





DIRECTOR'S MESSAGE

It is a pleasure for me to learn about the release of the ninth issue of "NATURA"-the magazine - of the nature club of our institute. Prakriti was founded by the students of our institute with the aim of spreading environmental awareness this is a very pertinent and important issue not only for us but for the future generation as well. Seeing our students taking ardent initiatives in these activities is really heartening.

I wish all the success for the present issue of NATURA and future activities of 'Prakriti', I also wish that the spirit of 'Prakriti' spreads out to more number of students and among other citizens at large.

PROF. ANUPAM BASU DIRECTOR, NIT DURGAPUR

FACULTY ADVISORS' MESSAGE

We've been privileged to be a part of a club that has functioned efficiently for so long! It is therefore a pleasure for us to know that Prakriti, the techno-environmental club is publishing another issue of its annual magazine. We hope to see articles that are enlightening in every manner and could inspire the readers to care about the environment. Let this issue get wide publicity and the members succeed in their noble endeavor.



PRESIDENT'S MESSAGE

Strengthening the bond with our Mother Earth has always been the aim of Prakriti Club. Besides creating awareness, Prakriti also encourages more innovations on behalf of our members and followers in order to work towards the protection of our Environment. The guidance and support provided by the professors and administration is praiseworthy. The existence of groups like Prakriti never let us forget our duty towards our Nature. I hope this issue of Natura makes its readers push a pause button to their daily routine and think about the environment.

I wish all the success for future activities of Prakriti.

BHOOSHITA NUNDOOLALL (SWETA)

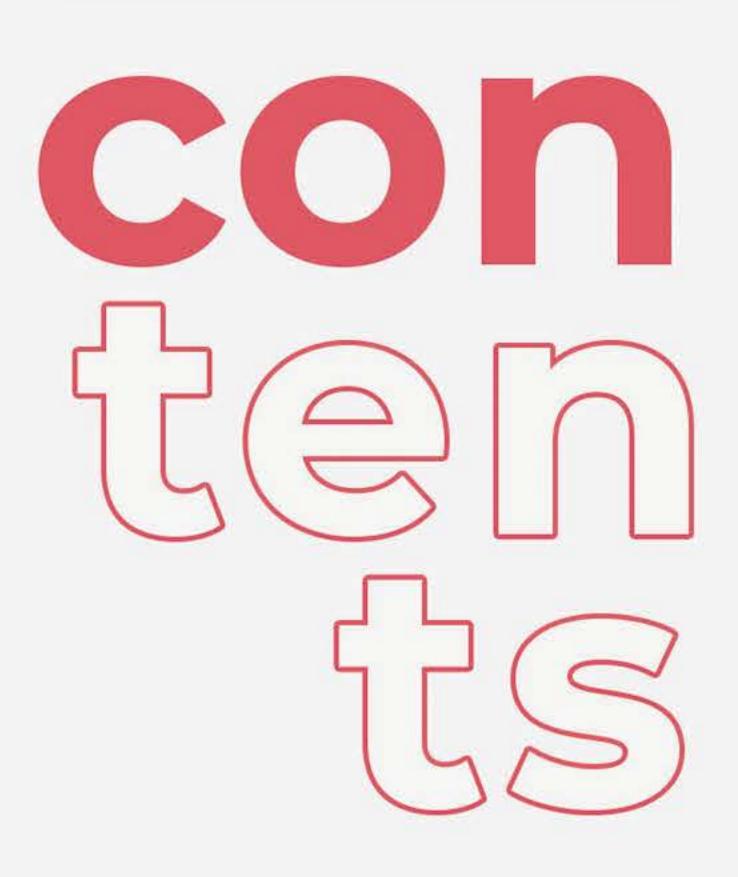
MESSAGE FROM PRAKRITI

Dear Reader,

Time indeed does fly and civilizations do perish. The world is exquisite and human psychology unfathomable. Civilizations rose and fell but time never elapsed. What have remained of these civilizations are manuscripts which were written back then, some good some bad. These manuscripts have been paramount in the rise of civilizations that follow. The 21st century is considered to be the most advanced human civilization that has existed till date on the face of the Earth. Here we are penning down the manuscripts of the 21st century for this civilization too shall perish sooner or later. What shall remain are these manuscripts which will then become paramount in the rise of another civilization, another battle against time.

HAPPY READING, TEAM PRAKRITI





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A TAIK WITH MATURE

When you bear tears,

The sunset can bring you cheers.

When in doubt,

The sunrise and clear it all loud.

Negatives vibes are treated with one procedure,

A solemn, a solo talk with nature.

When you are peevish,

The glimmer of the water can make your smile lavish.

When in vengeance,

The rain drops will soothe your conscience.

Your emotions shall reform into facture,

Just have a quiet, a profound talk with nature.

When you feel a surge of guilt,

Look! How tortuously mountains were built.

When you feel lost and helpless,

Remember the journey of rivers, before oceanic oneness.

Your ideas shall elucidate and imaginations turn to portraiture,

Just meditate, whisper, and have a talk with nature.

When you are vexed or confused,

The iridescence of flowers shall definitely earn you a boost.

In your deepest of fear,

The moonlight beach shall medicate you clear.

When you bleed, when in greed,

A talk with nature shall sow the fruitful seed.

When you lose a loved one,

Look how the moon is illuminated by her lover, the Sun.

When you feel rejected and alone,

Have a trek into the wild, you won't get an opportunity to moan!

Since our birth and even after our death, when coffined within entablature,

Our bodies shall be protected, embraced as our souls have a talk with nature.

Last but not the least,

If you are in pain, the starry sky shall make your eyes feast.

If you can't see, or hear, or speak your mind,

Feel the velvety touch of grass, Mother Nature is eternally kind.

Where there is hope, no light, no preacher,

You will always find a way with a talk with Mother Nature.

SANJUCTA ROY THIRD YEAR ECE

Delhi VS Kolkata NATURA

WHO WILL WIN THE BATTLE AGAINST AIR POLLUTION?

As the season of winter comes it brings the joy and happiness of outings and holidays. But in this season, many of us suffer from breathing problems as well. The reason? It is because the density of air increases in winter and the heavy air remains close to the ground with the pollutants in it. This is why the cruellest features of the air pollution are seen during winters!

The pollutant particles or the gases which are released in the air due to the burning of the fuels react to each other in the presence of sunlight and forms "Smog". Smog is harmful to both the respiratory (lungs) and cardiovascular (heart) systems. It causes heart problems, bronchitis, asthma, and other lung problems. Smog reduces lung function even in healthy people.

In November 2017, during The Great Smog of Delhi, the air pollution spiked far beyond the satisfactory levels, Levels of PM2.5 and PM 10 particulate matter hit 999 micrograms per cubic meter, while the safe limits for those pollutants are 60 and 100 respectively.

Kolkata is not far behind! It is giving Delhi a tough competition and about to surpass the level of pollution of the capital. According to the Central Pollution Control Board, when it comes to air pollution Kolkata along with Delhi is among the worst affected Indian cities. Kolkata is now at the fifth place among the major cities producing Greenhouse gasses and it is also the second highest contributor of CO2. The major sources of air pollution include automobile exhausts which is about 50%, industrial emissions that is almost 48% and the rest 2% from cooking.

Due to the increase of the level of the pollutants in the air visibility during early morning and late night has decreased severely causing an increase in the number of road accidents. Another study states that about 70% of all the inhabitants of Kolkata are suffering from respiratory disorders due to the increasing air pollution. It is also being said that the number of vector borne diseases including malaria and dengue will also rise in the city if the level of pollution remains same for long. According to the CNCI study, 18.4 cases of lung cancerper 100,000 people were reported from Kolkata.

Both the Delhi and Kolkata governments are taking steps to control the air pollution. The numbers of electric and battery run vehicles are being increased. The government has taken up a Green Cities mission stressing on developing low carbon urban township areas with special focus on environment. The plan is to have a low carbon output by using pollution free solar power, LED lights and by not burning the waste waste materials in open air.

Cleanliness is Godliness

They went to the temple to worship the Lord
They closed their eyes while praying to God
They narrate their pain with folded hands
They wished for goodness with bowed head
They take the Prasad with a spiritual mind
They donate few blankets as they're kind
They throw all the wastes here and there
and for the purity of the place, they don't care.
I am not questioning religiousness of theirs
but, can your worship reach the GOD
without purity of act but, only with prayer!!!

J.R.Mishra
Second year





The morning rays paint the black sky with a thin crust of golden orange and white cream, Letting the moon play hide and seek with the mighty sun, behind the smoky clouds... Chirpy sounds emanating from little birds, feathered with an enigma of colors, In wonder, this humanly mind wanders, amalgamating with the Universe! The reflections of a mirror might show the truth, The reflections of water...the dancing ebbs and flows, teach us life! Realizing that we do not possess the liberty to pause the clock and appreciate Nature, Human species run, bearing the wings of time as a burden on the sleeve... The break of dawn, kicks the beginning of so-called advanced technologies, To weave their magic through the threads of pollution; The dusk that welcomes the quivering silver moon beyond the stratifying layers, Satisfies the weak mind to resign to rest on the bosom of Mother Earth. Growing older everyday by number, it is not the vision of the eye that fades... But the picturesque of Nature, constantly withering in its own autumn; She says, "The summer today will turn into sorrow tomorrow", And we always wait for a tomorrow to look reciprocate her love and care... Forgetting that, when she goes to dust, it is the end of everything we exist for!

SRUTHI KRISHNAMURTHI
M. TECH FIRST YEAR
DEPARTMENT OF BIOTECHNOLOGY



TO THE EARNEST SEEKER



The Nature has music for those who listen. The music is so intricately composed that it has the ability to engulf all and sundry in its implicit expression of eternal bliss. May be that is one of the reasons why Nature is the ultimate haven where unconditional love and contentment blossoms to the zenith. Its music find its way into an occupied heart just like a liquid finds its way into a bottle full of pebbles. It is so harmonious that deep tranquil slumber creeps in liberating one from all meticulous and temporary.

Despite all the ignorance and insidious erosion of its freedom of existence the Nature always has love and space for the honest seeker. The slow jolly mumble of the rain, the swift rhythmic dance of the overburdened crops, and the deep soft whisper of the wind, the eloquent rustle of the sand and all such plethora of cheerful attributes of Nature alleviate the depressed seeker, rejuvenating the landscape of his vision and destiny. Nature is generous. Its generosity knows no bounds for it is all givers and has nothing to ask for in return. Plato rightly said, "Beauty lies in the eyes of the beholder". An earnest seeker can sense the fresh smell of the Earth just after the merry monsoon rain, the symphony in chirping of the birds, the joy in the bustle of the leaves on a windy day or the bellowing of the dry thirsty land. He can find life in air as it swiftly makes its way cutting through the top of the lean, dense grass, in the river that murmurs the old age songs all along its way to the sea and in the sophisticated patter of the rain avid in discharging salvation to the quench drenched Earth. The earnest seeker can fathom the agony in the childlike rumble of the land perturbed by the clamor of the obnoxious human civilization, a sense of completeness with the unification and hope, distant yet close, as the sun sets in the western horizon.

There is distinct clamor in silence, if you can hear, as all elements of Nature amalgamate to sway in jubilation. It does not demand prophetic sense to moor but a pure naive heart in search of harmony. Nature promises peace in its clamor and once moored the peace is priceless and unending. It is innocently dedicated in dispensing joy and promise like a blank sheet of paper, not bothered about the intention of its most intelligent creation.

Lately, the jubilation seems to have come to an abrupt end. An earnest seeker can now discern Nature's constant moan like that of a mother breastfeeding a hungry child ready to gormandize her breast. He can sense Nature's ecstasy in pain, a deep sense of satisfaction of having been able to serve her creation. Perhaps, Nature accepts cannibalism as a truth and offers itself like a mother spider does to its offsprings.

The debt we bear to the Nature is so gigantic yet it is so very selfless and forgiving. The debt is gigantic and so are our sins. We have illicitly jeopardized Nature's existence by exploiting it of its unconditional love and selflessness. We, being a part of Nature ourselves, no more seek harmony but chaos. The All Giver has just become the wheels of our relentless desire for ambiguous progress which ironically will sabotage the very fabric of all creation. Sadly, repaying the debt and reparation seems far from our motive and we all shall fall prey to our own contrived and craved apocalypse.

SHYAM SUBBA, THIRD YEAR ECE NIT DURGAPUR



A SPRING MORNING

On a delightful spring morning
Optimism greeted at every turning
The sweet fragrance of the blossom
Casted a bliss charm from clouds to bottom
The warmth of the glistering sunshine
Enveloped the world in a glee divine
The birds chirped in a harmony unknown
Enchanting the souls with its melodious tone

Springs a pool of joy and mirth
Plunge in this aura of ecstacy worth
Let your heart soak in the beauty
And forgot all the woes and worries of duties
Feel the rays of hope lightning up your path
The lord's always standing by your side till last
Wear all your scars like an armour
And let no fear leave your hope disarm

DIVYANSH SRIVASTAVA Second Year

Prakriti Project 01



Clay Incinerator

Rural schools in India typically face high rates of high absenteeism and dropouts, which is particularly high among girl students. Poverty, lack of knowledge and unhygienic menstrual methods are the major reasons. Lack of access to sanitary napkins is another problem; when they are available, their disposal becomes an equally compelling issue.

In order to solve this napkin incinerator, ous women in discardenvironan was developed. The thrown in open can hazards; therefore prevent the spread of odor is important. tary napkins are made takes around 500-800 compose. The average areas throws away more pads in her lifetime! If tive age starts using sani-58,500 million waste pads every year. This incinerator kins at a time, and can out spreading smoke. filled with used napkins, inserted in it through an The waste then burns be removed using a tool cinerator. The ash produced nourish plants. This novel inhelps women to dispose of their way.

which will help numering sanitary napkins ment-friendly way used napkins if left or pose serious health proper disposal to bacteria and foul Further, since saniof synthetic material, it years for them to de-Indian woman in urban than 10,000 disposable every woman of reproductary napkins, a staggering would be generated in India can burn many used napturn them into ashes with-When the incinerator is a burning matchstick is opening in the bottom. down into ashes that can provided along with the incan be mixed with soil to novation prevents littering and used napkins in an eco-friendly

problem a low cost sanitary

These clay incinerators are eco-friendly and cheap, and hence are being installed in schools, hospitals, primary health centers and homes. Besides solving the problem of menstrual waste disposal, these also provide livelihood to local potters.

Prakriti Project 02



Bioguide

Organic products are preferred by many but bought by none. Well, many stores claim to sell organic products but it is sad to know that most of them are actually synthetic under the veil of organic.

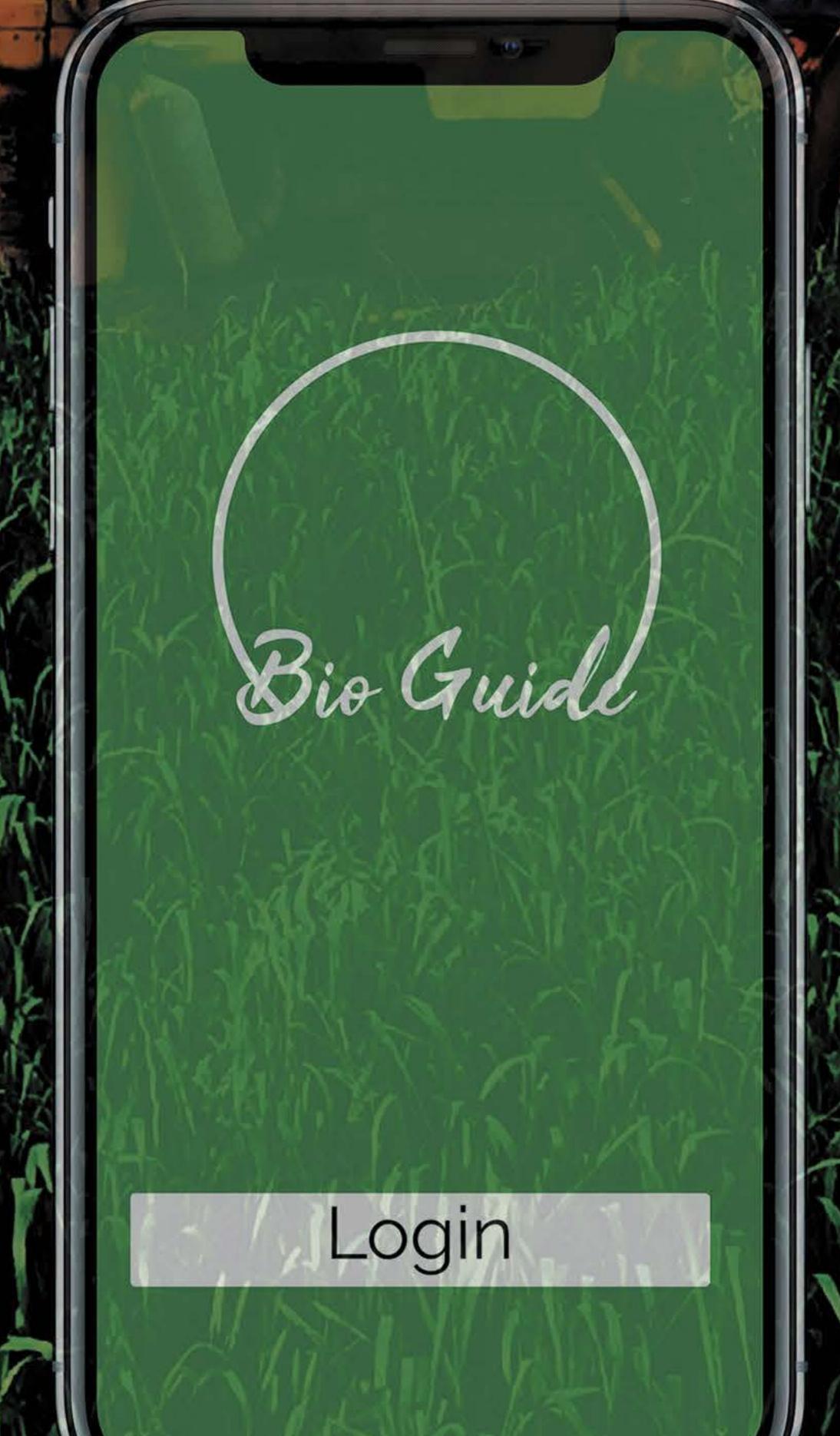
Organic products are harmless as they are free from synthetic fertilizers thereby proving to be healthy. Also, they help in preserving the ecosystem and can help compensate the damage made to mother EARTH.

While labels such as "organic" and "natural" attached to products sound reassuring these labels have little, if any, meaning. Just as companies are not required to conduct safety tests of ingredients in their products, they are also not regulated about what they put on products labels.

Many products may use the word "organic" yet contain a very small amount of organic herbs in a base of petrochemicals, toxins, and harsh preservatives.

What hazardous ingredients are in the product is the most important thing to look at. While the product may contain some organic ingredients is it also full of synthetic chemicals like parabens, petrochemicals, fragrances, or other harmful additives?

For a product to be healthy and safe - it must be more then organic - it must be as pure and non-hazardous as possible. To promote more of organic products and to make INDIA a healthy nation, we are presenting an app named, BIO GUIDE, which lets you know the biotic content of the product just by scanning the product. SO, every time you buy an organic product, you are persuading more farmers to grow organic. And ORGANIC will no longer be a short term DIET instead it will be a long term LIFESTYLE change.





Compost Bin

Composting is a natural biological process, carried out under controlled aerobic conditions (requires oxygen). In this process, various microorganisms, including bacteria and fungi, break down organic matter into simpler substances. Composting biodegrades organic waste i.e. food waste, manure, leaves, grass trimmings, paper, wood, feathers, crop residue etc., and turns it into a valuable organic fertilizer.

WHY COMPOSTING? The land filling of biodegradable waste is proven to contribute to environmental degradation, mainly through the production of methane gas, which constitutes one of the six greenhouse gases responsible for the global warming. The methane emissions from landfills constitute about 30% of the global anthropogenic emissions of methane to the atmosphere. It can provide a solution to our problems in our college as well. The huge quantities of kitchen wastes being produced in the hostel mess are being thrown away in dustbins. Through composting, we provide an efficient and productive use of these organic and biodegradable wastes which later on can be used as vermi-compost in gardening.

PROCESS OF COMPOSTING (WORKING PROCEDURE): Composting is seen as an environmentally acceptable method of waste treatment. It is an aerobic biological process which uses naturally occurring microorganisms to convert biodegradable organic matter into a humus-like product. The process destroys pathogens, converts N from unstable ammonia to stable organic forms, reduces the volume of waste and improves the nature of the waste. It also makes waste easier to handle and transport and often allows for higher application rates because of the more stable, slow release, nature of the N in compost. The effectiveness of the composting process is influenced by factors such as temperature, oxygen supply (i.e. aeration) and moisture content. Two broad categories of microorganisms consume and decompose organic matter: those that need air (aerobic) and those that don't (anaerobic).

CONCLUSION: Composting is an environmentally friendly method rather than directly dumped into earth and it method is useful to convert organic waste to useful products and that would otherwise have been land filled. Compost has a lot of benefits like: reduce landfill space, reduce surface and groundwater contamination, reduce methane emissions, reduce transportation costs, reduce air pollution from burning waste, provide more flexible overall waste management, enhance recycling of materials and can be carried out with little capital and operating costs.



SmartBin

Technology is the key to better human life. We want to keep our places clean technology can contribute greatly. With technological aid, life is becoming easier and we have grown lazy. Today robots are employed in various domains of life. An observation can be made that we throw a lot of wastes, some reach the dustbins but some do not. What if our dustbins become smarter and collect the wastes themselves. Here it is, we call it SmartBins. Let's imagine a cafeteria where cameras are placed in the ceiling that can see every inch of floor. A computer (microcontroller) which will work as central processing unit, will process the video feeds from camera to detect any waste on floor and direct the SmartBin to pick the waste. SmartBin is a mobile robot capable of traversing the floor, has a sweeping arm, a bucket which will collect the swept waste and a container for waste (dustbin). Bucket will move up along vertical supports actuated by motor with help of

rope-pulley mechanism and will dump the waste in container with a tippler mechanism actuated by a servo motor. After dumping waste in container, bucket will descend and restore its initial state. This will be a fully autonomous system that will keep our place clean. These SmartBins can be employed in various places like cafeteria, offices, public spaces, hotels, hospitals and our homes.

Smart Street light

Prakriti Project 05

INTRODUCTION: In today's world we all are well acquainted with our nation's energy scenario. We are well aware of the fact that not only the available power is less than the demand but also it is being wasted on a large scale. Street lighting consumes a major portion of our energy production. Everyday a lot of amount of light energy is wasted in street when there is no passengers on road. So in order to minimize this energy consumption we need smart street lighting which adjust the intensity of lights depending upon passengers and its position. thus only lights are on in required areas and in other areas it remain turned off when its not required.

AIM: The sole purpose of this project is to reduce power consumption across a street .this kind of project is mainly appropriate in streets where there is a minimum traffic during the nights.

OBJECTIVE: To establish smart street lighting system with ultrasonic sensors, arduino nano and LEDs to reduce the power consumption in street.

REQUIREMENTS:

1.ARDUINO NANO

2.ULTRASONIC SENSORS

3.LEDs

4.BREADBOARD

5.CONNECTING WIRES.

ARDUINO: The Arduino Nano is a small, complete, and breadboard-friendly board based on the ATmega328 (Arduino Nano 3.x) or ATmega168 (Arduino Nano 2.x). It has more or less the same functionality of the Arduino Duemilanove, but in a different package. It lacks only a DC power jack, and works with a Mini-B USB cable instead of a standard one. The Nano was designed and is being produced by Gravitech. It has 32 pins.

ULTRASONIC SENSORS: An Ultrasonic sensor is a device that can measure the distance to an object by using sound waves. It measures distance by sending out a sound wave at a specific frequency and listening for that sound wave to bounce back. By recording the elapsed time between the sound wave being generated and the sound wave bouncing back, it is possible to calculate the distance between the sonar sensor and the object.

PRINCIPLE USED: When a ultrasonic sensor senses a obstacle moving by the corresponding LED nearest to the vehicle lightens up brightly and other leds situated further away lighten up with less intensity depending upon the distance from the vehicle. We used ultrasonic sensor and LEDs on both side of the road in order to optimize the lighting effect. The first two leds and last leds remain turned on to indicate beginning and ending of road.

ENERGY SAVED: Here in our model we used 6 IEDs through this we are able to save about 57% of the total energy as compared to that of a normal 6 LEDs system.

If we implement it on a large scale we will be able to save about 50% of the energy consumption of the total street lighting system in the country.

CONCLUSIONS:Thus with this project we are able to built a simple module of smart lighting system. With its implementation we are able to reduce a lot of energy wastage in

OUR EVENTS





Raise your voice for the environment

Provides a platform wherein participants speak to bring out innovative solutions to various environmental problems.

Divided into groups, students represent themselves for a current environmental issue, come up with their solution and convince their fellow mates to agree with them. Conducted once a year, this is our flagship event which draws inintellectual and enthusiastic participation.

RUNIT Run towards a better future

It is a mini-marathon promoting the cause o12f preserving the nature and motivating people to save the environment. Usually conducted in February, this event is a huge success with massive participation from athletes and non-athletes in and around Durgapur.



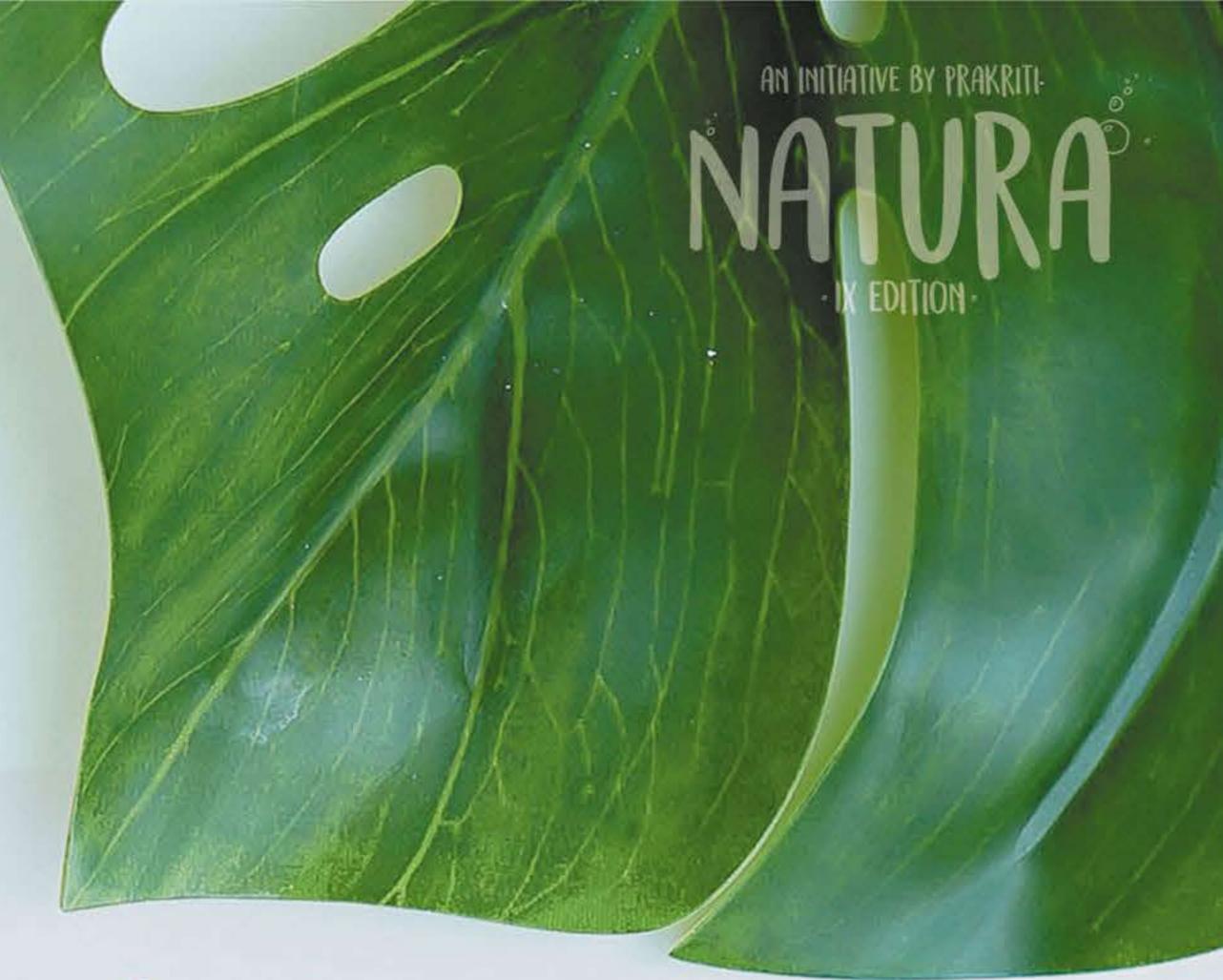
Plantation

He who plants a tree, plants a hope

Tree plantation is organized by Prakriti with the objective to sensitize the masses about the importance of trees. Held during the onset of monsoon, saplings provided by the Forest Dept. of Durgapur are planted in various areas inside the campus.

Several different medicinal plants were planted this is year by the club members, making this Diwali a greener one.

DUR EVENTS





Village Trip

This is an awareness campaign organized in a nearby village. In the exclusive trip by the core members of the club who visit a village every year, solutions to the existing environmental problems of that village are worked upon. Various activities such as sapling plantation, dustbin distribution and awareness talks are a part of this. Educating the village children also forms an important part of this trip.

Treasure Hunt

Organised on the day of Diwali, Treasure Hunt is one such event filled with fun and excitement. Prakriti took a new initiative in the form of e-clue this year which helped us save 10 pages per team since we had 10 check points to be covered for the whole hunt. Approximately 50 teams had participated; we could save 500 pages with the help of e-clues.





We find this as a responsibility to clean up our own home before trying to reform the whole wide world. Teams are divided among the club members and all interested people who join us to clean our campus with our own hands and also thereby motivating all others to maintain a clean and green campus.



EARTH HOUR

Earth Hour is now the world's largest grassroots movement for the environment, inspiring millions of people to take action for our planet and nature. Along with the rest of the world, this day is also celebrated by us to make our lives on earth justifiable. Candle march and lantern launching are organized as a part of our campaign.

NEW EVENTS

ENTZIFERN

'Entziffern' is all about breaking the stereotype that caring for environment can't be fun. There are many innovative and interesting ways to bring to people's knowledge about how deeply we've depleted our environment. The event is a reminder of how unrecognized some species are even though they're around us every time. The event is also a step towards recognizing the major days and organizations devoted towards working towards the upliftment of the prevalent environmental conditions.

ENSIGNIA

EnSignia is a badge of recognition for the greengineers, who work for the betterment of the mother earth. Sustainability is about ecology, economy and equity. In this event, we invite entries for projects which not only promote sustainable development but are also equally feasible sine the saying goes, "Waste not the smallest thing created, for grains of sand make mountains, and atomies infinity."

SURPRISE BIN

Prakriti, being what it is, always wants to contribute towards a cleaner and an environment friendly fest wherein not only the members of Prakriti but also the people around will be encouraged to put in efforts to clean the arena. The basic aim is to inculcate in people a natural reflex to throw wastes in a bin by offering them something in return to appreciate their good work. We hope to see a cleaner arena along with smiles in the faces of people in there!



AN INITIATIVE BY PRAKRITI

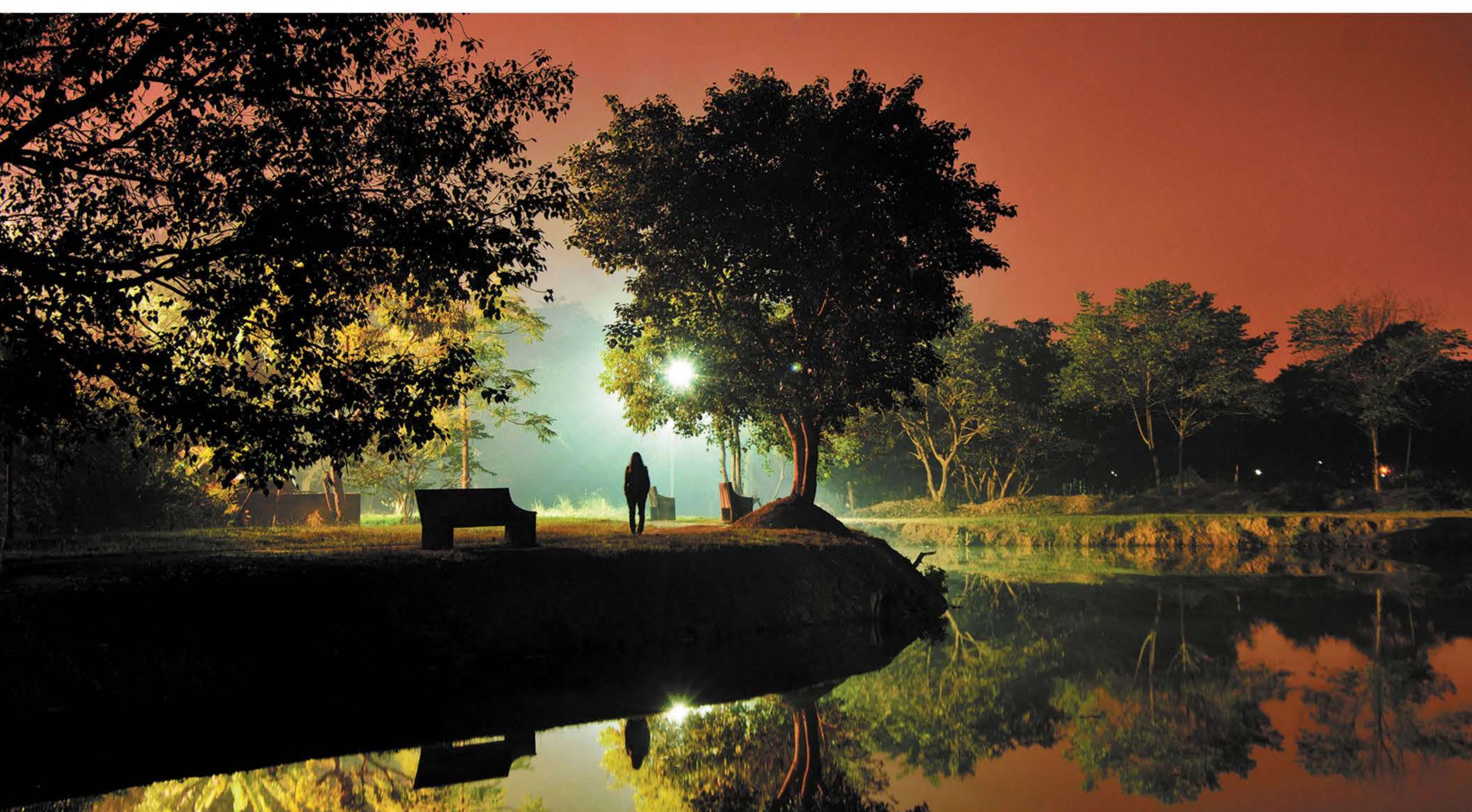
NATURA

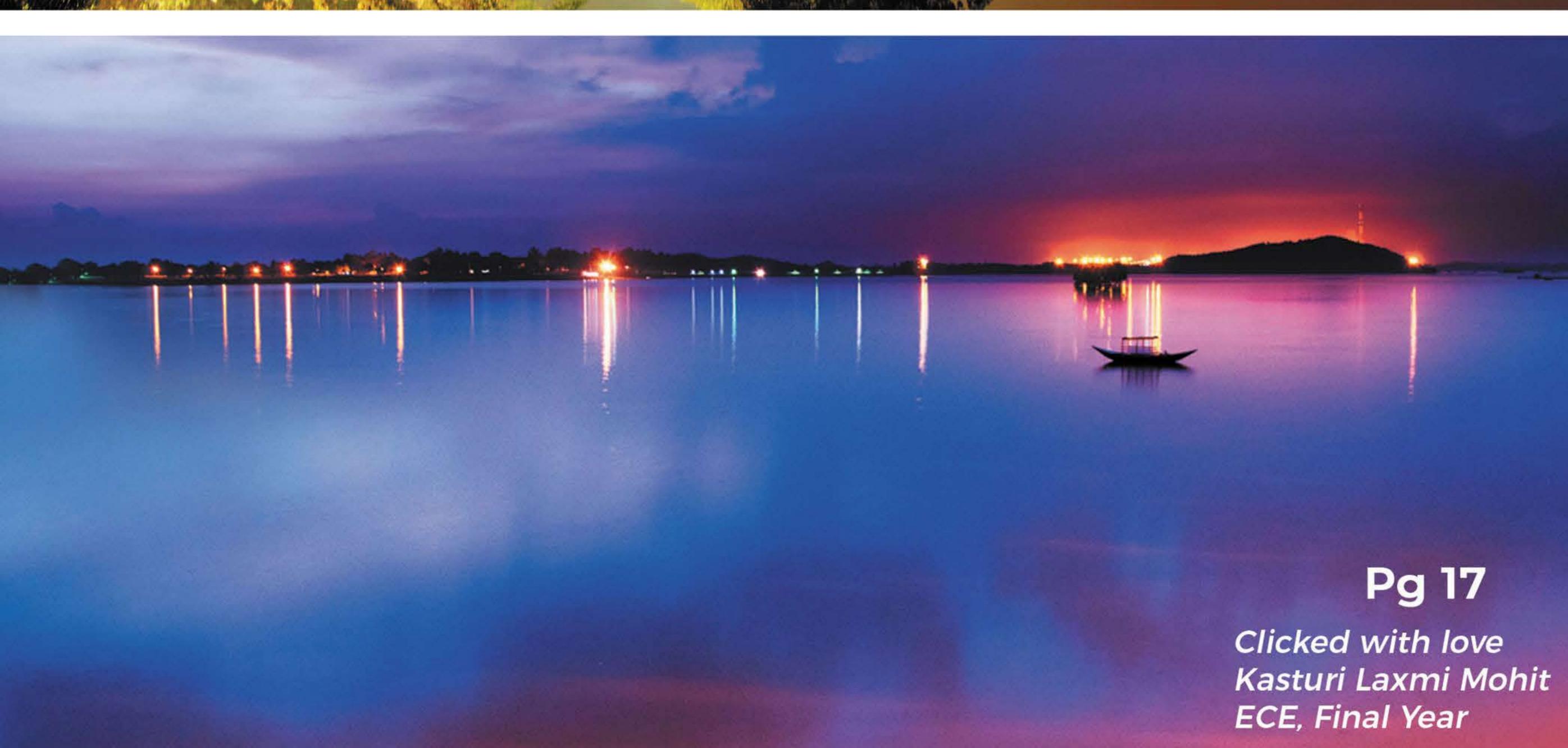
IX EDITION.

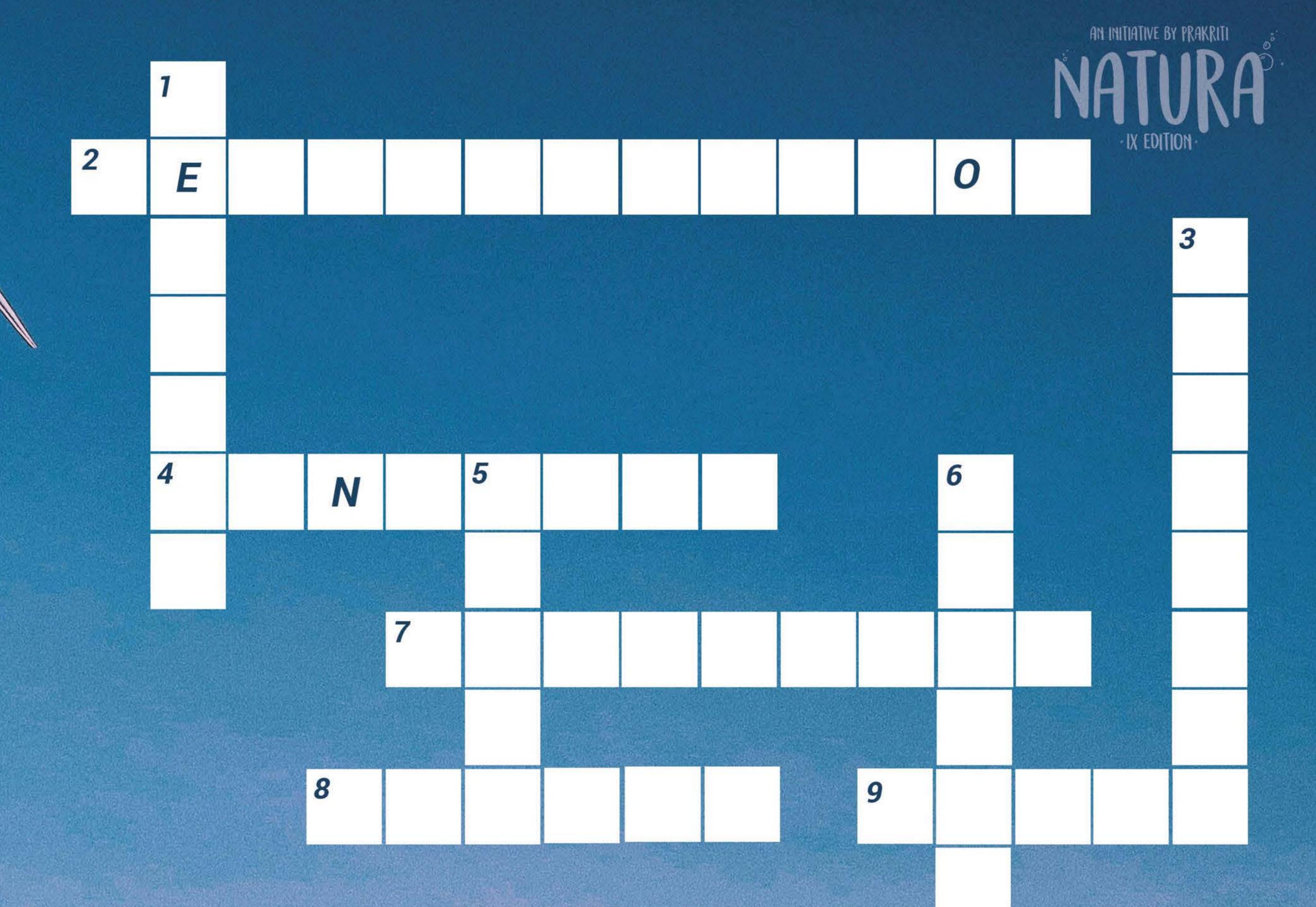
Captivating crafts of the Mother Nature are everywhere! Whatever you see is nature, what you are is nature. Witnessing a marvel is one thing and capturing it and reliving the same moment again and again is a bliss that photographers present to the mankind. **Nature and Man complete each other.** What is a lake without a boat or what is a sky without parachutes? Nature and us, we are a team. Prakriti presents to you some of such exquisite clicks for you to embrace Mother Nature and fall in love with it!











ACROSS

- 2. The act of cutting down or burning trees in a area
- 4. An area of land where large amount of waste material are buried under the earth.
- 7. Something making land, water or sky dirty
- 8. To make less rubbish
- 9. To use something again

DOWN

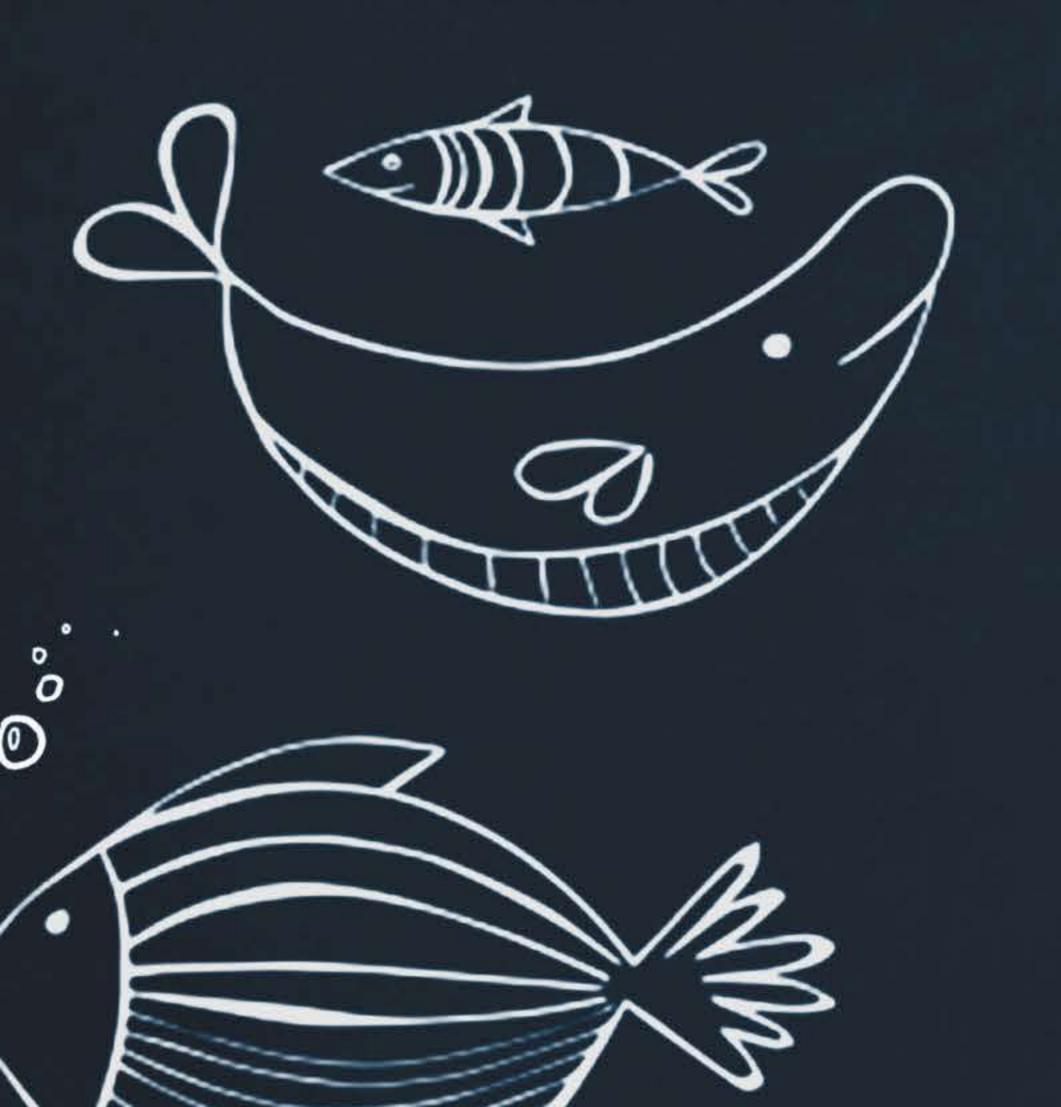
- 1. To treat things that have already been used so they can be used again
- 3. To keep safe from injury, harm or destruction
- 5. A large number of water covering an area that is usually dry
- 6. To watch and help an animal for the environment

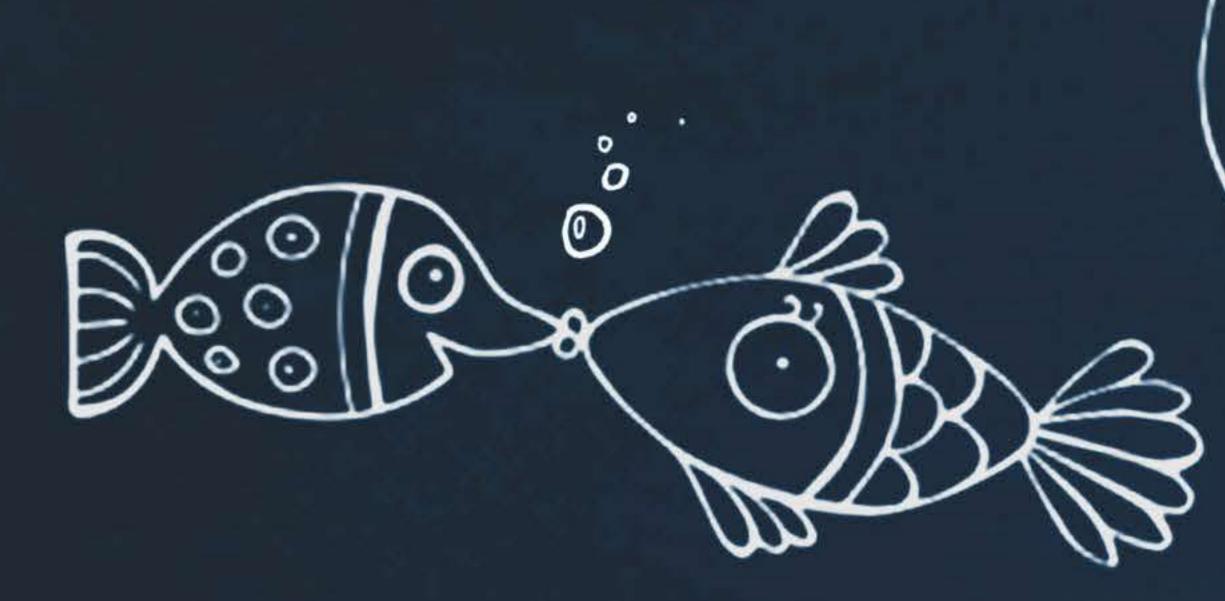
OUR GREAT TEAM



DEDICATED TO NATURE LOVERS WITH LOVE,

SWETA, SURAJ, KASTURI, HARSHA, POUSHALI, SATYASRI, KRUTIKA, NAVYA, AMBAR, SHANU, ARVIND, ADITYA, ARNAB, SANJEET, ANIRBAN, ATUL, ANU DEEPIKA, SANJAY, ASHUTOSH, DIVYANSHU, RISHAV, PIYUSH, DEVRAJ, ROHAN, AMIT, SUMIT, NANCY, HEMA, MOUMITA, RADHIKA, SANTOSH, SONAL, SRIJITA, PATALI, ARPITHA, PAPRI, VIKASH, SUDHANSHU, REHNAB, VAMSI, SHRISH, SHAHRUKH, NAVEEN, PIYUSH, AAYUSH, PREMJEET, DHYANESH, ROHITH, ASHOK, SHANKAR, SUKESH, VASAVI, TIASA, GULNAZ, SRAVANI, SUSHMA





MEN AND HUMANITY ARE ONE.



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