

NEWS ITEMS ON CAG/ AUDIT REPORTS

1. Chandigarh Estate Office failed to recover ₹50-cr dues: Audit (*hindustantimes.com*) Apr 05, 2024

A report by the principal director of audit, Chandigarh, has flagged multiple financial gaps at the Estate Office

The Estate Office failed to recover ₹50-crore dues on various accounts between 2021 and 2023, the principal director of audit, Chandigarh, has flagged in a report.

The Estate Office deals with property matters of the Chandigarh administration. Different types of properties of the administration, including residential, commercial and institutional, are allotted/auctioned by the office.

Records relating to the ownership of these properties are also maintained by different branches of the office that is also tasked with checking misuse/building violations and demolish unplanned structures.

₹35.26 crore not recovered from educational/religious institutions

The report has pointed out that the UT Estate Office allotted different sites to educational/religious institutes and trust bodies from 1968 to 2010 on leasehold and freehold basis.

As per the allotment letter, the licence shall be governed by the provisions of the Capital of Punjab (Development and Regulation) Bill, 1952.

It is the duty of the department concerned to ensure that the receipts and dues of the government are correctly and promptly assessed, collected and duly credited to the consolidated fund. But in 52 cases, an amount of ₹35.26 crore was not recovered, the report states.

₹5.70 crore licence fee not realised for mobile towers

The audit further found that as per the notification issued in 2015 regarding the “Chandigarh policy on towers for mobile telephone and data services”, a non-refundable licence fee of ₹5 lakh for seven years is to be deposited for each tower within 30 days of the grant of licence and before the commencement of work on the site.

The fee is to be at least doubled every seven years from the date of notification. During the checking of records, it was noticed that permission for the installation of mobile towers on 57 sites was given to various telecom companies. The non-refundable licence fee of ₹10 lakh for each mobile tower became due after seven years, amounting to ₹5.70 crore, that was never recovered.

₹3.55 crore spent to pay excess contractual staff

The report has highlighted that irregular expenditure of salaries to contractual staff hired in the UT Estate Office was more than the sanctioned strength, causing a loss of nearly ₹3.55 crore. It added that the department did not produce the sanctions obtained in support of the contractual staff hired in excess of the sanctioned strength directly or

through an outsourcing agency. The department paid wages amounting to ₹3.55 crore to the excess outsourced staff from April 1, 2019, to March 3, 2022.

₹76.40 lakh lost in stamp duty

The report says the UT administration had fixed the stamp duty charges for different types of leasehold/freehold properties. Perusal of records revealed that 33 properties were allotted to different allottees between 1953 and 2006 with the condition to execute the deed of conveyance within six months. But the lease deed of these properties had not been registered/executed till date and the department had also not taken any action, which resulted in non-realisation of stamp duty to the tune of ₹76 lakh.

₹66-lakh loss to government exchequer

The audit further observed loss to the tune of ₹66 lakh to the government exchequer due to unclaimed unearned increase in the value of property. The property pertains to commercial sites at the motor market in Sector 48. As per condition of the allotment letter, the lessee will not be entitled to transfer the site of the building without the prior permission of the Estate Office, such permissions will not be given until the lessee has paid full premium and the rent due under the lease for the site.

The report states that due to the non-finalisation of collector rates, the UT administration suffered a huge loss. It was noticed that 330 sites were allotted since 1954 to different bodies/associations, trusts, religious charitable trusts and educational institutes, but the collector rates of the same had not been finalised even after 70 years, resulting not only in a huge financial loss to the state exchequer but also discomfort/uncertainty for the said institutions.

RK Garg, who obtained the audit report under the RTI Act, said, “The audit observations should be taken seriously to resolve the financial issues at the Estate Office.” <https://www.hindustantimes.com/cities/chandigarh-news/chandigarh-estate-office-failed-to-recover-50-cr-duesaudit-101712270242425.html>

SELECTED NEWS ITEMS/ARTICLES FOR READING

2. Coal to Remain the Backbone of India’s Energy System for Next Two Decades: IIM Ahmedabad Report (*news18.com*) APRIL 05, 2024

Coal is projected to continue as the backbone of India’s energy system for the next two decades, according to a new report on energy transition prepared by the Indian Institute of Management (IIM), Ahmedabad. However, the non-fossil energy – renewable and nuclear – needs to replace the fossil fuel share slowly but surely, it stated.

The report was sanctioned by the Office of the Principal Scientific Advisor (PSA) to the government in November 2021 as part of a study project and addresses key questions on India’s energy trajectory, including how much energy India needs to achieve the high value of Human Development Index (HDI), pathways to achieve it and the energy mix projections for this until 2070.

LARGE ROLE OF NUCLEAR ENERGY ‘INEVITABLE’

According to the report, ‘net-zero’ is a challenge for India, and it is impossible to meet this goal by 2070 without substantial nuclear power and renewable energy generation, which is critical for providing clean, affordable power at low levelised cost of electricity for consumers.

The coal phase-down will require active policies on critical minerals and carbon dioxide removal technologies. The electricity sector will need to decarbonise well before 2070. Widespread electrification of transport and residential sectors and low-carbon and/or green hydrogen production will rapidly increase the electricity demand after 2050, but not a corresponding increase in the carbon footprints of the power sector.

The report estimates that over Rs 150-200 lakh crore (\$2-2.5 trillion) will be required during 2020-2070 for reaching the goal, and a considerable part of the financial flow must be international.

Dr VK Saraswat, Member, NITI Aayog, said development-led approach is the right approach to clean energy transition, even though such transition is going to be expensive. “More renewable energy penetration is needed with baseload energy sources as nuclear. Without nuclear energy, the storage requirements for renewable will be very high to tackle the intermittency of its supply. This will, in turn, enhance the dependence on critical minerals which is not sustainable,” he said.

NO SILVER BULLET TO ACHIEVE NET-ZERO BY 2070

Anil Kakodkar, former chairman, Atomic Energy Commission, who was also present at the release of the report, said India must decide her own strategies and priorities based on sound logic and assessments rather than being driven by vendors appearing at different points of time. “Most studies underestimate India’s energy needs, therefore, a strong need was felt for independent domestic studies on energy transition study from India’s perspective,” he said.

The report estimates that India’s emissions would range between 0.56 btCO₂ and 1.0 btCO₂ in 2070. It is expected that the remaining gap in emissions will be offset through sequestration in forestry and tree cover as envisaged in the Nationally Determined Contributions (NDCs). The report also recommends a level playing field for all low-carbon technologies by avoiding any preferential treatment for only select technologies, and a screening program to explore naturally occurring hydrogen in India.

“This comprehensive study brings together aspects from all sectors of power generation in one place, and will be helpful in the planning stages of our endeavours in clean energy,” said PSA Professor Ajay Sood while releasing the report in New Delhi.

The report has also received one-third funding from the Nuclear Power Corporation of India (NPCIL). <https://www.news18.com/india/coal-to-remain-the-backbone-of-indias-energy-system-for-next-two-decades-iim-ahmedabad-report-8840326.html>

3. Data on what Indians earn does have plenty to reveal of poverty in India (*livemint.com*) 05 Apr 2024

While a poverty line needs to be determined for use with fresh data on consumption spending, we have income readings that offer some clarity on the level of deprivation within the country.

Even though the fact-sheet on the Consumption Expenditure Survey (CES) has been officially released, the debate on poverty is far from over. Given that the new CES is based on a completely new survey design, the only way to resolve this issue is to have an expert committee decide on the appropriate poverty line to be used with these CES readings. Until that happens, the debate on poverty is likely to continue.

But that does not mean that we can't get an idea of the level of poverty. The best alternative is to examine the level of wages or earnings of the poorest group of wage workers. This is not a new idea. In fact, the initial poverty lines were anchored to the minimum wages of casual unskilled manual labourers, since they inhabit the poorest category of households. Further, the methodology of setting minimum wages is linked to a minimum requirement of food and some forms of non-food expenditure.

Minimum wages for unskilled workers in areas with lowest urbanization or rural areas for 2023 was ₹424 per day, as per a government notification. For 2024, it is ₹449 per day. This is lower than the price-adjusted minimum wages of ₹483 in 2022-23, as per the suggestion of the labour ministry expert committee. The updated Rangarajan poverty line for 2022-23 at ₹1,837/ ₹2,603 per month per person for rural/urban areas, respectively, implies a family poverty line of ₹9,185/ ₹13,015, assuming a five-member family. Based on the actual number of days worked in a month from the Periodic Labour Force Survey (PLFS), a wage worker with a family to support would need minimum earnings of ₹390/552 per-day in rural/urban areas to cross the poverty line. For all of India, it would imply a poverty line of ₹445 per day, slightly higher than the government notified minimum wages.

What is the actual level of wages received by casual wage workers? According to labour bureau data, the average wage in agricultural occupations in January 2023 was ₹362 per day. It was higher in non-farm occupations, at ₹412, still lower than minimum wages. Another data source are wages and earnings reported by the PLFS, for which the 2022-23 report is available. According to PLFS readings, casual workers in rural areas received wages of ₹383 in the January-March 2023 quarter. This was only ₹310 per day in case of agricultural workers, lower than the estimate reported by the labour bureau and almost two-thirds of the specified minimum wages.

On average, a casual wage worker is earning less than both the minimum wages and Rangarajan poverty line in 2022-23. We also have estimates from the India Employment Report (IER) 2024. As per the report, brought out by the International Labour Organization and Institute for Human Development, 52% of all casual workers did not receive the minimum wages. 76% of workers in agriculture and 70% in construction got wages lower than minimum wages. It is not just casual wage workers who received wages less than the notified minimum, but also regular workers. The proportion of regular workers whose daily earnings were less than minimum wages was 41%. Together, regular and casual wage workers account for almost half of all workers

in 2022-23. And almost 45% of them were earning less than minimum wages. The proportion of workers who earned less than the monthly sum needed to cross the Rangarajan poverty line was a fifth.

The IER also confirms the trend of a steady decline since 2011-12 in real wages of regular workers. While casual wage worker wages based on PLFS increased between 2011-12 and 2022-23, the wage growth rate was half the pace observed between 2004-05 and 2011-12. However, for casual wages, labour bureau data suggests a decline in real non-farm wages, with agricultural wages increasing at less than 1% per year in the last decade.

While these are not precise estimates, the wage and earnings data we have is comprehensive enough to suggest a significant proportion of Indians still live in poverty. A similar calculation for 2011-12 suggests that while poverty may have declined since then, it is only slightly lower.

The issue is not just of estimation of poverty, but a larger one of declining employment quality in India and meagre earnings for the majority of workers, including better-paid regular workers. The claim of India having eliminated extreme poverty may work as political rhetoric, but it may be at the cost of ignoring the stark reality of poorly paid workers and worsening employment quality.
<https://www.livemint.com/opinion/online-views/data-on-what-indians-earn-does-have-plenty-to-reveal-of-poverty-in-india-11712243262151.html>

4. NPS corpus rises 30% on year to Rs 11.73 trillion *(financialexpress.com)* April 5, 2024

10.3 million new subscribers added in FY24

The assets under management (AUM) under the National Pension System (NPS) including Atal Pension Yojana rose by 30.5% on year to Rs 11.73 trillion as of March 31, aided by new enrolment of 10.3 million new subscribers, according to the Pension Fund and Regulatory Development Authority data.

Despite saturation in enrolment of government employees, the subscriber base under NPS rose by 16% on year to 73.6 million. The net invested contribution amount rose to Rs 8.1 trillion as of March 31, 2024, an annual increase of 22%.

The average returns generated by pension funds under NPS have been handsome as well. Equities have given a return of 35.42% in one year and 13.48% since inception. The central government scheme and the state government schemes have given a return of around 12.5% in one year and around 9.5% since inception.

A few states that have issued a notification to pull out of the NPS to revert to the old defined pension system (OPS) continued to contribute to the NPS irrespective of the on-paper withdrawal.

With the government sector saturated, PFRDA is making efforts to rope in corporates to enrol their staff under NPS.

As against the target of 1.3 million new private sector subscriber enrolments in FY24, nearly 0.95 million has been achieved.

According to the extant NPS norms, a maximum of 60% of the accumulated NPS corpus from contributions during a person's working years is allowed to be withdrawn tax-free at the time of retirement. The subscriber has to invest a minimum of 40% of the corpus in annuities for a regular pension. However, it is not a guaranteed pension as returns are linked to markets. Annuities could fetch 5% to 7% return per annum depending on the choices made by the subscriber with single-life annuities giving higher returns as the corpus is not returned by the fund manager after the death of the pensioner.

Given that the NPS system is giving good returns, the NPS subscribers can stay invested in the NPS till they turn 75 years under the Systematic Withdrawal Plan (SWP) and draw monthly or quarterly or annual basis depending on their requirements.

<https://www.financialexpress.com/policy/economy/nps-corpus-rises-30-on-year-to-rs-11-73-trillion-3446790/>

5. RBI retains GDP growth projection at 7% for FY25 (*indianexpress.com*) Updated: April 5, 2024

The headwinds from protracted geopolitical tensions and increasing disruptions in trade routes, however, pose risks to the outlook, Reserve Bank Governor Shaktikanta Das said while unveiling the first bi-monthly monetary policy of the current fiscal.

The RBI on Friday retained the GDP growth projection at 7 per cent for 2024-25 fiscal on the back of expectations of a normal monsoon, moderating inflationary pressures, and sustained momentum in manufacturing and services sector.

The headwinds from protracted geopolitical tensions and increasing disruptions in trade routes, however, pose risks to the outlook, Reserve Bank Governor Shaktikanta Das said while unveiling the first bi-monthly monetary policy of the current fiscal.

Going forward, he said the outlook for agriculture and rural activity appears bright, with good rabi wheat crop and improved prospects of kharif crops, due to expected normal south-west monsoon.

“Strengthening of rural demand, improving employment conditions and informal sector activity, moderating inflationary pressures and sustained momentum in manufacturing and services sector should boost private consumption,” Das said.

He further said the prospects of investment activity remain bright owing to upturn in the private capex cycle becoming steadily broad-based; persisting and robust government capital expenditure; healthy balance sheets of banks and corporates; rising capacity utilisation; and strengthening business optimism as reflected in RBI's surveys.

“Taking all these factors into consideration, real GDP growth for 2024-25 is projected at 7.0 per cent with Q1 at 7.1 per cent; Q2 at 6.9 per cent; Q3 at 7.0 per cent; and Q4 at 7.0 per cent,” the RBI said, adding the risks are evenly balanced.

The governor said that with rural demand catching up, consumption is expected to support economic growth in 2024-25. Also, urban consumption stayed buoyant as evident from various indicators.

Das informed that the total flow of resources to the commercial sector from banks and other sources at Rs 31.2 lakh crore during 2023-24 is significantly higher than that of last year (Rs 26.4 lakh crore).

External demand improved in February with exports registering double-digit expansion. Trade deficit, however, widened in February as imports also accelerated.

On global growth, the governor said the global economy has remained resilient with a stable outlook as reflected in various high frequency indicators. Global trade is expected to grow faster in 2024, although weaker than its historical average.

Inflation is moving closer to targets, but the last mile of disinflation is turning out to be challenging, the governor added.

He also said worsening debt situation in advanced economies (AEs) can generate spill-overs for emerging market economies (EMEs) in the form of swings in capital flows and volatility in financial markets. <https://indianexpress.com/article/business/economy/rbi-gdp-growth-projection-for-fy25-shaktikanta-das-9252861/>

6. Focus on supply-side reforms, AI to boost economic growth: RBI (*economictimes.indiatimes.com*) April 5, 2024

There is a need for India to focus on supply-side reforms and new-age technologies such as artificial intelligence (AI) to boost economic growth, said the Reserve Bank of India (RBI) in its latest Monetary Policy Report, released on April 5. “

A greater push for supply-side reforms and harnessing of new-technologies such as artificial intelligence could provide a boost to productivity, global growth and demand. In this scenario, if global growth is higher by 50 bps, domestic growth and inflation could edge higher by around 15 bps and 7 bps, respectively,” said the report.

Earlier in the day, RBI Governor Shaktikanta Das presented the first Monetary Policy Committee Report of FY25. The Monetary Policy Committee (MPC) of the RBI decided to keep the repo rate unchanged at 6.5% and maintained the policy stance of “withdrawal of accommodation”.

While delivering the policy statement, Das talked about a continuing risk to the overall trade environment due to issues arising from protracted geopolitical tensions and increased disruptions in trade routes. “Headwinds from geopolitical tensions, volatility

in international financial markets, geoeconomic fragmentation, rising Red Sea disruptions, and extreme weather events, however, pose risks to the outlook,” said Das.

The RBI report noted that the rising trade distortions and geoeconomic fragmentation could also weigh on global trade and growth. “The escalation in geopolitical tensions in West Asia hampering shipping through the Suez Canal and resultant supply disruptions could keep inflation elevated, delaying the easing of monetary conditions. If the last mile of disinflation turns out to be protracted, it may require interest rates to remain higher for longer thereby posing considerable downside risks to growth. At high risk are less developed economies with relatively elevated debt-to-GDP ratio,” it added.

All these factors can pull down global growth well below the baseline, the RBI noted. “Conversely, on the upside, a faster disinflation could allow monetary authorities to reduce policy rates earlier than anticipated, easing financial conditions further, improving sentiments and providing a fillip to global growth,” it said.

Taking all these factors into consideration, the RBI has projected the real GDP growth for 2024-25 at 7% — with Q1 at 7.1%; Q2 at 6.9%; Q3 at 7%; and Q4 at 7% <https://economictimes.indiatimes.com/small-biz/trade/exports/insights/focus-on-supply-side-reforms-ai-to-boost-economic-growth-rbi/articleshow/109056729.cms?from=mdr>

7. Army Plans Transformative Reforms to Boost Combat Capabilities (*deccanchronicle.com*) 04 April 2024

The Indian Army's top leadership has announced plans to bolster the innovation capabilities of the Army Design Bureau (ADB) and establish its cells at Command Headquarters. It proposes to incorporate cutting-edge technology for future capability development, with a focus on self-reliance (Atmanirbharta).

The decision was made during the Army Commanders’ Conference that concluded on April 2. The Indian Army stated that organisational and procedural changes would be implemented to ensure the adoption of advanced technologies for future capabilities, stressing on self-reliance.

Established in 2016, the ADB has been fostering collaboration between the industry, academia, Defence PSUs, and DRDO to develop fully indigenous solutions, providing a strategic advantage over adversaries.

Further, during the conference, discussions included the exploration of creating a separate fund to support the initiative, nominating test bed brigades/formations for efficient trials, and incorporating holistic sustenance requirements in future procurements.

The Army also plans to collaborate with other ministries to optimise resources and enhance infrastructure development in border areas. Emphasis was placed on aligning training with technological advancements to harness the innovation potential of the Indian defence industry.

In line with this, Human Resource Management policies will be revised to facilitate the absorption of advanced technology and training infrastructure. Additionally, there are plans to explore the creation of an Adversarial Force for realistic wargaming and training.

Army Chief General Manoj Pande urged senior leadership to continue pursuing transformation and technology absorption, while also advocating for seamless situational awareness and doctrinal reforms to address future operational challenges. <https://www.deccanchronicle.com/nation/in-other-news/army-plans-transformative-reforms-to-boost-combat-capabilities-888398>

8. Indian Army Charts Path to Modernization: Key Insights from Commanders Conference (*financialexpress.com*) Updated: April 4, 2024

The Indian Army intends to explore more opportunities for collaboration with other ministries to maximize resources and synergize efforts.

The recent Army Commanders' Conference held in New Delhi provided a platform for senior leadership to delve into a wide array of security-related aspects and future strategies.

With a focus on leveraging technology, enhancing operational preparedness, and addressing emerging security challenges, the conference yielded several key takeaways that underscore the Indian Army's commitment to modernization and readiness.

Defence Minister Rajnath Singh, in his keynote address on April 2, 2024, reaffirmed the nation's trust in the Indian Army, acknowledging its indispensable role in national security. He applauded the stellar role of the Army in guarding the borders, fighting terrorism and providing aid to the civil administration during crises. The minister urged the Army leadership to constantly review doctrinal, structural, & organisational reforms to meet future challenges in view of the evolving security dynamics.

The defence minister also appreciated the efforts of Indian Army in developing niche technologies in collaboration with indigenous industries and premier educational institutions.

One of the central themes of the conference was the imperative to embrace technological advancements. The senior leadership emphasized the importance of integrating niche technologies into the Army's capabilities to ensure readiness for future challenges. This includes organizational and procedural transformations aimed at facilitating the adoption of innovative solutions.

Upscaling the innovation potential of the Army Design Bureau and establishing Army Design Bureau Cells at Command Headquarters were identified as crucial steps to foster collaboration with industry partners and expedite the identification and trials of niche technology.

Furthermore, the conference highlighted the need to strengthen capability development efforts in line with the national agenda of self-reliance ('Atmanirbharta'). The creation of a separate fund head to streamline procurement processes and ensure the seamless integration of niche technologies into the Army's arsenal was proposed. Additionally, the nomination of test bed brigades/formations aims to enhance efficiency in trials and procurement processes, ensuring the timely acquisition of cutting-edge equipment.

Collaboration and resource optimization emerged as another key focus area. The Indian Army intends to explore more opportunities for collaboration with other ministries to maximize resources and synergize efforts. This collaborative approach seeks to enhance capability building and infrastructure development in border areas, thereby bolstering national security.

Human resource management was also a prominent topic of discussion at the conference. Recognizing the pivotal role of human capital in driving technological advancements, the conference emphasized the need to revise HR policies. These revisions will focus on facilitating the absorption of niche technology through enhanced training infrastructure and innovative policies, ensuring that the workforce is well-equipped to navigate the complexities of modern warfare.

In addition to technological advancements and human resource development, the conference underscored the importance of realistic training scenarios. Ensuring realistic training is vital for preparedness in modern warfare. To this end, the feasibility of creating a tailor-made organization to serve as an adversarial force during wargames and training exercises was discussed. This initiative aims to enhance the Army's readiness by simulating real-world scenarios and challenges, thereby honing the skills of its personnel and ensuring optimal operational effectiveness.

The senior leadership of the Army was also addressed by General Anil Chauhan, Chief of Defence Staff (CDS), General Manoj Pande, COAS, Admiral R Hari Kumar, Chief of the Naval Staff (CNS) and Air Chief Marshal VR Chaudhari, Chief of the Air Staff (CAS).

The CDS praised formations and the soldiers for their commitment towards security of the borders with a professional approach while at the same time dealing with challenges and embracing the transformational changes enthusiastically.

The COAS Gen Manoj Pande called upon the senior leadership to continue pursuing the process of transformation and technology absorption besides adopting the best practices of sister services and modern armies. He also highlighted the need to ensure seamless situational awareness between commanders at all levels and troops on the ground. The Army Chief also emphasized that there is a constant need to undertake doctrinal and structural reforms by embracing change and being open to new ideas to meet future operational challenges.

Overall, the Army Commanders' Conference provided a platform for strategic deliberations and forward-thinking initiatives aimed at bolstering the Indian Army's capabilities in an evolving security landscape. By prioritizing technological innovation, collaboration, and human resource development, the Indian Army is poised to meet the challenges of the future while upholding its commitment to national security and self-

reliance. <https://www.financialexpress.com/business/defence-indian-army-charts-path-to-modernization-key-insights-from-commanders-conference-3446392/>

9. Keeping AI's future open: A key to ethical and inclusive AI innovation and governance (*economictimes.indiatimes.com*) April 04, 2024

The rapid evolution of AI presents a unique opportunity to merge cultures, ideas, and knowledge into a unified canvas of innovation. With AI predicted to inject \$15.7 tn into the global economy, its role extends beyond economic growth to societal transformation. Policymakers worldwide are focusing on a broader, more inclusive approach to governance that transcends conventional regulatory strategies.

Rapid evolution of AI offers a unique chance to meld cultures, ideas and knowledge into a unified canvas of innovation. With AI poised to inject \$15.7 tn into the global economy, its role extends beyond mere economic growth to being a pivotal force of societal transformation. This potential has captured the focus of policymakers worldwide, as we witness several national laws, multilateral guidance and global summits to ensure effective regulatory oversight.

However, the pace of AI innovation will surpass the speed at which new regulations can be developed. While regulatory frameworks are indispensable, they are not sufficient to navigate advancements and complex dynamics of the AI sector. A broader, more inclusive approach to governance that transcends conventional regulatory strategies is essential.

This approach demands the cultivation of an AI ecosystem rooted in openness and transparency, a fertile ground where deliberation, diversity and even dissent are not just welcomed but are incentivised pathways towards achieving consensus on ethical and responsible AI training, development and deployment.

The global AI community should support and promote the open-source movement. By fostering a dynamic open-source ecosystem that welcomes auditing, adaptation and use, we can create a transparent foundation that benefits technological advancement. There are learnings from India's digital public infrastructure (DPI), which is open source, open API and globally interoperable.

No monopoly games It acts as a great equaliser in the marketplace by democratising access to AI technologies. It guards against monopolisation, ensuring that the interests of a select few corporations or countries do not shape the future of AI. Over 93% of developers worldwide adapt and integrate open-source code into their projects. An open ecosystem minimises the time and resources necessary to create new applications, democratising access to tools across a broader spectrum of developers.

A 2024 Harvard Business School study, 'The Value of Open Source Software', reveals that the open-source ecosystem considerably lowers software costs for organisations, reducing expenses by up to 3.5 times. Also, open-source ecosystem's supply-side value is estimated at \$4.15 bn, while its demand-side value is about \$8.8 tn.

Cross-pollination A vibrant open-source AI ecosystem can foster interdisciplinary strategy in AI R&D and implementation, essential for harnessing its potential and building public confidence. Furthermore, a multidisciplinary method will ensure a discourse of ethical, environmental and social elements throughout the AI lifecycle, from ideation to deployment, mitigating many contemporary concerns.

More the merrier For AI to benefit and represent everyone, there must be widespread community involvement in AI development. This level of engagement is beyond the reach of exclusive, proprietary models. Instead, it calls for a thriving open-source ecosystem that fosters diversity and inclusivity, ensuring AI technologies are shaped by a multitude of perspectives and experiences.

Transparency triumphs To combat bias and discrimination in AI, promoting transparency in algorithms is crucial. For instance, Stanford's 2022 AI Index Report underscored that while LLMs have become sophisticated, they also tend to replicate and amplify biases and toxicity from their training data, reinforcing societal prejudices and power imbalances. The open-source ecosystem can be instrumental in offering a collaborative space for examination and enhancement, ensuring AI evolves as a force for equity, fairness and alignment with societal values.

Safety valve Openness plays a crucial role in bolstering AI safety. It adheres to principles of auditability and accountability, ensuring AI's reliability is rigorously maintained. Allowing for external scrutiny enhances the credibility and trustworthiness of AI models. An open-source ecosystem can provide a much-needed dialogue on audit practices, safety protocols and verification methods, enriching the AI landscape.

Real-time data AI ecosystem can significantly enhance regulatory processes by providing real-time data. Its inherent transparency enables ongoing monitoring and evaluation of AI technologies, ensuring regulators remain informed about the latest developments and challenges.

Narendra Modi recently approved the IndiaAI mission, with ₹10,371.92 cr. With objectives of democratising computing access, enhancing data quality, nurturing homegrown AI expertise, drawing top-tier AI professionals, fostering industry partnerships, offering financial support to startups, focusing on socially beneficial AI projects and promoting ethical AI practices, the mission's blueprint resonates deeply with the open-source philosophy. This strategic alignment will boost India's journey towards becoming an AI powerhouse.

As AI capabilities advance, it will increasingly be intertwined with diverse societal frameworks and functions. Given the swift pace of AI deployment and commercialisation, it's crucial for global stakeholders in AI development to commit to ethical practices that uphold accountability, explainability, fairness and transparency.

Embracing the open-source ecosystem in AI is critical for this. It will ensure a future where tech is developed with a foundation of humane values, ensuring the benefits from AI are shared widely and equitably. <https://economictimes.indiatimes.com/opinion/et-commentary/keeping-ais-future-open-a-key-to-ethical-and-inclusive-ai-innovation-and-governance/articleshow/109044686.cms?from=mdr>

10. Climate engineering carries serious national security risks — countries facing extreme heat may try it anyway, and the world needs to be prepared (*downtoearth.org.in*) 05 April 2024

International decisions on climate engineering are likely coming soon

The historic Paris climate agreement started a mantra from developing countries: “1.5 to stay alive.” It refers to the international aim to keep global warming under 1.5 degrees Celsius (2.8 Fahrenheit) compared with preindustrial times. But the world will likely pass that threshold within a decade, and global warming is showing little sign of slowing.

The world is already facing natural disasters of epic proportions as temperatures rise. Heat records are routinely broken. Wildfire seasons are more extreme. Hurricane strength is increasing. Sea level rise is slowly submerging small island nations and coastal areas.

The only known method able to quickly arrest this temperature rise is climate engineering. (It’s sometimes called geoengineering, sunlight reduction methods or solar climate intervention.) This is a set of proposed actions to deliberately alter the climate.

These actions include mimicking the cooling effects of large volcanic eruptions by putting large amounts of reflective particles in the atmosphere, or making low clouds over the ocean brighter. Both strategies would reflect a small amount of sunlight back to space to cool the planet.

There are many unanswered questions, however, about the effects of deliberately altering the climate, and there is no consensus about whether it is even a good idea to find out.

One of the largest concerns for many countries when it comes to climate change is national security. That doesn’t just mean wars. Risks to food, energy and water supplies are national security issues, as is climate-induced migration.

Could climate engineering help reduce the national security risks of climate change, or would it make things worse? Answering that question is not simple, but researchers who study climate change and national security like we do have some idea of the risks ahead.

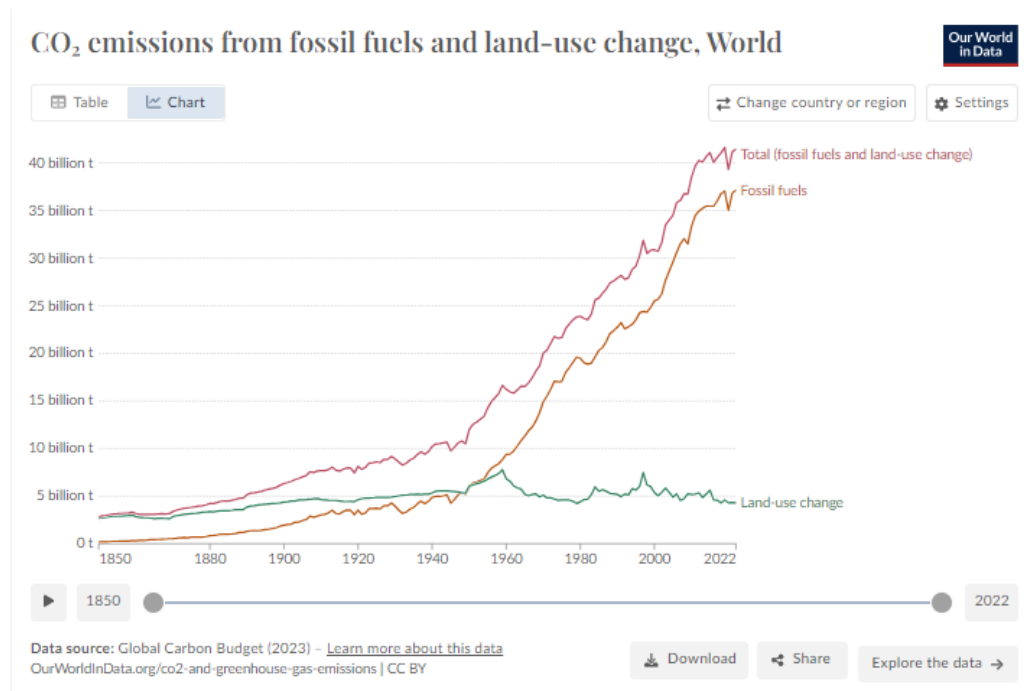
The massive problem of climate change

To understand what climate engineering might look like in the future, let’s first talk about why a country might want to try it.

Since the industrial revolution, humans have put about 1.74 trillion tons of carbon dioxide into the atmosphere, largely by burning fossil fuels. That carbon dioxide traps heat, warming the planet.

One of the most important things we can do is to stop putting carbon into the atmosphere. But that won’t make the situation better quickly, because carbon stays in

the atmosphere for centuries. Reducing emissions will just keep things from getting worse.



Countries could pull carbon dioxide out of the atmosphere and lock it away, a process called carbon dioxide removal. Right now, carbon dioxide removal projects, including growing trees and direct air capture devices, pull about 2 billion tons of carbon dioxide out of the atmosphere per year.

However, humans are currently putting over 37 billion tons of carbon dioxide into the atmosphere annually through fossil fuel use and industry. As long as the amount added is larger than the amount removed, droughts, floods, hurricanes, heat waves and sea level rise, among numerous other consequences of climate change, will keep getting worse.

It may take a long time to get to Net Zero emissions, the point at which humans aren't increasing greenhouse gas concentrations in the atmosphere. Climate engineering might help in the interim.

Who might try climate engineering and how?

Various government research arms are already gaming out scenarios, looking at who might decide to carry out climate engineering and how.

Climate engineering is expected to be cheap relative to the cost of ending greenhouse gas emissions. But it would still cost billions of dollars and take years to develop and build a fleet of airplanes to carry megatons of reflective particles into the stratosphere each year. Any billionaire considering such a venture would run out of money quickly, despite what science fiction might suggest.

However, a single country or coalition of countries witnessing the harms of climate change could make a cost and geopolitical calculation and decide to begin climate engineering on its own.

This is the so-called “free driver” problem, meaning that one country of at least medium wealth could unilaterally affect the world’s climate.

For example, countries with increasingly dangerous heat waves may want to cause cooling, or countries that depend on monsoon precipitation may want to restore some dependability that climate change has disrupted. Australia is currently exploring the feasibility of rapidly cooling the Great Barrier Reef to prevent its demise.

Creating risks for neighbors raises conflict alarm

The climate doesn’t respect national borders. So, a climate engineering project in one country is likely to affect temperature and rainfall in neighboring countries. That could be good or bad for crops, water supplies and flood risk. It could also have widespread unintended consequences.

Some studies show that a moderate amount of climate engineering would likely have widespread benefits compared with climate change. But not every country would be affected in the same way.

Once climate engineering is deployed, countries may be more likely to blame climate engineering for extreme events such as hurricanes, floods and droughts, regardless of the evidence.

Climate engineering may spark conflicts among countries, leading to sanctions and demands for compensation. Climate change can leave the poorest regions most vulnerable to harm, and climate engineering should not exacerbate that harm. Some countries would benefit from climate engineering and thus be more resilient to geopolitical strife, and some would be harmed and thus left more vulnerable.

Is geoengineering a risk worth taking?

While small experiments have been carried out, nobody has conducted large-scale climate engineering yet. That means that a lot of information about its effects relies on climate models. But while these models are excellent tools for studying the climate system, they’re not good at answering questions about geopolitics and conflict. On top of that, the physical effects of climate engineering depend on who is doing it and what they’re doing.

What’s next?

For now, there are more questions about climate engineering than answers. It’s hard to say whether climate engineering would create more conflict, or if it could defuse international tensions by reducing climate change.

But international decisions on climate engineering are likely coming soon. At the United Nations Environment Assembly in March 2024, African countries called for a moratorium on climate engineering, urging all precaution. Other nations, including the United States, pressed for a formal scientific group to study the risks and benefits before making any decisions.

Climate engineering could be part of an equitable solution to climate change. But it also carries risks. Put simply, climate engineering is a technology that can't be ignored, but more research is needed so policymakers can make informed decisions. <https://www.downtoearth.org.in/news/climate-change/climate-engineering-carries-serious-national-security-risks-countries-facing-extreme-heat-may-try-it-anyway-and-the-world-needs-to-be-prepared-95415>

11. **Equity a must in climate action** (*fortuneindia.com*) April 5, 2024

For women, especially in rural India, agriculture is the primary source of income and climatic changes affect their livelihoods, health, safety, and security

“With our collective efforts, the belief has increased that for the welfare of the world, it is necessary to protect everyone’s interest,” the prime minister of India evoked the sentiment at COP28 in Dubai. It is widely believed that climate change must be gender neutral. However, as per UNDP, women and children are 14 times more likely than men to die in a disaster.

Due to their societal roles, responsibilities, and cultural norms, women are more likely to be at risk from the effects of climatic disasters in situations of impoverishment. In fact, UN Women’s Report 2020 on ‘Gender Dimensions of Climate Change’ emphasises that women are disproportionately affected by climate change due to their roles in resource management and household responsibilities.

For women, especially in rural India, agriculture is the primary source of income and climatic changes affect their livelihoods, health, safety, and security. “Low-income women in India often rely on agriculture and informal sectors for their livelihoods. Poor women are invariably the resource managers in their families which means that they travel distances sometimes to collect the firewood and water, and on top of that also manage the water consumption at their homes,” Kalpana Ajayan, regional head South Asia, Women’s World Banking, a global nonprofit organisation, tells Fortune India.

Climate change introduces uncertainties such as erratic weather patterns, extreme temperatures, and unpredictable rainfall. Evidently, these factors pose a threat to crop yields, affecting agricultural productivity and subsequently impacting the income of women engaged in farming activities.

Several studies also suggest that between 1901 and 2018, the average annual temperature over India rose by nearly 0.7° Celsius while increasing the prevalence of heat waves. Given the cultural norms, risks to women are also higher due to exposure to indoor air pollution caused by burning of biomass in homes for cooking & heating, tied with lack of awareness. The way our society is formulated further exacerbates the burden of domestic unpaid work carried by low-income women and they are also disproportionately affected by the health risks posed by the climatic factors.

Gender lens in financial services

The poignant reality is that it is the economically vulnerable and weak which are affected by the implications of climate change. Alarm bells need to be sounded for equity to be deeply woven into climate crisis concerns.

“Women with access to financial services are better equipped to deal with the shocks related to climate risks and to build their resilience, alongside the resilience of their families and their communities,” says Ajayan.

She suggests that agricultural loans and insurance, weather-related and flood insurance, and G2P (government-to-person) payments for climate-related relief will act as pillars of a financial support ecosystem, and gender-disaggregated data will help spotlight gaps here.

On the other hand, she says that by embedding climate risk preparedness into their core business operations, FSPs can reduce their risks to the impact of climate change, better respond to market needs, and take advantage of new opportunities to increase the financial inclusion of low-income women.

Furthermore, access to credit could potentially encourage women to invest in resilient agricultural practices, embrace climate-smart technologies, or diversify their livelihoods, thereby mitigating their vulnerability to climate risks.

According to a report by ASSOCHAM in collaboration with the Ministry of Women & Child Development, empowering women would translate into a 20-30% rise in agricultural yields in India if they were to be provided with the same access to resources as men.

“India’s Digital Public Infrastructure has the potential to be the transformative force in augmenting women’s access to financial services, particularly in underserved areas,” Ajayan says.

Although quantifying the financial impact on women in India is largely exacting due to the lack of gender-disaggregated data, global studies indicate that the effects of climate change could slash global GDP by 11-14% by 2050, with South and Southeast Asia facing the most significant ramifications. Projections suggest that by 2050, climate change might force an additional 158 million women and girls into poverty, with 236 million confronting food insecurity.

"Women’s financial empowerment and climate resilience present a momentous opportunity, and this necessitates gender transformative interventions that tackle the root causes of women’s issues," the regional head notes.

In a country like India which has bullish targets on sustainability and where more than 65% of the agricultural workforce is made up of women, realising the repercussions and investing in women’s financial inclusion is not just a response to climate change, it is a proactive strategy for sustainable development. <https://www.fortuneindia.com/macro/equity-a-must-in-climate-action/116353>

12. Behind the haze: Exploring the causes of India's sulfur dioxide spike (*timesofindia.indiatimes.com*) April 4, 2024

In recent years, the issue of air pollution has emerged as a pressing concern worldwide, with sulfur dioxide emissions representing a significant contributor to environmental degradation and public health risks. Against this backdrop, a new analysis of data from a Nasa satellite has unveiled a troubling trend: a marked increase in sulfur dioxide emissions from power plants across India.

This revelation comes at a time when India is grappling with the adverse effects of air pollution, exacerbated by rapid industrialization and urbanization. With a burgeoning population and expanding economy, the country's energy demands have surged, leading to a significant reliance on coal-fired power plants. However, this reliance has come at a cost, as evidenced by the surge in sulfur dioxide emissions documented in the recent study.

Led by Zifeng Lu of Argonne National Laboratory in Lemont, the research offers valuable insights into the evolving landscape of air pollution in India. By analyzing data captured by an instrument on Nasa's Aura satellite, the study paints a sobering picture of the escalating sulfur dioxide emissions from Indian power plants. The findings reveal a staggering increase of more than 60 percent in emissions between 2005 and 2012, underscoring the magnitude of the challenge at hand.

India's ascent as the world's second-largest emitter of sulfur dioxide, surpassing the United States in 2010, is a poignant reminder of the scale of the issue. This milestone, based on emission estimates previously published by Lu and scientists from various institutions, highlights the urgency of addressing the underlying factors driving pollution in the country.

Sulfur dioxide, emitted during combustion processes in power plants and industrial facilities, poses significant risks to both the environment and human health. Its detrimental effects are manifold and extensively documented. Firstly, sulfur dioxide contributes to the formation of acid rain, a phenomenon that can wreak havoc on ecosystems, soil quality, and aquatic habitats. The acidification of water bodies can have devastating consequences for aquatic life, disrupting food chains and harming biodiversity.

Furthermore, sulfur dioxide is known to exacerbate respiratory ailments in humans, such as asthma and bronchitis. Inhalation of sulfur dioxide can irritate the respiratory system, leading to symptoms ranging from coughing and wheezing to shortness of breath and chest tightness. Prolonged exposure to elevated levels of sulfur dioxide can have serious long-term health implications, particularly for vulnerable populations such as children, the elderly, and individuals with pre-existing respiratory conditions.

In addition to its direct impacts on human health and the environment, sulfur dioxide plays a pivotal role in the formation of sulfate aerosols. These tiny particles, suspended in the atmosphere, can influence cloud properties and climate dynamics. Sulfate aerosols can act as cloud condensation nuclei, affecting cloud formation and properties such as reflectivity and lifetime. This, in turn, can have complex ramifications for regional and global climate patterns, including changes in precipitation patterns,

temperature, and atmospheric circulation. The study's findings, which align with ground-based inventories, underscore the need for robust monitoring and mitigation strategies to address escalating sulfur dioxide emissions in India. With the potential to exacerbate environmental degradation and public health risks, these findings underscore the critical importance of proactive measures to curb pollution from power plants and safeguard both human health and the environment.

The results of the study provide valuable insights into the dynamics of sulfur dioxide emissions from power plants in India. By leveraging an eight-year record of repeat measurements, researchers were able to analyze data from 65 power plants across 23 regions. Through this comprehensive analysis, a discernible pattern emerged, enabling scientists to differentiate between relatively constant emissions from power plants and more variable background concentrations of sulfur dioxide.

The utilization of OMI measurements and a consistent analytical technique allowed researchers to track sulfur dioxide emissions year by year. This approach, previously employed in a 2011 study focused on U.S. coal-fired power plants, revealed a significant decrease in average sulfur dioxide emissions over a three-year period. Unlike the U.S. study, which required three-year averages to confidently isolate power plant emissions from background concentrations, the favorable satellite observing conditions in India's lower latitude facilitated more precise tracking of emissions on an annual basis.

The findings from the satellite analysis were corroborated by ground-based inventory data, showing a substantial 71 percent increase in sulfur dioxide emissions from 2005 to 2012. This alignment between satellite-based observations and ground-based inventories underscores the reliability and validity of the analytical approach employed in the study.

To further enhance the accuracy of their findings, Lu and colleagues developed a ground-based inventory specifically tailored for sulfur dioxide emissions. Drawing on power plant- and unit-level information, the researchers considered a range of factors, including boiler size, coal type, and emission control technology. By adapting their analytical technique from previous work on nitrogen oxide emissions, the researchers ensured a comprehensive and robust assessment of sulfur dioxide emissions from power plants.

Overall, the results of the study provide critical insights into the trends and dynamics of sulfur dioxide emissions from power plants in India. By combining satellite-based observations with ground-based inventories and employing sophisticated analytical techniques, researchers have shed light on the factors driving the increase in sulfur dioxide emissions and the implications for air quality, public health, and environmental sustainability. These findings underscore the importance of continued monitoring and mitigation efforts to address the escalating pollution levels and safeguard human health and the environment.

As policymakers, researchers, and stakeholders grapple with the complex interplay of factors driving air pollution in India, the study serves as a clarion call for concerted action to address this pressing environmental challenge. From implementing stringent emission standards to promoting cleaner technologies and renewable energy sources,

there is a clear imperative to prioritize sustainability and environmental stewardship in the pursuit of a healthier, more resilient future for all. <https://timesofindia.indiatimes.com/blogs/scientificallly-trended/behind-the-haze-exploring-the-causes-of-indias-sulfur-dioxide-spike/>

13. Water crisis: Is Hyderabad going Bengaluru way? Stats show similar pattern (*timesofindia.indiatimes.com*) 05 April 2024

Hyderabad: The ripples of a recent study, that reveals an alarming 79% drop in Bengaluru's water level – driven by a 10-fold increase in concrete structures – are being felt in Hyderabad. Given the city's water shortage this summer, with fears of a drought staring it in the face, environmentalists and residents wonder if Hyderabad is going the Bengaluru way.

For starters, the statistics of the two metros aren't very different.

According to the latest study by the Indian Institute of Science, Bengaluru's built-up area surged from 8% in 1973 to 93.3% in 2023, marking a significant 1055% increase in concrete structures. This expansion has resulted in a 79% decrease in water spread area, diminishing the availability of the key resource.

Hyderabad isn't too far behind. Records of the municipal administration and urban development department (MAUD) show that between 2010 and 2014, the city witnessed a growth of 50.7 million sft in its total commercial built-up area. Subsequently, from 2015 to 2019, this area expanded by 100.4 million sft. From 2015 to 2021, Hyderabad saw an increase of over 500 million sft in built-up residential area. While the current exact built-up area is unavailable in the archives, experts emphasise that it has surged between 70% and 80% in the last three years.

“Due to this excessive concretisation in the name of urbanisation, the city is witnessing severe water shortage in March itself. Concretisation leaves no space for groundwater percolation thereby depleting groundwater levels. Similarly, the water bodies, which are meant to store water and recharge the groundwater levels, are filled with sewage and pollutants. This is also the cause of heavy urban flooding that we are witnessing almost every year,” said BV Subba Rao, an environmentalist, highlighting how authorities need to get the fundamentals of water management right to avoid the impending crisis.

Currently, Hyderabad has 185 notified water bodies, of which over 150 are either heavily polluted or encroached upon while another 20 have dried up completely, according to the Telangana State Pollution Control Board's records. Experts highlight that there are over 300 water bodies that are not notified and are also in an abysmal state.

Experts also state the ease of getting building permissions as another major cause for rapid urbanisation. “In 2016, the Telangana government introduced an online system called the Development Permission Management System (DPMS) for approving building plans. By 2019-2020, the GHMC made 986.4 crores by granting 17,538 building permissions, claiming a more than 100% increase in four years. The rules for

getting building permissions were relaxed to make it easier to do business, which worsened the problem of concretisation,” said Narsimha Rao Donti, a public policy expert.

Rainwater Harvesting

Key Explaining potential sustainable solutions, Kalpana Ramesh, a proponent of rainwater harvesting, emphasised the importance of addressing pollution in water bodies and monitoring encroachments, alongside adopting rainwater harvesting.

She suggested that approximately 50% of rainwater should recharge groundwater, with the remaining being reused. Rather than relying heavily on external water sources like the Krishna, Godavari, and Manjeera rivers, individuals can harvest rainwater in homes, parks, and roadside areas. Kalpana also stressed the importance of authorities creating artificial ponds, tanks, and wells for storing water and ensuring long-term maintenance and usage. “Rainwater pits are mandatory to be installed at any place with a surface area of 200 sq meters. ,” said Harish Daga, a social activist from the city. <https://timesofindia.indiatimes.com/city/hyderabad/water-crisis-is-hyd-going-bluru-way-stats-show-similar-pattern/articleshow/109048354.cms>

14. Is the urban water system breaking? (*thehindu.com*) April 05, 2024

Bengaluru, often celebrated for being a ‘garden city’, the ‘IT capital’ of the country, and its pleasant weather, has been making headlines this year for facing a severe water crisis following the drought of 2023. The water crisis is also likely to hit other urban centres and rural areas. According to a recent weekly bulletin by the Central Water Commission, even as peak summer is around the corner, most of the major reservoirs in the southern States of Karnataka, Tamil Nadu, Andhra Pradesh, and Telangana are filled to only 25% of their capacity or less. Is the urban water system breaking? T.V. Ramachandra and S. Vishwanath discuss the question in a conversation moderated by K.C. Deepika. Edited excerpts:

This is not the first time that a major city in India has been hit by a water crisis. What does it say about the water infrastructure in our cities?

T.V. Ramachandra: We see water crises in cities because there is mismanagement of water in most parts of the country. Bengaluru, for example, is undergoing unplanned urbanisation. In 1800, in a city landscape of 740 square kilometres, there were 1,452 interconnected water bodies and about 80% green cover. But today, 86% is paved surface and the green cover is less than 3%. Now, more than 40% of Bengaluru’s water requirement comes from groundwater sources. The city landscape should have been porous to allow groundwater recharge. There is a linkage between surface water bodies and groundwater resources. The city receives about 55-60% of its water requirement from the Cauvery river. But if you look at the Cauvery watershed, during the last four decades or so, 45% of the forest cover has been lost. The Cauvery catchment has 18% forest cover while 75% is agriculture. And then there is another factor, which is climate change.

S. Vishwanath: In the 20th century, we have designed our institutions of water provision as water supply boards. We have to change the paradigm of governance to maintain the water management board, where water not only includes piped water from a river but

also local water. The city has rainwater, ground water, surface water, lakes, tanks, river streams. It has wastewater or what we now call used water. All of these forms, if managed well, should be sufficient for the city. So, we have to change the governance of water through institutions, starting from the river basin. We don't have river basin institutions looking at the landscape, deforestation, sand mining, pollution, agricultural practices, and so on. We have to keep tabs on these and make sure that we do not alter the landscape irretrievably, so much so that the river stops flowing or flows with heavy polluted water. At the city scale, we have to create institutions which are able to be nuanced in their understanding of all forms of water and manage it as an ecological resource. That is the lesson that we have to learn from Bengaluru and all the other urban areas of India.

The irony that many are pointing out is that these are the same cities that are inundated during rains. Where are we going wrong?

S. Vishwanath: Again, the water management process. We have created institutions which operate as silos. In Bengaluru, the Bangalore Water Supply and Sewerage Board is in charge of piped water supply. The Bruhat Bengaluru Mahanagara Palike, with the Karnataka Tank Conservation and Development Authority playing a role, overlooks surface water bodies. Groundwater is with the Groundwater Authority. Wastewater, which flows into drains or lakes, is nobody's property. And wastewater is what partially causes floods. So, it is bad planning and bad design of our landscape.

The other issue is concretisation and poor construction of roads. Roads are becoming impediments to hydrological flows; they act as dams and barriers.

T.V. Ramachandra: First, as mentioned, there are too many agencies. Fragmented governance is the root cause of the problem. Second, most of these state agencies are headed by individuals who lack competence. I would prefer subject experts sitting there. If we manage water well, we will have sufficient water. With 700-850 mm of annual rainfall, we will have about 15 TMC of water in the city. Bengaluru requires 18-19 TMC of water. That means 70% of the water that the city needs is available in the form of rainwater. We need to harvest rainwater through rooftop harvesting in houses or by rejuvenating lakes and retaining the rainwater. If we re-establish the interconnectivity of the lakes, we will solve the problem of flooding; the water will move from one location to the other and there won't be flooding. When we talk about floods, the government comes up with plans for remodelling, which is nothing but mismanagement of storm water drains. The government concretises and narrows storm water drains, which is against the hydrological principle for any drain.

There are two arguments regarding the Bengaluru situation. One is to depopulate the city by creating new centres of livelihood. The other is to create better water infrastructure. Where do you stand on this?

S. Vishwanath: After the 1991 reforms, considering the kind of capitalist model of economy that we adopted, urbanisation has become irreversible. People were attracted to Bengaluru because of the climate. Then they were further attracted to the city because it became an economic engine and provided great livelihood opportunities. We will continue to grow. If we plan for future growth and set up infrastructure right from the beginning, it is possible to enhance livelihoods and livability and also accommodate the

population that will continue to come in. What is failing us is our inability to anticipate or deal with the growth of the city, especially in the periphery. I am optimistic that if we manage resources well, manage our lakes and aquifers and rainwater, and treat wastewater, we can support an increasing population.

T.V. Ramachandra: For any city to be livable, we should not cross the carrying capacity. Unfortunately, Bengaluru has crossed the limit. There has been an 1055% increase in concrete area over five decades, 18% loss in vegetation, and 79% loss in water bodies. This shows that we have made a huge blunder. We can hope for the better with good management but where are the managers? We have not trained people to cope with this situation which has risen because of five decades of mismanagement.

I think we should opt for cluster-based development. Our agenda should be to reverse migration, so that youngsters can move to other districts. If we can shift industries to taluk headquarters, those regions will develop. Developing other parts of the country and the State is a requirement. Why should we make sure that everything is concentrated in Bengaluru and make it more unliveable?

Much of the focus is on urban centres. There is not enough attention being paid to regions along the river basins. Isn't it high time that governments start respecting ecosystems away from the cities that ultimately help these cities thrive?

S. Vishwanath: The question I ask is, how do we create a governance framework which will protect our environment at the river basin scale? We had the Gadgil and Kasturirangan Committee Reports. Both were rejected by people who occupied the Western Ghats or by politicians who manipulated them to do that. Bengaluru exists because the Cauvery. The moment the Cauvery suffers, Bengaluru dies. When will Bengaluru realise that it is essential for it to make sure that the Cauvery flows in a pristine condition and is full of water? This should become a common point of conversation among ordinary citizens. We should not be worried only about piped water or tanker prices. Those are symptoms. The real cause of the problem is environmental destruction. Unless we build the right institutions to manage our systems and resources and bring in expertise, we will continue to suffer.

Every time there is a crisis, we see knee-jerk reactions. What should governments do to secure the future of our cities?

S. Vishwanath: Well-rounded institutions that should be able to understand the problem, define it correctly, and then frame long-term and sustainable solutions.

T.V. Ramachandra: The right institutions, yes, but also accountability in the system. We are creating projects just to use funds. Unless we tackle corruption, planning will fail. We should also elect the right people.

T.V. Ramachandra is the Coordinator of the Energy and Wetlands Research Group, Centre for Ecological Science, Indian Institute of Science; S. Vishwanath is a water conservationist <https://www.thehindu.com/opinion/op-ed/is-the-urban-water-system-breaking/article68027545.ece>