those who didn't have formal education also knew this.

The students decided to take up a pilot project to see what could be done. They selected the coastal village of Junagaon, a swampy coastal belt that was just 15 km away from their school, so easy

to reach and make frequent visits to. Teams of students, accompanied by their teachers and other experts, first surveyed the area. While there were rich mangrove forests in some parts, they also observed scanty growth in some areas and bald patches in others. The mangrove growth in the latter areas was likely stunted by overgrazing and by pollution from industries, while other areas had been cleared to make way for the development of infrastructure. The surprising fact was that experiments confirmed that the area had temperatures suitable for the profusion of mangroves. So why was there not abundant growth? Even if the areas had been denuded in the past, reforestation programs would have brought back the area to its former self. These were questions that needed answers, and the students began an exhaustive search for the reasons.

After discussions with villagers, the conclusion the students came to was that the locals had limited knowledge about the many uses of mangroves. They also lacked the specialized training required to develop mangrove nurseries. The students decided they would address both these issues. Thus was born 'Project 1600'. 'Our strategy was based on 3Cs (Classroom, Campus, Community) and 3Ss (Students, Search Research, Sustainable Development),' say the students of SVV.

The students first researched to put together relevant data that showcased the many uses of mangroves. These included mangroves acting as buffers against the effects of natural disasters such as cyclones and the onrush of high tide, reducing the engulfing of land and seawater (and thus protecting shorelines), their roots playing a vital role in stabilizing soil (so crucial as coastal regions have a high density of population), providing a conducive environment for the breeding of several species of fishes and crabs, amongst others.

Working with the forest department and the local village administration, students from SVV learned to identify the different mangrove species, the ideal season to plant, the most suitable sites and most favorable techniques. The forest officers explained the unique way mangrove seeds need to be planted: in raised beds of mud to ensure the seeds get embedded and not washed away during high tide.

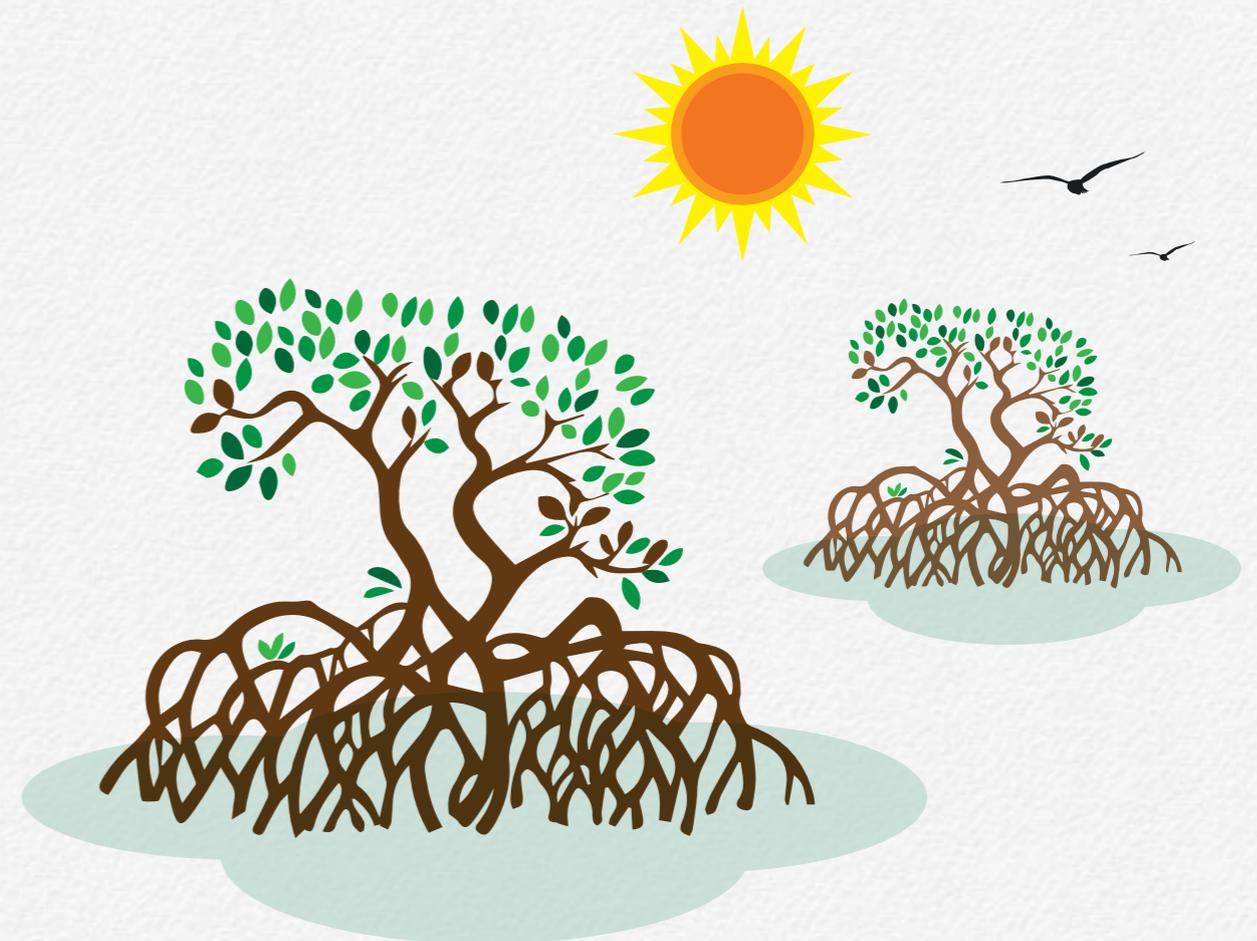
Armed with all this knowledge, the students of SVV made presentations on 'The Benefits of Mangroves' during morning assemblies at local schools. Intense workshops were then conducted for those students who expressed their willingness to be a part of 'Project 1600'. At these, video clips, PowerPoint presentations, and other interest-generating communication means were used. The attendees were encouraged to share what was learned with their families and communities as well.

When planting season came, the SVV students and their newly formed friends from the local schools demonstrated their acquired skills with great zeal and enthusiasm. There were 200 enthusiasts who worked alongside local forest officials. 500 mangrove seeds were collected and sown in the ocean bed at Junagaon. The villagers got enthused and came forward to help. They assured the students of SVV that they would care for the plants.

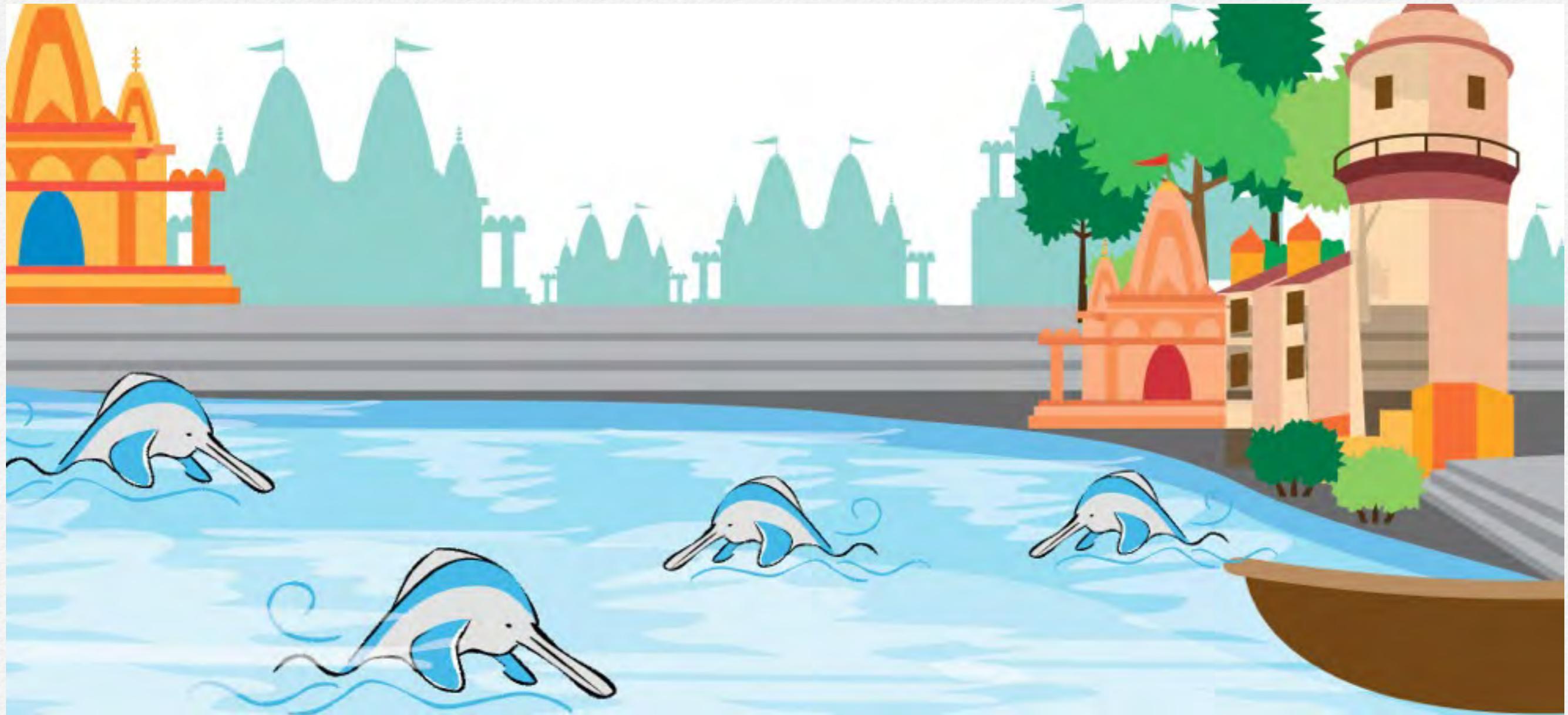
This was the first time that such a large number of students from the Surat area had taken part in an environmental program. The most striking feature was that it was a student-centered exercise that reinforced the school's motto, 'Passion for Excellence.'

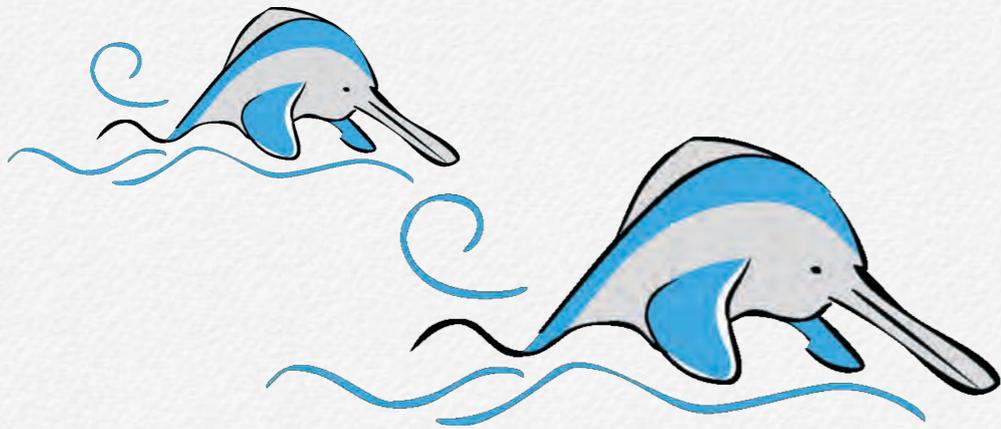
Small hands, but what a mega environmental program they created!

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# Rare Gangetic Dolphins





# Rare Gangetic Dolphins

Most Indians can readily name the ‘tiger’ as the country’s national animal, and the ‘peacock’ as the national bird. However, how many know that the ‘Ganges River Dolphin’ (*Platanista Gangetica*) was named the national aquatic animal of India in 2009? The creatures are mammals that come to the surface every 30 to 50 seconds to breathe. The *Susu*, as the species is referred to in local parlance, is a strong indicator of the purity of the water it inhabits, as it can only survive in unpolluted fresh water.

Till recent times, the Ganges River Dolphins were found in large numbers. They delighted all those who saw the creatures with pink-tinged skins emerge to catch a few lungfuls of oxygen. However, over the years, many reasons have contributed to a dwindling of their numbers. The habitats of the Ganges River Dolphins are today threatened by damming of the waters for irrigation and power generation. Oil drilling and the resultant increased noise levels

disturb the creatures. One of the results of extensive deforestation has been increased silting of the river. Pollution further aggravates the problem. Dolphins also get harmed by getting entangled in fishing nets. Worse still, the Ganges River Dolphins are hunted by locals for their oil, for use as fish bait, and as food.

It is no wonder that the Ganges River Dolphin is facing extinction and has been included in Schedule I of the Wildlife (Protection) Act of India, 1972. It is estimated that their current population is only around 1,200 to 2,000: as many as 100 of these die annually. Since it is an endemic and rare mega-fauna found only in the Indian subcontinent, the Government of India recognized that there is an urgent need to conserve this natural aquatic heritage. With this in mind, the government has initiated and continues to support, education and awareness programs in schools that are located close to the major habitats of the Ganges River Dolphins.

Varanasi in Uttar Pradesh, which is located on the Ganges, is one of the areas chosen. With the help of the NGO Vikas Evam Shikshan Samiti that operates in the city, a ‘Dolphin Conservation and Education Program,’ has been initiated. Its target is to reach out to 50,000 students from 35 schools that are located within a 5 km radius of the river. To begin with, a ‘Train the Trainer’ workshop for teachers of these schools was conducted so that the participants could be the master trainers to lead efforts in their schools. Most schools had their biology teacher selected for this training. Next *Susu Samooh* (Dolphin Clubs) for students from classes VI to IX, were formed in each school. An intensive program of awareness-building was begun to focus on developing understanding about the species, its habitats and what could be done to protect the dolphins. Along with the more traditional methods of teaching via posters, workshops, essay competitions and formal

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lectures, innovative approaches such as specially designed games were also utilized. To widen the numbers of those made aware, the members of the Club were then asked to reach out to their peers. Students from urban areas were helped to connect with nature by attending camps in nearby forests. To ensure hands-on experience, the students were taught methods to test the Ganges water for purity and see for themselves how polluted the river was. After the initial awareness-building in schools, Ganges River Dolphin Resource Centers were formed, one for each cluster of schools, to carry out the execution of this project.

To widen the initiative and reach out to the general public and to fishermen as well, *nukkad natak* (street plays) and Dolphin *melas* (fairs) were also held.

The project has faced a number of challenges. The paucity of funds is a major issue. In addition, continued overfishing and the use of chemical pesticides in agricultural land alongside the river continue. Despite the Ganges being referred to as a 'Holy River', and revered as a 'Goddess,' sewage and untreated industrial waste continues to be discharged in it. All this threatens the natural habitat of the Ganges River Dolphins.

The students have decided that they will not just sit back and let the species die out. They will continue their non-stop efforts to save the Ganges River Dolphins.

The results are there to see as the dolphin census indicates an increase in their numbers. The people of Varanasi now know about the Ganges River Dolphins and their importance. Almost all students of Varanasi are aware that it is our national aquatic animal and thus are eager to be a part of the conservation activities. To ensure continued success of this

program, there are regular follow-up sessions with schools for monitoring the activities of the various Dolphin Clubs and documentation of success stories.

The Ganges River Dolphins have benefitted by the efforts of students who were helped to understand the significance of the creatures and the urgent need to protect them. Perhaps the method of involving youth could be replicated in other parts of the world to save other endangered species as well.

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# Respect for Mother Earth





# Respect for Mother Earth

‘The best way to encourage others to learn is by setting an example,’ is sage advice that has come down the ages. At St Mary’s Ramganj Mandi School at Kota, Rajasthan, this saying was once again reinforced.

The school, run by the Franciscan community of nuns, is located in the rain shadow of the desert state of Rajasthan. It is a member school of Tarumitra (Friends of Trees), a students’ movement to protect and promote a healthy environment on earth. Started by students in 1988, the movement has spread far and wide to hundreds of schools and colleges all over India.

On a visit to Tarumitra’s Biosphere Reserve, the principal of St Mary’s was amazed to see how nature grew abundantly, and more importantly, without the application of any of the harmful chemical fertilizers and pesticides that most growers continuously pumped

into their fields. Only natural ones were used. Seeds sprouted in abundant numbers. Plants were healthy and survived the inroads of pests. ‘What was it,’ she wondered, ‘that convinced farmers that the use of chemicals was essential to cultivation? ‘Why is it that despite knowing that chemical use degrades the quality of the soil, people continued to go that way?’

The principal of St Mary’s School wanted to replicate the natural method at her school and decided to experiment growing wheat on a two-acre plot of the convent’s land. If students at Tarumitra’s headquarters could do this, she was convinced that her students could do it as well, regardless of the fact that Rajasthan was water scarce and thus any effort to grow things would be doubly difficult. She wanted St Mary’s school to engage in agricultural practices that did away with the use of poisonous pesticides and chemical fertilizers that create havoc both for the land as well as the inhabitants around. ‘People’s health has deteriorated in the last 30–40 years and is inversely proportional to the expansion of the Green Revolution propagated in the country,’ the principal believed. This belief was supported by doctors that practised in the hospital close by.

To encourage the students to pick up the shovel and not hesitate to dirty their hands while planting, the nuns at St Mary’s decided to lead by example and began tilling the soil themselves. After all, Tarumitra had always taught them to ask themselves, ‘If not us, then who? If not now, then when? If not here, then where?’ At morning assembly, the principal elaborated on how people traditionally respected nature and lived in harmony with it. She went on to explain that with the passage of time, this was fast disappearing. Then came what she hoped to see in her school. She wanted the students to ‘Grow up with reverence for the land

that supported them with food, water, and life breath. If this life-giving Earth is not sacred, then what is?' she asked. 'Loading the land with chemicals was not maintaining the planet's sanctity but abusing it' she explained.

Enthused by their teachers, the students gladly came forward to prepare the land for sowing. Organic manure made from dried leaves and cow dung was used. The Head Boy and the Head Girl of the school took the lead in procuring the seeds. Amidst great jubilation, a local variety of wheat was sown. The neighborhood farmers were amazed at the scene of nuns and students working on the land, determined to grow natural produce. Many local farmers came forward to offer free advice on how futile it would be to attempt this in arid Rajasthan. Everybody who mattered disagreed with the non-chemical method adopted and put forth several arguments in favor of continuing with the practice of loading the land with chemicals to ensure quick growth as well as protection to crops from pests.

With bated breath the school watched the crop turn green and tall. The neighborhood farmers continued to spread chemical fertilizers such as urea and sprayed pesticides in their farms. The school's community resisted the urge to follow suit. They stood steadfast in their resolve not to use these polluters. Their produce would be natural, not chemical-tainted.

Finally, the wheat matured and ripened. The harvesting was nothing short of a festival. After threshing was completed, there were 27 quintals of wheat! The byproduct of over ₹10,000 worth of hay was a bonus. The seasoned neighborhood farmers couldn't help but admit that the school's crop was the best harvest. The farmers appreciated the fact

that the school had achieved all this with so little investment as no money was spent to buy fertilizers and pesticides.

The two-acre plot now serves as a natural classroom for environmental education. The eco-friendly way of farming adequately demonstrates sustainable living in close proximity to nature. The students now understand that nature gives back abundantly when cared for. The hands-on learning has inspired the students to spread the good word wider and deeper so that farmers in the area also turn to natural, agricultural systems and give up the old ways of chemical-fed farming.

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# Saniya's Duniya





# Saniya's DunlYa

Have you ever stared hard at an object till it begins to transform into something else? Have you ever wondered how many shapes and sizes take-out boxes come in? Is it hundreds, or is it thousands? Are the shapes all square, or do triangles and circles also predominate? Have you ever picked up something discarded on the road? Have you ever found something looking pretty, even when everybody considered it to be ugly?

Interesting questions you might say. Answers to these resulted in a fabulous exhibition of objects that Saniya Agarwal, a student of Loreto House, Kolkata, West Bengal put together. Saniya had creatively reused useless, and in some cases, unwanted items and transformed these into products that were of higher value, whether from the point of aesthetics or otherwise. She had successfully managed waste by upcycling it.

As a child, Saniya loved to play with different colors, shapes, and sizes of toys and knickknacks. She didn't go by established norms of color while painting. 'Which is probably why the trees in all my old coloring books had pink and purple leaves,' she says. 'But that was the fun part—never having to care whether my trees fitted into the conventional picture, since I hated following traditional lines and always thought about how I could step outside,' she says.

Saniya's talents are recognized by her school. She is often called upon to put together props for school functions, design posters and so much more. She is an enthusiastic member of the school's Art and Craft Club as well as the Nature Club and aware about how imperative it is for all (students included) to conserve earth's precious resources. 'My teachers always advise me not to go out and procure new material for projects but to make use of anything that is available at home or in school. That, I think', Saniya says, 'was the beginning of my effort to create things out of waste.'

It was not a Big Bang moment for her she says, but took hours and months of reflection to think about what she could do. At first, it started with converting small, thrown-away objects into items of use, or even into just something that looked pretty to the eye. Lights for Christmas trees crafted out of discarded take-out boxes, vases from empty bottles etc. The ideas were there and then came the learning. 'Upcycling' was a new word that was added to her vocabulary.

Whenever any guests came over, Saniya would proudly show them all the items she had created. There were much 'oohs' and 'aahs' on how amazing the transformation was of discards into things of beauty. Soon people in her close circle started sending her their junk. They were more

than happy to get rid of useless objects that were unnecessarily cluttering up space. The largest piles came from relatives who were redecorating their homes. From these emerged the bigger installation that Saniya put together. Saniya says her family's car mechanic helped her collect nuts, bolts, tires and cycle chains. On a visit to her father's office she collected all electronic junk imaginable. She stored things carefully and kept tucked away in some overflowing drawer or the other, cut outs from discarded cards, wrapping paper, boxes, price tags, dried leaves, stickers, erasers-even something as mundane as a roll of toilet paper.

Adding a bit of gloss and glam to junk started for Saniya as a hobby, but soon become a habit, a passion, a quest. 'It is like a treasure hunt or even like placing the pieces of a puzzle together, or so it felt like to me while I was hunting for a base for a table and chanced upon an old cycle tire that beautifully served the purpose,' Saniya says. Making a stand out of toothpaste boxes, painting cans, decorating a chocolate box and converting it into an earring sorter, sticking colorful toffee wrappers and aluminum foils on cards, are some of the ways I creatively upcycled. The options are endless. Saniya thoroughly enjoyed mixing different media and would eagerly wait to see the end result of her handiwork. Coasters were produced by sandwiching elastic bands, safety pins, band-aids between two Compact Disc covers. Saniya discovered a 30-year old bed that her father once used but was now lying gathering dust in the storeroom. She pulled it out, studded it with broken coconut shells, painted it, and converted it into a large chessboard. For chessmen, Saniya used empty coffee and pickle jars. Rubber and Rexine waste from a shoe factory filled into a net cover formed the mattress. The pride of place in her world is the broken window that instantly reminded her of a rock star's dresser. Hence, its frame is

painted red and there are light bulbs on it. Paint cans and toy boxes make up the holders for combs and cosmetics. A discarded air conditioner filter placed on one of the missing panes of the window frame is the hanger for earrings. Which rock star would not give an arm and a leg to have such a dresser!

Saniya was afraid that her mother would object to the junk lying around. But surprisingly, her mother was open to the upcycling venture and even came forward with suggestions. So emerged Saniya's DunIYa, an exhibit of over 150 big and small, recreated, recrafted objects that could be put to new use or serve as art décor items. The capitalized letters in DunIYa signify Do It Yourself, for Saniya believes that upcycling is a satisfying and enriching activity that anyone with a creative streak can do. 'For those who are not as imaginative, there are examples on the net to replicate,' she says.

Looking back, Saniya says, she now finds it easier to answer the question, 'Why did upcycling fascinate you?' It has taken her six years from the time she started collecting junk to her exhibit Saniya's DunIYa-to work out an the answer. 'If we seriously intend to reduce our carbon footprint, we need to rethink excessive buying and useless discarding. Instead of throwing away things, we can recreate these creatively,' she says.

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# Tackling a Burning Issue



# Tackling a Burning Issue



Members of the Eco Club of Hargovandas Lakshmichand College of Commerce, Ahmedabad, Gujarat, were concerned. Published data showed that air pollution levels in the city were high. Something needed to be done to ensure that each breath citizens took had more oxygen and fewer pollutants in it. People were entitled to live in an environment that was healthy, not noxious.

The students decided to look at major sources of pollution and identified the routine practice of garbage disposal in many residential colonies as a primary cause. This was not done professionally through garbage collectors. Typically waste was collected from each household, piled in a heap at a particular spot and just burnt, thus increasing the toxic load on the environment as air, water, and soil got contaminated. And what did this do to the health of all those who lived in the vicinity of smoldering garbage piles? Their lungs inhaled the soot, toxic chemicals and particulate matters flying around, while

poisonous fumes bombarded their bodies. To quote from an article by Climate Central, 'An estimated 40 to 50 percent of the garbage is made up of carbon by mass, which means that carbon dioxide is the major gas emitted by trash burning.'

The students were surprised that the residents were oblivious to the fact that their action of waste incineration was causing so much harm to the planet and to people. On inquiry, the students found that some residents did understand the dangers, but expressed helplessness as they were the minority voices, and besides, they weren't aware of any alternative, regularized mechanisms for waste disposal.

The students developed an action plan to address this issue. Three teams were formed. The first was tasked with putting together a detailed list of residential colonies that burnt waste. This was a huge challenge as most colonies burnt waste randomly and in some remote corner, away from the public eye. In order to solve this problem, students requested their peers to look out for and report to the team, any signs of waste being burnt. This helped and soon a list of sites was generated.

The second team worked on creating attention-catching, eye-appealing literature that clearly stated the harmful effects of burning waste. The third team worked to liaison with local municipal corporations, as well as private waste collection agencies and prepared a list to share with housing complexes so that they could opt for a more environment-friendly system of waste management.

Once this was completed, it was time to put the plan into action. Students began the task of reaching out to administrators of residential colonies on the one hand, prominent members such as teachers, doctors, and social activists on the other. The aim was to first convince these

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people about the need to make a change. It was not an easy task to reach these individuals. Some saw the gesture as interference in their management process and were reluctant to meet with the students. Others found it difficult to take time out from their busy schedules. Still others brushed the students off as 'activists who were over-reacting to something that was the normal practice.' On whichever lucky day a willing listener was found, the students used the opportunity to share with the individual, convincing data on toxic pollutants and how children and elders were particularly affected. That said, they also showcased eco-friendly alternatives to the present system of burning garbage.

'We even thought of identifying and working with prominent citizens who were known to any one of us and convincing them to be the leaders. However, this too failed,' says one Eco Club member as no one was willing to take on the rest of the residents. So the students gave up this idea and instead, worked to put together small meetings with residents, generally over a cup of tea. At these, they informally initiated dialogues and made presentations. Once these small groups were convinced about the harm that setting fire to garbage caused, a major hurdle was crossed. Those convinced about the need to change to a better system became the catalysts to widen awareness among other residents as well. It was in this manner that slowly by slowly, the students inched forward to a position when the majority of the residents were with them.

As consensus to find a better way to manage waste grew, the students began the process of connecting the managements of the residential colonies to reputed waste collection agencies and ensured that negotiations between the two resulted in contracts for systematized waste management. There had to be some give and take from both

sides and the students used all their persuasive powers to facilitate that. The students even convinced garbage management organizations to make a goodwill gesture with a one-time donation to the residential society's fund. As a symbolic token of appreciation to residential complexes that agreed not to burn waste, students gifted tree saplings.

The students say that the most critical element of the project was making the decision to set it up. Once it was taken, it was the energy and the determination of the students that kept the momentum going. The impact of the project was measured by how many residential complexes agreed to segregate waste and how many waste collection agencies began to regularly collect it. The students are proud to say that their efforts have resulted in over 120 colonies completely stopping the harmful practice of burning waste and many more in the process of doing so.

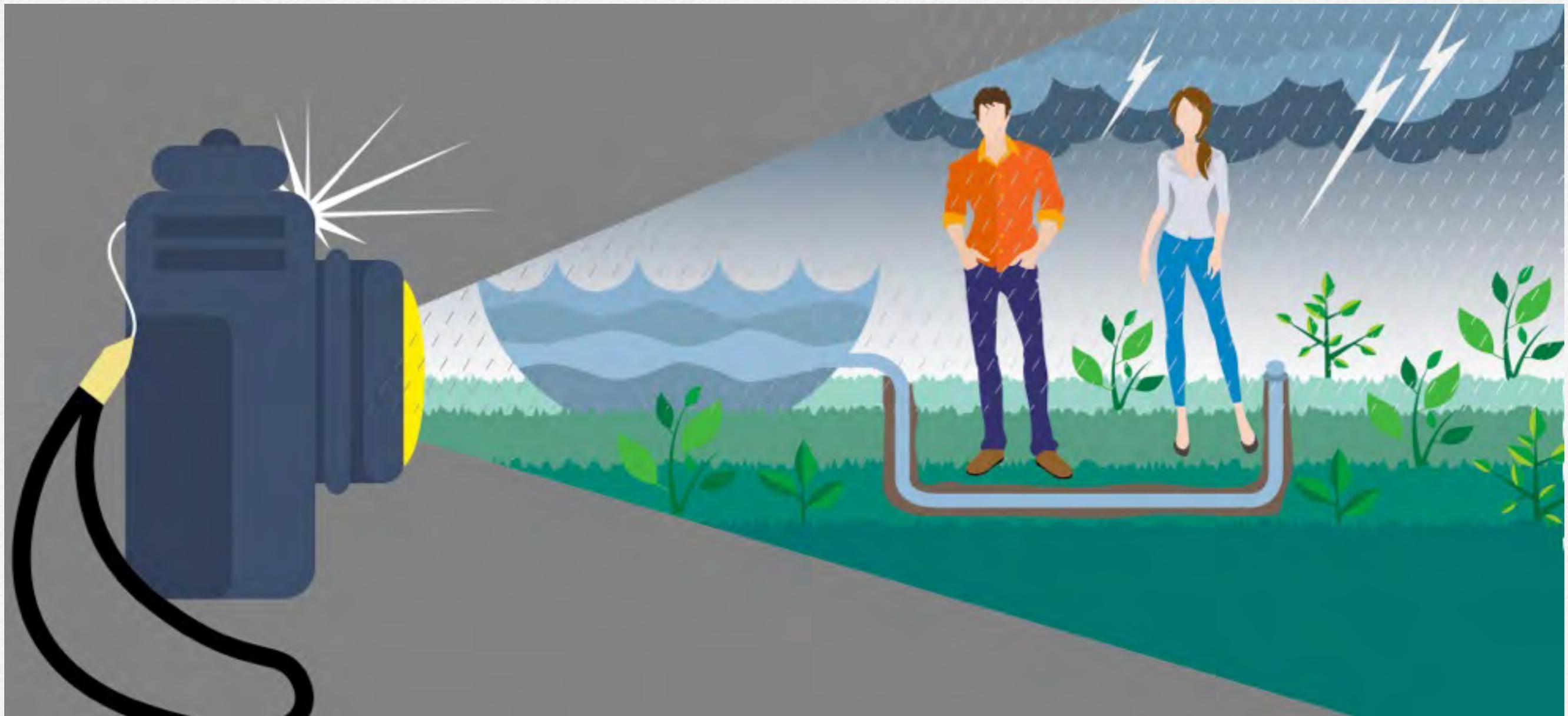
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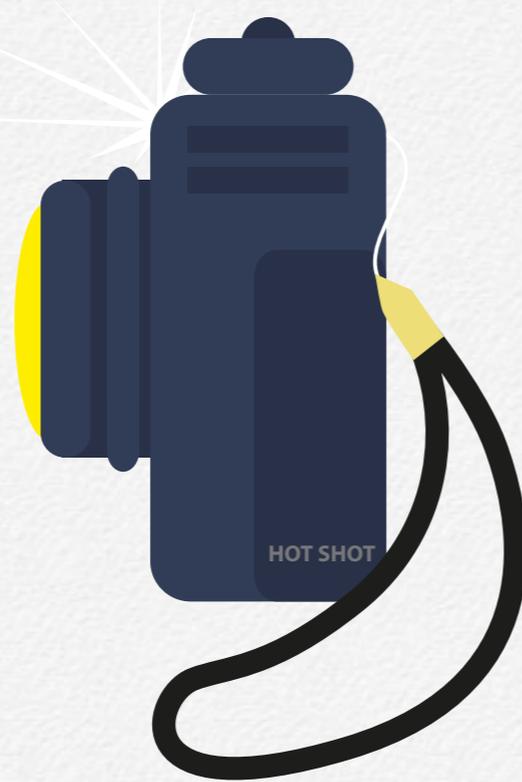
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# Through the Camera's Eye



# Through the Camera's Eye



Making a film often helps bring greater clarity to a chosen topic. The film captures images that are there for you to look at again and again, while the brain might forget what the naked eye saw in a flash. When you make a film, there are so many angles your camera focuses on and the innumerable takes and retakes reinforces the image. Once a film is made, it can be screened multiple times, and before varied audiences, while what the eye sees could be a one-time image that often stays personal. With this in mind, Earth Day Network and Bichitra Pathshala have been conducting 'Earth Reel', a filmmaking competition for students from in and around Kolkata.

Earth Reel requires youth to compete by sending in entries of original films they make on a particular environmental issue. To encourage a better quality of production, Bichitra Pathshala has its team of experts hold sessions for all Earth Reel participants on basic cinematic techniques for all three categories of the competition—short films,

news capsules, Public Service Announcements. Participants learn strategies to effectively project the message they want to convey even if the time is just a couple of minutes, when to zoom in their cameras, how best to use camera speeds, voice modulation and so much more.

On the day of the competition, entries are screened before an audience that comprises students and teachers from several institutions. An eminent panel of judges is there to judge the films. All the filmmakers need to be prepared to answer jury questions on the environmental issue their film focuses on. For example, if the film depicts the beautiful East Kolkata wetland, then the jury might want to know the definition of a wetland, what is the present condition of the wetland filmed, are there any environmental concerns in the area, and if so, what recommendations could the filmmaker put forth as ways to resolve these. As half of the allotted marks are set aside for interactions with the jury, it ensures that each filmmaker has well researched the subject of his/her film.

Schools eagerly await the announcement of Earth Reel. The Dhulagori Adarsha Vidyalaya in Howrah District of West Bengal had heard about the competition and considered making a film on a very pressing problem that Dhulagori faced: water shortage.

Dhulagori is located on the outskirts of the large metro city of Kolkata. Over the past few years, this area has seen unprecedented industrial growth. Needless to say, the numerous factories that have sprung up need huge amounts of water, which they draw in copious amounts. With limited urban planning, this additional burden has resulted in acute water scarcity. There is just not enough water for the existing residents and the growing population of factory workers. Tube wells have been pumped dry, while the ponds that exist are unusable as they are polluted

with industrial runoffs and even human waste. The people of this industrial belt are compelled to buy water, often from illegal suppliers.

The students of Dhulagori Adarsha Vidyalaya often went thirsty. Nor did their school have adequate water to flush the toilets. These were major problems. The students discussed the water crisis with the elders in their families and realized that a majority of them had limited knowledge about simple, scientific techniques to store water. Rainwater harvesting was something very few had heard about. It was imperative, the students concluded, to make the people of Dhulagori aware of these effective methods. And, at the same time, instill in the people of Dhulagori, civic consciousness that directs them to judiciously use water. Only then could the water crisis be reduced to some extent, they thought.

The students, with help from their teachers, put together well-researched information on rainwater harvesting methods and ways to minimize water wastage. The next step was to utilize communication strategies that could clearly carry the message in an attractive, attention-grabbing way. 'Let's use the medium of film,' they decided and registered to be a part of Earth Reel.

The entry from the students on the water crisis in Dhulagori won them the first prize. With all the praise the Earth Reel judges lavished on the film, the students were encouraged to make it the center point of multiple presentations to the people of Dhulagori. 'Getting through to the adults was tough at first,' they said. 'Our elders just wouldn't take us seriously.' However, the students were not to be cowed down. No amount of rejection stopped them in their purpose to bring about awareness. They continued to screen the film at any and every given opportunity

and at the same time, made use of social media sites to generate additional viewership.

The students' efforts have borne fruit. This year, the Panchayat (local self government) members, who were earlier reluctant to give the students a patient hearing, have begun to take some measures to minimize the water crisis by installing new tube wells in a few *paras* (localities). The local community also now plays an active role in the cleanup of ponds so that the water in these is safe to use for washing purposes at least.

The camera's eye indeed helped the students effectively spread the message about simple techniques to manage an ever growing environmental problem. 'Today these students are the young ambassadors for earth who campaign house-to-house to bring about awareness on ways to live life with adequate water,' Bichitra Pathshala officials say.

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# Towards a Greener Education





# Towards a Greener Education

Nishant Panicker and Aniruddha Voruganti, two students of National Public School Koramangala in Bengaluru, Karnataka, wanted to find a way to give back to society. Many hours were spent on debating to isolate the best way to do this. The system needed to be simple for student volunteers to implement, yet have the potential to make a significant difference. Several ideas were floated and many models rejected. What emerged was Towards A Green Education (TAGE).

TAGE works to harness the potential of students to contribute and bring about a positive change. It acts as a bridge that connects students from across the economic spectrum—those who have the resources and the will to make a difference, with those whose economic backgrounds restrict dreams from turning into reality. What an innovative way to bring about change!

The initiative was first launched at their school. TAGE members, as well as other high school students, began collecting used, recyclable paper from students, faculty as well as from their families and communities. This was then segregated. The unused pages of notebooks formed the raw material for biannual, inter-house notebook making competitions that today are a regular feature of the academic year. The participants work to meet the quality standards and guidelines set by TAGE members. Beautiful notebooks emerge.

For the rest of the waste paper collected, TAGE has a tie up with ITC Limited's 'Waste to Wealth' (WOW) program. ITC arranges to collect the paper from the school, and in exchange provides stationery for distribution to needy students. At times, ITC even pays TAGE for the trash. With the funds, TAGE members purchase additional items that students in their partner school require.

The TAGE model is to pair a specific donor urban school, with a designated rural recipient. With notebooks and stationery, and other essential items in hand, TAGE members visit the beneficiary school. 'It is wonderful to see students from both schools interacting with each other and exchanging notes. It really doesn't matter that they come from diverse backgrounds, and lead lives that are often poles apart. When together, they are all youngsters with the same interests and similar aspirations.

The donor school's students make it a point to regularly visit their partner school and go beyond just handing out things, to spending time to understand the other's problems. Brainstorming sessions are then held to try and find solutions to these. Once a solution is found, then the next step is to implement it. NGOs and others experts are invited to help.

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Resources are generated through collection drives. All this leads to strong bonds being formed between students from both schools.

TAGE has faced several problems along the way. A key issue was to make sure that the model was system-driven and not individual-driven. Making TAGE a part of school curriculum was identified as the solution. This ensured that the activities continued every year, even after the initial founding students graduated from school.

TAGE's greatest success has probably been the positive response from, and involvement of, the student community at large. Some 600 students are part of the initiative. Paper collection drives and notebook making competitions are conducted in competitive settings with the winners earning points for their school houses. The power of such large scale involvement reflects in the statistics of the program's success. Over the past year, TAGE has collected some 8,000 kg of waste paper, about 200,000 sheets of blank paper, and enough funds to buy stationery for more than 1,000 lesser privileged children. What makes these statistics even more impressive is that TAGE collected all this solely by students.

TAGE plans to expand their program to provide lesser privileged students opportunities to showcase their knowledge and talents through events and scholarships. They are also working toward creating multimedia-based educational content in local languages for incorporation into existing school curriculums.

Aniruddha and Nishant say they are inspired to expand their venture. 'If with just a single school we could do so much, imagine if 100 schools joined TAGE, or even better, if all schools in Bengaluru participated, there would be millions of students working together, for each other,

and toward a remarkable cause. By sheer numbers alone, this could bring about a sea change in society,' the TAGE team says.

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# Transforming a Cesspool into a Garden





# Transforming a Cesspool into a Garden

The NGO Sankalp Sanskritik Samiti has as its focus state, Chhattisgarh. Its officials are regularly invited to government schools there to teach students about hygiene. Often on a visit they would notice the detestable conditions around the school's hand pumps. A floating mess of food and other particles, the result of washing hands and utensils, combined with water that leaked out every time the hand pump was cranked, formed nauseating cesspools around the pump.

The NGO team decided that something had to be done to ensure that the hand pump areas were not slushy, nor infested with flies and mosquitoes. A thought struck them. Could this run off of waste water be diverted to grow things? An out-of-the-box idea but 'there was no harm in trying it out,' the team thought. Students could be taught to grow things on the irrigated plots. They could also learn about the nutritional value of each of these, and, best of all, have

the pleasure of enjoying fresh, naturally cultivated fruit, vegetables and herbs. All this, in addition to clean surroundings!

The Sankalp Sanskritik Samiti team approached the administrator of the Rajeshwari Karuna Higher Secondary School at Rajnandgaon, who agreed to give the experiment a try. He invited the team to address the students and explain to them how implementing the idea would have so many benefits. 'There would be no filth around the hand pump area. Nor would the students have to hold their noses to block out the usual stench. Breeding of disease-carrying vectors would reduce. And imagine, a garden in place of a cesspool, and fresh produce available for free,' the team explained. The students were convinced.

Now came the catch. The NGO and the school's administration were definite about one thing: the students had to take full responsibility and do everything themselves from start to finish. It would have been easy for the Sankalp Sanskritik Samiti team to provide a little seed capital and do the initial work. But no! The onus would be on the students to work toward raising funds; digging and cementing the flow channels from the pumps to the designated plots; arranging for saplings; learning how to choose healthy plants; understanding when best to plant; working out water, compost, and fertilizer requirements; recognizing the best time to pluck; and studying the nutritional value of each of the produce. It had to be totally their effort.

The collection of funds was the first step and this took time. ₹1 per month was all each student could spare as the majority of them came from lesser-privileged sections of society. Next came the task of procuring saplings. The students took the help of the team from Sankalp Sanskritik Samiti to shortlist government forests and horticultural departments that

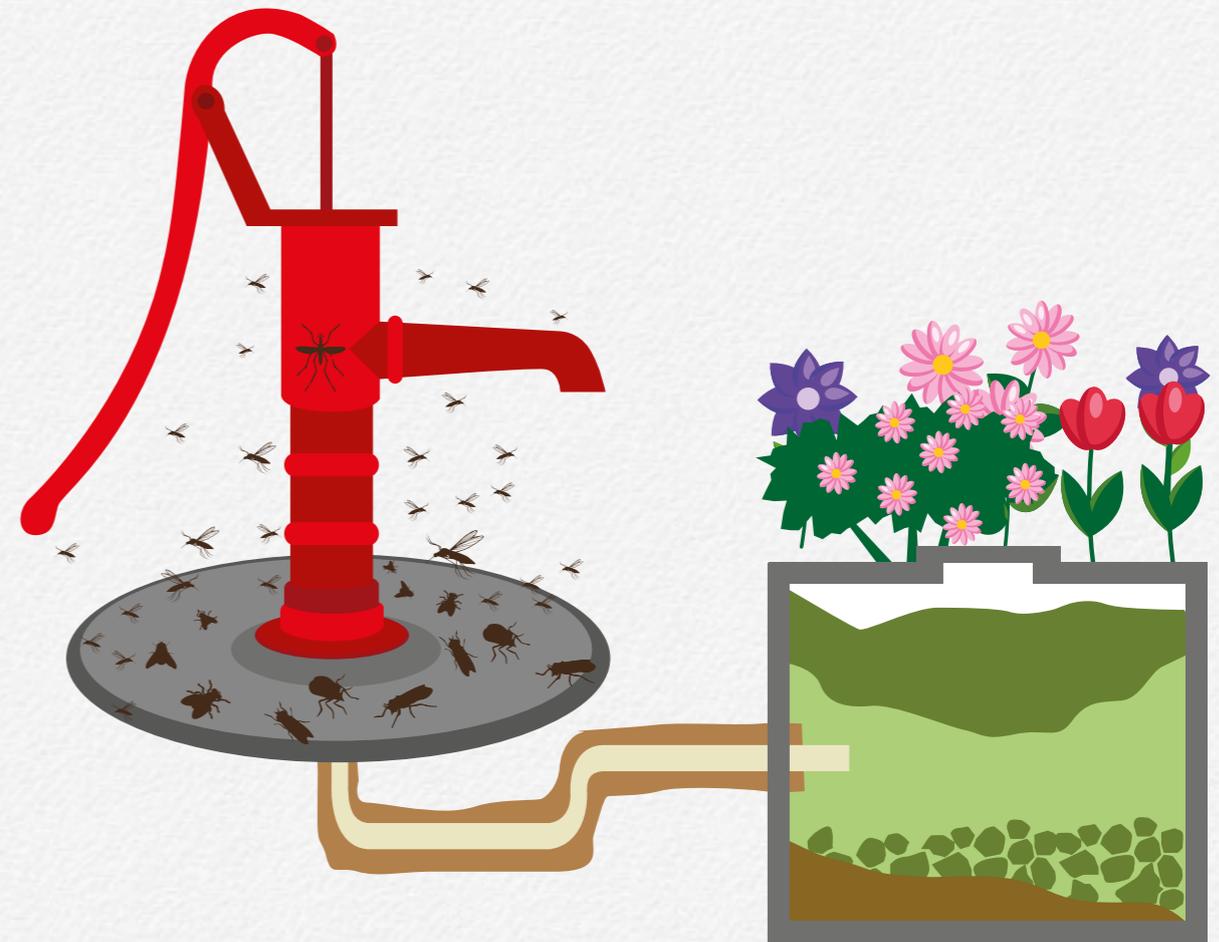
gave away free saplings during the Van Mahotsav (forest festival). They then began the process of visiting these offices. Often the students had to sacrifice their playtime and instead trudge down to the offices to request for the saplings. Not all saplings came from this source. Some were bought. It was a learning experience for the students to recognize what made for a healthy plant. The students also had to know which species to choose and what was the best time to plant each.

As word spread, parents and neighbors readily came forward to lend the students implements such as spades and rakes. Students happily went about preparing the soil and then planting and caring for the saplings. For them, it was great to be outdoors instead of cooped up in their classrooms. Compost pits were also created so natural fertilizer was readily available for use.

The first few harvests have been reaped. Senior students who have been working on the project for a number of years are now the instructors for the juniors. The area is today transformed. Fruit trees and vegetables are seen on patches that were once cesspools. Students are now aware of ways to make the best use of waste water to grow things, a knowledge they can put to good use when they go back to their villages. Mosquitoes and flies have been forced to vacate the space. Students from other schools come to see this innovative process of turning a cesspool into a garden and get inspired to do the same in their schools as well.

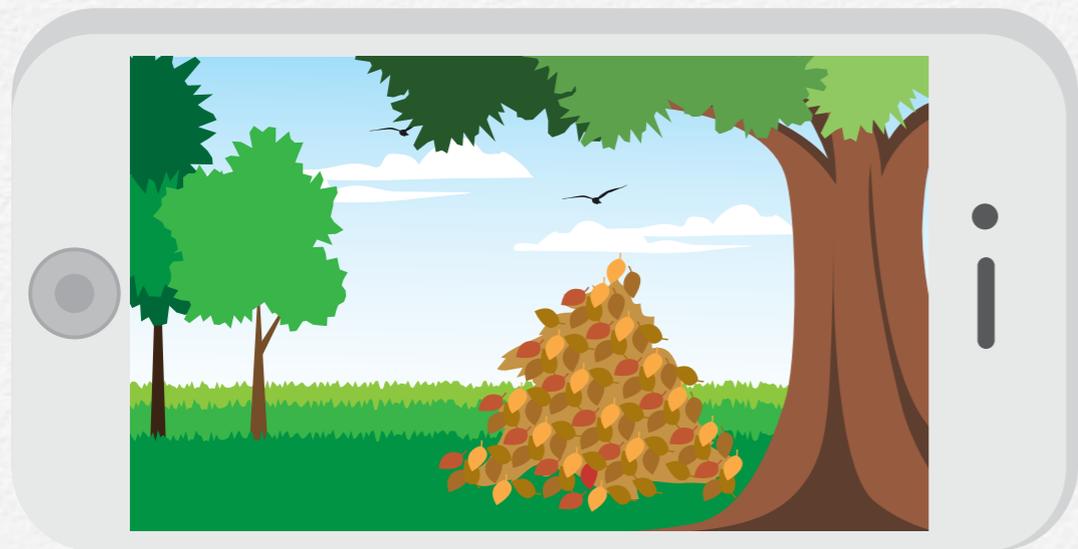
A truly environment-friendly effort that is green and clean simultaneously!

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# Video Pledges





## Video Pledges

Many would agree that promises made often fall by the wayside as there is usually no way to hold people to these. And, pledges made by adults in authority to youngsters may stand an even lesser chance. To circumvent this risk, and at the same time, involve school students in the decision-making process, the Centre for Environment Education (CEE), Ahmedabad, Gujarat, in collaboration with Earth Day Network (EDN), put together a campaign titled 'Video Pledges.'

The Video Pledges campaign called upon students across India to take on the mantle of environmental stewardship. The students had to explore their campuses to identify an environmental problem that had perhaps escaped the attention of the school authorities. Just pinpointing the problem was not good enough. They had to research to see why the problem was there in the first place and then work out possible solutions. Many hours were spent in doing this. Animated discussions were held to first agree upon the one problem

that the students thought was needing most attention. Websites were then searched, and experts approached for information on ways to deal with the issue. Armed with their findings, students approached their authorities for a patient hearing. The adults, impressed with the thoroughness with which the students had identified problems, and the lucid, well-thought-out, easy to implement solutions presented, readily agreed to pledge their support.

Over 100 principals and administrators agreed to a 'Call for Action' and pledged to do something concrete to resolve the environmental issues raised. The time frame was not some time in the distant future, but within the next academic term. Students in each school used mobile phones and digital or hand-held cameras to record the 2 to 3 minute pledge made by their school authority. These were then uploaded to YouTube and shared with CEE and EDN to post on their social media sites as well.

The idea to record pledges on video was very successful. Promises made were documented, and there in full view for all to hear. Accountability became a must. There was hectic activity as administrators began the process of implementing what was pledged. Their efforts were to be entered in a competition to see which promises made on camera were most effectively executed. It now became a question of honor to ensure that their school won. All the schools achieved so much. It made it difficult for the judges to select the best three in this very closely-fought competition. On Children's Day (November 14), the results were announced and the top three schools awarded.

The Video Pledges campaign brought together students and authorities to collectively work to resolve problems that would result in cleaner and greener campuses. Many of the issues identified were common across the country. Saving water and managing garbage topped the list. In most cases, the solutions were practical, low-cost and easy to emulate by others. For example, a school in Punjab with many trees, turned to composting as a way to deal with the copious amounts of leaves that were shed in autumn. Even with regular sweeping the rising heaps of dried leaves posed problems. The headmaster authorized the construction of compost pits. The organic fertilizer that resulted became the preferred choice of use in the school gardens. What was left over was distributed among local farmers. Students in Gujarat, who had identified expanding landfills as a major issue, saw the implementation of their suggestion of reexamining discarded items with fresh eyes. Perhaps there were still some items there that could be retrieved and reused or upcycled. Students in Odisha who had expressed concern about the use of chemical-based color during the Holi festival, were thrilled when their authorities organized workshops where they were taught to make eco-friendly colors from flowers and other natural products. The authorities were also inspired to look beyond the boundaries of the campus and help conserve a local pond that grew Spirulina. The nutrient-rich food became a free supplement for the students and their families. Another school installed a paper recycling plant to take care of the reams of paper that the students used during examinations to write answers on. Still another, where the headmaster had a water audit conducted, giving credence to the students' suggestion that this was a way to ensure the judicious use of water. In Maharashtra, authorities put in place systems to recharge ground water aquifers. In another, authorities set up herbal gardens. A school in Rajasthan that had Neem (*Azadirachata indica*) trees

in their campus began the process of mass-scale drying and pounding of the leaves and using the end product as a natural pesticide.

In this way, the Video Pledges campaign brought about changes in school campuses that were good for the environment. Just as important, the campaign helped the students grow to be stewards of the environment and know that if they presented well-researched ideas to elders, there was every likelihood that these would get implemented.

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# Zero Waste Himalaya





# Zero Waste Himalaya

The Himalayan mountain range is awe-inspiring. It fascinates people across the globe and draws many to experience its breathtaking majestic stature first hand. The range is an area of pristine beauty, with biodiversity hotspots that teem with wondrous flora and fauna. It is rich in minerals and other natural resources. Considered an abode of the gods by Hindus, its vast snowfields, and large glaciers are the source of several mighty rivers of Asia. It is no wonder that the area is considered sacred and revered: a truly precious one that needs careful care and protection.

Modern technology has facilitated greater human mobility across the range. Where once people hesitated to tread as weather conditions were often inhospitable and the rock faces too treacherous, improved mountaineering equipment now available has opened up the area. It is a sad fact that the growing number of people traversing the Himalayas has upped the risk of increased amounts of litter being left behind by often careless humans.

In 2010, Zero Waste Himalaya was formed by a group of like-minded people who were concerned about the mounting waste (non-biodegradable items in particular), and the effect this polluting would have on the fragile eco-system of this once untouched area.

Sikkim, an Indian state that nestles in the foothills of the Himalayas, seriously took up the initiative. The state is recognized as the greenest in India. It has the distinction of being among the first to ban the sale and use of plastic bags across its districts. In the past, people unceremoniously flung plastic products into drains and waterfalls. This was identified as a menace that resulted in blocked drains and landslides.

Young students and other members of Zero Waste Himalaya in Sikkim now moved a step further to also ban the sale of another polluting item—Styrofoam. This is the common name for products made from polystyrene, the petroleum-based compound that is molded into disposable dishware and packing materials.

It was a tall order as Styrofoam is such a popular item, used not just in urban areas, but rural ones as well. Its features of being lightweight, relatively cheap, and easily disposable made it a hot favorite. For example, the use of Styrofoam products at large functions ensured that the tedious and water-consuming task of washing up was done away with. All one had to do was pack the used items into garbage bags and cart these off to dumping sites. No long hours of labor were required. Instead, the clean-up was completed in a jiffy.

Niraj Sapkota, a student member of Zero Waste Himalaya asks, 'Just imagine the burden on landfills with so much dumping? And, this is just one of the many disadvantages of using Styrofoam. There are so many more,' he adds. Along with team members, Niraj first conducted a survey to see who the major users of Styrofoam were. The answer was 'the common people' who extensively used Styrofoam items, in particular when large numbers of people were to be fed. The more affluent, the team concluded, could afford the luxury of using crockery that was

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reusable. It was a lesser pinch on their pockets to pay extra for someone to wash items after use. Those with monetary limitations opted for Styrofoam.

Now that the target group had been identified, the students began a house-to-house campaign. 'We are champions at this,' said Niraj. With statistics and well-researched information in hand, the group trudged the streets of Gangtok, the capital of Sikkim, to make people understand why they thought another word for Styrofoam was D-A-N-G-E-R. 'The material, injected as it is with gases, is definitely to be avoided,' they recommended. They explained that scientific research indicated that suspected carcinogenic matter present in Styrofoam containers could percolate into hot or cold food or even beverages carried in these.

Continuous sensitization of people was carried out—from the street to the institutional levels. Exhibitions, public performances, and other effective, mass communication channels were used to ensure that awareness reached a sizeable number of people.

To approach the issue from another angle, food providers that people hired to cater for big feasts were persuaded to avoid serving in Styrofoam dishes, nor provide plates etc of the material. Their standard response was, 'But people ask for it.' To counter this, the caterers were persuaded to give a discount to those customers who opted to have their guests served in items that were not made of Styrofoam.

As the use of Styrofoam was also common in rural areas, special campaigns were designed for outreach to rural populations. Sessions were programmed around village fairs and large gatherings such as those associated with the harvest festival of *Makar Sankranti*.

As in every journey towards change, there were many hurdles. The adamant nature of some was a big hindrance. They were just not willing to give up the use of Styrofoam and brushed off the members of Zero Waste Himalaya saying that the members were 'creating an unnecessary hype about the dangers of using Styrofoam.' Sometimes, even if people wanted to make the change, circumstance didn't allow them to do so, as happened in the close-by town of Darjeeling. The 'No Styrofoam' campaign failed in this area as, unlike Sikkim, Darjeeling is water scarce. 'The people of Darjeeling were compelled to choose what could be used and thrown away,' Niraj says.

Miles and miles were walked by the Zero Waste Himalaya members, many pairs of shoes worn out, many doors knocked on. All to good avail as earlier this year the Government of Sikkim made it illegal to use Styrofoam in the state. Niraj and the team are however cautious about celebrating this victory. They understand that law often needs strong enforcement. Their next step, therefore, is to hold another survey. This time to document how many people have actually made the change. 'If many have, then we can celebrate,' Niraj says.

'There will be many instances where people will discourage us but for me, it will not matter. I will stand by my pledge to get rid of harmful waste in the beautiful Himalayas. I am a Waste Warrior after all,' Niraj says.

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# Produced by Earth Day Network, India

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It is our continuing effort to bring out volumes that are available on the internet for free so that more and more people benefit from already tried and tested techniques for sustainable development.

Our previous volumes include *Pathways to Green Cities: Innovative Ideas from Urban India, Volume I* and *Pathways to Green Cities: Innovative Ideas from Urban India, Volume II*. Both are available on the internet for free.

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