HORIZON

AN SCMC CHRONICLE MAGAZINE

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EDITOR'S NOTE

This is the third edition of the special issue on environmental issues that the Final Year Journalism students of SCMC bring out every year. This year it was decided to brand this product and call it 'Horizon' – considering the fact that environmental pollution is both literally and figuratively darkening the future of the planet, and the horizon looks bleak.

With the Glasgow global climate summit just concluded, there is a preponderance of reports on various aspects of global pollution. One such report examines what five giant global corporates are doing to reduce their carbon footprints. There are reports on more imminent dangers like climate change affecting global food security. Concern over the carbon footprint of the soccer World Cup in Qatar also finds mention.

Significantly, student reporters have also focussed on issues affecting the city. They have reported on the work being done by a clean-up group which calls itself the Pune Ploggers; and another, trying to save the popular Vetal Tekdi hill (there are two stories on that). The growing levels of automotive emission in the city is also a concern. Pune's claim to being a Smart City has also been questioned.

Perpetual concerns like crop-stubble burning, plastic ban, solid waste management, conservation efforts like preventing deforestation and saving mangroves are also reported in this issue. One remarkable feature speaks of a seemingly bizarre plan to 're-freeze' melting polar ice.

Bringing the cheetah back into the Indian habitat has grabbed popular attention. There are two stories on that too.

CREDITS

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Despite Protests, Pune May Lose One Last Green Space

Vetal Tekdi is a unique ecosystem that attracts a lot of migratory species

BY ATHARV UNHALE

To ease congestion in India's fourth most traffic-congested city, the Pune Municipal Corporation has planned three road development projects that threaten the environment.

Pune's Vetal Tekdi (Hill) in the Kothrud area is one of the last remaining habitats in the city for wildlife, including migratory species. It is part of the Vetal Tekdi-Hanuman Tekdi complex, a forested, hilly expanse that stretches as far as Pashan and Senapati Bapat Road across the city. The hill is also an important groundwater recharge zone. However, it might soon be destroyed.

To curb traffic congestion in the city, the Pune Municipal Corporation (PMC) has planned three road development projects in the area: Bal Bharati-Paud Phata link road on Law College hill slope, the High Capacity Mass Transit Route (HCMTR) elevated road, and tunnel roads from Panchavati which exit at Sutardhara and Gokhalenagar. These projects can irreversibly damage the ecology of the hill and severely hamper its groundwater recharge capacity.

Community Organisations Protest

The hill has been a space for community engagement for decades, with people from all walks of life coming here to relax, exercise and escape the city. The Mehandales, a retired couple, have been frequenting the hill for the last decade.

"This place is a breath of fresh air, literally. Often, this is the only place that helps us keep healthy. It's home to wildlife. Why would you want to lose this? PMC must find an alternative," they say.

Some citizens have strongly reacted to these projects and assembled under the banner of Yellow Ribbon Campaign (YRC) to protest. Protesting since early August, they have been tying yellow cloth ribbons on trees marked for felling for the projects.

Before the YRC, protests were also organised by the Deccan Gymkhana Parisar Samiti and Save Pune Traffic Movement as early as May. Though some of the protests were attended by 1,000-2,000 people, public participation has remained limited.

Anti-Development ot Anti-People?

The PMC has regularly termed these protests as "anti-development". In response, Aditi Deo, from YRC, says, "What do you mean by development? A good city must have places where citizens can be one with nature. If they (PMC) say we're anti-development, we say they are anti-people." Appealing to the corporation, she adds, "You can't just be so greedy. It's not worth it."

Slum Dwellers of Kelewadi Ignored

However, the protests against the PMC projects have faced shortcomings. Apart from the lack of consistent public participation, they have also failed to involve one of the primary stakeholders – the residents of Kalewadi. Kelewadi is a slum on the slopes of Vetal Tekdi. Residents here may face displacement as work for the three projects gets underway.

This is something that they have dealt with before. Just before the COVID-19 pandemic, a private real estate development threatened to displace many residents here in exchange for paltry compensation. They resisted and saved their houses. Now they may have to do it all over again.

However, they have not been meaningfully involved in the protests that have taken place against the projects. A local doctor, running the only clinic in the slum, says, "We are aware of the projects and strongly oppose them. However, we had no idea of the Yellow Ribbon Campaign or other protests. If we knew, we would show up in large numbers."

Without their involvement, the protests against the projects may not be as effective, possibly leading to the hill becoming another case of a green space lost in the name of 'development'.

Pune's Road Dev. Projects Irk Environmentalists

Environmentalists, activists and pressure groups in Pune have protested against the road projects that would undermine the ecology of Vetal Tekdi (Hill seen above)

BY PRANOTI ABHYANKAR

Is demolishing this Vetal Hill necessary for a 'short-term' traffic congestion solution?

The Pune Municipal Corporation's three proposed road development projects have been red-flagged for the detrimental impact that they might have on the ecology of Vetal Tekdi (Hill), leading to protests by several groups.

Environmentalists, activists and pressure groups in the city have analysed impact studies and predicted outcomes to buttress their claim that the projects would not lead to any tangible benefits for the people, and instead destroy the biodiversity of the area.

The PMC's plan to curb traffic congestion in Pune City led it to propose three road development projects: the Bal Bharati- Paud Phata surface road on Law College hill slope, the High Capacity Mass Transit Route (HCMTR) elevated road, and tunnel roads from Panchavati which exit at Sutardhara and Gokhalenagar.

'With Only 15% Likely Reduction in Congestion, Is it Worth It?'

Protests have been organised against the projects by organisations such as the Deccan Gymkhana Parisar Samiti and Save Pune Traffic Movement. The latter's director, Harshad Abhyankar, said, "The primary objective of PMC's road project is to reduce the congestion on Law College Road. Even though the PMC appointed consultants to analyse vehicular counts and study traffic congestion, they did not draw concrete conclusions. If only 13-14% of people are likely to take this road and there's only a 15% reduction in traffic congestion, is constructing the road worth it?"

He pointed out that traffic congestion in Pune could instead be curbed by the development of the metro that has a substantial network. The bus services in the city could also be revamped to become more efficient.

"Focus on the emergence of e-buses, build bus stops with shades and set up a good network. It will encourage more citizens to take up public transport," he suggested.

'Dubious Benefits'

A citizen-led movement active online against the PMC's plans, 'Save Vetal Tekdi' has critically reviewed two studies carried out by the PMC – an environmental impact study and a traffic congestion study. The conclusions from the former have indicated that the Air Quality Index (AQI) of the Law College Road is similar to that of other busy roads in Pune, and constructing the Balbharati Road would actually increase the AQI at Kanchan Lane.

Meanwhile, the latter study's conclusions have indicated that few commuters are likely to benefit from the road development, and it will only end up being a short-term solution for 12 to 15 years.

"Is it worth wasting Rs 150 crore of public money, not to mention the irreversible impact on groundwater and biodiversity for a road with dubious benefits?" asked Sushma Date, an environment activist and one of the organisers of the Yellow Ribbon Campaign, another initiative that has protested against the road projects.

Defining Development

With the PMC calling the protests "anti-development", Abhyankar emphasised on the need for certain natural resources in the city to be out of bounds for 'development', so as to conserve the ecosystem. "Constructing something sophisticated by spending crores of rupees is not the definition of 'development'. The benefits and outcomes are determining factors," he said.

The Chronicle attempted to reach out to VG Kulkarni, the Road Department Head from the PMC, but did not get a quote from him regarding the issue.

Pune Really A Smart City?

BY NANDINI TUPE

To preserve its natural resources, the city will need to control its construction waste disposal.

B asking in its flawless geographical existence, the Queen of Deccan was once a paradise for people looking for a getaway from their fast paced corporate life. However, this sleeper's paradise, having seen massive growth in the commercial aspect in recent years, has resulted in increasing pollution that is taking a sizable bite off the fostering weather. The city seems to be advancing towards being stolen off its capabilities to rejuvenate the pensioners.

Rise in Construction

The city is developing at a pace faster than ever. The appealing economic and demographic conditions, continues to make Pune a thriving residential market. The demanding IT sector too highlights the city and puts it on the map of development. Many well known builders such as VTP and Kolte Patil Developers are coming up with residential schemes in the coming year. Construction in numerous parts of the city is rising. The city does not have a construction waste disposal system. Every day, the city generates an approximate of 110 - 250 tonnes of construction and demolition waste. The Pune Municipal Corporation (PMC) is still planning how to properly dispose of this waste.

Demographic Advancement

People are moving in significant numbers to the city, for new work opportunities. The city's slums are also a result of this. The ESR research notes that the city has 950 ha (hectare: 10,000 square meters of land) of hilltop in hill slope green cover and 2880 ha of forest cover, but that due to increased urbanisation, the city's green cover is slowly declining

Pune has always been one of the Asian-Pacific cities with the quickest growth rates. The city's population increased from 1.6 million in 1991 to 2.5 million in 2001, a 40% growth. Pune has experienced at least 40% decadal growth over the past 40 years and if this trend continues, it is predicted that the city's population would reach 5.6 million by 2030.

Mula - Mutha Project

The PMC and PCMC regions of Pune are divided by the rivers Mula and Mutha, which are both very significant rivers. Since a few decades ago, the twin cities have undergone significant urbanisation, putting pressure on these rivers. The rivers are no longer considered advantages to the city because they are now largely unreachable from it. These waterways have been abandoned by the city. Pune Municipal Corporation has initiated a comprehensive project called the Mula, Mutha and Mula-Mutha Riverfront Development Project throughout the entire Pune Municipal corporation region in order to address these existing concerns and establish a relevant public realm along the rivers.

In the coming decades, however, the technique became impractical due to rapid climate change and unfavourable conditions.

The city is coping with increasing demographics and construction work.

Having electric buses is a step in the right direction, but core issues continue to be unaddressed

City Chokes As Government Chooses To Snooze

BY ALLEN DAVID JAMES

Clear blue skies, pleasant weather and clean air – these have been some of the terms used to describe the city of Pune in Maharashtra over the years. Boasting of a thriving education sector, booming industrial development and a fast-growing IT sector, the city offered the promise to become an urban success story.

But fast forward a couple of years and the city is crumbling, threatening to reach a breaking point, as overpopulation and lack of governance have derailed holistic growth and development.

Present Scenario

A city that was once home to a thriving cycling culture, Pune now finds itself to be a victim of air pollution, with a major contributor being the transportation sector. The booming industrial development is also not far behind. In 2018, Pune gained an interesting distinction of becoming the first urban region to have more vehicles than the number of people. Ironically, it was in this very year that it topped the Ease of Living Index released by the Union Ministry of Housing and Urban Affairs.

Data Paints a Worrisome Picture

In a recently published report by the Automotive Research Association of India (ARAI), transport emissions and road dust (gravel and concrete) contribute around 45% of the air pollution in Pune. Experts have highlighted particulate matter emissions – PM2.5, PM10 – to be the most dangerous after Nitrogen Oxides (N0x) and carbon emissions.

The ARAI report highlighted that transport emissions are responsible for 20% of the PM2.5 emissions in Pune district, with road dust accounting for 35% of the PM10 emissions and about 20% of PM2.5.

A 2019 ICMR study revealed that Maharashtra had the second highest air pollution-related deaths that year, with the report also disclosing that the cost to the state's GDP was a whopping Rs 7,182 crores.

These figures paint a grim picture, with the negligence from city authorities only adding to the woes. The city witnesses traffic snarls daily, with inadequate public services exacerbating the situation.

The Road Ahead

First, there is an urgent need for a sustainable plan of action that sees the city's public transport system become more efficient and affordable. The usage of private vehicles needs to be discouraged through the investment in the improvement of the PMPML service and resurgence of BRTS, along with improved cycling and walking infrastructure.

The adoption of electric buses is a step in the right direction. Union Minister Nitin Gadkari has been an advocate for flex-fuel engines and has emphasised on the need to revamp the entire public transport system to an electric base, along with increasing charging stations across the city. While the plan of action has been laid down, trouble arises when it comes to the execution.

IMAGE COURTESY: Vichry Alvian & Anandvan Pune

Urban Forestry Is A Viable Option?

BY PARIDHI MAHESHWARI

A Pune-based organization aims to make the city the first Urban Forest of India but can such a model withstand climate change?

The Indian Ministry for Environment, Forests and Climate Change had made an announcement back on June 5, 2020 (World Environment Day) regarding the implementation of the Nagar Van Scheme. The scheme aims at creating and promoting urban forestry across 200 Indian cities between the period of 2020-25.

As per a report by The Third Pole, no progress was tracked between the years 2016-20, when a similar announcement was made by the then minister Prakash Javadekar in 2016.

However, the scheme was finally kicked off in New Delhi this year during the 'Hariyali Mahotsav' on July 8, 2022. The scheme is at present being implemented in 75 Indian cities. As per a press release by the MOEFCC dated August 1,2022, the pilot scheme aims at developing 400 Nagar Vans and 200 Nagar Vatikas in the period from 2021 - 2025.

Urban Forests as carbon sinks

Cities around the world are responsible for over 75% of CO2 emissions and a healthy tree can store up to 13 pounds of carbon annually. Trees also help control stormwater run-off which is becoming a massive problem in India year after year. Tokyo, Belfast, Singapore, are great examples of cities which have taken urban forestry to the next level. Urban forests are cropping up as the best nature-based solutions to climate-resilience cities. However, they are also prone to the impact of climate change if not planned and regulated well.

The Anandvan Model

Pune was known for its pleasant climate all throughout the year. However, rapid urban development has increased the climate vulnerability of the city in the past few years, with erratic monsoon showers and extremely high temperatures during summers.

As per IMD's Retired Director General Ranjan Kelkar, high-rises, constructions and deforestation are among the major reasons for a warmer climate.

The Anand Van Mitra Mandal is an NGO based out of Pune which aims at making the city the first Urban Forest of India. Apart from 6 core committee members, this is a completely community-driven initiative that has helped transform over 50 acres of barren land into forested area in Pune, with 150 acres more in progress. They work on land given by the forest department and aim at cultivating native species in order to facilitate better tree health and provide a space for migratory and native birds.

Cost and Maintenance are cited as the biggest difficulties in Urban Forestry because Urban trees die quickly due to the polluted environment around them. " All the committee members do not take salaries from the NGO and pool in our own money for this initiative. Companies who engage in CSR activities are also among the biggest stakeholders in this initiative. We ensure that these green patches are a little distant from the main streets and follow the Japanese Miyawaki technique of forestry. These help grow trees vertically and closer to each other," said Mr Vishal, the Vice-President of Anandvan.

Land encroachment is another massive problem that Vishal felt could be tackled. He cited the 2019 protests against the HCMTR project over the cutting of hills and green cover. "This is a very strong community driven initiative, we will not let anything happen to these green patches."

Left : School children planting trees at the Anandvan site ;
Right : The Anandvan site at NIBM Road, Pune

Clean-Up Initiative: The Pune Ploggers

BY ADITI IYER

Plogging is a Swedish term for picking up litter while jogging, a new effort in environmental conservation.

Pune Ploggers was founded by Vivek Gaurav in 2019. It adopts the Swedish term for picking up litter while jogging — and is one of the world's largest community-plogging campaigns.

Initially a grassroots-level movement, plogging is gaining traction as more people have started recognising its work. It is a volunteer-oriented organisation, taking volunteers who are interested in the campaigns that take place across various areas. In Pune, the city's ploggers have reportedly organised over 300 cleanup drives around Pune.

Volunteer Experiences

I spoke to various volunteers present at a cleanup drive that took place on FC Road, Pune, on 8 September. They told me that they had gathered to make their contribution towards betterment of society. Around 70 people turned up, of whom 50 were regular volunteers – with the volunteers ranging from school children to elderly people. They began plogging at 7:30 am and it went on till 9 am.

I got in touch with Prafull, a campaign organizer who has been a part of the Pune Ploggers for two and a half years and has regularly been organizing weekly campaigns. He joined after the founder moved to Bristol for his further studies. I asked Prafull about his experiences in the organisation.

How long does it take to organise a campaign?

The process starts with making a poster for the drive, with the help of our Social media and Graphics Team. The poster is uploaded on our social media accounts on Wednesday or Thursday. Then we purchase biodegradable plastic bags (they are used during monsoon; usually, we use cloth bags) and have reusable gloves, distributed at the drive. The process starts on Wednesday and ends on Sunday.

Volunteers cleaning up during a campaign in F.C. Road

How organisers and volunteers use their free time and dedication to environmental conservation through plogging

What did you hear about Pune Ploggers that made you approach this organisation?

The word plogging itself is what attracted me towards the activity. When I searched the word online, I found out that plogging means picking up trash while jogging. The concept made me want to join the group.

How much waste did you collect off the road at the end of this campaign?

We collected 27 bags of plastic, and 4 bags of glass bottles.

How has your experience been as an organiser?

I have been organising all the cleanup drives for the last 1.5 years. Organising a drive for more than 100 people every weekend helps you grow, so my experience has been wonderful.

The Pune Ploggers' growing popularity in cities worldwide has helped highlight the problem of littering in public places. Through these campaigns, the organisation and its volunteers hope to instil that even the smallest steps can lead to significant changes.

A cheetah in its majesty

India's Ambitious Cheetah Project: Shortcomings And Criticisms

BY MAANSI ANAND

The Cheetah Project has been applauded by many, but also criticised by some. Here's why.

The first year of India's independence saw the extinction of the Asiatic Cheetah. Shot last in the princely state of Koriya, presently known as Chhattisgarh, the Asiatic Cheetah made its comeback almost 70 years after it was declared extinct in 1952. Eight cheetahs were released by PM Narendra Modi on 16 September, 2022 in the Kuno National Park in Madhya Pradesh. This re-introduction plan materialised almost 12-13 years after it was first conceived by the UPA government in 2008-09.

The 'Project Cheetah' aims to re-introduce and develop a metapopulation in its historical range in India. It further aims to allow the cheetahs to perform their functional role as a top predator, contributing to expanding the cheetah population in its natural habitat. A Memorandum of Understanding in 2022 was signed between the Indian and Namibian governments, leading to the donation of eight felines by the latter.

Although the move has been instituted in hopes of the restoration of the Kuno grassland ecosystem and the eventual increase of biodiversity, several conservationists have been skeptical about the Cheetah Project.

So far, we have encountered the following shortcomings of The Cheetah Project.

The New Habitat is Unsuitable for Cheetahs

The Cheetah is a wide-ranging species – travelling annually across areas up to 1,000 sq. km. With smaller parks, India offers less space than bigger areas in their home country, Africa. Apart from this, the movement of tigers across Kuno-Palpur to escape overcrowding also needs to be tracked.

This brings up the complicated issue of an existing wildlife corridor between the two reserves. While the Kuno National Park currently suits the needs of the cheetahs, it may ultimately evolve into an area more suited to tigers - a dry, scrubby forest, experts have pointed.

No Scientific Evidence to Draw Upon

There has been no scientific evidence to prove that big cats like cheetahs, tigers, lions, and the like can co-exist comfortably. Such life in a shared habitat may have unexpected repercussions, but there is no real-life experience to draw upon to gauge the extension of its shortcomings.

Where Do the Long-Displaced People of Kuno Go?

To make space for cheetahs, almost 24 villages in the Kuno region were emptied - however, thousands of those displaced are yet to receive their land rights. About 1,500 families occupied these territories as directed by the 2011-version of the Cheetah Action Plan; a decade later, there has been no word on the relocation of the displaced people.

Poorly planned and executed relocations have resulted in confusion and fear amongst the locals displaced; villages like Bagcha, Khalai, Nayagaon and others were forced to leave their homes, and give away the ploughs, grains and vegetables stored for future use as collateral damage.

The Cheetah Project is on its way to becoming a boon for wildlife tourism; however, it may present the threats of intra-species and human-wildlife conflict. More than a conservation imperative, it may emerge more as a vanity project fulfilled despite environmental concerns regarding the ecosystem.

Welcome Back Cheetahs!

"A long wait is over, the Cheetahs have a home in India at the Kuno National Park," PM Narendra Modi tweeted

BY IKSHAA DHODI

Cheetahs welcomed in India by PM Modi in September 2022, quarantined for health checkups.

No one is a stranger to the big news about eight cheetahs being brought to India on Prime Minister Modi's birthday. Cheetahs were declared extinct in India around 1948, primarily due to habitat reduction and overhunting. Since the government declared the cheetah extinct, plans were drawn up to bring them back from foreign countries like Iran. From the extinction to bringing them back, 26 years have passed, and the cheetah reintroduction plan has just started.

Formal proposals to bring back cheetahs were drawn up in 1955, starting in Andhra Pradesh. These proposals prompted the government to bring back the cheetahs for experimental purposes. Initially, it was planned that India would acquire the cheetahs from Iran, and while the two countries shared multiple diplomatic level talks, due to Iran's domestic issues, the plan could not go further. In later years the number of cheetahs in Iran decreased, making it hard for India to get Cheetahs from them. On the side, Kenya was sending multiple offers to the Indian government about sending their cheetahs.

Initiation and Early Steps

In 2009 Laurie Marker, who is also the supervisor of the Cheetah project now in India, introduced the plan to relocate South African cheetahs to India and keeping them under strict supervision. Wildlife Institute of India (WII) and Wildlife Trust of India (WTI) were also a part of this meeting alongside many other significant NGOs. After the Ministry of Environment, Forest and Climate Change approved the plan, the tiresome process of relocations started, with the biggest question being --- "Where will the cheetahs live?"

According to the then government, the following places were being discussed as potential habitats:

1. Kuno Palpur National Park
2. Nauradehi Wildlife Sanctuary
3. Gandhi Sagar Wildlife Sanctuary
4. Shahgarh bulge
5. Mukundara Tiger Reserve

Kuno being the highest rated, became the number one choice for everyone to bring cheetahs in for the initial stages. However, the plan did not materialise immediately.

With multiple bumps around the way, on 17th September 2022, eight cheetahs were brought to India from Namibia. The cheetahs have been put in quarantine for a month and have been installed with digital chips to help their caretakers keep track of them. They will then be introduced to small areas of the park slowly till they get used to their environment.

The cheetahs have been put in quarantine for a month and have been installed with digital chips to help their caretakers keep track of them. They will then be introduced to small areas of the park slowly till they get used to their environment.

Future Plans

There are big plans made by the government to increase the cheetah population in India. Aside from breeding, twelve more cheetahs will be brought from South Africa in October 2022. If the breeding process goes according to the plan and a few more cheetahs are brought in, the number would significantly increase. Then the cheetahs can be sent to other national parks in different locations.

Cheetahs were the first species in India that went extinct due to unnatural issues, these big cats are what India used prides itself about. If the project goes as planned, then India will soon be able to pride itself on its cheetahs once again. India is ready to welcome the fastest land animal back, and this time with more planning and positivity.

Stubble Burning: Options There, No Implementation

BY AMBIKA ATUL BAPAT

Efficient substitiutes for stubble burning are available, and policies have been formulated, but the cases of stubble burning still continue.

To prepare the soil for sowing in the rabi season (October-March), farmers clear their fields of residual stalks and stubble by burning them directly in the field. This method is cheap, convenient, and quick.

When harvesting is done manually, the stubble is completely cleared. But the combine harvesters leave around 15 cm high stubble as residue, which is then burnt by farmers. The states of Punjab, Haryana, and Uttar Pradesh, bordering Delhi, report the most cases of stubble burning in the country.

Earlier, the Centre had submitted to the Supreme Court that stubble burning in October and November 2021 had contributed 30-40% to Delhi's PM 2.5 count – a measure of air quality – and a total of 77,000 such cases were reported, the highest in the last four years.

According to the Ministry of Agriculture and Farmers' Welfare, every year, almost 30 million metric tons of stubble is generated, of which the farmers burn 23 million.

Sustainable Alternatives

Stubble can be effectively utilised as a resource. It can be used as a raw material in biomass power projects and 2G Ethanol plants, or to produce paper, cardboard and cattle feed. Crop diversification and machines such as happy-seeders – which can simultaneously sow seeds while removing stubble – are some of the alternatives, which can offset the problem of stubble burning.

In November 2021, the Indian Agricultural Research Institute developed a bio-enzyme known as PUSA, which can decompose stubble into manure

This invention also has the potential to solve the problem of stubble burning, as it enriches the soil with vital nutrients that would otherwise get destroyed in stubble burning.

But all these alternatives come with challenges. In 2009, the Punjab and Haryana governments passed laws to prohibit farmers from sowing paddy before the onset of monsoon to encourage the use of rainwater instead of groundwater. This caused the entire cropping season to shift, with the timeframe between the harvest of kharif crops and the sowing of rabi crops decreasing.

Farmers clearing fields in Punjab

IMAGE COURTESY: Neil Palmer

This compelled farmers to choose stubble burning, which can clear the field overnight. Alternative methods like the PUSA enzyme require two to three weeks, thus disincentivising their use. Moreover, transportation and machinery costs remain as they are.

Policies and Implementation

The formation of the Aam Aadmi Party (AAP) government in Punjab in March 2022 has eliminated the possibility of a political blame game this year.

Despite the various schemes of the Central and state governments, such as the 2018 scheme on the promotion of agricultural mechanisation for management of crop residue which was allotted Rs 2,438 crores, cases of stubble burning have continued. The government has also provided subsidies for the purchase of machinery. This year, free spraying of PUSA bio-decomposer is being taken up as a pilot project in parts of Punjab. An awareness drive about alternatives to stubble burning has also been launched.

The government should engage with farmers to know about their reservations and apprehensions if it has to solve the problem of stubble burning and consequent air pollution. Though increased government spending, and formulation of policies and guidelines are welcome steps, they should be accompanied by effective implementation.

Climate Change Threatens India's Food Security

Floods caused by incessant rains in Bihar

BY UZMA AFREEN

The vulnerability to food security has been spiked by unseasonable winter rains and summer heatwaves.

On 13 May 2022, India announced a ban on wheat exports– sending shockwaves in the global market. Almost four months later, in September, India also banned export of broken rice, and imposed a 20% export duty on non-Basmati rice, with an exception for parboiled rice.

The decisions came as a blow to the international community which had been relying on the second largest wheat exporter of the world, in the wake of the war in Ukraine. But what was the reason behind this?

Vulnerability to food security was spiked by unseasonable winter rains and summer heatwaves, the markers of climate change.

The Scorching Heat Wave

India witnessed its worst heat waves in 122 years during the months of April and May that resulted in damaged, shriveled wheat grains. Smaller grains weigh lesser – thereby bringing down the total output to 111.32 million tonnes, which is 3.8 million tonnes less than that of the previous year.

According to the Indian Council of Agricultural Research (ICAR), the increase in temperature also resulted in low yield of several fruit and vegetable crops.

"Heat waves also led to reduction of cucumber and bitter gourd yield by 30 to 50%, and more than 40% in tomato compared to normal situation in Kathua and Bandipora districts of Jammu and Kashmir", ICAR stated.

The yield of summer fruit, mango, was also affected by extreme weather conditions. "The Kesar and Alphonso varieties of mango got impacted by Tauktae cyclone, very low temperature, isolated unseasonal rainfall and fog in December-January and high temperature in the month of March resulting in lower yields", the ICAR report, released in 2022 explained.

Unpredictable Monsoon Rainfall

After waves of scorching heat, farmers were waiting eagerly for the monsoon rainfall. However, the monsoon arrived too late, affecting the paddy crop this Kharif season. According to the first estimate released by the Union ministry of agriculture, a decline of around 6% in rice production is projected as compared to last year. It is to be noted that these estimates were calculated before heavy rains struck North India in the last week of September. The sudden heavy rainfall has worsened the situation. While the government has started the process of procurement of the rice crop, farmers are waiting for their crop to dry.

Food Production at Stake

According to a report released by the Intergovernmental Panel on Climate Change (IPCC) in 2022, the yield for crops like rice, wheat and pulses in the country is projected to further decline by 2.3% by the year 2030.

The report states that India is emerging as the most vulnerable nation in terms of crop production in Asia.

"Despite the observed increase in total food production in terms of crops and food yields from 1990 to 2014 in Asia (FAO, 2015), there is high confidence that overall, at the regional level, the projected total negative impacts will far outweigh the expected benefits, with India emerging as the most vulnerable nation in terms of crop production", the re.

Price Spike

The IPCC report has predicted price spikes for crops in all South Asian regions, emphasizing that India, Pakistan, and Sri Lanka are expected to see "significantly higher rice and wheat prices than under the baseline scenario".

"This will likely severely affect the overall economic growth of these countries since they are mainly agriculture-driven economies", the report stated.

Solid Waste Management: Where Does India Stand ?

Urgent need to improve India's solid waste management system

BY PUSHPANGI RAINA

In a country like India, where globalisation is increasing, Solid Waste Management (SWM) has posed a significant threat with more than 100,000 metric tonnes of waste generated daily. By definition, SWM includes collecting, segregating, transporting, processing, and disposing of waste. India's solid waste collection efficiency is around 22% to 60% today, as per India Water Portal. Out of the total collection, about 12 million tonnes are treated, 31 million tonnes dumped in landfill sites. Since India's current systems cannot handle this, most of the waste is left hanging within the ecosystem, harming ecology and health.

Do Policies Exist?

The Ministry of Environment, Forest and Climate Change issued Municipal Solid Waste (MSW) Rules 2016 to ensure effective waste management. Implementing these regulations and creating the necessary infrastructure for proper disposal of MSW are the responsibilities of the authorities. These rules are applicable to municipal areas, urban areas, towns, industrial townships, areas under Indian Railways, airports, special economic zones, places of pilgrimage, religious and historical importance, and government organisations.

The 12th Schedule of the Indian Constitution states that 'urban local bodies' are responsible for the cleanliness of cities and towns. Unfortunately, most lack the necessary infrastructure, financial incentives, oversight from authorities, political will and public awareness.

Recent Initiatives?

With the enactment of new rules, the 'Swachh Bharat Mission' (SBM) started a door-to-door collection of waste. The 'Swacch Survekshan' was launched under the SBM to give ratings to garbage-free cities and towns. The multi-media 'Compost Banao, Compost Apnao Campaign' was started to convince people to compost their kitchen waste so that it can be utilised as fertilizer and to cut down on the quantity of waste that is dumped in landfills.

Additionally, SWM is a part of the National Mission on Sustainable Habitat 2010, which is one of the eight missions under the National Action Plan for Climate Change (NAPCC) and addresses sustainability problems related to habitats.

Change Is Required!

The SWM in India is in a bad state because the best methods are not being applied to improve them. Municipal authorities don't have enough budgets to cover the expenses related to a proper waste collection, treatment, and disposal system.

Innovation that could revolutionise waste management has been stifled by a lack of environmental awareness and no motivation.

Waste management needs to be considered an essential service requiring sustainable financing.

Waste must be segregated at the source to allow more efficient value extraction and recycling. Indore, the cleanest city in India six times a row, generates over 1,115 metric tonnes of garbage a day. All of it is collected from the source, and through the cooperative efforts of the people, 100% of its residential and commercial units have achieved waste segregation at source.

Several organisations, NGOs, and MNCs are working towards a comprehensive approach to waste management in India in the future. Pimpri-Chinchwad Municipal Corporation has stated that if big housing societies have not constructed wet waste processing facilities, it will not collect "wet garbage" from them.

Today, India relies on inadequate waste infrastructure, despite the government initiawtives.

When community awareness is built and people's attitudes toward waste are changed, India will no longer suffer from poor waste management systems.

Single-Use Plastic Ban: Why It Failed In India

BY PRATISHTHA BAGAI

The Central Pollution Control Board issued a public notice dated 4 February 2022, notifying the ban on the manufacturing, sale, purchase and use of 19 Single-Use Plastic (SUP) commodities effective from 1 July 2022.

In July 2022, the nationwide ban on nineteen single-use plastic commodities came into force. However, not only are these items still in circulation and distribution, especially in metro cities, but also the items covered in the list of banned commodities are questionable, say experts.

In conversation with Prashant Sharma, Founder, Children's Earth Organisation, a NITI AAYOG and UNEP-affiliated NGO, we understand why the single-use plastic ban has failed in India.

Which Items Are Banned?

The nineteen items covered in the ban are earbuds with plastic sticks, plastic sticks for balloons, plastic flags, candy sticks, icecream sticks, polystyrene (thermocol) for decoration, plastic plates, cups, glasses, cutlery such as forks, spoons, knives; straws, trays, wrapping or packaging film around sweet boxes, invitation cards, cigarette packets, plastic or PVC banners less than 100 microns, and stirrers. Experts have pointed out that the ban does not cover all single-use plastic items.

According to these reports, the share of the now-banned single-use plastic is as low as 2%-3% of the 3.5 million tonnes of plastic India generates.

How Has the Ban Affected Different Segments of This Industry?

"Even though the major industries had ample time before the implementation of the ban to alternate their production and packaging according to these guidelines, it turned out to be quite impractical in some ways," Prashant Sharma commented.

For example, plastic straws attached to liquid containers have been replaced with paper straws by most of the major players in the industry. However, the paper straws are covered in plastic wrappers as there is no restriction on that, which defies the purpose of the ban altogether. Another example of the elimination of plastic cutlery with popular instant food items like instant noodles, instant poha, instant upma etc., without provision of alternatives like wooden cutlery makes consumption. Such industries have also benefited from lower packaging costs.

As far as the unorganised sector is concerned, they did not take the ban well either. "The economy took a major hit in the pandemic and is further worsened by inflation. In this condition, the cost of acquiring biodegradable alternatives to the listed items adversely affects small business owners, and their customers," Sharma said. "The lack of sturdy, affordable and practical alternatives to banned items further adds to their problems," he added.

How Well Did the Government Plan and Implement the Ban?

Poor planning and implementation have affected the most vulnerable segment of the industry, while the major industries found a loophole and got away with similar or even cheaper packaging. Nor are the consumers very satisfied with this change. In some cases, they even pay extra for the items they got cheaper earlier.

"Before implementing the ban, the SUP items that had already been produced and are still in distribution should have been acquired by the government for better implementation," Sharma suggested.

Perspective on Future Plans?

On 30 September, carry bags with thickness below 75 microns were banned, and the minimum thickness will further be increased to 120 microns on 31 December this year. In Sharma's view, "The plan seems good on paper and will be beneficial only if the ground implementation is well taken care of by the government."

How Are Pastoral Communities Coping With Climate Change?

Pastoralists have been facing the wrath of nature despite caring for it due to their nomadic activities

BY ROSHNI KUMAR

They juggle between climate shocks & repercussions of government policies to make a living

For centuries Pastoralist communities have been involved in rearing livestock and sustaining the ecosystem. They thrive in rangelands or places which do not produce much and depend on their livestock products for survival

Today many pastoralist communities are fighting for their survival due to the ill effects of climate change on their livelihood. Erratic weather patterns are among the causes slowly eroding ecosystems and lands, thus making them unsuitable for pastoralists. Their nomadic lifestyle helps in alleviating climate-induced risks on ecosystems but tends to get disrupted due to human pressures that strains natural resources and does not permit the balance to be maintained.

To cope with climate variations many pastoralist communities have to frequently migrate to sustain their livestock. Though mobility is an integral part of their lifestyle but lack of access to grazing lands forces them to move often to survive . The Bakerwals and Gujjars from J&K have had to move regularly to adjust to the seasonal changes as their grazing pastures were affected . This also resulted in the loss of their animals which are the prime source of their sustenance. With the onset of winter they fear whether they will be able to find fodder for their livestock despite their deep knowledge of area and the location of resources

Pastoralist communities have maintained close ties with markets in order to sell their livestock and their products. To relieve themselves from climate shocks they depend on markets as an alternate source of income. They are also known to have a symbiotic relationship with farmers as these two communities rely on each other for support.

The nomadic community has adapted to strategies such as flexible mobility and adapted breeds to be included in agriculture developments. Communities such as the Rabari, Gujjar, and Dhangars, have been adopting this practice in order to obtain nutritious fodder for their livestock.

How do they provide a sustanible environment ?

Pastoralists, through their traditional methods, help in conserving biodiversity and soil fertility in lands which aids in plant growth .Their grazing activities maintains vegetation which in turn reduces carbon dioxide and soil erosion which keeps landmasses intact and facilitates water holding capacity that provides essential resources and a livable habitat for wildlife. This nomadic lifestyle greatly helps to reduce the adverse effects of climate change on the ecosystem .

Lack of Empathy from Government

Despite promoting a sustainable environment and being managers of livestock Pastoralists in India remain invisible in the state policy. Reasons behind this could be the poor documentation of them and lack of understanding of their livelihood by the powers that be. Although there are schemes pertaining to livestock that cater to farmers and documented populations of animal keepers, they do not focus on pastoral communities adequately. Linkage of pastoralists with government and private institutions would be necessary for them to get incentivised and obtain benefits. This will help them to deal with climate shocks and regain their way of life.

Mangroves In Kerala: A Losing Battle

BY RANIYA ASHRAF ALI

Mangrove forests are one of the world's most productive ecosystems. They shield the coastlines from surges and waves, binding the coastal soil layers, and preventing soil erosion and withstanding floods. They also sequester carbon, making them crucial in the fight against climate change. These unique ecosystems are, however, threatened around the globe by both natural and manmade challenges.

A Fast Depleting Treasure Trove

Globally, mangroves are depleting at an annual rate of 1-2%, five times the rate of global forest loss. Kerala is no exception to this trend. As of 1975, the total mangrove cover has drastically shrunken from spanning over 700 sq. km to 6 sq. km by 2013, mostly due to habitat conversion, according to a research paper, published in the Journal of Forestry Research.

Although the state has recently witnessed an increase in mangrove forest cover, growing to cover 9 sq. km in 2019, the region's biodiversity has taken a hit. Conservation efforts in the state dismissed location-specific and species-specific information on mangrove forests, which encouraged mono-species dominance. This is seen as a step backwards, as Kerala represents 41% of the true mangrove species in India, even if the state accounts for just 0.19% of the total mangroves of India.

Nearly 80% of the state's mangrove forests are found in Kannur and Kasargode districts, with moderately dense cover seen in areas along the river banks in Kasargode, Kottiyur and Valapattanam as well as along the Pazhayangadi River.

Until a few years back, the district of Ernakulam overtook Kasargod in terms of mangrove cover. But much of this has been lost to urbanisation and ecological degradation over the years. In the span of around three decades, the total mangrove cover of the district came down from around 500 hectares to 182 hectares, as per India State Forest Report (FSI, 2010).

One Step Forward, Two Steps Back

According to a report by The Kerala Forest Research Institute (2008), more than 80% of mangrove regions in Kerala are under private ownership, posing to be one of the biggest hurdles in the way of actual conservation efforts.

Mangrove forests in Kerala face insurmountable odds in the battle against deforestation as regulations that protect these regions give way to human interests.

All mangrove regions come under the Coastal Regulatory Zone (CRZ) and are legally protected by the CRZ Act. However, there has been unabated destruction of mangrove forests for Kaipad paddy cultivation and shrimp farming, even though this directly violates the CRZ Act. Though not explicitly encouraged, these activities are further aided by government projects like "Nellum Oru Meenum", which incentivizes paddy farming along with fish culture through government subsidies.

Furthermore, many have objected to the latest CRZ notification (passed in early 2019), which proposes measures to relocate mangrove vegetation in areas under 50 sq. metres to a mangrove land bank (MLB).

The notification, which underwent drastic changes from earlier versions of the notifications (passed in 1991 and 2011), permitted the clearing of mangrove vegetation for a number of anthropogenic activities, in the condition that thrice the amount of cleared mangrove vegetation is replanted; a recommendation that has been severely criticised from all corners.

Like Dr B. M. Kurup, the Founder Vice-Chancellor of the Kerala University of Fisheries and Ocean Studies, Panangad told The Hindu, "no amount of compensatory mangrove planting would make up for the functional efficiency of the natural mangrove ecosystem."

IMAGE COURTESY: Timothy A. Gonsalves

Dahanu, A Vulnerable Coastal Region Near Mumbai, Under Attack

BY EESHA JAVADEKAR

Dahanu is recognised as the "region's fruit and food bowl," and the bulk of the people are either in farming or fishing. Along with seafood and lobster, one of Dahanu's main exports is Bombay duck.

❝Dahanu is densely forested with mango and chikoo [sapota] orchards. It also provides dry grass [fodder] for animals, which allows Mumbai residents to enjoy their daily share of dairy. Dahanu is the region's final green patch, which the environment ministry wants to demvolish," Phiroza Tafti of the Dahanu Taluka Environment Welfare Association, a local non-profit fighting to conserve the eco-fragile area, said.

The 1991 notification "imposed restrictions on the establishment of industries that have a negative impact on the environment, and established guidelines for the establishment of industries and industrial units in specific locations based on whether they were covered under the Green, Orange, or Red Category."

Furthermore, the notice urged the state government to form a monitoring committee to guarantee compliance with the terms of the 1991 notification. The state government was also required to produce a master plan for the eco-fragile zone based on the taluka's current land usage within a year of notice. However, little progress was achieved in this area.

The Union Ministry of Environment, in October 2022 petitioned the Supreme Court to replace the Dahanu Taluka Environment Protection Authority with a monitoring committee. Locals and environmentalists claim that such a move would expose the environmentally vulnerable Dahanu area to pillage.

Villagers in Dahanu object to the project.

This new action by the environment ministry has upset environmentalists and local residents, who are opposing the anticipated dissolution or weakening of the Dahanu authority's powers.

Currently, this body is endowed with "all the authorities required to conserve the environmentally vulnerable Dahanu

Dahanu is an environmentally vulnerable location. Dahanu *taluka* is situated in Maharashvtra's Palghar district, about 120 kilometres north of Mumbai

Taluka and to regulate pollution in the said region" under Section 3(3) of the Environment (Protection) Act, 1986.

However, for the kind of process that it is, cloud seeding comes with its own set of challenges and questions about its effectiveness.The process of inducing precipitation requires the presence of moisture-laden clouds. It is not possible to carry out similar operations in dry conditions, thus reducing the scope of cloud seeding as a widespread practice. Cloud seeding does not hold much promise for restoring rainfall in regions without adequate rain-bearing clouds, thus limiting the success of various proposals.

Villagers who are likely to be impacted by the projected Mumbai-Ahmedabad High Speed Rail (MAHSR) project have been protesting since 2018, against a survey for the bullet train that is being conducted in a Dahanu hamlet while allegedly keeping people in the dark.

The train is likely to depart from the Bandra Kurla Complex (BKC) and, according to reports, arrive in Gujarat at Sabarmati. It would cover 12 stations in Thane, Virar, Boisar, Vapi, Bilimora, Surat, Bharuch, Vadodara, Anand, and Ahmedabad.

A Leopard Sighting in Belgaum Betrays Disrupted Wildlife Corridors

Leopard spotted near the Belgaum Golf Course. It managed to escape even as officials were ready to trap it.

BY POORVI AMMANAGI

What does it mean for wild animals to leave their home and come to ours.

On 5 August 2022, a wild leopard made its way into the city of Belgaum, Karnataka. It was spotted near Hanuman Nagar Circle, where it attacked a man. The man survived with no major injuries but the leopard escaped. It was later confirmed that the leopard had taken cover in the Belgaum Golf Course, which is surrounded on all sides by sub-urban residential neighborhoods. This terrified the people of the area. Although this was the first time a leopard was spotted in the heart of the city, the wild animal is periodically sighted in areas surrounding the city.

Although this was the first time a leopard was spotted in the heart of the city, the wild animal is periodically sighted in areas surrounding the city.

Increased Sightings of Wild Animals

Belgaum is a small city in the north of Karnataka that is surrounded by evergreen and semi-evergreen forests of Hemmadga and Jamboti. As a growing city, Belgaum has undergone significant changes over the past few decades to become an urban sprawl.

In order to make a city well-connected, railway and highway lines have to be laid out. When it comes to a city like Belgaum, this means that those lines cut through forest areas, causing a disruption to wildlife corridors.

Forests have also been cleared to give way to farmlands, while farmlands closer to the city are making way to give space to the growing population. With a rapidly changing ecosystem and disappearance of forest covers, there have been increased sightings of wild animals all around Belgaum. Just in the last few months, a hyena was spotted near Balekundri and a wild deer was seen in the streets of Bhutramanhatti.

An Expensive Operation

For an entire month – from 5 August to 5 September – the Forest Department, with the help of the police, attempted to search for the elusive leopard. The government spent around Rs 3 lakh a day for surveillance and tracing the leopard. Cameras were installed at Golf Course to trace the movement of the animal, forest department personnels stood guard outside the compound armed with lathis, and trained elephants were called in to help with the search – all to no avail.

On 5 September, the search was officially called off. According to Deputy Conservator of Forests (DCF) Anthony Mariyappa, after ten days of the leopard not being spotted on cameras, they called off the search, believing that the animal might have retraced back to its original habitat since there was no evidence to the contrary.

Life Returns to Normal?

A month later, life seems to have returned to normal for the residents in the vicinity, even though some of them who we spoke to were still fearful about visiting the golf course.

The operation was a massive undertaking, and not just monetarily, with over 300 officials involved in the search. However, not everyone believes it was efficient enough, with one local telling us that by the end of the month, while the operation was still on, the officials who were supposed to be guarding the compounds were nowhere to be seen.

The Case For Climate Reparations

IMAGE COURTESY: State of California

Tennant Fire, outside Yreka, CA (Photo: State of California

BY SOHAM SHAH

Climate change due to emissions largely caused by the Global North disproportionately affects the Global South. The poorer nations must be paid reparations for this.

Since the beginning of the industrial age, North America and Europe alone have contributed to about 62% of global carbon emissions. India, on the other hand, accounts for only 3% of historic carbon emissions even though it currently holds over 17% of the world's population. The African continent holds over 16% of the global population, but has contributed only 3% to historic emissions. As the consequences of climate change become clearer and clearer each passing year, this imbalance in emissions has become increasingly important to highlight.

Various floods in the past few years have been linked to an increase in temperature due to human activity. There has been an increase both in the frequency as well as intensity of flooding. Cases in point are the recent floods in Bihar and Pakistan. While the devastating floods in Bihar in 2017 left 514 people dead, the deluge in Pakistan in 2022 claimed the lives of more than 1,000 people, apart from crippling infrastructure.

Moreover, extreme heatwave events, like the ones in the Indian Subcontinent and Europe this year, have been made 30 times more likely by climate change. This year, India experienced the hottest March since 1901, leading to the deaths of over 90 people in the subcontinent. Europe was also affected by a severe heatwave and drought, with the record-setting temperatures in the UK grabbing headlines.

Why Reparations?

Another important distinction to make here is that Europe, with its much higher GDP per capita and social welfare measures, is much better placed to combat and adapt to these adverse events. The Global North has more resources to tackle these problems, with better prediction and evacuation systems, and the ability to invest more in disaster-resilient infrastructure.

Hundreds of years of imperialism has led to poverty and deprivation in the Global South. Coupled with the fact that a majority of the emissions come from the Global North, the case for climate reparations to the Global South becomes obvious.

The Global North must provide monetary compensation to the South to help transition to renewable energy sources. To ask poor countries to pay for expensive energy by diverting resources from essential services like education, healthcare, and housing is not only unfair but also immoral.

Reparations are not a new idea: Germany has paid Israel and Poland for the Holocaust, Japan to Philippines and Vietnam for World War II. The same logic must apply here, as the damage is caused by the Global North but the Global South bears the brunt. Pakistan's Minister for Climate Change, Sherry Rehman, made the same demand in September this year, saying, ""Historic injustices have to be heard and there must be some level of climate equation so that the brunt of the irresponsible carbon consumption is not being laid on nations near the equator which are obviously unable to create resilient infrastructure on their own."

Will the rich countries listen?

Is Cloud Seeding A Viable Alternative ?

Cloud seeding comes with its own set of challenges and questions about its effectiveness

BY PRANITH YASA

It's difficult to draw a conclusive link between cloud seeding and effective rainfall.

Earlier this year, China's Agriculture Minister Tang Renjian announced the ministry's plans to induce rainfall in agricultural regions with the help of cloud seeding technology.

China is no stranger to this practice, as authorities have used cloud seeding as a precautionary measure against water scarcity in agricultural regions and air pollution in cities. However, cloud seeding as a long-term solution is surrounded by a great deal of uncertainty, and may in fact prove detrimental to local ecosystems.

Cloud Seeding Also Experimented Within India

The most popular instance of cloud seeding in India is the efforts of the Tamil Nadu state government in the 1980s (led by then-Chief Minister MG Ramachandran) to restore water security in the state. While the government proposed multiple plans including rainwater harvesting and desalination, cloud seeding was the most ambitious proposal at the time. These attempts purportedly proved to be fruitful, as various drought-stricken areas in and around Chennai saw plentiful rainfall.

In the coming decades, however, the technique became impractical due to rapid climate change and unfavourable conditions.

Similarly, China has resorted to cloud seeding on various occasions as a short-term measure. In 2009, government authorities launched iodide rockets over Beijing in order to induce snowfall, which reportedly inadvertently resulted in abnormally high snowfall in surrounding areas over the next few days. Cloud seeding has also been used to reduce the pollution levels in cities, with rainfall providing much-needed relief to residents.

Challenges, Concerns

However, for the kind of process that it is, cloud seeding comes with its own set of challenges and questions about its effectiveness. The process of inducing precipitation requires the presence of moisture-laden clouds. It is not possible to carry out similar operations in dry conditions, thus reducing the scope of cloud seeding as a widespread practice. Cloud seeding does not hold much promise for restoring rainfall in regions without adequate rain-bearing clouds, thus limiting the success of various proposals.

The primary substance used in the execution of this technique is silver iodide - a compound made up of silver and iodine, which has the ability to induce freezing conditions in the presence of water. While the compound is generally considered to be safe due to its insolubility, there is uncertainty concerning the long-term consequences of exposure and consumption of the substance. Argyria, an illness caused by prolonged exposure to silver, is cited as a possible side-effect. Scientists have expressed concern about the possible repercussions of silver retention in humans, animals and crops.

Alternatives More Effective

Considering that it's difficult to draw a conclusive link between cloud seeding and effective rainfall, the emphasis should rather be on preventative measures. In the case of Tamil Nadu, the implementation of rainwater harvesting in households alleviated the high burden placed on public water sources.

Over time, rainwater harvesting infrastructure has played a major role in meeting water demands.

At best, cloud seeding may only be a short-term fix, and cannot be sustained over a long period. In China's case, the government does not seem to give attention to long-term solutions for climate change, and primarily focuses on immediate results.

Refreezing Could Offer A Solution To Melting Ice

Polar ice caps are melting due to global warming

BY ARYA ZADE

To stop the loss of ice, scientists recently presented a bizarre plan: to refreeze the north and south poles.

Under the effects of global warming, glaciers are changing quickly and significantly. Glacier shrinking has a profound impact on ecosystems, natural hazards, regional water cycles, global sea levels, and ecosystems. Changes in the ice glaciers and the causes causing such changes have been the subject of several research. However, not many studies have shown us how to fix the melting of glaciers.

Previous Solutions For Melting Ice Caps

For years, researchers have been looking for solutions to keep the enormous ice sheets covering Greenland and Antarctica from melting and dissolving into the ocean as a result of global warming. They have suggested a wide range of potential solutions, such as dumping seawater onto the ice in the hopes that it will freeze and replenish lost ice or seeding the atmosphere with compounds that block sunlight to cool the planet. However, these ideas have been widely criticised for their exorbitant cost, which would be hundreds of billions of dollars a year and the numerous risks involved.

Scientists in the past years have come up with bold new plans for protecting these massive glaciers and preventing the potentially devastating rise in sea levels that would occur if they vanished.

One involves protecting vulnerable glaciers with underwater walls built by robots; the other proposes pumping cold water through vast tunnels bored under the ice to thicken it and keep it from sliding into the ocean.
However, none of these plans has been successfully carried out.

The Stratospheric Aerosol Injection (SAI) Method

Scientists have now proposed an ambitious and bizarre plan to reverse the ice loss, and that very plan is to refreeze the north and south poles. The study was carried out by Wake Smith of Yale University and published on 15 September 2022 in Environment Research Communications.
At 60 degrees north and south latitudes, the strategy by the lead author suggests that a high-flying aircraft spray tiny aerosol particles into the atmosphere. It is predicted that this will result in a 2-degree Celsius decrease in temperature at the poles. That much cooling will help refreeze the polar extremes — thereby returning the average temperatures.

The study found that these aerosols would gradually float poleward and significantly shadow the land below — they were spread out at the height of 43,000 feet. They believe that by providing more shade, the melting arctic might refreeze, reducing the problems associated with melting ice glaciers and rising sea levels.
According to the scientists, the approach would slow climate change by reflecting a small portion of the incoming solar radiation back into space. However, it does come at an enormous cost. This method is known as the stratospheric aerosol injection (SAI), which comes at a price of 11 billion USD annually.

The researchers have admitted to this idea being controversial and asserted that it is achievable as 11 billion USD is extraordinarily cheap compared to other climate solutions proposed, like carbon capture.
Just like every proposal has its benefits, a few drawbacks follow it. Global warming-related emissions would be produced by the aircraft. The aerosol also contains sulphur dioxide, which, at high concentrations, corrodes the lungs and airways and causes nausea, vomiting, and stomach pain.
As the concept is still in its preliminary stage, the researchers believe the vision assures exploration.

Corporations And Net-Zero: The Problem With Promises

BY ANANYANARAYAN DHANABALAN

Corporations promising to be carbon neutral are investing in carbon offsets. However, the solution may not be the silver bullet it claims to be.

A 2021 report by the UK-based Energy and Climate Intelligence Unit and Oxford Net Zero stated that over one in five of the world's 2,000 largest publicly traded companies now have a commitment towards "net-zero" emissions to tackle climate change.

The top five of these companies by market cap have all set targets to become carbon neutral. These companies include Apple Inc. (net-zero by 2030), Amazon.com Inc. (2040 target), Google's parent company Alphabet Inc. (carbon neutral by 2030), Microsoft Corporation (carbon negative enterprise by 2030), and Saudi Aramco (net-zero by 2050).

While all of the above companies have been publishing annual reports giving an insight into their sustainability efforts and how close they are to achieving their goal, there have been numerous issues reported with their claims.

The 2022 Corporate Climate Responsibility Monitor Report by the NewClimate Institute analysed the claims made by 18 companies about their net-zero targets, and assessed whether they are on track to achieve them.

Apple

Apple has been cited by them for their Scope 3 emissions (defined by the US Environmental Protection Agency as the "result of activities from assets not owned or controlled by the reporting organisation, but that the organisation indirectly impacts in its value chain") due to the shorter lifespans and low repairability of their devices. The report also calls into question the amount of emissions Apple plans to offset using renewable energy programs and "nature-based solutions" by 2030 (25% relative to 2015), whilst currently, they only successfully offset roughly 1.5% of their total emissions with investments in organisations like Conservation International.

Amazon

The e-commerce giant has put out its annual sustainability report, and announced a $2 billion Climate Pledge Fund. However, Amazon has been slammed by the report as the emissions of the company and the steps they are actively taking to bring them down as part of their daily operations are still highly-guarded information.

Google

Google claims that it has matched 100% of its global annual electricity consumption with renewable energy and is the world's largest corporate purchaser of renewable power. The company has outlined its vision to be transitioning into carbon-free energy by 2030, thereby removing the very need for carbon offsets and sequestrations. While the report is highly critical of Google's claim of being carbon neutral since 2007 (calling it a claim of "low integrity"), it does point out that the company has made several investments in renewables for their offices and server operations. The report also says that Google has not presented a viable plan to offset their current emissions by 2030.

Microsoft

Microsoft is arguably the company with the loftiest goal of going carbon negative by 2030, along with targets outlined to remove all their historical carbon emissions by 2050. The company has made massive strides in terms of investment in renewable energies, and has also experimented with running their cloud servers with fuel cells instead of carbon-powered energy. However, recent years have seen a growth in their emissions (higher scope 3 emissions due to people having purchased more Windows and XBox products during the pandemic). Moreover, the company has invested in carbon offset projects that depend on avoiding emitting more carbon into the atmosphere rather than reducing the amount currently present.

Saudi Aramco

The Saudi Arabian Oil Company has set for itself a net-zero goal of 2050. However, this comes with the caveat that the company has only committed to be net-zero in Scope 1 and Scope 2 greenhouse gas emissions in wholly-owned or operated assets.

This is a major issue as a majority of Aramco operations are partly owned in conjunction with several other companies, and an overwhelming majority of their emissions also come under Scope 3 emissions. Even this flimsy goal is a high bar for a company that vastly understated its emissions, according to Bloomberg News.

Indian Veganism: A Myth

BY JESSICA TRIVEDI

The myth behind India having a dominantly plant-based consuming population and why we should help make it come true.

India is one of the largest nations in terms of vegetarian food consumption, with approximately 23-37% of its population identifying as vegetarian, as per BBC News. However, a sizable portion of vegetarians in the nation regularly consume dairy and dairy products.

The idea of veganism is deeply ingrained in various traditions and cultures in India. The philosophy of non-violence (ahimsa), which has been a guiding principle in India's consciousness, strengthens the foundation of veganism even more.

Despite all of this, 75% of Indians are not vegetarian, according to the Indian National Family Health Survey (NFHS 2005–06). Majority of the nation consumes animals or animal-based products. There has been an increase in the population of non-vegetarians in the country over the years including states like Gujarat, who were previously highly consisting of vegetarians.

India is still regarded as a strict vegetarian nation for the West despite having a sizable population of demonstrably non-vegetarians. The "vegetarian stereotype" is more likely to permeate people's minds as a result of the government data demonstrating that vegetarian households are wealthier and have higher incomes.

Because a cow is revered in Hinduism, India has a violent history of mob lynchings and social exclusion of those who eat beef. The BJP, the country's ruling party, is open about its preference for vegetarianism. The way we eat has significantly gotten more political due to which the data collected is not always accurate.

There are several benefits to becoming a vegan such as – religion, health benefits and availability of vegan alternatives, increasing awareness about its environmental and ethical impact.

The myth about India having a vegetarian dominated population is untrue to say the least. However, because of the influence of the west, celebrity endorsements, and rising consumer awareness, veganism in its purest form is now becoming more popular in India. emotion reasons as it is against animal cruelty, influence of celebrities and public

figures who have turned vegan etc.

Switching to a plant-based diet can't single handedly solve all environmental problems, there are multiple factors contributing to it as well. Livestock farming in India can be made more sustainable by focusing on animal health.

The farm animals' natural immune systems are strengthened by a balanced diet, which helps to maintain their best possible health. By allowing animals to produce more, farmers can use fewer animals to meet local demand, reducing greenhouse gas emissions. By focusing on the production of methane during the digestion process, innovation in dietary supplements and vaccines is assisting in the reduction of emissions. Industry development, good animal health, and welfare all work together to ensure more productive farming methods and, consequently, more sustainably raised livestock.

Poor animal health, a lack of welfare, and poor management of livestock make animals more prone to disease and increase the likelihood that they will pass away before lactation, breeding maturity, or slaughter age. In the struggle to reduce emissions from livestock, nutrition is crucial.

India still has a long way to go, but due to its population size, if the above said measures are taken responsibly and the citizens as well the government make active efforts to help control global warming, a lot can be achieved.

How Sustainable Is Fashion Today: A Tale Of Two Brands

BY MIMANSHA WALIA

While concerns about the environment are taking a toll on every sector, the fashion industry is making amends — from independent retail stores to 'magnanimous' global brands.

The idea of not having a future is not just a concept that only exists as a fictional idea. It has materialized itself into fragments of everyone's reality as climate change has substantialized itself again and again. That is part of the reason why there have been efforts across sectors to make products and services increasingly sustainable.

This is paving the way to a future of newer possibilities and innovations. Sustainable fashion has been the talk of the town ever since the downsides of 'Fast Fashion' started gaining more attention. In layperson's terms, sustainable fashion is the practice of dressmaking with organic and eco-friendly fabrics, materials, and production methods, while keeping basic human labor wage rights in mind.

Kapaas – From Couture to Sustainability

Kapaas, a local designer store established in 2013, is located in one of Pune's most loved street markets –– the FC Road Market. A wide variety of prints and fabrics are displayed; the texture and vibrancy of colors evident.

It started with the prime agenda of couture, housing wedding collections, then slowly shifted towards more comfortable, cotton-based light clothing, favoring sustainable fashion. Amruta Zoshi, the owner and fashion designer of the store, shares her journey of recentring her vision to make Kapaas as sustainable as possible.

"The initial shift was daunting. People were not as aware of the concept of sustainable fashion then, but someone has to take the leap for real change to occur."

Their supply chain is largely outsourced. The designs are sent to workhouses in Jaipur that use different environment-friendly processes to generate and dye fabrics. Some of the sustainable methods used by them include the hand-block print process and mud therapy while emphasizing reusing and recycling fabrics.

They have fostered the use of natural dyes (for example, indigo dye, and iron rust extractions). As a result, the color may minimally fade over time, but the quality of the material softens and reinvigorates with every wash. Therefore, ensuring at least 75% of their fabric is organic.

When asked about the significant difference in the shift of the cost from the production of wedding couture to that of sustainable wear, interesting findings came to light. "The cost of fabric has increased while the cost of labor has progressively decreased," shares the owner. This balances out their cost, even though the latter still proves to be more expensive than the former.

H&M – Sustainable Fast Fashion?

H&M has been repeatedly called out to be one of fashion's biggest polluters because of its fast fashion consumer approach. Since its rise, it has been constantly redefining the industry's norms, making it more accountable to address this issue. The policy of rewear-recycle-reuse is their prominent strategy aimed at generating large-scale sustainability. Under this, they have a garment collecting programme where they encourage customers to hand in their old clothes and reuse/rewear/recycle them. Many of their new fabric designs have also been generated from the same.

H&M, Kapaas – Finding Similarity

Both H&M and Kapaas have different approaches toward sustainability. While H&M cannot refrain from being a fast fashion brand and Kapaas cannot achieve 100% organic fabric, there still have been attempts at minimizing and refurbishing their supply chains to ensure a balance between sustainability and profits. While there is still a long way to go, these steps are commendable, which is where the similarity lies.

We, as consumers, must become highly selective about what we're wearing and be aware of how our clothing choices affect the environment. Sustainable fashion may seem like a costlier option, but one must bear one cost to spare another, especially when the cost of our environment is at stake.

Formula One: Driving To Survive

BY ADITI KRISHNAN

Formula One is on its path to becoming more sustainable. But the question remains: is its drive to become carbon-neutral enough to ensure its survival?

The roaring engines. The super-fast cars. The burnt tyres. The smell of gasoline. Formula One is the fastest and one of the most exciting sports on the planet. The world tour, travelling circus, the gas guzzling. And finally, the carbon footprint. However, it is also one of the least eco-friendly sports on the planet.

The Climate crisis is real. It is happening right now. And it isn't something that'll just go away if we stop using fossil fuels. It is a known fact that greenhouse gases are released when fossil fuels are burned, and the unmitigated release of these has led to climate change - the most significant contributor being carbon dioxide (CO_2). So yes, reducing greenhouse emissions is crucial, but with that, our aim should also be to restore the earth to pre-climate change conditions. Although this is a challenging feat to achieve, we must start somewhere. And Formula One has started doing its bit.

Net Zero 2030

In 2019, F1 announced its plan to become 100% sustainable and have a net-zero carbon footprint by 2023. A plan that took action back in 2014, when F1 cars switched from 2.4-litre V8 engines to 1.6-litre V6 turbocharged hybrid engines, started aiming to use lesser fuel back then. And now, as part of its "Countdown to Zero" campaign, F1 is developing a 100% sustainable fuel which will be used from 2026 along with the introduction of next-generation hybrid engines. F1 has positioned itself as a technological leader in transport applications and anything involving a combustion engine. It is pioneering this **drop-in fuel*** that has enormous potential to be adopted in vehicles globally. Even though it seems that the automotive industry is shifting to electrification, it is estimated that only 8% of the 1.8 billion cars predicted to be on roads in 2030 will be electric. This is why F1 is pioneering this fuel for use even in non-urban settings and aid in decarbonising the automotive industry.

F1's Carbon Footprint

According to F1's Sustainability Report, contrary to popular belief, it's not the 20 cars' track running that hurts the environment the most. Of the 256,000 tonnes of CO_2 generated annually by F1 on average, the power unit emissions associated with fuel usage amount to only 0.7% of the total emissions.

What makes F1 non-eco-friendly is its logistics. 45% of the emissions are generated solely by logistics - the movement of cars, equipment, and paddock infrastructure from one venue to another. This used to include a mobile broadcast facility that housed the production and editing suites, contributing around 7.3% of emissions. But the COVID-19 pandemic forced the shift to a remote broadcasting facility, which has reduced travelling freight by 34%, and the travelling staff by 37%. Along with logistics, business travel, the factories, and the event operations contribute significantly to the carbon emissions of F1.

> The 2022 Singapore Grand Prix implemented new sustainability initiatives - 20% more recycling bins, more water filling stations, and generators that provided cleaner energy to certain areas - in its aim to become the most sustainable F1 circuit.

NET-ZERO EMISSIONS

Achieving an overall balance between greenhouse gas emissions produced and greenhouse gas emissions taken out of the atmosphere.

*DROP-IN FUELS

Renewable hydrocarbon biofuels that are produced from biomass sources through a number of biological, chemical and thermal processes.

F1 vs Other Sports

When it comes to only participants and their activities in sports, it's likely to find F1 towards the top half of that list. But considering all factors (the usual + equipment production, spectators, maintenance), F1 is not at the top. Given that F1 is the only sport to publicise its carbon footprint, it is difficult to compare it to other sports directly. But Skydiving (jet fuel) and Golf (water consumption, chemicals) are sports that are more harmful to the environment. And when it comes to spectators (their travel), sports with a bigger fan following, like football, have higher carbon emissions.

While being a leader in technological advances, F1 has also inspired other sports to follow suit to become carbon-neutral. The governing body of professional men's tennis (ATP) aims to become carbon-neutral by 2040.

What F1 Is Doing

F1 aims to reduce the CO2 emissions its logistics, operations, and cars generate. To achieve this, it is developing a 100% sustainable fuel that is unique, lab-created from renewable biowaste, has fewer emissions, is more efficient, and has the same energy density as the current E10 fuel (10% ethanol). It uses the least CO2-intensive transport available to improve logistics while reviewing travel and freight logistics. It's also working towards making all its factories and venues 100% renewable. At venues, the use of single-use plastic has been slashed, all waste is being reused/recycled, and incentives are being made for fans to reach the events in a greener way.
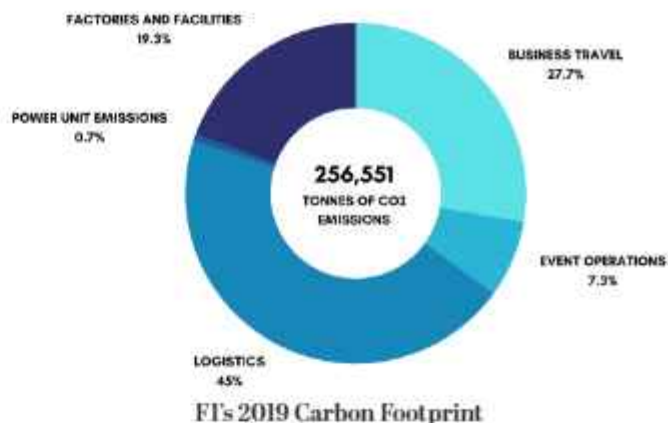
What Else Can Be Done

For 2023, F1 announced a record-breaking 24-race calendar, with races in 21 different countries spread out throughout the year. This means more logistics and, therefore, more carbon emissions. Reducing the number of races to between 12 to 15 will reduce F1's carbon footprint to approximately half of what it is now. But given that most of its fanbase is from countries where races happen, the problem of maintaining this growing fanbase will arise. Its ultimate aim is to make every aspect of the business carbon-neutral so that the number of races won't matter. But what can be done is holding races in the same region close to one another. For example, 2023 features three races in the USA (May, October and November). Instead of scheduling them this way, they can be held during the same period, clubbed with races in Canada and Mexico.

IMAGE COURTESY: Abed Ismail

A flypast before the Abu Dhabi GP at the Yas Marina Circuit, Abu Dhabi

256,551 TONNES OF CO2 EMISSIONS

FACTORIES AND FACILITIES 19.3%
BUSINESS TRAVEL 27.7%
POWER UNIT EMISSIONS 0.7%
EVENT OPERATIONS 7.3%
LOGISTICS 45%

F1's 2019 Carbon Footprint

Power Unit Emissions: All emissions associated with the fuel usage of the power units across all 20 cars.

Event Operations: All event impacts, including broadcasting, support races, Paddock Club operations, circuit energy use, generator use and teams at circuit impacts.

Facilities and Factories: All F1-owned and team-owned factories and facilities.

Business Travel: All individuals' air and ground travel as well as their hotel impacts.

Logistics: All road, air and sea logistics across the sport.

F1 cars making donuts after the 2019 Abu Dhabi GP