

CLEAN FACTS.

About agrivoltaics



Agrivoltaics is the simultaneous use of land for agriculture and photovoltaic (PV) power generation. The concept comes from agroforestry, which involves growing plants, grasses, and shrubs that require less sunlight under the cover of trees.

In agrivoltaics, solar panels replace trees. Agrivoltaics was first tested in Germany and Japan in 2004. Later, it was tried in the US, China, Italy, Malaysia, Egypt and Chile.

India has 14 pilot projects spread across the country from Gujarat, Rajasthan, Uttar Pradesh and Haryana to Maharashtra and Kerala.



Agrivoltaics is in the nascent technology demonstration stage in India. The potential is huge since agricultural land accounts for 60.4 per cent of India's total

surface area of 32,87,263 sq km. Dual land use could solve the concerns about food security and energy security. Electricity generated in the fields, besides supplying to the grid, could also provide power to local communities without any transmission loss.

Agrivoltaics is also a sustainable solution to water scarcity. Solar panels can be employed to harvest rainwater, which could be used for irrigation and panel cleaning. Moreover, crop coverage between solar arrays can check soil erosion.

THEY SAID IT.

“Growing geopolitical tensions and uncertainty in the international environment must not distract us from the imperative to collaborate and address climate change as the greatest transnational challenge of the century.”



MUKHTAR BABAYEV, President of the UN COP 29

Recycling and a treasure trove of critical minerals

RESOURCE RESERVE. Incentives could bolster extraction of precious lithium, cobalt, and nickel from end-of-life Li-ion batteries

Preeti Mehra

With auctions of critical mineral blocks in India having met with a lukewarm response, will recyclers prove to be a crucial set of urban miners who will help meet the demand for cobalt, lithium, and nickel in the country?

It is learnt that a legislation is in the pipeline to address the serious shortage of critical minerals for the manufacture of Lithium ion (Li-ion) batteries and other electronic devices. In all likelihood, the move will take the form of a productivity linked investment (PLI) scheme for the recycling of critical minerals in the country.

This will help create a circular economy and give a fresh incentive to recyclers to extract the maximum secondary metals from end-of-life lithium-ion batteries.

The Global E-waste Monitor 2024 has cited figures

which should serve as an eye-opener. In 2022, as much as 900 million primary ore extraction from the earth was avoided globally by reclaiming materials through documented recycling. The value of metals embedded in 2022 e-waste included \$19 billion worth of copper, \$15 billion in gold and \$16 billion in iron. The value of secondary raw materials reclaimed from e-waste was \$28 billion. In addition to this, 93 million tonnes of CO₂ emissions were avoided by formal e-waste management. And all this, when only 23 per cent of the global e-waste was formally recycled.

PLI SCHEME

Closer home, India's PLI scheme may well boost the extraction from end-of-life batteries and reduce its need to import critical minerals. “India does not have reserves of critical minerals, and this is a step in the right direction. Why pay taxpayers money for importing?” says Nitin Gupta,



CELL OPTIMISATION. India's PLI scheme may well boost the extraction from end-of-life batteries and reduce its need to import critical minerals. REUTERS

CEO and Co-founder at electronic waste and battery recycling company, Attero.

He feels recycling has a methodology that has a larger agenda and that incentives should be given to companies that have good efficiency and a rate of extraction that is 90 per cent or so. Attero's patented technology gives it an extraction efficiency of 98 per cent. “The companies must be

technologically advanced and be able to match the top quality. Besides, those who have developed the extraction technology in India must be given more brownie points,” he says.

ENERGY-EFFICIENCY

Bengaluru-based MiniMines, a fledgling start-up, is one that has also developed its own technology. The founders

Anupam Kumar and Arvind Bhardwaj hope that with an extraction efficiency of 96 per cent, they too will be covered.

“We have developed a water and energy-efficient hybrid hydrometallurgy process to extract rare metals like lithium, cobalt, nickel and manganese from Li-ion battery waste. We have developed the technology from scratch and have taken it from lab unit to pilot unit and have been evaluated by Oil India Ltd and the United Nations Industrial Development Organisation. We hope small players like us who cannot match the financials of large companies but have the efficiency also get a chance,” they say.

“If companies are required to provide balance sheets for many years and show massive investments, we will not be able to fulfil the criteria. The incentive scheme should be fair to all of us,” says Kumar hoping seed fund companies are also covered under the scheme.

MiniMines recently re-

ceived a grant of \$100,000 from ACT, a non-profit Indian venture philanthropy platform which is supporting ground-breaking, cutting-edge clean tech solutions and helping start-ups scale up. “We apply venture capital principles to our grants and our investment committee does strict evaluation and due diligence before awarding a grant, says Alankrita Khara, Director ACT, making a case for MiniMines.

Meanwhile, experts feel that besides a PLI scheme, it would be pertinent for the government to consider mandating EV battery manufacturers under its Battery Waste Management Rules to use a percentage of secondary raw minerals in their new batteries and incentivise them for the same. This would be a further boost for recyclers and ensure that critical minerals extracted in India do not find their way into other countries, while India imports raw material. That would, no doubt, be a prudent move.

How land use and roads are impacting herbivore habitats

A recent study shows that the genetic diversity of the Gaur and Sambar are under threat in central India

Divya Trivedi

Herbivores, animals that eat plants, play a crucial role in the health of a forest by maintaining the diversity of plant life. They shape the ecosystem by controlling wildfires, cycling nutrients, and maintaining vegetation dynamics. Unfortunately, they often get left behind by large carnivores when it comes to targeted conservation efforts. But increasingly, human activities in landscape modifications for development are impacting herbivore habitats and require urgent attention.

In a first study of its kind, the National Centre for Biological Sciences

(NCBS) Bengaluru, a centre of the Tata Institute of Fundamental Research, has shown how change in land use patterns and roads in the central Indian landscape are disrupting genetic connectivity of two large herbivores — Gaur and Sambar.

Gaur and Sambar are endemic to South and South-East Asia and rank among the top prey species for large carnivores like tigers.

For the study published in the international journal for research, *Molecular Ecology*, the research team comprising lead author Abhinav Tyagi, Uma Ramakrishnan, Nidhi Yadav and Awadhesh Pandit, collected hundreds of faecal samples of Gaur and Sambar from the tiger reserves of Kanha, Pench, Nagzira-



Human activities in landscape modifications for development are impacting herbivore habitats

Nawagaon, Bor and Tadoba-Andhari, besides Umred Karhandla Wildlife Sanctuary and the wildlife corridor between Kanha and Pench Tiger Reserve. They found that both species face threats such as habitat

fragmentation, habitat loss, illegal poaching, and other anthropogenic impacts responsible for population decline and local extirpation.

RISING THREATS

Central India, like other areas of conservation concern, faces threats from growing linear infrastructure such as highways, railway lines, and changes in land use patterns, expanding road network, mining activities and other development projects. Such infrastructures hinder animal movement creating fragmented populations confined within small habitat patches disconnected from each other. Maintaining movement among habitat patches usually results in mating and genetic

exchange, the loss of which can increase the probability of species extinction. Researchers stress that Umred Karhandla Wildlife Sanctuary with a small population is the most genetically differentiated and needs conservation intervention.

Urban areas and road networks are expected to grow substantially by 2030, and human populations are also expected to increase, especially in biodiversity hotspots. The combined effects of human demographic growth, land use change, and climate change pose a serious threat to wildlife connectivity. Despite the need for development to meet India's economic goals, it is imperative to align development with conservation objectives, says the study.

Thalassemia patients' ask from the Budget

BY INVITATION
ANUBHA TANEJA MUKHERJEE



BLOOD DONATION. A lifesaving act for thalassemia patients ISTOCK.COM

Blood transfusions are a lifeline for patients with blood disorders such as Thalassemia. But access to safe blood remains a challenge for people with such disorders.

With an estimated 42 million beta-thalassemia carriers worldwide, 1 in 8 thalassemia patients resides in India. Currently, over 1.5 lakh people are living with thalassemia major in India and the number is growing at an alarming rate. Despite being a preventable condition, over 10,000-15,000 children are born with thalassemia major every year.

Thalassemia patients depend on frequent blood transfusions for survival. Unfortunately, blood transfusion service in India is largely fragmented and lacks standardised norms covering all aspects of blood transfusions, including screening for transfusion-transmitted infections like HIV and HCV. To ensure safe and adequate blood, all activities related to blood collection, testing, processing, storage and distribution should be governed at the national level.

India requires 14.6 million blood units each year, according to the “Final Report on Estimation of Blood Requirement in India” from the Union Health Ministry, but faces a blood deficit of around seven million units. This scarcity creates immense pressure on blood banks and challenges for patients suffering from thalassemia. Presently, 80 per cent of the blood requirement is from replacement donors — individuals donating only when a family member or friend

needs blood. Encouraging regular blood donation from healthy individuals through a national public education campaign is essential for reliable blood supply. Despite campaigns by blood banks and the Red Cross Society, people are reluctant to donate blood. Besides saving lives, donating blood improves the donor's health by stimulating production of new blood cells and maintaining a healthy iron level.

Funding indigenous gene therapy research in India is also required for improving thalassemia treatment. Financial support is critical for wider adoption of Nucleic Acid Testing (NAT), an advanced blood testing method, in blood banks. The NAT technique boasts greater accuracy in detecting infections and enhancing blood safety. Furthermore, the need for a national blood law is imperative.

In the upcoming Union Budget, Centre needs to outline new measures to address these challenges. A concerted effort from the government, healthcare institutions, NGOs and the public is essential to create a robust blood transfusion system that prioritises safety and supports patients.

The writer is Member-Secretary, Thalassemia Patients Advocacy Group. Views are personal.

Breaking down ‘patent thickets’ without smothering innovation

CHANGING TIMES. With recent patent-linked rejections, governments push back on big pharma's strategy

PT Jyothi Datta

The last two-odd weeks witnessed three significant developments aimed at improving access to affordable medicines, playing out in India, South Africa and the US.

All developments involved patents, and signal a change in the way governments increasingly view the practice of drugmakers filing multiple patents through the life of a drug, say legal experts.

Early July, the Indian Patent Office (IPO) rejected Johnson and Johnson's (J&J) patent application on the paediatric version of its break-through tuberculosis (TB) drug bedaquiline. The move is expected to pave the way for generic drugmakers to make similar versions of this drug at lower prices. In March 2023, the IPO had rejected J&J's attempt to patent the salt form of bedaquiline, stopping efforts to add four more years to the drug's life, even as the primary patent was to expire (July 2023). Civil society and patients fought both cases, with support from Médecins Sans Frontières/Doctors Without Borders.

In South Africa, its Competition Commission ended an investigation into alleged “anti-competitive” actions involving bedaquiline this month. J&J agreed to not pursue secondary patents on the drug in 134 low and middle income countries and they dropped prices in S Africa by 40 per cent, the Commission said.

Separately, in the US, “patent thickets” were targeted through the Affordable Prescriptions for Patients Act (APPA), sponsored by two US Senators. It was passed unanimously. Patent thickets involve multiple patents filed on a single drug by a company. They tend to block out competition for a long time.



STACKING NO MORE. From India to the US, policy changes sweep nations even as stakeholders clash over the future of medical innovation ISTOCK.COM

“Some pharmaceutical manufacturers have been deliberately abusing the patent system to prevent potential competitors from entering the marketplace using tactics like erecting patent thickets, which slow the entry of lower-cost biosimilars,” they said in a note.

This bill puts a “reasonable limit on the number of patents a manufacturer can contest, preventing a ‘patent thicket’” the note explained. The move would “deter branded manufacturers of biologics from gaming the system to increase the number of patents they assert, while preserving the incentives provided by the patent system to encourage the core innovation that produces new biologic treatments in the first place,” it added.

CONNECT THE DOTS

“Patent reforms have started to find a voice... pushing big pharma to make concessions, the bedaquiline saga in South Africa being an example,” observes Krishna Sarma,

Managing Partner, Corporate Law Group. The consequence would mean “higher threshold for patentees to maintain their core patent pharma/biopharma portfolio, and at the same time, giving leeway to the generics to chip away at the patent thickets resorted to by innovator companies,” she added.

On limiting patent filings, she explained, “As per APPA, 2023, only up to 20 patents (the core patents) can be asserted by biologic companies in a court of law, with the possibility of raising the cap in the interest of justice. At present, on an average, a major drug is protected by around 74 patents.” With the number of patents protecting a drug significantly going down, “the entry of generics into the market would be much earlier,” she said.

As a result, she said, “patent filings on pharmaceuticals and biopharmaceuticals would reduce significantly and the present strategy to cover a particular drug with numerous patents (patent thickets leading to ever-

greening) could see a radical change.”

INNOVATION INTERRUPTED?

The Pharmaceutical Research and Manufacturers of America (PhRMA) counter saying that they've always supported the full lifecycle of medicines — from innovation to generic and biosimilar uptake. “We do however have concerns with (US) Congress prohibiting innovators from enforcing lawfully granted patents,” they added.

“Innovation shouldn't stop once a new medicine becomes available to patients. IP protections incentivise researchers to continue R&D after a product's initial FDA approval to improve the medicine, make it more effective and expand treatment options,” they explained.

Public health lawyer Leena Menghaney disagrees that disallowing secondary/follow-on patents stifles innovation. Companies get 20 years of patent protection (with no competition) on their innovative basic patent. Crediting civil society in pushing for change, she points to the watershed Glivec case in India (where patent protection was disallowed on the blood cancer drug for not being a new invention or more efficacious). The access fight has been case by case, she says, recalling HIV/AIDS, Hepatitis C, breast cancer and TB drugs. Unless the US system changes, other world systems will continue to be under pressure, she observed.

“The pharmaceutical industry has to stop using patents as tools to manage competition. Otherwise governments will step in,” says KM Gopakumar, an IP (Intellectual Property) expert, with Third World Network. In India, the IPO should be consistent in reviewing patents and follow the law in letter and spirit, he says. Besides, he adds, “India has imported oil from Russia; similar political willingness can be shown in addressing anti-competitive practices involving medicines.”

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MY FIVE.



Dr Sanjay Katkar
(Joint MD, Quick Heal Technologies)

Pranayam, veggie smoothies and adventure sports

- 1 Morning Run:** I enjoy a morning walk with quick bursts of jogging for about 30 minutes to start my day. It helps me stay active, energised.
- 2 Strength Training:** I go to the gym, do strength training thrice a week after my morning walk.
- 3 Healthy eating:** I follow a balanced diet, starting my day with a green veggie smoothie and making sure I have the right combination of carbs, protein and fibre for my three meals.
- 4 Meditation:** Mental well-being is important. I practice pranayam and meditation twice a week to reduce stress and improve focus.
- 5 Adventure Junkie:** An avid adventure sports enthusiast, I challenge myself physically and mentally. Recently went skydiving.

COMING UP.

Act on hepatitis infections

Deaths from viral hepatitis-related causes are increasing, with around one hepatitis death every 30 seconds, says the WHO, ahead of World Hepatitis Day (July 28). Nearly 220 million with hepatitis B and another 36 million people with hepatitis C, are undiagnosed. This year's theme is, “It's time for action!” — as hepatitis infections, deaths, are preventable.