

EARTH MOTHER MAGAZINE

NOVEMBER 2022

ISSUE 06

 Sponsored by
English Doctor Barcelona

HOW 1 YOUNG ACTIVIST IS CHANGING THE WORLD

**EXCLUSIVE
INTERVIEWS WITH
LICYPRIYA KANGUJAM &
CHRISTOPHER MBANEFO**

**CONNECTION BETWEEN
CLIMATE AND GENDER
EQUALITY**

**WHAT HAPPENED TO THE
OZONE HOLE?**

**SPECIAL
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EDITION**



**COP27
- ANOTHER
GREENWASHING
CIRCUS?**



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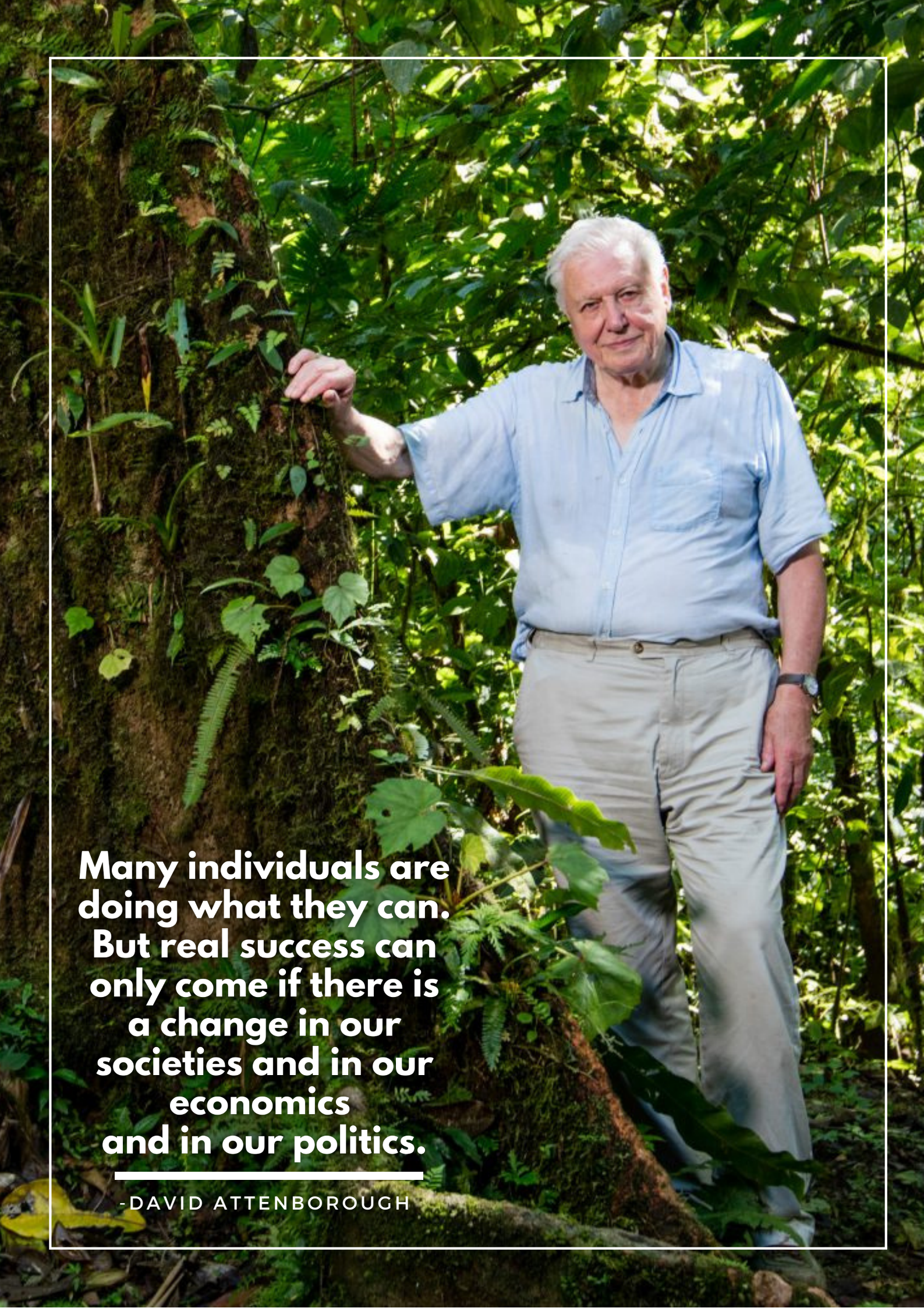


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A photograph of David Attenborough standing in a lush, green forest. He is wearing a light blue short-sleeved button-down shirt and light-colored trousers. He is leaning his right hand on a moss-covered tree trunk. The background is filled with dense foliage and sunlight filtering through the trees.

**Many individuals are
doing what they can.
But real success can
only come if there is
a change in our
societies and in our
economics
and in our politics.**

-DAVID ATTENBOROUGH



LETTER FROM THE EXECUTIVE EDITOR

It's hard to believe we are on our sixth magazine issue and second issue since being acquired by Earth Mother Community. Our previous issue performed very well, and we connected with the incredible Licypriya Kangujam, the young climate activist, featured on our cover.

It's so inspiring to see youths getting involved in climate action, but also a sad reminder of the realities of climate change. It's saddening that young people can no longer go about their lives as normal and enjoy their youth. Instead, they are fighting for nature's rights and their future because their leaders just won't listen.

This issue is also centred around the recent COP27, with articles on some of its central themes, including decarbonisation, green infrastructure, youth climate action, and gender equality. We are very excited to contribute to these essential conversations. I want to thank our entire magazine team and dedicated volunteers from Earth Mother Community.

I would also like to thank Licypriya Kangujam and Christopher Mbanefo for their time and contribution to our magazine. We found their insights incredible and their journeys into climate action equally inspiring. With that in mind, we hope all our readers enjoy this particular special edition and that it inspires you to continue to live your best sustainable life!

Bronagh Loughlin

Executive Editor
EARTH MOTHER COMMUNITY



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LETTER FROM THE EDITOR-IN-CHIEF

As 2022 draws to a close I am reminded that we are still far away from our goal of curbing greenhouse gas emissions. While the Covid pandemic presented many opportunities for solutions, it also exacerbated the climate crisis. As a team, we are so deeply concerned about the climate crisis that we decided to bring out a special edition that focuses exclusively on the crisis. While the Ukraine war rages on and the planet suffers food and medical shortages as a result of the senseless fighting, we have to endure man's utter stupidity in adding fuel to the fire, so to speak, when it comes to the climate crisis.

Cop27 held recently in Egypt was meant to address the urgent situation and come up with solutions and earnest pledges. Instead they accepted Coca-Cola as a sponsor - one of the planet's utterly WORST polluters - and received delegates who flew in on private jets. Have you ever heard of anything quite so preposterous?

All we can do is shake our heads in disbelief and continue fighting the fight. This is the reason why our magazine even exists. We need more people taking the climate crisis seriously. We need more activists. We need more people minimising their greenhouse gas emissions and being more conscious of their total carbon footprints. And we need to stop paying lipservice and accepting greenwashing. Enough is enough already!

The time is NOW. Soon we will run out of time. If not us, then who will drive this message home? Will you join us in working to leave a greener and healthier planet for our great grandchildren?

My sincere thanks to Dr. Steven Joseph from English Doctor Barcelona who has kindly sponsored this special edition because he cares about the planet and what the future holds for generations to come.

My deepest gratitude goes to my incredible mag team. Despite everyone being exhausted and burned out as the challenging year comes to a close, they still soldiered on to bring out this issue. Special thanks to Bronagh Loughlin (Executive Editor), Nubla Adam (Art Director) and Vani Bhardwaj (Editorial Assistant) for your dedication and commitment to the cause and to educating anyone reading our digital magazine. You are all valued and treasured!

May you enjoy reading this mag from cover to cover. And may the messages encourage you to join our fight in curbing emissions and lowering the global temperature. Together we are stronger.

Amour Gatter

**Mag Editor-in-Chief
Founder/Project Director
EARTH MOTHER COMMUNITY**



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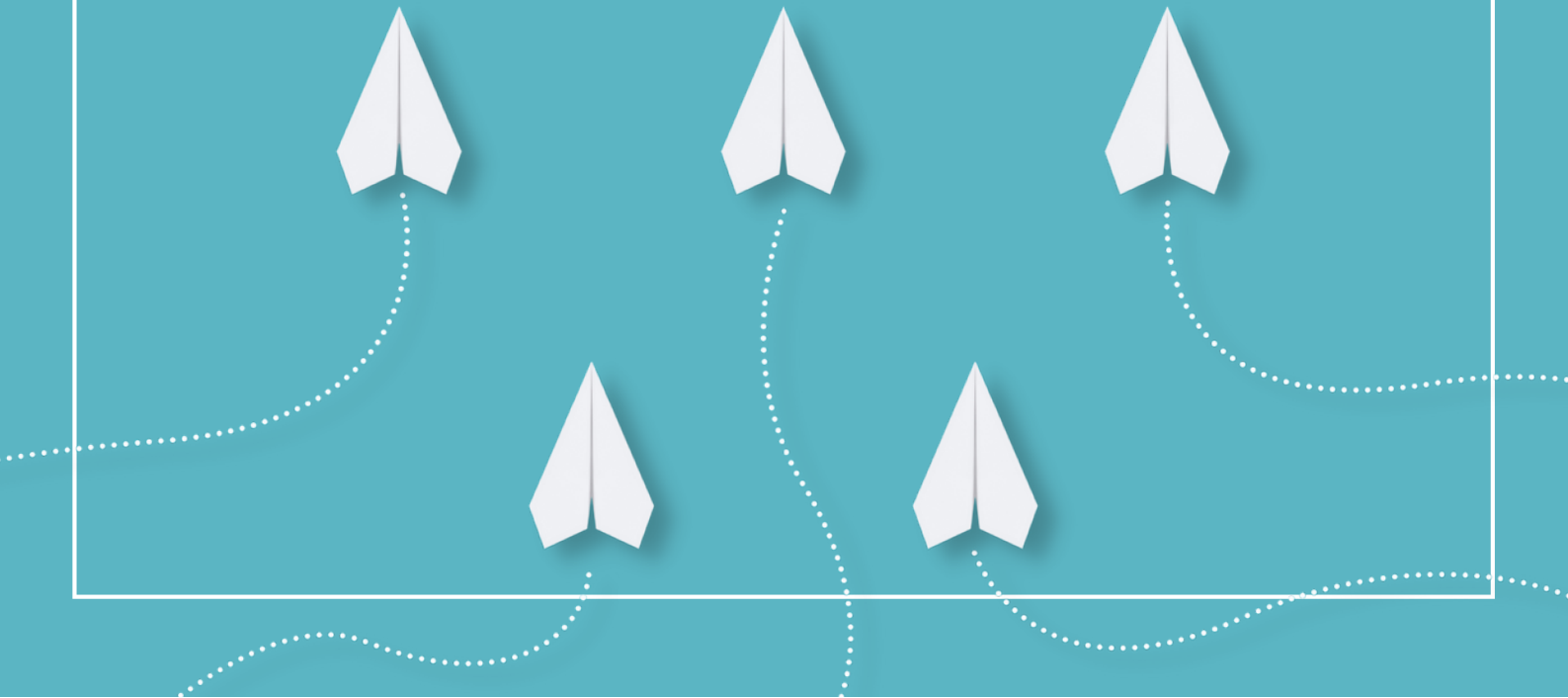
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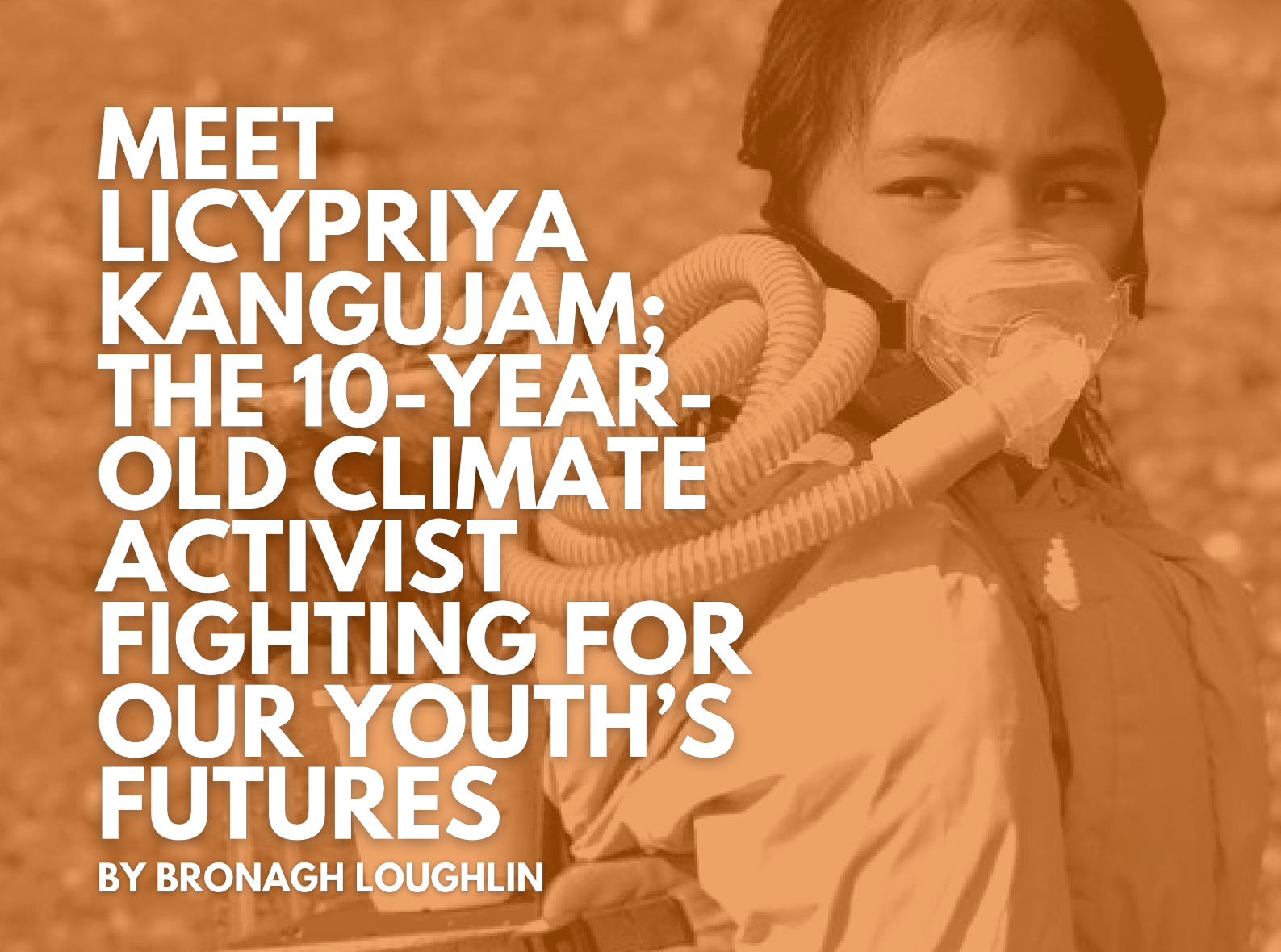
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MEET LICYPRIYA KANGUJAM; THE 10-YEAR- OLD CLIMATE ACTIVIST FIGHTING FOR OUR YOUTH'S FUTURES

BY BRONAGH LOUGHLIN

[Licypriya Kangujam](#) is a 10-year-old Indian child environmentalist and climate activist. She is also the Founder of The Child Movement. Currently studying in Grade 5 at Ryan International School, she is fighting to save our planet and our youth's futures.

We caught up with Licypriya to spotlight her incredible work and amplify the voice of the millions of children she represents. Licypriya's interest and awareness of environmental issues and drive to fight for climate justice occurred following Cyclone Titli in 2018 and Cyclone Fani in 2019.

She was born in Manipur, a small carbon-negative state in India full of rich biodiversity and an alluring atmosphere. She grew up in Bhubaneswar, Odisha, for her schooling. Her life was hit with the first cyclone in 2018 and then again in 2019.

" I HAVE NO HIDDEN AGENDA; I AM ONLY FIGHTING FOR MY FUTURE. LOSING MY FUTURE IS NOT LIKE LOSING AN ELECTION OR A FEW POINTS IN THE STOCK MARKET, I AM HERE TO SPEAK FOR MY GENERATION AND ALL THE GENERATIONS TO COME."

-LICYPRIYA KANGUJAM

Speaking on this, she says: "During the cyclones, many people lost their lives, and many children lost their parents. Thousands of people became homeless. I was very sad. I couldn't sleep. I couldn't drink or take my food."

Following the cyclones, she moved to Delhi, where she found her livelihood and health impacted again as a result of significant air pollution and extreme heat wave disasters. It was all of these upsetting disasters that transformed Licypriya into a child climate activist.

Talking about what inspires her activism, Licypriya references getting the opportunity to attend the United Nations Disaster Conference in Mongolia when she was just six years old. She explains: "I met many world leaders, scientists, experts, and policymakers. It was a life-changing event. When I returned from Mongolia in 2018, I began my own organisation called The Child Movement or Bachpan Andolan in Hindi, to call the world leaders to take urgent climate action to save our planet and our future."

The kind of action Licypriya is demanding is to pass climate change laws to control carbon emissions and greenhouse gases. In addition, laws to make climate education mandatory in the school curriculum should be introduced as she feels it is necessary so youths can fight climate change from the grassroots. Licypriya also feels it is important world leaders learn about the changing climate from their own children and grandchildren because only then will it truly resonate since they continuously ignore the science.

Making climate education mandatory is one of Licypriya's biggest aims. Speaking on why this is so crucial, she says: "I'm a child who strongly believes children have the power to change the world. Education is the only tool to fight climate change. Climate action will come from climate education. Without climate education, there will be no climate solution."

Licypriya Kangujam was born in India, but her voice has traveled much further afield. As a result, her youth activism has





had a global impact in motivating others to stand and fight for climate justice. She is also one of the youngest climate activists worldwide.

Talking about why she feels youth activism is so important, Licypriya says: "This is the time to open up your eyes. This is the time to send your children and grandchildren to fight for their survival and for their own future. The best gift parents can give their children is not a beautiful house, expensive cars, or lots of money, it is a beautiful green planet."

Following that, Licypriya speaks about some of the changes she has made to her country through her advocacy work. One initiative she has implemented, in particular, is the Monday for Mother Nature.

She explains: "We plant hundreds of trees every week on Monday with the school children with the mission to plant a minimum of 1 million trees every year. So far, we have planted over 350,000 trees. Delhi University makes it compulsory for every student to plant at least one tree per year to pass their final exam."

In addition to that, Licypriya received letters from the Rajasthan and Gujarat Governments that they will make climate education mandatory. She also spent a night protesting alone in front of the President's home to enact a law to find a solution to control Delhi's air pollution crisis in 2020. She was detained for her actions, but days later, the President of India signed an ordinance to enact a new law to fight the air pollution crisis in Delhi.

Speaking on other developments, Licypriya shares: "In July 2022, I launched an initiative called 'Plastic Money Shop', where people could bring single-use plastic waste from home and take free rice or school stationery items or a sapling from my shop. The mission of this project was to eliminate single-use plastic waste, and the waste has been converted into school benches, desks, roofs for homes, road tiles, bricks, and much more. So far, we have collected more than 2000 kilograms of plastic waste, and the Indian Government has banned single-use plastic products."

Licypriya also protested at the Taj Mahal on June 20th, 2022, with a banner that read, "Behind the Beauty of Taj Mahal is Plastic Pollution". The photograph went viral on social media, and the Taj Mahal was cleaned the following day.

Talking about the areas she is most passionate about and how she envisions the planet in the future, Licypriya says: "I have a dream where there are more bicycles on the roads than cars. I have a dream where there are no coal power plants or thermal power plants. Instead, they are replaced with clean solar energy. I have a dream where all the children living in this world have clean air to breathe, clean water to drink, and a clean planet to live on. These are our basic rights."

Licypriya's activism journey began when she was just six years old, and her family have played an integral role in supporting her. Unfortunately, her activism has resulted in her facing lots of bullying, abuse, and threats from people who wish to silence her. Speaking about what keeps her going when faced with such responses, Licypriya says: "when I started my movement, I was alone but today, I have thousands who share their love and support from across the globe."

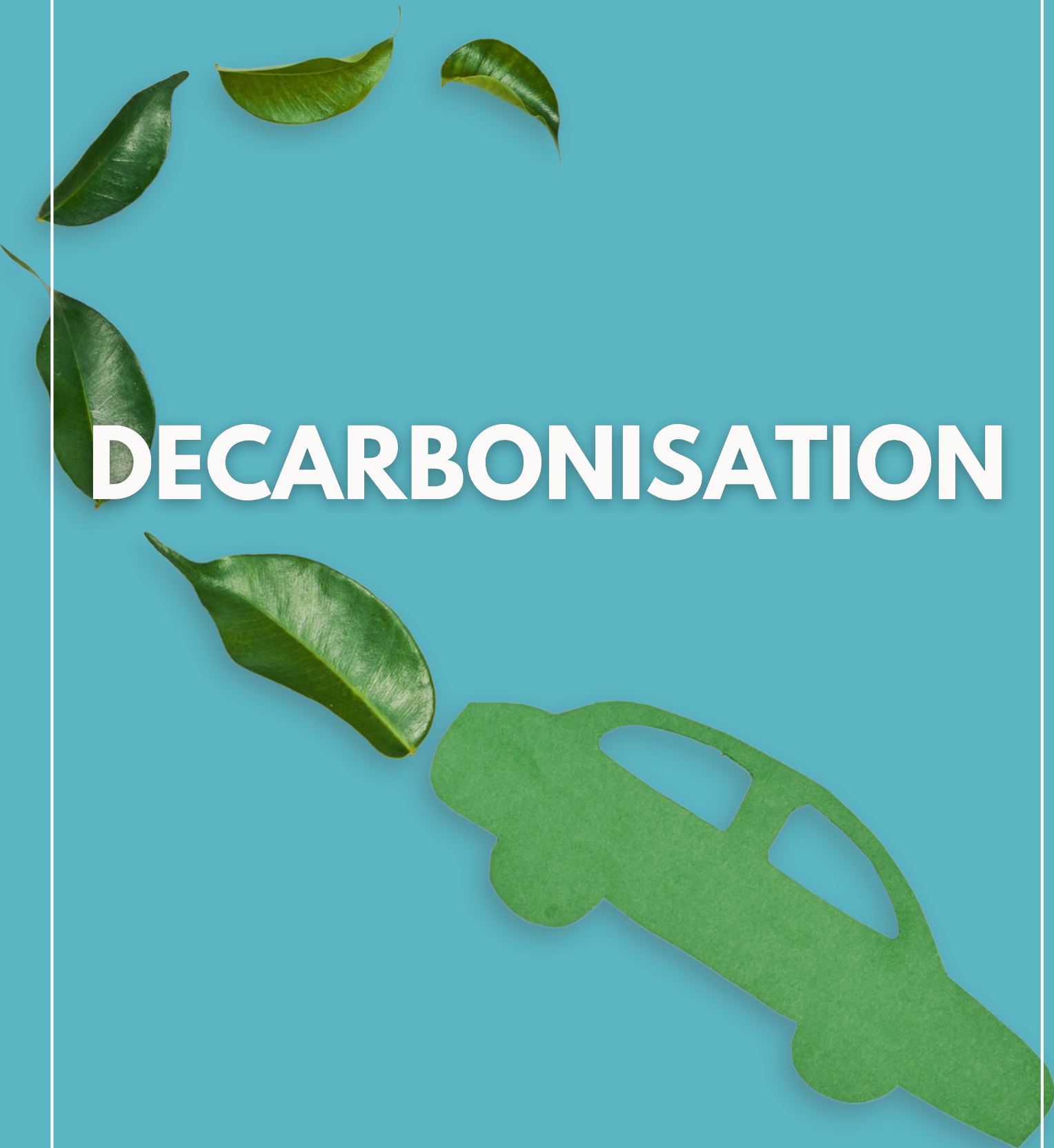
As a youth climate activist, Licypriya recognises the importance in activism for fighting the climate crisis. She gives some advice to others looking to start their activism journeys: "You can begin your activism journey by lobbying your local and national leaders. Send a simple letter or an email with your precise demands and if they do not take action, use your voice to bring about change. You can also meet them and speak with them directly. The media can also help here to amplify voices. If it doesn't work, take to the streets and draw leaders' attention to take action that way. Social media is also a powerful tool. One tweet can change the whole world. Anyone can become the voice of their local community, tribe, state, and nation, and for the world."

Ultimately, when it comes to fighting climate change, Licypriya feels world leaders must trust one another. She feels this is one of the biggest problems and that they blame one another rather than finding long-term solutions to climate problems. Like many activists, she demands concrete action now.

Licypriya is one of many youth activists that is fighting for change to ensure a better world where all can thrive. In order to tackle the climate crisis successfully, she feels we need to change our behaviour. Similarly, that climate injustice is deeply rooted in racism, capitalism, and colonial bias, and we need to begin living by different principles and systems.



DECARBONISATION



A portrait of Christopher Mbanefo, a man with a goatee, wearing a dark jacket, standing in a lush green field with trees in the background. The image is partially obscured by a white wavy graphic at the bottom.

CHRISTOPHER MBANEFO'S INCLUSIVE SOLUTION

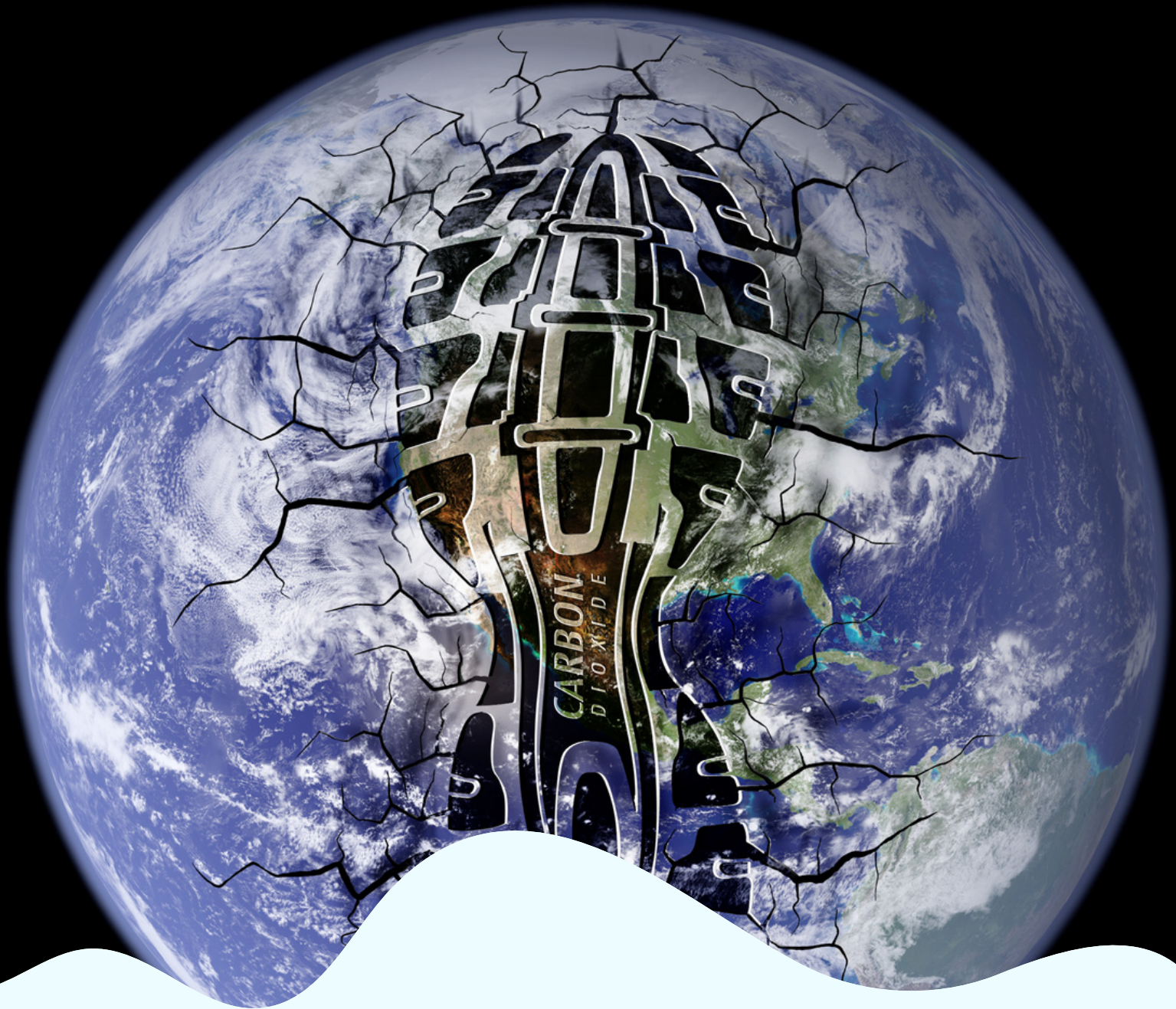
BY VANI BHARDWAJ

How can one monetise carbon sequestration? How can terrestrial carbon sinks be made more beneficial for grassroots communities? How does blockchain fit into this dynamic? Christopher Mbanefo's brainchild, OXI-ZEN is the answer to all the above questions.

Christopher is the Founder-CEO of YASAVA Solutions and the Founder-CEO of OXI-ZEN. He has been involved in aircraft design and flight testing and is also a professional pilot and an aeronautical engineer. His company Yasava Group offers innovative designs for aircraft material. This led to the creation of OXI-ZEN.

OXI-ZEN involves the development of the carbon platform where monitoring and assessment of carbon sequestration is undertaken for both terrestrial and marine carbon sinks together.

Sustainability has always been at the back of his mind which triggered Christopher to become proactive in this space. "I wanted to create an airline that has a special USP. We don't ask the passengers whether they want to offset their carbon footprint. It is automatically integrated. By doing that we believe that we set an example for what can be done in the aviation industry and if the aviation industry can do it, other industries can follow suit. It is not enough just to be carbon neutral, but we need to



be carbon negative. To state it another way, we need to be climate positive.

You see multiple metrics and scales not based on science; there is no transparency as nobody is able to explain to us exactly how, where and when carbon is absorbed and sequestered. So that led us to engage in a research project to identify what is actually needed. Is there a scientific way of measuring that is agreed upon by the global science network”?

Christopher brings out the significance of working with the global scientific community that has been crucial for OXI-ZEN, “The difference between what OXI-ZEN is doing and what others are doing is

that certain organisations determine the metric, they are the ones that qualify the data.

In many cases they do the measuring themselves and the certification is also done through agencies in which they are an interested party. In the case of OXI-ZEN we do not define the metric because we are not qualified to do that. So, we go to the global science network. We ask them to apply the latest scientific tools and quantify the sequestration that occurs either in a terrestrial or a marine carbon sink. OXI-ZEN is not involved in finding the metric nor is it involved in the measurement. All that is done by the global science network and that is what makes us different”.

Integrated blockchain technology brings in data integrity into the domain of carbon sequestration in the Global South. The process of tokenisation by OXI-ZEN creates a dataset in the form of a token which can then be transferred in ownership between Party A and Party B.

In regards to the vision for OXI-ZEN for the next 8-10 years, Christopher asserts that “at OXI-ZEN we believe that the actual stakeholders should be the full beneficiary of any monetisation process. So, if you have an indigenous community or a farming community in a rural area, they are very much disconnected from the financial system. If one can have an inclusive solution that connects people in remote rural areas to the financial system allowing them to monetise the benefits of nature-based sequestration; then the chances are that the community will value the carbon sink and thereby protect it.

OXI-ZEN infuses fresh breath of life into the everyday functioning of the actual owners of the carbon sink - the rural population. “OXI-ZEN provides a plan B by monetising carbon sequestration of the carbon sink that is close to them. Once that occurs, chances are they will protect it, enhance it, restore it and also possibly expand it. That is one way to make the rural population realise the economic benefits and thereby improve the quality of life”. As Chris passionately elaborates on his passion projects, it becomes evident that the USP of OXI-ZEN lies in its concern for the local beneficiaries in the Global South.

The OXI-ZEN ambassadors involved with the OXI-ZEN Ambassadors Programme create the human connection for the company. The ambassadors are focal points on the ground. Their responsibility is to identify converters and emitters and to help the converters to go through the process of registering and onboarding their carbon sinks and their communities onto our system.

OXI-ZEN labels one metric tonne of carbon into GAYA. Any entity emitting carbon is the emitter and the custodians of these carbon sinks are the converters, OXI-ZEN facilitates the creation of linkages between the two entities via their platform. They also furnish the transaction report to its customers, “say an emitter wants to purchase 500 metric tonnes of carbon dioxide (Gaya), OXI-ZEN provides more than a mere pdf. A transaction report contains dataset for each Gaya (for each metric tonne of carbon dioxide), information on how the assessment for carbon sinks was done. It has information on converters, social programs that the convertor is embarking upon. You also have a satellite image of how, when and where each one metric tonne of carbon was sequestered. The transaction report is a huge dataset that is burnt into the blockchain in the form of a Non-Fungible Token (NFT). It is a digitised report. Thus, data integrity is maintained”.

COP 27 has just finished and decarbonising was one of the key themes. In this context, Christopher brings our attention to “one of the tragedies of the Paris Agreement being - Article 6.4, that states clause of additionality”. You have a situation where large MNCs with their massive value chains traceable to the forests are able to monetise the carbon sequestration. But the community who owns the forest to feed these supply chains are excluded from monetising the carbon sink due to conditions of additionality under Article 6.4. “That is madness!”, he exclaims.

“The CDM mechanism is in place today with positive intention but the compliance market is in excess of \$200-\$300 billion a year. Whereby the IPCC reports have stated that 70% of nature-based carbon sequestration occurs in the tropical regions of the planet.



You would logically conclude that 70% of this \$200-\$300 billion is being invested where the sequestration occurs, i.e., the Global South. Fact is less than 1% of that transactional volume goes into the tropical South. There is greenwashing going on at a grand scale.

Secondly, we know that as we speak right now, only 30% of all anthropogenic carbon emissions is absorbed by terrestrial carbon sinks. The oceans are absorbing much more carbons than they were naturally designed to. We have to increase the terrestrial carbon sequestration capacity by 30-50%”.

As we reach the tail end of our interaction, it becomes obvious that the respect for ethics based in integrity that Chris holds, whether it is ideational or in principle, has smoothly transitioned into his business ecosystems.

There’s no doubt we have to introduce a scientific method for evaluation of carbon sequestration and we have to ensure that the capital generated is for the beneficiary on the ground. We have a planetary emergency going on right now in countries like Pakistan, Bangladesh and South Pacific Island nations. Ironically, COVID has brought on relatively lesser disaster than the climate disasters and yet most resources were mobilized for COVID but not for climate emergencies.

Earth Mother Community is in sync with OXI-ZEN’s drive to bring the mother back into the hands of the folks on the ground who are surviving realities emerging out of high carbon emissions. It is with their involvement that technology-based solutions can have any tangible real mitigatory effects.

GENDER EQUALITY





THE CONNECTION BETWEEN CLIMATE CHANGE AND GENDER EQUALITY

BY JAMIE FOX

Climate change is causing many global problems, especially in developing countries. Underprivileged individuals suffer the most as they do not have the resources or infrastructure to cope with climate issues.

As more research has been carried out, it is becoming increasingly evident that there is a connection between climate change and gender inequality. Unfortunately, women and young girls, in general, are part of this underprivileged group.

Agriculture is the largest source of income for families across Africa. The Intergovernmental Panel on Climate Change 2007 report estimates that Africa will be the most vulnerable to climate change globally, where temperatures will likely increase by between 1.5-4°C this century.

The WWF says that "... Latin America's

temperatures are rising, and some areas are experiencing changes in the frequency and severity of weather extremes such as heavy rains." Countries in Asia face similar threats where the UN says that "flash flooding in the Himalayas claims around 5,000 lives every year, and it is women who are most vulnerable to this."

Land Ownership and Resources

Women's main issue is their extreme lack of access to resources and autonomy. According to the UN, 70% of people who live in poverty globally are women. In developing countries, females only own around 10% of the land despite them spearheading possibly up to 80% of the world's food production.

There is a gross discrepancy where women in developing nations do most of the 'heavy lifting' compared to men. Still, their male counterparts benefit more because

they are in a position of authority over the policies of farms and land ownership.

They are also more likely to be wealthier and own more land and equipment. Adaptability to unexpected change is a reliable measure of one's standing on the social and economic ladder. It is becoming clear that women, due to the gross discrepancy, are simply not as capable as men of adapting to climate change.

Education and Influence

Women and girls are statistically less likely to be educated in the developing world, creating problems going forward. Women in developing regions have been marginalised from decision-making processes and education, which is deeply embedded in traditional discrimination and socio-cultural norms.

Another finding by the UN claims that "during extreme weather such as droughts and floods, women tend to work more to secure household livelihoods. This will leave less time for women to access training and education, develop skills or earn income."

If a family's farm or commercial land is flooded or the land becomes infertile, the problem-solving process is expected to be undertaken by the men while women tend to the home. This means the knowledge and power gap between them becomes even more significant, which creates a cycle likely to continue each time a family or business is confronted with an issue.

Climate change will also affect future generations, as struggling mothers often cannot afford to send their children to school or get help running their businesses. The children will be uneducated upon adulthood, creating a repeated cycle.

When you add in the threats of climate change to an already gender-unequal

society, it becomes a threat multiplier where mothers, young women and girls will be left further on the outskirts of society as they will have less to rely upon when their livelihood is swept away.

Trafficking

Women are also vulnerable to criminal traffickers when weather disasters strike and their community becomes dispersed in search of a new start. It is becoming increasingly evident that organised traffickers' networks specifically target vulnerable young girls and women.

In particular, those reaching out for new employment or homes are off the back of being uprooted from their regular lives. The organisations will then coerce them into forced labour or sex work. It is widely agreed that the threat of sex-based violence is greatly enhanced during conflict and acute poverty.



Solutions

In relatively simple terms, male dominance in policy and decision-making means that men's needs are very often prioritised over women and girls. The fact that women are more vulnerable to recent climate change events highlights pre-existing gender inequality and underpins them further.

A balance is needed here; to achieve a homogenous and somewhat functioning society, both sexes must contribute to its zeitgeist. Men, of course, have great value in the battle for social change, but it is far better served when paired with an empowered and equal feminine contribution.

The UN also said that "there is empirical evidence that women are less likely to gamble with the future or to take risks about issues that may affect their own well-being and that of their children and families." It is obvious that social systems everywhere lack this quality, and this needs to change to reduce the risk that climate hazards pose to vulnerable groups.

Many initiatives and groups are doing outstanding work for disadvantaged people worldwide to aid them in being better equipped to adapt to climate change, including [Vita Ireland](#), a development partner supporting farmers and communities in Africa for over 32 years.

They met with Layhugni, a 36-year-old potato farmer and mother of three. Her potato seeds were of low quality and didn't grow a good crop. Layhugni was also not up to date on contemporary farming methods needed to thrive in a changing environment.

Vita and their partners supplied her with a superior quality potato seed. They provided training on innovative land management "that showed programme participants how to use fertiliser, rotate

and manage their crops, and safeguard their plot from overworking."

On this initiative's results, Vita said Layhugni's farm – and indeed, her life – has been transformed. Layhugni's yields have increased from a little 8 or 9 quintals to 20 quintals... the effect this has had on Layhugni's entire family is profound. Her children can now be better educated by attending a good school; her home has been transformed as she can finally afford to buy proper furniture, and Layhugni can start building her business towards the success she has always dreamed of."

This story is an example of how women's and children's lives can be changed not only by providing them with essential resources but by educating them further, allowing them to have their own autonomy moving forward. Unfortunately, climate change is not gender-neutral, and we need to ensure women and girls have access to natural resources to bridge the gap.



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CLIMATE CHANGE





COP27 - ANOTHER GREENWASHING CIRCUS?

BY BRONAGH LOUGHLIN

The 2022 United Nations Climate Change Conference, or as it is also known as the Conference of the Parties of the UNFCCC (COP27), took place recently in Egypt. COP occurs each year and primarily revolves around debates and negotiations. The primary goal of the conference is to review progress towards the entire purpose of the UNFCCC, which is to limit climate change.

The conference usually sees scores of activists arrive in support of its mission. However, this year's COP was questionable in terms of sustainability. So much so that even Greta Thunberg boycotted the conference. The Swedish climate activist decided to skip this year's

COP due to greenwashing. She said she feels the COP conferences are mainly harnessed as an opportunity for people in power and leaders to grab attention and that they use many different greenwashing tactics to achieve this.

She added that the COPs do not aim to transform the entire system but encourage gradual progress. Greta feels the COPs are not working unless they are utilised as an opportunity to mobilise. In addition to activists' feelings on COP, Coca-Cola, the worst plastic polluter for five years in a row, sponsored this year's event. When the news was shared that COP27 was to partner with Coca-Cola, numerous activists slammed the move, pointing out how much

progress the company has to make regarding the environment. John Hocevar, USA Oceans Campaign Director at Greenpeace, referred to the move as baffling.

He also cited that the beverage company produces 120 billion throwaway plastic bottles annually and reminded COP27 that 99 per cent of plastics are created from fossil fuels, worsening the climate crisis. Moreover, he mentioned that the brand has yet to honestly acknowledge this problem and share how they plan to achieve its climate goals without reducing plastic production. He finished his statement by saying: "This partnership undermines the very objective of the event it seeks to sponsor."

Besides the ridiculous conference sponsor, there was also a lot of criticism on social media regarding many of the delegates arriving at the conference via private jets. Data from FlightRadar24 revealed 36 private jets came to Sharm el-Sheikh between the 4th and 6th of November at the beginning of the conference. Another 64 flew into Cairo, 24 of which had arrived from Sharm el-Sheikh. It is well known that air travel creates greenhouse gas emissions, primarily carbon dioxide emissions. Moreover, emissions per kilometre travelled are far worse than any other kind of transport.

The carbon footprint of air travel depends on a range of factors, including the efficiency of the engines, how many passengers are on board, and the size of the aeroplane. In saying that, private jets create much more emissions for every passenger than commercial flights do. The private jet flown most regularly into Egypt for COP27 was the Gulfstream G650 model. This model uses around 500 gallons or 1,893 litres of fuel every hour. Therefore, if this private jet went from Amsterdam to Sharm el-Sheikh, it would have taken around five hours and used approximately 9,465 litres of fuel.

With that in mind, it's apparent private jets have a much more significant impact than commercial flights, so they are another peculiar choice of transport for a climate conference. Besides the above, a number of the pledges that are made at the COP conferences can also be viewed as greenwashing. This year's COP27 focused on important issues such as mitigation and adaptation, as well as climate finance, solutions, and much more. These conversations are so meaningful in the fight against climate change, as are the pledges from delegates to take action. However, it is worrying that the well-renowned global climate conference is coming under fire for greenwashing and losing support from crucial climate activists.

If an important climate action conference driven by world leaders such as COP is so littered with greenwashing, what hope do we really have for the future of the planet?





WHAT HAPPENED TO THE OZONE HOLE?

BY NUBLA ADAM

A subject of great scientific attention and research since the mid-1800's, the concept of the stratosphere and its layer of increased ozone gas is a verity that is now familiar to almost everyone.

Befittingly coined as the Ozone Layer, this concept depicts a thick layer of ozone gas that surrounds the globe and is 15 to 50 kilometres above the surface of the planet. The role of the Ozone Layer is to absorb a component of the sun's radiation, namely the UV light UV-B, from reaching the surface of the Earth.

While The Ozone Layer serves as a sun-shield for life-threatening radiation, it also allows in beneficial sun-rays to reach the surface and lets in enough heat to keep the Earth's temperature constant. Fundamentally, the Ozone Layer is essential to life as we know it.

In 1974, a Nobel-prize winning study published by two chemists, Mario Molina and Sherwood Rowland, asserted that man-made chemical compounds, particularly ChloroFluoroCarbon gases (CFCs), are to blame for the thinning of the Ozone Layer.

In light of the detrimental impact that CFCs have on the Ozone Layer, this study found that the atmosphere's capacity to absorb chlorine was limited. This pushed for the regulation of Ozone depleting substances globally. These findings were promptly confirmed, as a tangible representation of mankind's capacity to harm the Earth, through a hole in the Ozone Layer.

In 1985, severely low levels of Ozone over the south pole was recorded by a Junior Researcher during his supervision for the British Antarctic Surveys.

Recorded by Jon Shanklin, the discovery of the Ozone Hole over the Antarctic, one of the most catastrophic declines of the Ozone Layer noted at the time, took everyone by surprise. In contrast to pre-1975 research, Ozone levels had decreased by as much as 33%. Further investigation revealed that the Ozone depletion was caused by halogen chlorine-catalysed chemical destruction induced by man-made CFCs present in the atmosphere. About 10% of the top Ozone Layer was thought to have depleted at its worst stage in the late 1990s.

The international panic caused by these findings resulted in the 1987 Montreal Protocol on substances that deplete the Ozone Layer. This historic agreement to phase out compounds such as CFCs and other Ozone depleting substances was initially signed by just 46 countries. Currently it is acknowledged as the first and only UN environmental agreement to be recognised and sanctioned by 197 UN member countries as well as nearly every other nation. CFC manufacturing was initially reduced, then abolished - their concentrations in the lower atmosphere were observed to have stopped increasing in the early 2000's. To reduce the usage and production of powerful greenhouse gases like CFCs and hydrochlorofluorocarbons in the future, Ozone-friendly substitutes were put into place. According to the UN Environmental Agency, the Antarctic Ozone Hole would be replenished by the 2060's. Meanwhile, other regions will return to their pre-1980's measurements.

Without the implementation of The Montreal Protocol, we would be living in a world where the mass thinning of the Ozone Layer would have left us with far-reaching repercussions. According to estimates, the Montreal Protocol's adjustments led to 230 million fewer cases of skin cancer, 1.3 million fewer deaths from the disease, and 33 million fewer occurrences of cataracts in the US alone.

Additionally, the Montreal Protocol contained the risk of a premature catastrophic collapse in the plant and marine ecosystem as well as the global food system and biochemical cycles.

Furthermore, a more recent international legislation that forbade ozone damaging compounds went into effect in 2009 and is among the tightest and most advanced laws in the world. The Montreal Protocol governs bulk production and distribution of these compounds, but the EU Ozone Regulation restricts and controls their use in products and equipment. The Regulation supervises and keeps track of ozone-depleting compounds that are not only covered by the Montreal Protocol but also a few new ones. It also administers licensing requirements for all ozone-depleting substance exports and imports.

The Ozone Hole is still in the initial phase of its road to recovery. Although CFCs have been discontinued, there is currently still enough CFCs in the atmosphere to completely destroy the Ozone layer over Antarctica at certain altitudes under ideal climatic circumstances. Additionally, there are also concerns that increased emissions by unregulated chlorine-containing chemicals and illegal use of Ozone depleting gases would impede the Ozone Layer's recovery. The recent increase in CFC-11 emissions from eastern China, as well as western and tropical Asia, serve as reminders that Ozone depleting gases must be monitored, reported, regulated, and enforced in order to maintain progress.





The environmental success story is still ongoing. But what does this mean for us and our role as a society? It is factually known that CFCs cannot exist naturally, thus it is up to us as a species to regulate the use of Ozone depleting gases. The Montreal Protocol represents a time of global unity and action that should be celebrated as one of the greatest environmental accomplishments in human history. We should hold nations accountable to strictly adhere to the protocol and not deviate from it for monetary gain. We can all have a power of influence on the regeneration of the ozone layer by paying more attention to the chemicals in the items we choose to purchase.

BIODIVERSITY





CAN WE RESTORE OUR ECOSYSTEMS THROUGH GREEN INFRASTRUCTURE?


BY ROISIN CARTER

In a healthy ecosystem all living elements interact with their environments and exist in harmony supporting each other.

The impacts by humans have damaged many ecosystems, whether it is through the destruction of habitats to facilitate developments or increased pollution from gases and plastic waste. All this increases the earth's temperature causing dramatic climate change.

In an effort to combat the damaging effects of a growing human population on ecosystems a new concept has been created. Green infrastructure embraces ecosystems to create sustainable living spaces and support the growth of the natural environment. Combining man-made structures with natural elements allows ecosystems to thrive. Green walls on large residential buildings and permeable paving are examples of green infrastructure that help create a more harmonious living environment between humans and wildlife.





Green infrastructure also extends to efforts by the local government to protect existing habitats.

Importance of ecosystem restoration

Without functioning ecosystems our world will dramatically change. The knock-on effects can lead to catastrophic consequences for civilisation.

If we fail to restore our ecosystems, we will experience a mass loss of species. It's expected that by the end of the century 50% of the current species on this earth will be extinct unless we take action now.

It's easy to see statistics and not comprehend the personal impact but it is real. Without efforts to restore coral reefs, marine life will be impacted which in turn means over 3 billion people who rely on fish as a source of animal protein will be without food, let alone the financial impact of a resourceless fishing economy.

Restoring damaged ecosystems is a great benefit to our health. Being surrounded by nature improves our cognitive functions and mental health. Respecting the need for wild animals to have their own space also protects our physical health.

Maintaining and protecting forests, which are home to wild animals, can prevent the spread of transferable diseases. Whilst humans and animals can exist in the same habitat, increased animal populations coming into contact with humans leads to a higher risk of cross species diseases, such as the Covid-19 outbreak. We can avoid the damaging global consequences by restoring the natural environment for these animals.

We can also battle the large carbon emissions that we've pumped into our atmosphere by restoring our ecosystems. Thriving ecosystems can store carbon, from trees and soil to oceans and seagrass. Allowing ecosystems to recover can help us reach a much-needed cleaner atmosphere through natural absorption.

Is green infrastructure the solution?

Green infrastructure is an important starting point to building living spaces in a more mindful and sustainable way. Implementing changes in urban areas can reverse some of the damage caused and protect these areas from extreme weather events such as flooding.

Green infrastructure will help us create a much more harmonious environment and restore elements of the ecosystem which have been damaged. An example being the reintroduction of trees in urban living spaces. Trees help filter pollution and improve air quality. They also provide shade and cool the area they cover, thereby helping to reduce surface temperatures.

Simple efforts such as keeping a variety of plants in your home's outdoor space can help encourage and support the ecosystem. Plants will attract wildlife back to its original environment. Strategically placed gardens can provide essential water absorption which are an important defence against heavy rainfall and flooding.

Green infrastructure helps us to support the nature around us. By allowing ecosystems to thrive we can continue to enjoy the services they provide. These include but are not limited to carbon absorption, oxygen production by trees and pollination of crops by bees which we will harvest later.

Moving forward

Green infrastructure is a great vehicle to restore ecosystems which have been damaged by human residential areas. Making a natural environment in urban areas will encourage displaced species to return. Increased plant life and green spaces will reduce polluted atmospheric conditions by not only benefiting air quality for humans but also preventing the saturation of soil.

Whilst green infrastructure alone won't restore ecosystems, it is a great perspective from which we can design and adapt our living spaces to better support the natural environments around us.

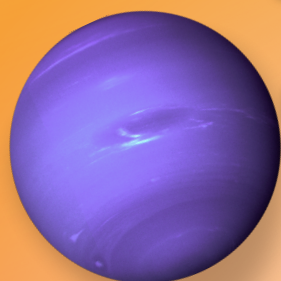
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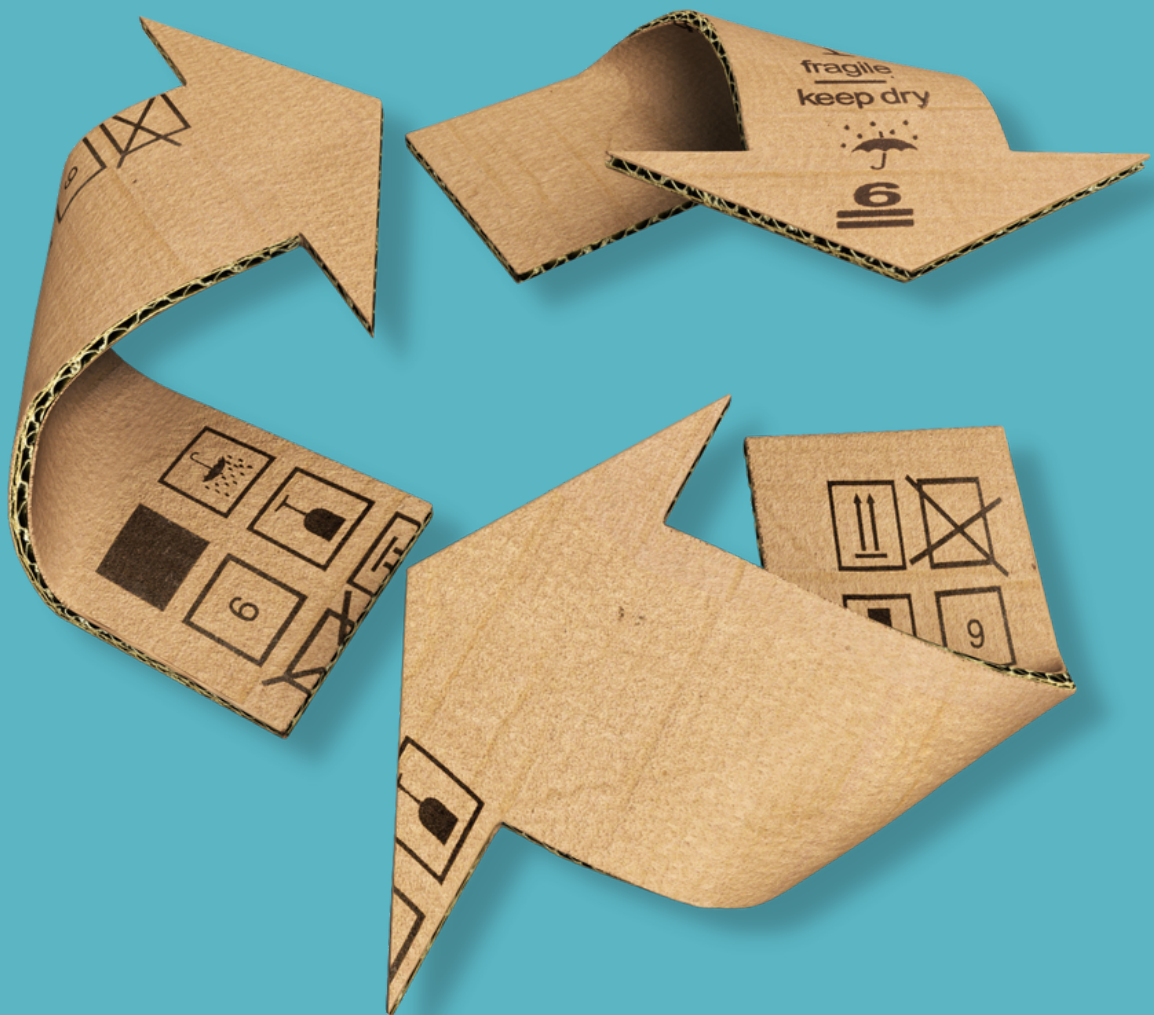
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ENVIRONMENT





WHY NOISE POLLUTION IS A MAJOR ENVIRONMENTAL CONCERN

BY VANI BHARDWAJ

Did you know that a gunshot with over 140 decibels can cause immediate hearing loss by rupturing the ear's tympanic membrane? Physical and mental health gets disturbed with long-term exposure to low levels of noise in urban areas as well. If you listen to music at the maximum volume for 15 minutes daily, your hearing could become damaged.

Continuous exposure to more than 85 decibels for 8 hours daily can create permanent hearing damage. It has been highlighted in the UN Environment Programme's (UNEP) Report in 2022, 'Noise, Blazes and Mismatches: Emerging Issues of Environmental Concern', that the noise made by animals or natural events constitutes natural sound.

However, when sound turns into anthropogenic noise made by ships, windmills, railways, industrial activities, airplanes, and road traffic, white noise leads to health challenges for humans and biodiversity. High Sleep disturbance caused by noise pollution can cause cardiovascular effects, elevated blood pressure, diabetes and chronic annoyance among humans. Such health impacts can cause premature deaths.

Early heavy daytime traffic causes the birds to change their singing behaviour to earlier in the dawn, just before the morning rush hour begins. At abyssal depths, marine organisms become highly dependent on sound. In light of the turbidity caused by industrial effluents and sonic noise, whales and dolphins cannot use their echolocation capabilities.

If a whale is within a range of 200 metres of a container ship or 100 metres around a small boat, the echolocation range gets

reduced by 95%. Therefore, noise pollution in the ocean requires noise mitigation technologies in containers and reducing marine pollution to have clear water for efficient echolocation and healthy life for aquatic organisms.

Policies executed to mitigate noise pollution

The electronic Noise Data Reporting Mechanism was devised in 2007, requiring specifications of spatial infrastructure in Europe for reporting noise data. Road traffic noise levels have become dangerous to the health of more than 20 percent of citizens in the European Union. Historical acoustic landmarks can have a cultural identity, such as calls to prayer from Masjid. Therefore, handling noise levels in an urban area also has socio-political underpinnings. Environmental and natural sounds can be cathartic; thus, silence is not the solution to noise pollution. Environmental acoustics in urban planning encourage acoustic insulation materials.

The government of Egypt has encouraged policies to reduce noise levels from air conditioning systems, adopting building energy standards and using bicycles. Berlin has reduced the space for vehicles on the road by switching to cycles for commuting. In Denmark, fibreglass is made from decommissioned wind turbine blades.



Steps That Can Be Taken

The sounds of birds chirping in the early morning and the sound of a flowing river stream are conducive to balanced mental health. Natural sounds are conducive to attention restoration and recovery from stress. To create urban landscapes that are conducive to enhancing noise reduction, the following steps can be executed:

- Soundscape management undertakes a listener-centred perspective, emphasising individual preference and not discomfort. Therefore soundscape management is the journey from noise mitigation to a desirable landscape.
- When tyres come in contact with the road, noise pollution escalates. Hence, urban planners must ensure that the road built with porous asphalt surfaces reduces lower emissions at more incredible vehicular speeds.
- Vegetated roofs and tree belts facilitate soundscape design with positive acoustics, even in public spaces, by reducing street amplification and diffusion of noises.
- Vehicles with internal combustion engines must be replaced with quieter propulsion systems.
- Quiet urban parks or green and blue areas within courtyards of communities or gardens can help escape the city noise.
- Public green spaces of high quality are relatively inaccessible to socioeconomically deprived sections than affluent groups. In multiracial pockets of the city, inequitable exposure to noise levels is endured more by marginalised communities.

We have now seen how soundscape management involves proactively promoting a sound culture that enhances comfort.

- Environmental acoustics in urban planning encourage acoustic insulation materials.
- In association with protected areas, synergised solutions to light and noise pollution are required for healthy urban planning.
- Noise pollution disrupts the biological rhythms of animals and birds while also impacting mammals. Making serene environments within urban pockets induces inner calmness and healthy mental space.
- Urban forestry can be a noise absorber and have positive ripple effects.

Noise mitigation becomes crucial for healthy, sustainable living in times of rapid urbanisation. Hence, we see how soundscapes are equally vital as landscapes. Transitioning noisy environments to an oasis of peaceful living contributes to sustainable, minimalist living. One can induce such changes incrementally. So, next time instead of going for a concert, choose to go for an early morning walk with birds chirping in the trees. Also, let us not forget the dolphins and whales that die out due to dire stress from the noise made by sea vessels. We need to make the ocean free from noise pollution for them as well, not only by way of sustainable maritime transport but also sustainable tourism near rivers, ports, beaches and oceans. It is time to raise the decibels against noise pollution through constructive changes in our environment, one decibel at a time!

SOLUTIONS



IS ZERO BUDGET FARMING THE WAY FORWARD?

BY VANI BHARDWAJ

Sustainable agriculture indicates community-related resilience towards sustainable production patterns as advocated in Sustainable Development Goal (SDG) 12. The self-regenerating nature of agriculture is highlighted by Zero Budget Natural Farming (ZBNF) as the use of chemical inputs is eliminated. While this method of farming has been lauded globally, what is in it for the non-farming community like us? How can you be part of progress towards SDG 12? We can easily adopt the ZBNF method at micro scales to our kitchen gardens. That is where ZBNF gets interesting and applicable.

Zero Budget Natural Farming (ZBNF) is the meeting ground for agriculture meeting ecological conservation. As indicated by Food Agriculture Organization (FAO) this will help us achieve environmental and global food security. Just imagine if we are growing what we put on our plate under our supervision, then the soil health remains intact and so does your gut health. No worries with respect to chemicals or lack of nutrition!

Small-scale farming is a viable opportunity, particularly in urban and peri-urban areas and not only in the rural hinterlands. Natural Farming indicates the availability of homemade, readily available ingredients that induce pest management, closure of nutrient cycling loops, and soil health.

Components of Zero Budget Natural Farming

1. **Bijamrita/Seed treatment:** Neem leaves, pulp, tobacco and green chilli extracts manage pests and insects. Seed health is ensured with this organic seed treatment. Cow dung from native breeds should be used to make the mixture. Bijamrita keeps the roots of young crops safe and free from fungus.
2. **Jiwamrita/Microbial culture:** It is fermented and made from jaggery, pulse flour, urine, and cow dung. This mixture enhances the activities of microorganisms and earthworms. Increased microbial activity in the soil enriches its nutritional value and prevents soil disease from impacting crops. Doing this, the community garden or the kitchen garden in your backyard will become more self-sustaining.
3. **Mulching:** Organic debris and crop residue are added to the topmost layer of soil. Mulching puts a stop to further growth of weeds as humus gets formed. It prevents the hassle of weeding out the undesirable growth.
4. **Waaphasa/soil aeration:** water vapour condensation for better soil moisture. Adequate soil aeration is met via aeration and mulching. Mulching amounts to humus formation.

ZBNF encourages minimal watering and you will have to spend the least amount of time tending to what you are growing for your personal kitchen. Meanwhile, you can have your own mixed cropping. That remains feasible under ZBNF.

If we look at all the above features, they are all interlinked and fit in well together. Therefore, the process is not time consuming; although if you are averse to odour you may have to take initial precaution for your olfactory senses.

Advantages

Soil fertility is affected adversely by the use of chemical fertilisers. Herein ZBNF works in complete harmonisation with the environment sans any chemicals. ZBNF lowers cultivation costs and methane emissions, along with lesser consumption of electricity and water. ZBNF is palatable to all agro-climatic zones.

Interestingly, ZBNF rejects organic farming, vermicomposting and manure. You are not expected to expend on purchasing inputs; however, making all the components requires minimal costs. Given we are not cultivating hectares of land, ZBNF seems custom made for our small gardens. Let us see how practicing ZBNF is having a macro effect. Adoption of ZBNF will have cumulative reduction in ocean acidification and marine pollution. You can also begin outsourcing your produce from your kitchen and community garden to weekly organic markets for fruits and vegetables.

Disadvantages

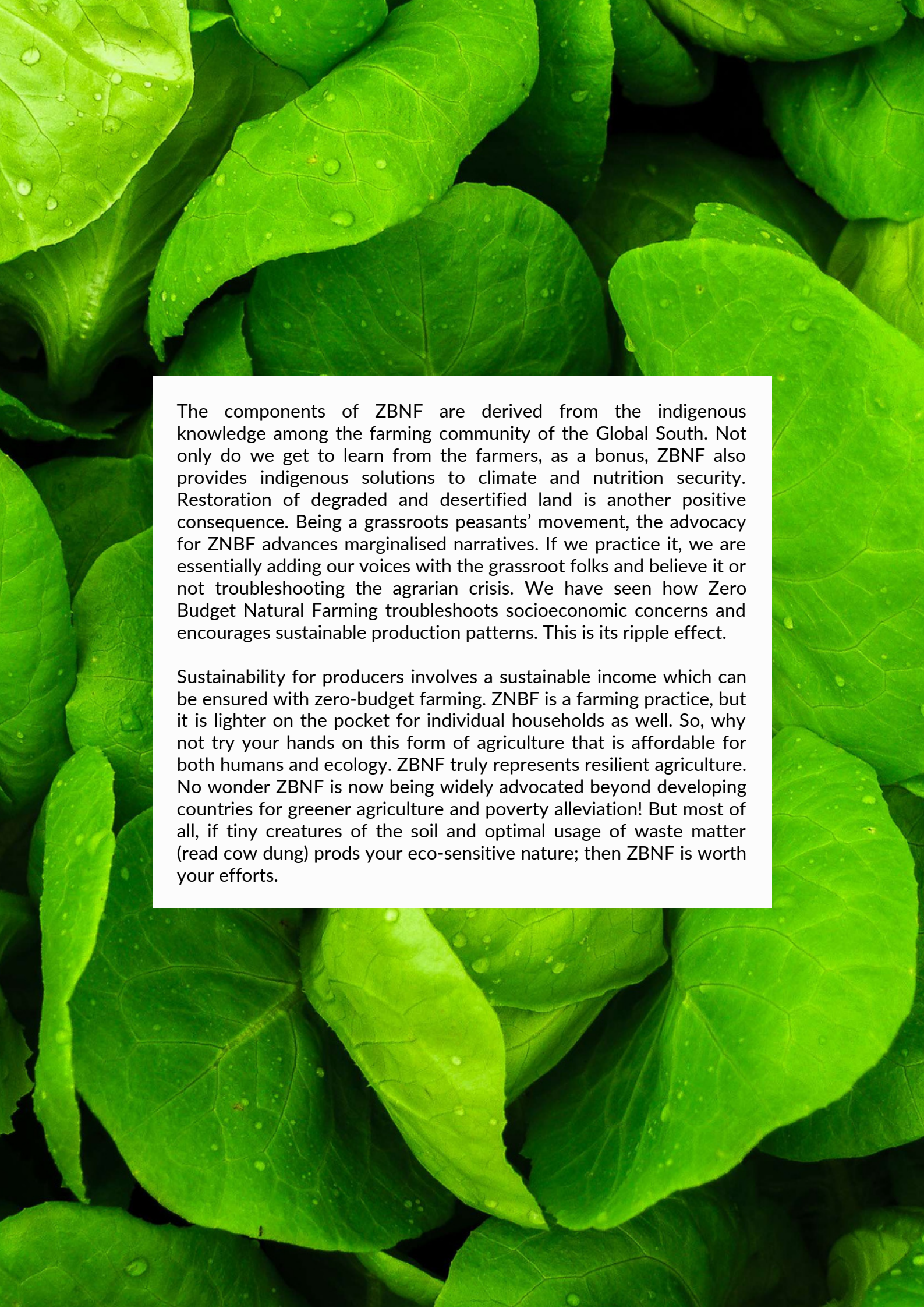
Not all of us maintain a cow farm, so arranging the ingredients can get cumbersome. Then there are issues of the unpaid care work that goes into building that sustainable garden. But all of it is worth it when assessed cumulatively, not to ignore the inner satisfaction it brings for contributing towards a greener

production pattern - one household at a time. Getting organic certification for crops grown under ZBNF becomes problematic. There is no doubt that ZBNF has hidden costs in contrast to what its terminology suggests. In practice, following strict ZBNF protocols is possible when you are driven equally towards saving your health and that of the soil as well.

Policy Recommendations

- ZBNF can be practised in the form of vertical farming in areas with high population density.
- ZBNF can be implemented in community gardens in circular cities.
- Small and marginal farmers having smaller pieces of landholdings can carry out ZBNF.
- ZBNF is conducive to women farmers with less access to institutional finance in developing countries. Single poor women farmers find financial resilience through ZBNF, free from a life of debts and defaults.
- ZBNF is cognizant of landless farmers as they get linked to international and domestic trade markets in ZBNF vertical.
- ZBNF plots of land will be more resilient to flooding and high-speed winds than non-ZBNF plots.

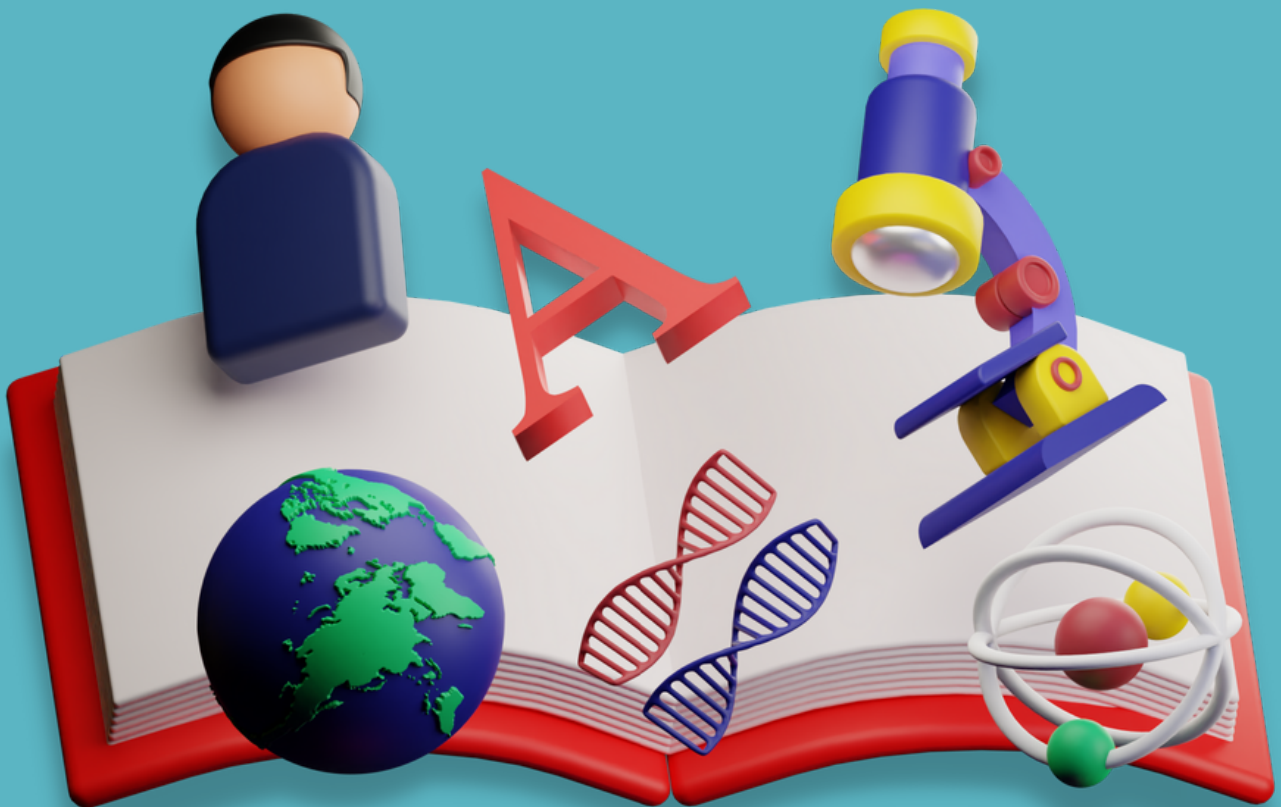




The components of ZBNF are derived from the indigenous knowledge among the farming community of the Global South. Not only do we get to learn from the farmers, as a bonus, ZBNF also provides indigenous solutions to climate and nutrition security. Restoration of degraded and desertified land is another positive consequence. Being a grassroots peasants' movement, the advocacy for ZBNF advances marginalised narratives. If we practice it, we are essentially adding our voices with the grassroot folks and believe it or not troubleshooting the agrarian crisis. We have seen how Zero Budget Natural Farming troubleshoots socioeconomic concerns and encourages sustainable production patterns. This is its ripple effect.

Sustainability for producers involves a sustainable income which can be ensured with zero-budget farming. ZBNF is a farming practice, but it is lighter on the pocket for individual households as well. So, why not try your hands on this form of agriculture that is affordable for both humans and ecology. ZBNF truly represents resilient agriculture. No wonder ZBNF is now being widely advocated beyond developing countries for greener agriculture and poverty alleviation! But most of all, if tiny creatures of the soil and optimal usage of waste matter (read cow dung) prods your eco-sensitive nature; then ZBNF is worth your efforts.

CLIMATE SCIENCE





CLIMATE RISK MODELLING

BY VANI BHARDWAJ

How on earth do you predict constant climate-related disasters? Frequent cyclones, floods, forest fires; the list of such disasters is endless and ever-increasing due to continuing global warming. Not only the onset of catastrophe but their aftermath brings more significant worry about how to create resilient transitions. Here we see how climate risk modelling is helpful for all three phases of climate-related disasters: pre-disaster, the duration and aftermath of disasters.

The importance of climate science and associated technology has been repeatedly stressed in multiple Intergovernmental Panel on Climate Change (IPCC) reports and Conference of Parties (COP). Climate scientists use previous and present climate patterns to develop future projections of climate trends through climate model

simulations, such as Climate Risk Management, Climate Enabled Catastrophe Loss Models and Climate Change Physical Risk Modelling.

Mathematical equations in climate models enumerate and visually represent how energy flows by using numerous three-dimensional grid cells. In this manner, winds, surface hydrology, heat transfer and relative humidity are measured within every grid. Thus we end up studying all atmospheric, oceanic, chemical and bio-physical processes.

Ecosystems can be researched by supercomputing earth systems and using remote sensing data from NASA Earth



Exchange (NEX). Scenario analysis and risk modelling include stress testing via Artificial Intelligence and Machine Learning technologies.

Assessing climate risks for green transition for governance and corporate business systems remains crucial. Earth science-based datasets and algorithms can predict floods, forest fires, cyclones, heatwaves and droughts. This not only benefits the agricultural economy but also encourages water harvesting techniques. Global Precipitation Management (GPM) is an open-source mission that measures global precipitation and energy cycles in terms of rain and snow. This way incidents of crop failure and droughts can be gauged beforehand.

Aerosol mapping indicates greenhouse gas activities as well as the intensity of air

pollution. This predicts the potential of increase in respiratory diseases that have graver repercussions for those in informal settlements and urban clusters.



Significance

- Enabler of transition economies that are green and relatively more climate resilient.
- Enriches Environmental, Social and Governance (ESG) data to guide public administration, corporate sector energy policies and social impact strategies.
- Potential climate resilient solutions by mapping out climate risk exposures and vulnerabilities at a regional and global level.
- Environmental forecasting prevents future probabilities of disruption across financial services, supply chains, global trade and logistics sectors.
- Mitigate the urban island effect concerning green cover
- Facilitates conservation of biodiversity – exotic plant and animal species
- Helps in locating potential flashpoints indicating outbreaks of ecological distribution conflicts
- Increasing greenhouse gas emissions, such as methane production by unsustainable agricultural production, are caught by remote sensing for ecological forecasting.
- Climate adaptation projects can be planned when weather and microclimates can be mapped.
- Public health systems will be strengthened against heat waves and weather-related outbreaks of diseases, and transboundary air pollution action plans.
- Disaster risk reduction strategies must include customised insurance plans for frequent slow-onset and rapid-onset disasters.
- Ocean warming, harmful algal blooms, cryosphere – the destruction of permafrost and oil spills.



Constraints to Climate Risk Modelling

Data storage of large terra-bytes is indeed not eco-friendly. Climate science also requires more significant representation of women scientists of colour. This would be a move to consolidate racial climate justice at the basic foundations itself. Data analytics of climate risk must be taught under climate education in schools. Geo-engineering techniques have a double-edged sword that can manipulate natural climate trajectories or be very cost-inefficient while at the same time presenting themselves as climate risk solutions.

Policy Suggestions

- Ocean floor mapping, cryosphere and atmospheric models need a multi-sectoral approach that focuses on small island developing states.
- Community-level use of climate data analytics can be implemented by coherent climate-resilient planning. Concomitantly, microclimates can be coordinated with local agro-climatic patterns.
- STEM-related careers in environmental data must recruit the youth.
- Smart agriculture is enabled by land restoration as land degradation and desertification gets redressed.
- Science-led early warning systems and post-disaster transition models are required.
- Climate risk modelling requires more investment in research and development while cohering itself with localised indigenous knowledge about weather and climate patterns.

Disorderly climate transition has been reported as a significant global risk in the Global Risks Report, 2022, by World Economic Forum. Culturally relevant climate teaching and indigenous knowledge can translate modelled climate data into context-based realities. Climate risk modelling facilitates a net zero carbon economy with pre-disaster and post-disaster assessments. Simply put, escalating importance of technology in climate science requires more significant involvement of women of colour, climate resilient traditional ecological knowledge. They are the most impacted stakeholders by slow and rapid onsetting disasters.

We have seen how data science, climate change and data visualisation all come together to save us from all impending and current climate risks. Surely, we can safely say that climate forecasting has become much more advanced and interesting than mundane prime time weather alerts!



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