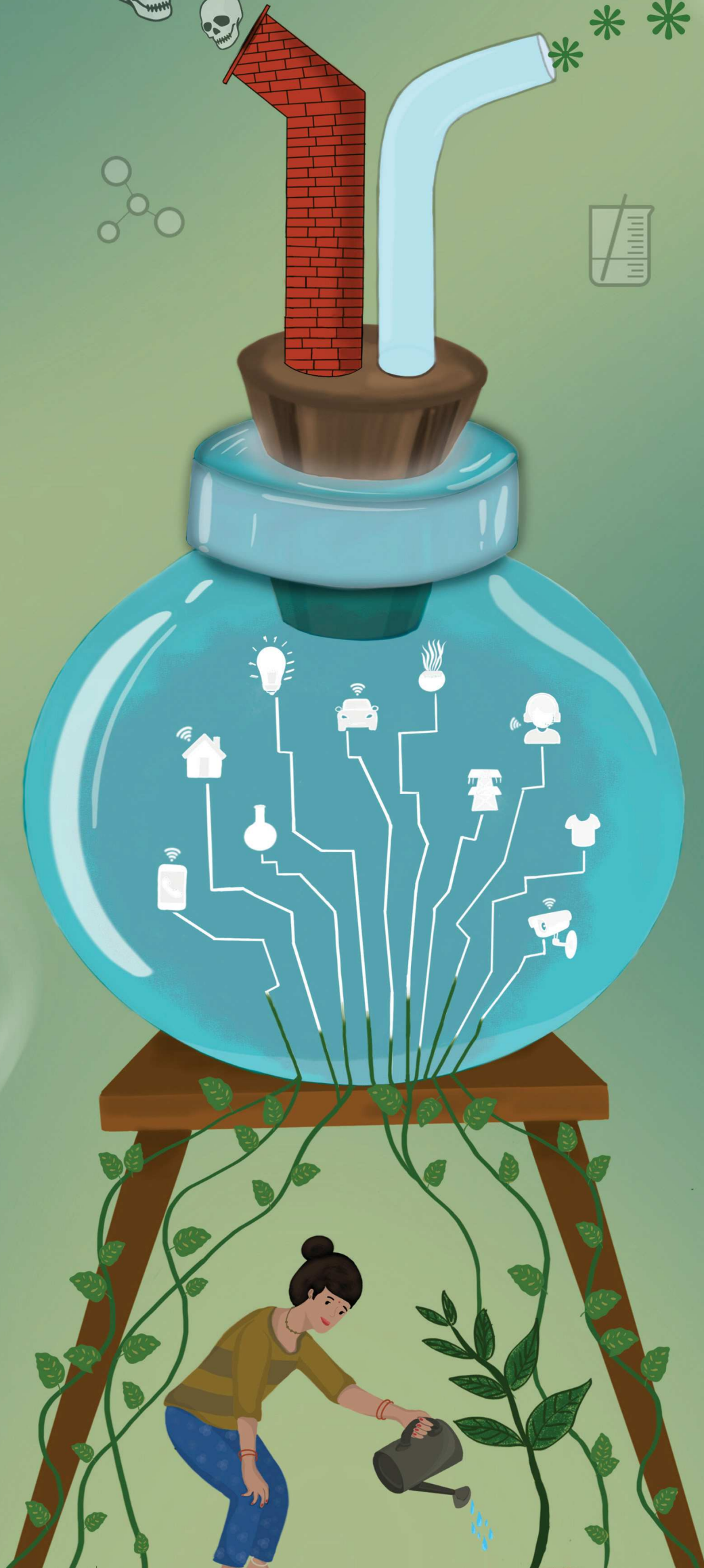


HARIT KHABAR

August, 2022



Read on Page 3-
Do Science and
Environment go
hand in hand?



An initiative of HCL Foundation and World Comics India



We are experiencing unprecedented change in our environment in terms of melting ice covers, rising global temperatures, changing precipitation patterns, and proliferating natural calamities. It is affecting every human activity for example agriculture, travel and transport, etc and hence adapting to climate change is the need of the hour!

Trapped in a Vicious Cycle ?

Have you ever thought that agriculture is one of the major contributors to Green House Gas emissions?

Slash & Burn Farming in Sumatra



Photo: iStock

There is nothing in the world that is more dependent on climate than agriculture. Agriculture is most susceptible to climate change. Farmlands take the biggest hit whether there is an abundance of water, as in floods, or a lack of it, as in droughts. Rising global temperatures are reducing agricultural yields on the one hand and also fostering weed expansion on the other.

Scientific evidence suggests that agriculture is not only a victim of climate change but also induces it. The World Bank website notes that agriculture currently generates 19-29 per cent of the total greenhouse gas emissions escalating global warming. It seems we are trapped inside a vicious cycle that urgently needs to be ended. But the question arises, can we break this?

Adapting to Climate Change

- **Diversify** - An agricultural system's capacity to adapt to climate change increases generally as it becomes more diverse. Focusing on an integrated system that has more than one type, such as crops and livestock, crops and forestry, etc. can help farmers
- **Restore Deteriorated Pastures** - Farmers must adopt sustainable methods to restore degraded pastures by planting native forage or grass, or by introducing trees to avoid soil erosion.
- **Agroforestry** - Integrating woody perennials such as trees, shrubs, palms, bamboos, etc. on farmlands not only improves productivity and sustainability but also increases the profitability of small farmers.



Agroforestry Is The New Mantra

Changing monsoon patterns across Madhya Pradesh have adversely affected farmers in the regions, including Dhansukh. Practising monocropping and being unable to grow a second crop adds to their financial woes.

In a novel attempt to adapt to climate change, **SayTrees** introduced agroforestry to Dhansukh and other farmers in the region. Over the next few years, Dhansukh will be planting mango, guava, kinoo, amla and karonda saplings across his four-acre field to increase the productivity of his field as well as increase his profitability.

Building Climate Resilience

Photo: UNDP



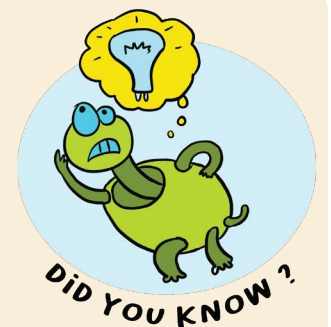
When a natural disaster strikes anywhere in the world, our immediate thought is, thank god it did not happen to us. A very natural response indeed, but should it be our only response? Of course not. The need of the hour is disaster risk reduction, especially when you live in a country like India.

According to the National Disaster Management Authority's annual report for 2020-2021, India is vulnerable, in varying degrees, to floods, droughts, cyclones, tsunamis, earthquakes, urban flooding, landslides, avalanches and forest fire. Of a total of 36 states and UTs, 27 are disaster-prone. More than half of the landmass of India is prone to

earthquakes of moderate to very high intensity and 12 per cent is prone to floods and river erosion. Three-fourths of the coastline is prone to cyclones and tsunamis. Besides this, food security in India is also being compromised as 68 per cent of the cultivable land is vulnerable to drought.

These horrifying facts and figures are enough to encourage us for building resilience, adapting to climate change and working towards disaster risk reduction.

Are natural hazards and disasters isolated events? No. Climate change plays a major



role. Not only does climate change increase the frequency and severity of natural hazards, but it also has a disproportionately negative impact on people. Because of environmental degradation, decreased access to food and water, and changes in livelihoods, some people are more vulnerable to climate change than others. What do we learn from this? To put it simply, your actions could endanger others while having little or no effect on you.



Photo: NASA

Science is in the air!

Even a few decades ago, no one would have believed that we could connect with people all over the globe in seconds or we could travel across seven seas in a day or two. But science has made this possible. Okay, but what has this got to do with the environment?

Look around and you will find the answer that is science and the environment are inseparable. From a process as simple as evaporation to the collision of tectonic plates, science is everywhere, and all environmental issues, be it air pollution, global warming, land degradation, disaster reduction, etc. involve scientific processes.

Cloud Seeding & Artificial Rain

Imagine saying “with proper scientific techniques, we can increase the quantity of rainfall” to humans from the medieval era. They would have gone berserk! But to the modern human, this comes as no surprise. Yes, we are talking of cloud seeding and artificial rain. How did we reach here? Let’s go back to our school textbooks – where does rain come from? Clouds. Tiny water droplets or ice crystals condense when water vapour cools down and form clouds. Now comes the interesting part. Modern science has enabled us to transform the cloud structure by adding minuscule ice-like particles like silver iodide to induce artificial rain. This weather modification technique is called cloud seeding. The usage of this technique has increased all over the globe, from China to Dubai to Mexico.

Photo: iStock



Life Beyond Sunlight

“The use of energy from sunlight by plants doing photosynthesis is the basis of life on earth”

This is a quote from the Biology NCERT textbook of Class 11th. It may now be time to change this statement. Scientists from the University of California have come up with ‘Artificial Photosynthesis’ that does not require sunlight to produce food. Yes, you read it right! The technique surpasses the need for sunlight for food production and uses a two-step electrocatalytic process that converts carbon dioxide, electricity, and water into acetate. This scientific innovation has huge implications for the global food demand as the co-author and head of the UC Riverside Plant Transformation Research Center, Martha Orozco-Cárdenas says –**“Imagine someday giant vessels growing tomato plants in the dark and on Mars -- how much easier would that be for future Martians?”**



Photo: iStock

Relax, Pause at Space

Our flamboyant space travel instincts and the thirst to explore other planets are costing us a decent living on earth. Researchers from the University of Cambridge and the Massachusetts Institute of Technology (MIT) have found that black carbon (soot) particles emitted by rockets retain heat in the atmosphere almost 500 times more than all other sources of soot combined. If this trend grows, we would also have to bid adieu to our dearest ozone layer.

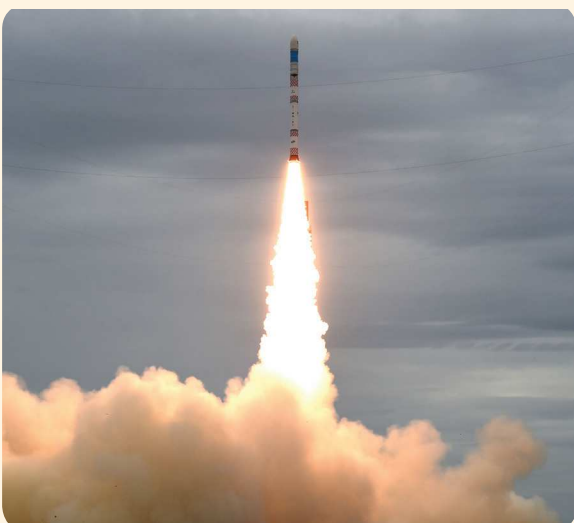


Photo: ISRO

‘SENSOR’ing The Environment

In the context of science and the environment, two specific terms are used worldwide - Geographic Information Systems and Remote Sensing. But what do these two jargons mean?

A Geographic Information System (GIS) is a digital tool that creates, manages, maps, and analyses all types of data on earth. It gives you every possible information for a particular location, such as population characteristics, vegetation type, economic development opportunities, etc.

Now imagine you could scientifically obtain physical properties of an area, such as land type, without actually being there. This is exactly what Remote sensing does. Sensors on aeroplanes and satellites collect data in the form of images and integrate them with GIS to know better about our earth.

What remote sensing and GIS can do for the environment?

- Help curb air pollution according to researchers from the University of Technology, Sydney.
- Track carbon storage in mangroves according to researchers from the Institute of Industrial Science, The University of Tokyo.
- Identify species at the risk of extinction according to research by Duke University.
- Improve prediction and response to disasters.

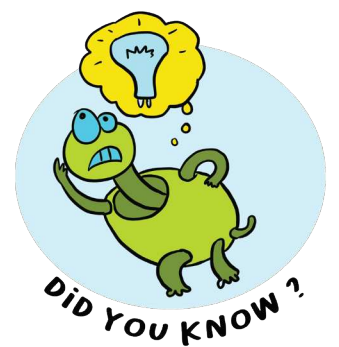


Photo: NASA

If you want to share your experience on how you applied scientific methods to better understand the environment, then please write to us about it at wci.hcl@gmail.com

Gendered Response to Climate Change



Photo: iStock

Empowering women is the single most important way to ensure effective climate action.

-Michelle Bachelet, UN High Commissioner for Human Rights

Climate change affects us all. But does it affect us all equally? No. Every new disaster that strikes reinforces the already prevalent unequal social relations. The same is true when it comes to environmental degradation and climate change. Various academic studies and research suggest that women are more likely to face the adverse consequences of climate change and environmental degradation than men.

While natural disasters adversely affect women more, droughts and water scarcity force women to travel to far-off places to fetch water.

Since the problem before us is multidisciplinary, the answer to it will also be multidisciplinary and we need to understand that environment, climate change, sustainable development, and women empowerment are all inextricably interconnected and cannot be separated. If we need to fight the climate emergency, we cannot ignore a gendered response to climate change while formulating policies and envisioning a sustainable future for all.

Climate Change hits Women hard



Photo: UN Women

There is no denying that climate change affects women disproportionately more than men. According to a study by the National Sample Survey Office in 2019, 4 out of 10 women spend hours fetching water in rural India. Some even spend one-fourth of their day managing the water

crisis that further affects their health, mental well-being, and nutrition. This has a direct impact on the overall health of the community as children and immediate family members are heavily dependent on women's labour. According to The International Development Enterprises, Indian women spend 15 crore work days every year fetching water, equivalent to a national loss of income of Rs.100 crores.

Sacrifice Not In Vain

History is testimony to the fact that women have played an important role in environmental matters. Around 300 years ago, in the year 1730, the Bishnoi women of Khejdali Village in Jodhpur bore the seeds of positive change in the environment. Trees are considered pure in the Bishnoi culture, and women of the community sacrificed their lives for environmental protection and forest conservation. The movement in Khejdali Village gained huge popularity in the upcoming centuries, and it is also believed that this movement encouraged other iconic movements like the Chipko Movement in independent India.

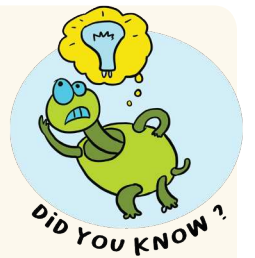


Photo: UNEP

Women in Darfur Battle Climate-Crisis

Harsher climate conditions have added to the woes of female farmers in Darfur in Western Sudan. The conflict-ridden region is prone to droughts which have made cultivation difficult in the region. However, some female farmers of Darfur are battling the climate crisis with the help of a UNEP-led initiative.

The project has trained women in modern farming techniques, teaching them how to harvest, store and market their produce and as a result, some of them have been able to produce a bumper harvest of sesame and peanuts.

Women Scientists From Kashmir Pave the Way for Climate Action through their Research

Women Scientists from Kashmir are at the forefront of battling the climate crisis that continue to endanger ecologies and livelihoods in the region. Coming from different fields of science and technology, Nasheeman Ashraf, Ulfat Majeed and Mehreen Khaleel are providing solutions to unique climatic problems in Kashmir.



Photo: Hirra Azmat

Nasheeman Ashraf, a biotechnologist, highlights climatic impacts on saffron cultivation and offer solutions to boost the production and cultivation of one of the most expensive spice in the world.



Photo: Ulfat Majeed

Ulfat Majeed's research aims to understand glacier-glacial lake-climate interactions and associated Glacial Lake Outburst Flood hazards over the western Himalayas.



Photo: Mehreen Khaleel

Mehreen Khaleel decided to use her research and conservation efforts to examine the lesser-known facets of climate change and how it affects the region's biodiversity.

'What Doesn't Kill You Makes You Stronger'

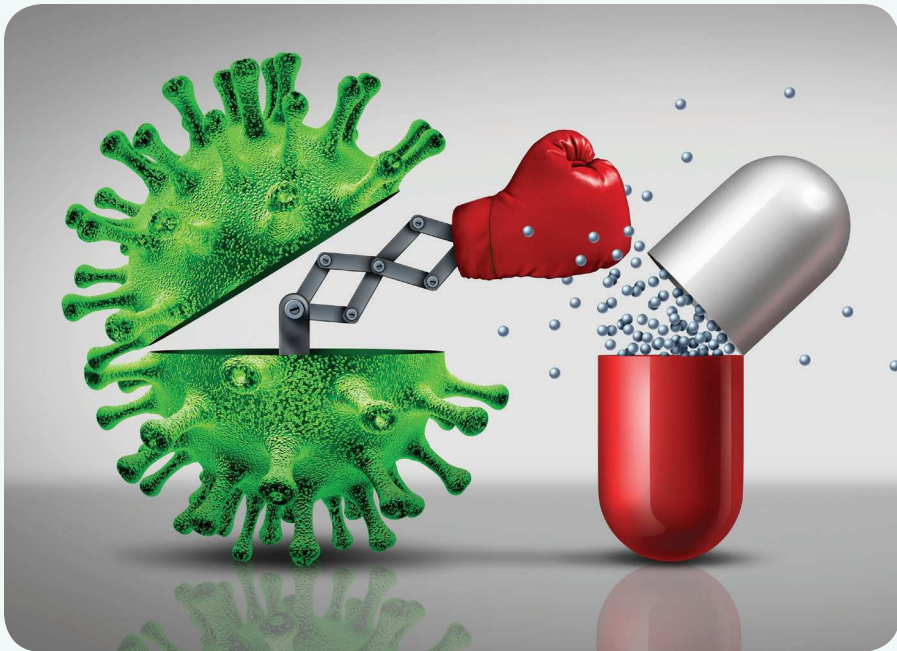


Photo: iStock

Microbes are tiny living beings that can only be seen with the help of a microscope and the most common types are bacteria, virus, fungi, etc. Throughout history, these tiny organisms have challenged human life through epidemics and pandemics and the latest coronavirus has taken around 6.5 million lives globally. However, not all microbes are essentially evil and some of them are useful for our body to function properly. The philosophy is simple - kill the enemy before it kills you. As a response, medical research has developed drugs that help us fight them in the form of antimicrobials that include fungicides, antivirals, antibiotics, and parasiticides.

With the invention of antimicrobials, we thought this is the end game and we need not worry about the future, but sadly these microbes had other plans. Microbes evolved and changed their DNA in such a way that they are no longer killed by antimicrobials that earlier killed them. This is called Anti-Microbial Resistance (AMR). According to a publication of the United Nations Environment Programme (UNEP), Anti-Microbial Resistance can be acquired through mutations. While we followed the 'kill the enemy before it kills you' philosophy, microbes followed the 'what doesn't kill you makes you stronger' philosophy.

Causes of Anti-Microbial Resistance

The chief causes of Anti-Microbial Resistance include -

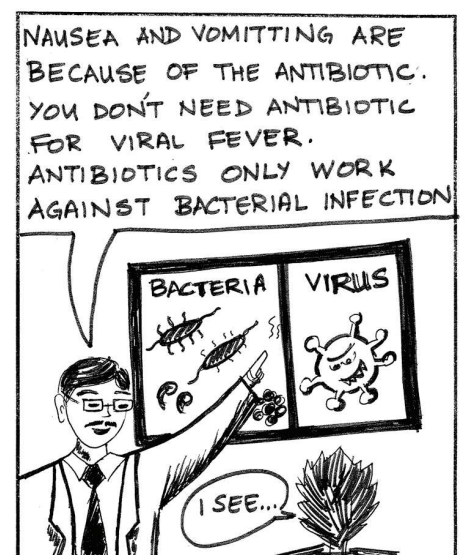
- Misuse and overuse of antimicrobials
- lack of access to clean water, sanitation and hygiene (WASH) for both humans and animals
- poor infection and disease prevention and control in healthcare facilities and farms
- poor access to quality, affordable medicines, vaccines and diagnostics
- lack of awareness and knowledge

Environmental Waste & AMR

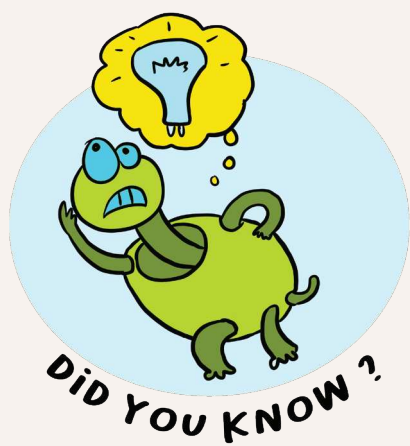
Here are the five main pollutant sources that contribute to the development, transmission and spread of Anti-Microbial Resistance in the environment -

- Poor sanitation, sewage and waste effluent
- Effluent and waste from pharmaceutical manufacturing
- Effluent and waste from healthcare facilities
- Use of antimicrobials and manure in crop production
- Releases, effluent and waste in animal production

know when to say **NO**



KADAMBARI · N



DID YOU KNOW?

Our journey has not been an easy one. We have fought various diseases throughout history to reach where we are today. Diseases that seem harmless now were deadly at some point in history and our ancestors lost their lives to them. While we have shown great resilience, the same is

being exhibited by microbes. According to a report by UNEP, antibiotic-resistant infections were responsible for the deaths of 1.27 million people in 2019, with an overall 4.95 million deaths associated with complications from resistant bacterial infections. If we do not envision a plan to curb it, it is estimated that Anti-Microbial Resistance could cause up to 10 million deaths globally per year by 2050.

Climate Change Augmenting AMR

In contemporary times, it is impossible to discuss the environment without including climate change, and the same holds true for discussions on Anti-Microbial Resistance. Academic studies point out that higher temperatures are associated with greater Anti-Microbial Resistance. The rising number of natural disasters such as floods can expose untreated sewage rich in Anti-Microbial Resistant microbes to surrounding communities. Moreover, the current climate crisis is adversely affecting agriculture which in turn means that to sustain food production there will be an increasing dependency on antimicrobials.

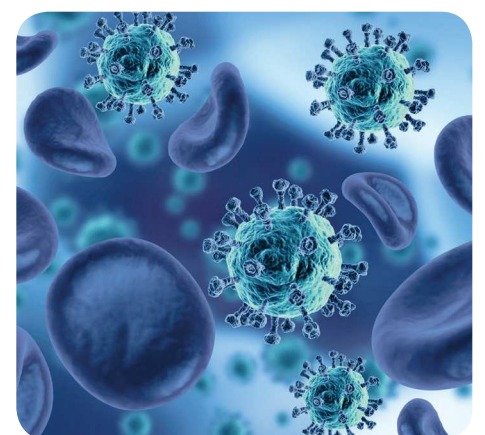


Photo: iStock



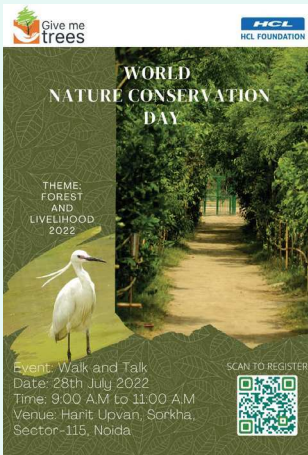
Say No to E-Waste

HCL Foundation's Clean Noida project is on a mission to strengthen Noida's municipal solid waste management.

To date 18 E-waste awareness events have been conducted across 21 sectors of Noida, where people pledged to keep their surroundings clean and recycle their e-waste the right way. Additionally, 10 E-bins have successfully been installed for the systematic collection aiming to increase the numbers and help more and more people recycle their e-waste. Moreover, activities such as Nukkad Natak, drawing competitions, games, and informative sessions helped engage people across all age groups.

Such unique efforts aim to raise awareness around the harmful effects of e-waste and highlight the importance of its safe disposal. This initiative is a result of the partnership between Clean NOIDA and RLG Systems India Private Limited.

Walk & Talk



On the occasion of World Nature Conservation Day which is celebrated on July 28 every year, Give Me Trees Trust organised a walk and talk session at their urban forest – Harit Upvan, Sorkha Noida. The theme of the session was Forests & Livelihood.

The theme of the session was Forests & Livelihood.

Mitigating Man-Animal Conflict



Wildlife Rescue and Rehabilitation Centre (WRRC) in collaboration with the HCL foundation conducted

need assessment and outreach programs in various schools around Bannerghatta national park to highlight the importance of conservation and mitigating man-animal conflict on the fringes of the national park.

Bats bags National Award

On The Brink Season 2, Bats episode won the 68th National Film Award under the category of Best Science and Technology film!! It is produced by HCL, The Habitats Trust, and The Gaia People.



Kids set up Kitchen Garden



With the partnership of the HCL foundation, the OFFER team formed a Children's Parliament and provided training to make organic kitchen gardens in Kasthuribai Gandhi Corporation sr sec school in Madurai. As a result, students themselves have taken resolutions through the Children's parliament meeting to set up a terrace garden in their school to create a greener environment. Moreover, to ensure that everyone has access to nutritious meals, the children's parliament team has also planned to use the terrace garden's cultivated vegetables for their school's mid-day meals.

Learning More About Tigers

Gorakhpur Environmental Action Group (GEAG) celebrated International Tiger Day, 2022 with full force on July 29, 2022. Indulge in different types of activities like face painting, face mask making, poster making, slogan writing etc. children in Police Lines GB Nagar learnt the importance of tiger conservation. They also learnt interesting facts about tigers and their pivotal role in balancing & maintaining the ecosystem.



Pond Rejuvenation Process: In our last edition, we covered how the association of HCL Foundation and ActionAid Association is changing the landscape in Gautam Buddha Nagar through pond rejuvenation. Let's take that story further and present what happens behind the scenes of pond rejuvenation. Before the process is initiated, there is a pre-assessment study based on parameters such as present condition, social and technical measures, etc. Further, water testing is conducted to detect the quality of water before rejuvenation. It is done every three months to keep a track of water quality and changes.



Step 1 - De-watering

De-watering includes drawing the pond water out of the pond and transferring it to nearby places until the rejuvenation process is complete.



Step 2 - De-silting

De-silting is a process through which silt is drawn out of the pond. This is done so that water flowing to the pond after rejuvenation can reach the ground smoothly.



Step 3 - Layering

Layering involves creating layers at the pond site to make sure

that water reaches the pond in a well-defined manner and can be stored in the pond within a stipulated area.



Step 4 - Water Chamber

Then, it's time to create water chambers at the pond which provide the inlet and outlet of water. Water chambers process the water and limit the inflow of grey water along with any other solid substances at the pond.



INSIGHT

Step 5 - Fencing

The last step is to barricade the pond through a fence and pillars to protect it from encroachments and to avoid accidents, etc.

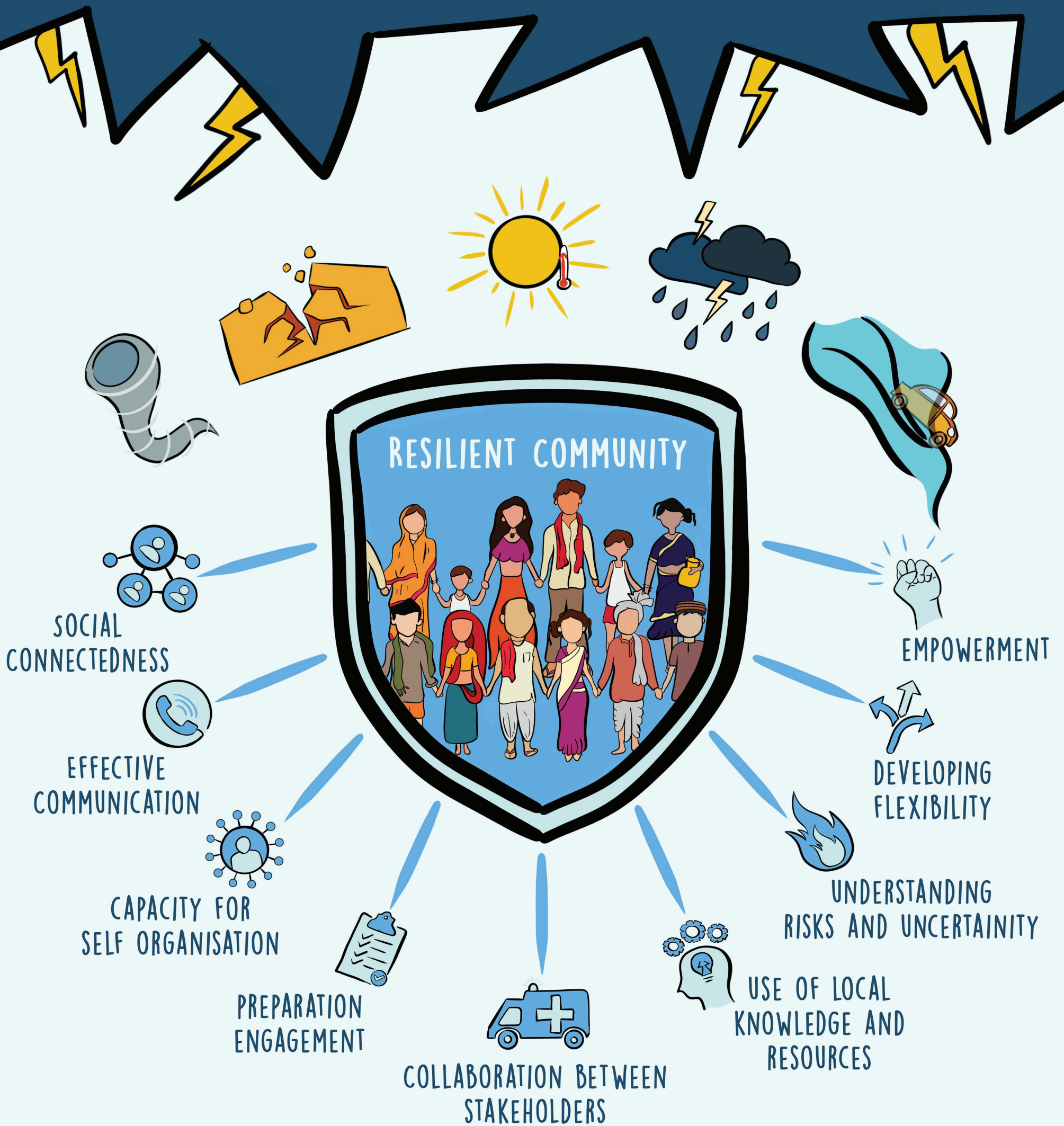


Installation of pipe

Construction of Inlet

Water Chamber

ADAPTABILITY AND RESILIENT COMMUNITIES TO COUNTER INCREASING CLIMATE ADVERSARIES



Climate change is inevitable but a resilient community, local solutions, adaptability can mitigate the risk.

Tackling Complex Issues Through Comics



World Comics India is here again to prove that complex issues and challenging subjects like environmental education can be learnt and taught easily with the help of Grassroots Comics through their second comics anthology on environmental issues.

Made by employees of HCL Foundation partner organisations based out of Tamil Nadu, the comics in this anthology are a testimony to the fact that it is easy to look beyond textbook knowledge and issues at the surface once a creative communication tool is at play.

The issues covered in these comics came from real-life experiences and incidents of the participants and ranged from using low-cost & efficient bulbs, showing empathy to animals, degrading common property resources to removing water-guzzling plants and saving sea creatures, etc. Taking you to the south of India, the comics not only helps you to understand environmental issues better but will also encourage you to act upon them. In addition to the preceding anthology, this publication is a superb illustration of user-generated content creation that promotes information sharing and knowledge dissemination locally.

Cut Down on Plastic



Photo: iStock



Students of Junior High School, Kulsera, Noida celebrated World Nature Conservation Day with **Gorakhpur Environmental Action Group** in partnership with the HCL Foundation. World Nature Conservation Day is celebrated every year on 28 July.

The day aims to raise awareness about the conservation of natural resources for a sustainable future for all. Observing the adverse effect plastic pollution has on biodiversity loss, this year the day was celebrated under the theme 'Cut Down on Plastic'.

International Youth Day Celebrated



On the occasion of International Youth Day, **ActionAid Association India** in partnership with HCL Foundation organized plant distribution and awareness in Gulaothi (Noida), a pond rejuvenation site of HCL Harit.

Reverse Engineering with Bees



Photo: iStock

Homo Sapiens have always believed that we are the most superior beings, being the most intelligent. While we have shown great intelligence to evolve over centuries, it does not translate that other beings lack intelligence and cognitive abilities. New research by Lars Chittka, professor at the Queen Mary University of London observes that bees possess a high degree of sensibility, or "awareness," in addition to a stunning level of cognitive intelligence.

This research takes forward previous research on bees that provides insight into how bees communicate excellently among themselves and solve complex puzzles for a reward. What is even more striking is that bees have also been found to form democracies. Observing their abilities, we can surely learn a thing or two from them.

About the publication

HCL Foundation and World Comics India's collaborative initiative 'Harit Khabar' is a monthly newspaper that aims to educate people on environmental issues and challenges and raise community participation towards the cause of the environment. This publication has been launched to provide a platform to various partner organizations working in collaboration with the HCL Foundation's distinct flagship programme HCL Harit - The Green Initiative to showcase their work and accomplishments and also to create a network between them. Through Harit Khabar we aim to stir meaningful debates on critical issues concerning our environment and ecosystem, accessibility to environmental education and public participation in decision-making processes in the country.

About HCL Foundation

HCL Technologies implements its Corporate Social Responsibility agenda through its CSR arm, the HCL Foundation. Various flagship programs and special initiatives of the Foundation endeavor to contribute toward national and international development goals, bringing about lasting positive impact on people and the planet through long-term sustainable programs.

About World Comics India

Advancing Grassroots Comics as an alternate tool of communication to local communities, World Comics India has been continuously working for the past 20 years. Many successful mass campaigns have also been organized using this medium of communication.

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We are grateful to HCL Harit partners for their significant contribution to this publication.

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