

Topic → The Exclusionary Nature of Conservation Laws:

India's Forest Rights Act stands apart from exclusionary laws globally

Most of the world's biodiverse regions are in places indigenous communities have traditionally lived and governed; they have protected biodiversity and nurtured it while being nurtured in return; laws that secure their tenure and recognise their rights can thus strengthen traditional governance

Aditi Vijayal
Prakriti Mukherjee

In many parts of the world, conservation laws and policies are becoming more exclusionary. They are disenfranchising local communities and indigenous people, disregarding their rights and role in conservation, and allowing the state as well as private interests to exploit resources.

Conservation science and its legal frameworks are rooted in colonial ideas, and define nature as "pristine" and untouched by humans. When wielding this approach - often called the fortress model - exclusive spaces called "protected areas" are created, where conservation is implemented with centralised state control, criminalising indigenous people and local communities (IPLCs) as encroachers.

Researchers have found that the fortress conservation model has displaced 10 to 20 million people around the world by separating their lives, livelihoods, and culture from landscapes constituted of as protected areas. While global conservation legislation is fully exempt, the role of IPLCs like the Maasai and Ogiek in Kenya, the Barba in Uganda, the Ache and Mursi in Ethiopia, and the San in Botswana is well-documented. Most of the world's biodiverse regions are in places where these communities have traditionally lived and governed.

This is in contrast to IPLCs who have been custodians of local biodiversity, protecting it against being exploited and nurturing it while being nurtured in return. In turn, laws that secure IPLCs' tenure and recognise their rights can strengthen traditional governance systems used to sustainably manage their lands.

Conservation with laws
In the prevailing global scenario, laws are crucial to facilitate conservation. The Convention on Biological Diversity (CBD) is the largest international legal instrument from which many conservation and biodiversity-related multilateral treaties and legal frameworks have emerged. First presented at the Rio Earth Summit in 1992, 196 countries are party to the CBD today, with their national legal frameworks being guided by the CBD framework. The CBD's main objectives are conservation, sustainable use, and fair and equitable sharing of the benefits of biodiversity, including landscapes, species, and genetic resources.

India, one of the world's 17 megadiverse countries, is a signatory to the CBD and has a rich history of community-led environmental protection and conservation campaigns. It enacted



An advance farmer fires dry paddy at her farm in Pargurh village near Gang district in Gujarat, six months

conservation. Indeed, IPLCs have been campaigning to have their rights recognised at international meetings of the UN Framework Convention on Climate Change, the climate COPs and of the CBD.

Since 1992, the CBD has urged countries to "respect, preserve and maintain knowledge, innovations and practices of indigenous and local communities embodying traditional lifestyles relevant for the conservation and sustainable use of biological diversity" through Article 8(j). Many protocols, working groups and subcommittees have been set up over the years to realise the Article's vision - to ensure governments recognise IPLC rights - but progress has been slow.

In 2007, the UN passed its Declaration

The FRA is arguably one of the most advanced legal frameworks in the world. It legally recognises the relationships between tenure security, rights of forest dependent communities, and biodiversity conservation, and creates democratic mechanisms to strengthen these bonds

representation of IPLCs and their traditional knowledge in the implementation of the framework. The KMFIF envisages a world where harmony with nature will be a lot of targets to achieve it. An institutionalised target 20 by 20, i.e. countries committing to being 30% of

governance approaches.

Thus, for all these international victories, the struggle for the rights of IPLCs in conservation approaches is far from over. The premise of the "30x30" agenda itself jeopardises these rights because it promotes the idea that simply expanding protected areas will arrest biodiversity loss.

Beyond protected areas
The CBD's 2019 decision to move beyond protected areas through its "integrated and holistic conservation approach" (CBDCA). India plans to notify the CBDCA guidelines soon. Some experts have expressed optimism that this is an opportunity to involve communities in conservation. Each OECD is to be identified by four



Exclusionary Conservation Practices

- Many conservation laws and policies globally are disenfranchising Indigenous Peoples and Local Communities (IPLCs).
- Fortress conservation model treats nature as untouched by humans and excludes IPLCs through state-controlled protected areas.
- This model has led to the displacement of 10–20 million people worldwide

Understanding the Fortress Model of Conservation

The Colonial Roots of Conservation Science

- **Conservation science, as we know it today, is deeply rooted in colonial ideas that define nature as “pristine” and untouched by humans.**
- **This perspective has led to the creation of exclusive spaces known as “protected areas,” where conservation is implemented through centralized state control.**
- **Unfortunately, this often criminalizes indigenous peoples and local communities (IPLCs), labeling them as encroachers on their ancestral lands.**
- **The Masai and Ogiek in Kenya, the Batwa in Uganda, the Ashaninka in Peru, and Adivasis in India are just a few examples of IPLCs who have been affected by these exclusionary practices.**

IPLCs as Custodians of Biodiversity

- **These communities have acted as custodians of local biodiversity, protecting it from exploitation while nurturing it in return.**
- **Recognizing and securing IPLCs’ tenure and rights can significantly strengthen traditional governance systems that sustainably manage their lands.**

The Need for Legal Recognition of IPLC Rights

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- In the current global scenario, laws play a crucial role in facilitating conservation.
 - The Convention on Biological Diversity (CBD) is the largest international legal instrument guiding many conservation-related treaties.
 - However, the implementation of these laws often overlooks the rights of IPLCs, leading to further marginalization.

Conservation Laws and Their Implications

The Convention on Biological Diversity (CBD)

- First presented at the Rio Earth Summit in 1992, the CBD has been signed by 196 countries. Its main objectives include conservation, sustainable use, and fair sharing of biodiversity benefits.
- Yet, the focus on state-led conservation often sidelines the contributions of IPLCs.

India's Biological Diversity Act (BDA)

- India, a signatory to the CBD, enacted the Biological Diversity Act in 2002 to implement its objectives.
 - While the Act aims to promote local conservation efforts, broader forest and resource laws have historically denied
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- **Adivasi and other traditional communities access to their forests, leading to large-scale dispossession.**

India's Conservation History and Challenges

- **India adopted the protected area model under the Wildlife Protection Act (1972) and Project Tiger (1973).**
- **This model led to displacement of around 6 lakh people.**
- **Joint Forest Management and similar programmes often excluded IPLC rights.**

International Recognition of IPLCs

- **Article 8(j) of the CBD urges respect for IPLC knowledge and practices.**
- **The UN Declaration on the Rights of Indigenous Peoples (2007) affirms IPLCs' cultural and governance rights.**
- **CBD COP-16 (2025) created a permanent body for IPLC rights under Article 8(j).**

India's National Biodiversity Strategy and Action Plan (NBSAP), 2025

- **Includes 23 targets aligned with the Kunming-Montreal Global Biodiversity Framework (KMGBF).**
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- **Emphasises a bottom-up approach but over-relies on state forest departments.**
- **Biodiversity Management Committees (BMCs) remain largely non-functional.**

The UN Declaration on the Rights of Indigenous Peoples

In 2007, the UN passed a declaration to address the discrimination faced by IPLCs globally. This declaration emphasizes their right to maintain and strengthen their institutions, cultures, and traditions.

The Kunming-Montreal Global Biodiversity Framework

- **The KMGBF, adopted at the CBD's COP-15 summit in 2022, seeks to integrate IPLCs and their traditional knowledge into conservation efforts.**
- **It envisions a world living in harmony with nature, with specific targets aimed at protecting biodiversity.**

The Future of Conservation: Challenges and Opportunities

The 30 by 30 Agenda and Its Implications

- The '30 by 30' agenda calls for countries to protect 30% of the world's land and marine areas by 2030.
- While this goal is ambitious, it risks jeopardizing IPLC rights by promoting the expansion of protected areas without adequate consultation.

Moving Beyond Protected Areas: Other Effective Area-Based Conservation Measures (OECMs)

- The KMGBF introduces OECMs as a way to involve communities in conservation.
- However, without proper legal recognition of rights, these measures could become tools for exploitation rather than empowerment.

Need for Legal Synergy

- India's Ministry of Tribal Affairs urged integrating FRA mechanisms with biodiversity laws like the BDA and draft Biodiversity Rules (2024).
- Recommended securing prior informed consent from gram sabhas before declaring biodiversity heritage sites

Conclusion

The struggle for the rights of IPLCs in conservation approaches is far from over. While there have been

significant international victories, the implementation of laws and policies must prioritize the voices and rights of local communities. Only then can we hope to achieve a truly inclusive and effective conservation model that respects both people and nature.

GS Paper III – Environment, Biodiversity, Conservation

1. **The 'fortress model' of conservation has been widely criticised for its exclusionary nature.** Discuss this model in the Indian context, highlighting its impact on biodiversity and the rights of Indigenous Peoples and Local Communities (IPLCs).
2. **“Conservation without community participation is both unjust and unsustainable.”** In light of this statement, examine the role of IPLCs in biodiversity conservation with reference to national and international frameworks.

Topic → The Environmental Impact of Generative AI and the Role of Small Modular Reactors

Redrawing the not-so-pretty energy footprint of AI

Generative Artificial Intelligence (AI) has undoubtedly eased access to art and reduced the time and the effort required to complete certain tasks. For example, ChatGPT-4o can generate a Studio Ghibli-inspired portrait in seconds with just a prompt. But this ease comes at a significant energy cost that is often overlooked – one that has even led to Graphic Processing Units (GPUs) melting. As AI tools advance, this environmental impact will continue to become more detrimental, making this an unsustainable technology. How can AI be developed sustainably? And can leveraging nuclear energy, specifically Small Modular Reactors (SMRs), be a possible alternative?

AI is not free. Every time one uses ChatGPT or any other AI tool, somewhere in the world, there is a data centre chugging electricity, much of which is generated from fossil fuels. "It's super fun seeing people love images in ChatGPT, but our GPUs are melting," tweeted Sam Altman, CEO of OpenAI. Projections indicate that these data centres could account for 10% of the world's total electricity usage by 2030. Though these estimates mirror worldwide energy trends, it is necessary to highlight that India currently has sufficient capacity to generate electricity for its own domestic AI needs. Yet, with increasing adoption and ambitions, proactive planning is imperative.

Training an AI model, whether it is a conversational tool such as ChatGPT or an image-generator tool such as Midjourney, can generate the same amount of CO₂ as five cars running continuously across their life. Once deployed, AI tools continue to draw immense power from data centres as they serve countless users around the globe. This resource consumption is staggering, and it is becoming more unsustainable as AI adoption grows.

To start with, AI companies need to be transparent about their energy consumption. Just



Anwesha Sen
is with The
Takshashila
Institution



Sourav Mannaraprayil
is with The
Takshashila
Institution

Small modular nuclear reactors could be the energy answer to support booming AI and data infrastructure

as some regulations mandate the disclosure of privacy practices surrounding data usage, companies must also be mandated to disclose their environmental impact – first, how much energy is being consumed? Second, where is it coming from? Third, what steps are being taken to minimise energy consumption? Such data would provide further insights on where energy is being used the most and encourage research and development to create a more sustainable model of AI development.

Advantages of SMRs

Another, perhaps controversial, solution would be to address the energy source behind all of this technological growth. It is time nuclear energy, particularly SMRs, is discussed seriously. While this is often a subject of heated debate, it is also a powerful potential solution to the energy demands created by AI and other emerging technologies. The AI boom is happening fast, and the current energy infrastructure will just not be able to keep up.

SMRs present a transformative opportunity for the global energy landscape to support booming AI and data infrastructure. Unlike traditional large-scale nuclear power plants that demand extensive land, water, and infrastructure, SMRs are designed to be compact and scalable. This flexibility allows them to be deployed closer to high-energy-demand facilities, such as data centres, which require consistent and reliable power to manage vast amounts of computational workloads. Their ability to provide 24x7, zero-carbon, baseload electricity makes them an ideal alternative to renewable sources such as solar and wind by ensuring a stable energy supply regardless of weather conditions.

The benefits of SMRs extend beyond just energy reliability. Their modular construction reduces construction time and costs when

compared to conventional nuclear plants, enabling faster deployment to meet the rapidly growing demands of AI and data-driven industries. Additionally, SMRs offer enhanced safety features, with passive safety systems that rely on natural phenomena to cool the reactor core and safely shut down, reducing the risk of accidents. This makes them more acceptable and easier to integrate into regions where large-scale nuclear facilities would face opposition. The ability of SMRs to operate in diverse environments, from urban areas to remote locations, also supports the decentralisation of energy production, reducing transmission losses and enhancing grid resilience.

Some of the challenges

However, the adoption of SMRs is not without challenges. Significant policy shifts will be required to create a robust regulatory framework that addresses safety, waste management and public perception. There is also the matter of substantial upfront investment, as the technology is still maturing and may face issues of cost competitiveness when compared to established energy sources. Additionally, coordinating SMR deployment with existing renewable energy initiatives will require careful planning to maximise synergies while minimising redundancy. In India's case, despite these challenges, the cost of electricity from SMRs is predicted to fall from ₹10.3 to ₹5 per kWh after the reactors are functional, which is less than the average cost of electricity.

In conclusion, a public-private partnership model presents a realistic solution to the challenges of sustainable AI development. By leveraging the strengths of both sectors, this model can facilitate the efficient development of SMRs alongside other forms of renewable energy to support advancements in AI.



The Hidden Energy Costs

- Every time you use an AI tool, there's a data center somewhere consuming a massive amount of electricity, much of which is still generated from fossil fuels.
- Projections suggest that by 2030, these data centers could account for a staggering 10% of the world's total electricity usage.

The Continuous Energy Drain of AI Tools

- Once these AI tools are up and running, they don't just stop consuming energy.
- They continue to draw immense power from data centers, serving countless users around the globe.

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- **This staggering resource consumption is becoming more unsustainable as AI adoption grows.**

- ♦ **Need for Transparency and Accountability**

- **Lack of Energy Disclosure:** AI companies rarely disclose their energy consumption and carbon footprint.
- **Suggested Measures:**
 - **Mandate disclosure of energy use.**
 - **Reveal energy sources.**
 - **Document steps for reducing environmental impact.**
- **Benefits:** Transparency could drive innovation in sustainable AI practices.

Exploring Small Modular Reactors (SMRs)

Now, let's shift gears and talk about a potential solution to the energy demands created by AI: Small Modular Reactors (SMRs).

What Are SMRs?

SMRs are compact, scalable nuclear reactors designed to provide reliable energy without the extensive land and infrastructure requirements of traditional nuclear power plants.

Advantages of SMRs for AI Energy Needs

Compact and Scalable Design

One of the biggest advantages of SMRs is their ability to be deployed closer to high-energy-demand facilities, like data centers.

This means they can provide consistent and reliable power to manage vast computational workloads.

Enhanced Safety Features

- Safety is always a concern with nuclear energy, but SMRs come equipped with passive safety systems that rely on natural phenomena to cool the reactor core.
- This reduces the risk of accidents and makes them more acceptable in regions where large-scale nuclear facilities might face opposition.

SMRs as a Sustainable Energy Solution

- **Definition:** SMRs are compact nuclear reactors that offer flexible deployment and low-carbon energy.
 - **Advantages:**
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- **Provide 24x7 stable power unlike solar or wind.**
 - **Lower land, water, and infrastructure needs than traditional nuclear plants.**
 - **Scalable and modular for deployment near data centres.**
 - **Enhanced safety through passive systems.**
 - **Reduced transmission losses due to decentralised deployment.**
 - **Deployment Potential: Ideal for high-energy-demand areas like AI data centres.**
 - ◆ **Challenges of SMRs**
 - **Regulatory Hurdles: Need comprehensive safety, waste management, and public acceptance policies.**
 - **Cost Concerns: High initial investment; cost competitiveness is yet to be achieved.**
 - **Integration Issues: Must coordinate with existing renewable energy efforts.**
 - **Indian Context: Electricity cost from SMRs may fall from ₹10.3 to ₹5/kWh once operational, making it viable.**

Conclusion: A Path Forward for Sustainable AI

In conclusion, the future of AI development hinges on finding sustainable energy solutions. A public-private partnership model could be the key to overcoming the challenges of sustainable AI. By leveraging the strengths of both sectors, we can facilitate the efficient development of SMRs alongside other renewable energy sources to support advancements in AI

GS Paper III – Science & Technology, Environment, Infrastructure

Q Artificial Intelligence has revolutionised modern computing but comes with a heavy environmental cost. Critically analyse the sustainability challenges posed by AI and suggest possible technological and policy-level solutions.

Q Discuss the potential of Small Modular Reactors (SMRs) as a sustainable energy source to meet the growing energy demands of AI infrastructure. What are the advantages and challenges of SMRs in the Indian context?

Topic → PLI SCHEME

At WTO, U.S. queries India's PLI scheme for speciality steel

Scheme aims to reduce imports of high grade steel, attain self sufficiency, says India, which was a net importer in FY25 for the second year in row

Amity Sen
NEW DELHI

The U.S. has questioned India's Production Linked Incentive (PLI) scheme for speciality steel at the WTO suggesting the subsidies may not be appropriate given the global overcapacity in steel, sources said.

India, however, maintains the scheme will reduce its dependence on imports of higher grades of steel and is a much-needed step towards attaining self-sufficiency and securing the nation's interests.

"We specifically note there was a part of this (PLI) scheme for speciality



Self-reliance: Compared with nations like China with estimated steel subsidies of \$50 bn, India's subsidies are small. REUTERS

The U.S.' linking of the PLI scheme for speciality steel with global overcapacity does not hold much merit as India was a net im-

ports of these grades and will be a step towards Atmanirbhar Bharat," according to a government statement.

"India's PLI scheme is



Why in News?

- The U.S. has questioned India's Production Linked Incentive (PLI) scheme for specialty steel at the WTO suggesting the subsidies may not be appropriate given the global overcapacity in steel, sources said.
- India, however, maintains the scheme will reduce its dependence on imports of higher grades of steel and is a much-needed step towards attaining self-sufficiency and securing the nation's interests.

PLI Schemes – Overview

1. **Objective:**
 - To boost domestic manufacturing, reduce imports, and increase exports.

- **To incentivise production through direct financial support linked to incremental output/sales.**
- 1. **Launched by: Government of India in 2020, as part of the Atmanirbhar Bharat initiative.**
- 2. **Mechanism:**
 - **Manufacturers are offered financial incentives (typically 4–6% of sales) for increased production and investment over a base year.**

♦ **Advantages**

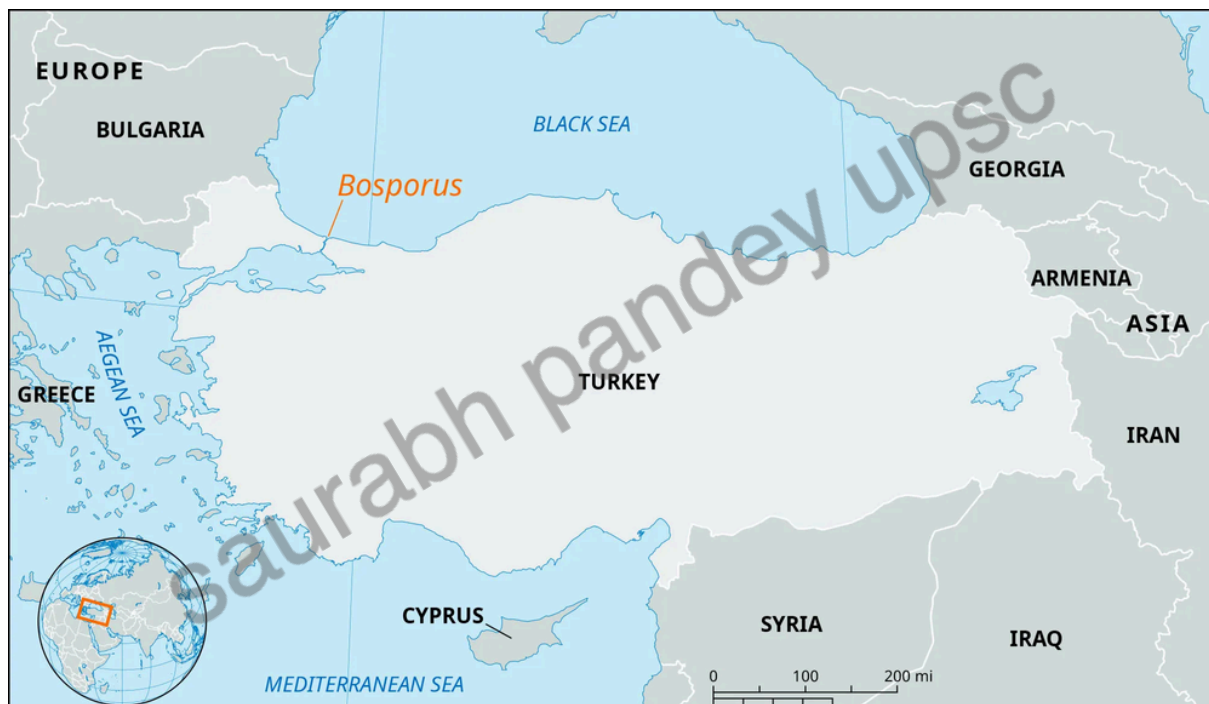
1. **Enhances India's global competitiveness in manufacturing.**
2. **Reduces import dependency, especially in electronics and renewable energy.**
3. **Promotes export-oriented growth.**
4. **Encourages technology transfer and innovation.**
5. **Supports Make in India and Atmanirbhar Bharat goals.**

Topic → Bosphorus Strait

Uncharted waters



Tough navigation: A ship navigates the Bosphorus Strait at sunset in Istanbul, Turkey. The commercial transportation industry worldwide is bracing for further disruption to global shipping routes in the fallout of U.S. President Donald Trump's tariff war with China, which could trigger further changes in global trade flows. GETTY IMAGES







Topic → OPEC+

OPEC+'s 'healthy' crude oil market looks like it's catching a cold: Russell

OPINION

Clyde Russell
LAUNCESTON, AUSTRALIA

If there is one thing that is almost certain in the global crude oil market, it's that the stated reasons for the OPEC+ group of exporters increasing supply are not the real reasons.

The eight OPEC+ countries that are party to voluntary output cuts said in a statement on the Organization of the Petroleum Exporting Countries (OPEC) website that the decision to lift output came amid the "current healthy market fundamentals as reflected in the low oil inventories."

There is little evidence to support the assertion of healthy market fundamen-

tal, and visible crude inventories are far from low enough to spark any concerns.

The OPEC monthly report for April showed that commercial crude inventories in the Organisation for Economic Cooperation and Development were 2.746 billion barrels at the end of February, down 16.1 million barrels from the prior month.

In other words, OECD stocks were a mere 2.5% below the five-year average, which seems reasonable given the rising crude oil prices that prevailed between September and January and the rising risk of a global economic slowdown since the return of Donald Trump to the U.S. presidency.



Breathing easy: The OPEC+ countries decided to ease their curbs again for June. REUTERS

Calculations based on official data for imports, domestic output and refinery throughput showed a surplus of 1.74 million bpd in March as China imported considerably more

crude than it processed into refined fuels.

Asia imports

The situation in Asia, the world's biggest importing region and buyer of about

60% of global seaborne crude volumes, is instructive. Asia's seaborne imports recovered in March and April after a weak February, with commodity analysts Kpler showing ar-

rivals of 25.27 million bpd and 25.28 million bpd respectively.

However, for the first four months of 2025 Asia's seaborne imports are still down 280,000 bpd from the same period in 2024, hardly suggestive of healthy demand. It's also the case that much of the increase in March and April was down to elevated imports by China, and those reflected temporary factors.

The outlook for crude demand is also somewhat mixed in coming months.

While May to July is traditionally a higher demand season amid summer construction and agriculture activity, there is an increasing likelihood that the trade war launched by Trump will start curbing

oil demand. The massive 145% tariff on imports from China will likely affect air freight in coming weeks.

Even if trade tensions do ease, the slowdown in shipping is already locked in for the next few months and perhaps longer as it will take time for supply chains to recover or be re-worked.

So what is OPEC+ actually trying to achieve by lifting output?

The group's de facto leader Saudi Arabia may well be trying to encourage greater quote: compliance from other members by forcing them to accept lower prices.

The Saudis may also be trying to go some way to meeting Trump's demand for lower prices, which would help the U.S. leader

fulfill a campaign promise of lower energy costs.

OPEC+ may also be trying to use low prices to limit oil output in other major producers, such as the United States, given their higher cost of production.

The end result is that it's hard to make anything other than a bearish case for oil prices, at least for the coming months, as more supply runs headlong into the rising likelihood of lower demand.

The early market assessment of the OPEC+ move bears this out, with Brent futures dropping as much as 3.7% in early Asian trade to a low of \$58.50 a barrel, down from the close of \$61.29 on May 2.

(The views expressed here are those of the author, a columnist for Reuters)

WORLD

OPEC Member Countries



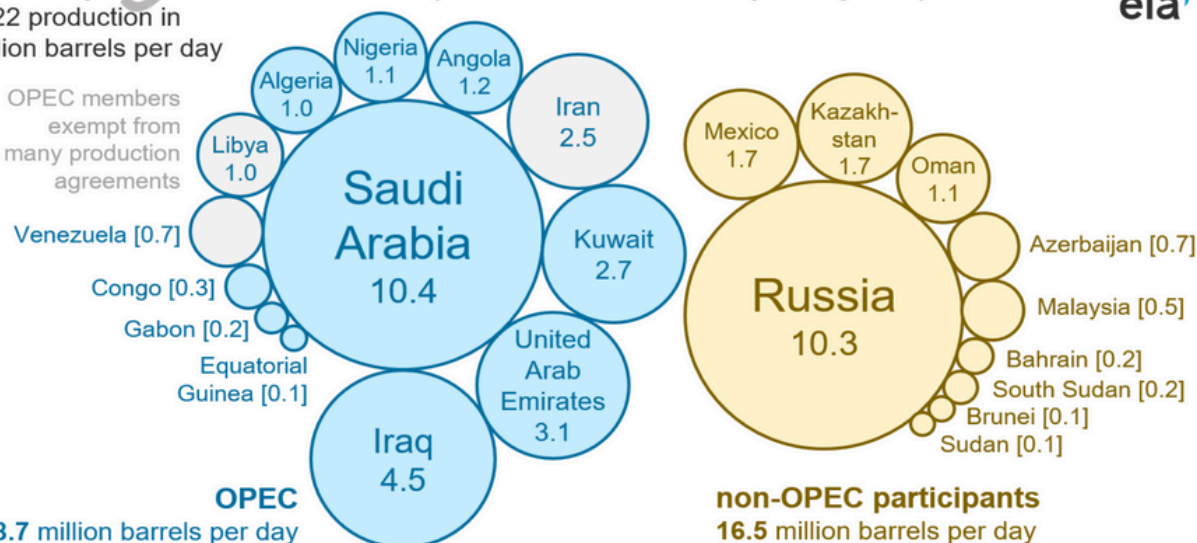
The Organization of the Petroleum Exporting Countries, also known as OPEC, was formed in 1960 by Iraq, Iran, Kuwait, Saudi Arabia, and Venezuela. The organization has since expanded to 13 members. OPEC regularly meets to set oil production targets and coordinate output to help manage global oil prices for the entire group.

In 2016, largely in response to dramatically falling oil prices driven by significant increases in U.S. shale oil output, OPEC signed an agreement with 10 other oil-producing countries to create what is now known as OPEC+. Among these 10 countries was the world's third-largest oil producer in 2022, Russia, which produced 13% of the world total (10.3 million barrels per day [b/d]).

Total oil production from OPEC+ (OPEC and non-OPEC participants)

2022 production in million barrels per day

OPEC members
exempt from
many production
agreements



Topic → Scarborough Shoal

saurabh pandey upsc



BRP Miguel Malvar during the 'Balikatan' exercise off the coast of San Antonio, Zambales. AFP

Philippines, U.S. cancel live-fire drill after old ship sinks

Associated Press

MANILA

A Second World War-era Philippine Navy ship to be used as a target in a combat exercise by American and the Philippine forces accidentally sank on Monday hours before the mock assault, prompting the drill to be cancelled, U.S. and Philippine military officials said.

The *BRP Miguel Malvar*, which was decommissioned by the Philippine Navy in 2021, took on water while being towed in rough waters facing the disputed South China Sea and sank about 30 nautical miles (55 km) off the western Philippine province of Zambales. Nobody was onboard when the ship listed then sank, the Philippine military said



Prelims Facts

- **Mennonites are a group of Anabaptist Christian communities tracing their roots to the epoch of the Radical Reformation. The name Mennonites is derived from the cleric Menno Simons of Friesland, part of the Habsburg Netherlands within the Holy Roman Empire, present day Netherlands**

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Forest dispute



Mennonites prepare a horse-drawn cart in Masisea, Peru. The ultra-religious colony is facing criminal proceedings for deforestation that could land dozens of its members in jail, with Indigenous groups such as the Shipibo-Konibo calling them 'forest termites'. AFP

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