IOSR Journal of Humanities and Social Science (IOSR-JHSS)
Volume 31, Issue 5, Series 1 (May, 2026) 75-79
e-ISSN: 2279-0837, p-ISSN: 2279-0845.
www.iosrjournals.org

The "Hormuz Blockade" and India's Strategic Petroleum Reserve (SPR) Adequacy

Prof. Shashi Pratap Shahi
Vice-chancellor, Magadh University, Bodh Gaya

Abstract
The Strait of Hormuz functions as a maritime chokepoint which connects the Persian Gulf with the Arabian Sea and handles 20 percent of global oil shipments that occur each day. The closure of Hormuz would create an international crisis for India which depends on Gulf countries for 85 percent of its crude oil imports. The situation would develop into an economic emergency for the country. This article first establishes whether a Hormuz blockade could occur next to its expected impacts on India's energy system before testing if India's Strategic Petroleum Reserve (SPR) infrastructure can handle such an emergency. The article demonstrates that India needs to develop its SPR system further because its current capacity of 5.33 million metric tonnes at three underground storage sites exceeds International Energy Agency standards yet fails to meet India's actual import risk. The article examines several policy solutions which include expanding SPR facilities and diversifying energy sources and creating energy consumption constraints because India needs to transform its energy security policies at this point.

Keywords: *Hormuz blockade, oil supply disruption, crude oil imports, Strategic Petroleum Reserve,India energy security, Persian Gulf*

I. Introduction

Picture this: it's a Tuesday morning in Mumbai, and crude futures have jumped 40 percent overnight. Petrol queues stretch around the block. Airlines are cancelling routes. The rupee is sliding. The trigger? A naval confrontation in a stretch of water barely 33 kilometres wide at its narrowest point — the Strait of Hormuz, wedged between Iran on one side and Oman and the United Arab Emirates on the other.

This scenario is not fiction. It is the kind of crisis that energy planners, naval strategists, and finance ministries have quietly war-gamed for decades. The Strait of Hormuz is the single most critical maritime chokepoint in the global energy system. About 17 to 21 million barrels of oil pass through it every day, depending on the year and the season. Liquefied natural gas flows through it in enormous volumes too. There is no easy bypass. The alternative pipelines that exist — through Saudi Arabia and the UAE — can reroute only a fraction of Hormuz traffic.

For India, the exposure is acute. The country has become one of the world's largest oil importers, crossing 4.7 million barrels per day of consumption as of 2024, and the overwhelming share of that demand is met by imported crude. The Gulf region — Saudi Arabia, Iraq, UAE, Kuwait, and Iran collectively — supplies somewhere between 55 and 65 percent of India's crude imports in a typical year. A serious, sustained Hormuz disruption would hit India harder than almost any other major economy outside the immediate Gulf region itself.

Against this vulnerability, India has built a Strategic Petroleum Reserve — three underground rock caverns on the country's west and east coasts, capable of storing about 5.33 million metric tonnes of crude oil. The question this article takes seriously is a simple but uncomfortable one: is that enough?

II. The Strait of Hormuz: Geography, Traffic, and Threat Scenarios

2.1 Why Hormuz Is Irreplaceable

The geography is the thing. Hormuz is not just important — it is structurally irreplaceable in the short to medium term. Saudi Arabia has the East-West Pipeline, which can carry about 5 million barrels per day to the Red Sea port of Yanbu, bypassing Hormuz entirely. The UAE has the Abu Dhabi Crude Oil Pipeline running to Fujairah on the Gulf of Oman. But these pipelines together can handle perhaps 7 to 8 million barrels per day at full utilisation — less than half of average Hormuz throughput. For the remainder, there is no alternative route.

Expanding those pipelines would take years and tens of billions of dollars. Building entirely new ones would take longer. So in any near-term crisis — say, one lasting weeks or a few months — the world would simply lose access to a large chunk of global oil supply. Prices would spike. Allocation conflicts would follow. Countries without meaningful strategic reserves would face hard choices between industrial output, transport fuel, and household energy.

2.2 What a Blockade Could Actually Look Like

When people say "Hormuz blockade," they usually imagine Iran closing the strait — something Tehran has threatened explicitly during periods of maximum pressure from Washington. Iranian military doctrine includes mining the strait, deploying anti-ship missiles from coastal positions, and using fast-attack boats to harass or disable tanker traffic. Iran's Revolutionary Guard Corps (IRGC) has exercised these capabilities repeatedly in the Gulf, most notably in the tanker attacks and seizures between 2019 and 2023.

A full closure is actually less likely than a partial disruption — because Iran depends on the strait too, both for its own limited oil exports and for imports of goods. What's more plausible is a scenario where tanker insurance rates spike so dramatically that commercial operators voluntarily avoid the route, or where mine-laying creates genuine navigational hazards even if active hostilities are limited. Lloyd's of London war-risk premiums during the 2019 tanker crisis jumped by 300 to 500 percent in a matter of days, effectively pricing many smaller operators out of Gulf routes without a single ship being sunk.

The duration matters enormously. A two-week disruption is painful but manageable for countries with adequate reserves. A two-month disruption is a genuine macroeconomic emergency for import-dependent nations. A six-month disruption — while unlikely — would represent a fundamental reshaping of global energy markets.

III. India's Oil Import Dependence: The Numbers Behind the Risk

3.1 How Deep Is the Exposure?

India's import dependence on crude oil has actually grown over time, not shrunk — despite significant investments in renewable energy. Domestic crude production has been declining steadily, with ageing fields at Bombay High and the Krishna-Godavari basin producing less than they did a decade ago. New fields have not adequately offset that decline. As a result, roughly 85 percent of India's crude consumption comes from abroad, a figure that has been remarkably stable for several years.

The Gulf's share of that import basket is large and sticky. Iraq has been India's single largest supplier for most of the last five years, followed by Saudi Arabia. UAE, Kuwait, and — when sanctions have been relaxed — Iran all feature regularly. Russia emerged as a major source from mid-2022 onward, when Indian refiners took advantage of discounted Russian Urals crude following Western sanctions, and by 2023–2024, Russia was supplying approximately 35 to 40 percent of India's crude imports. That diversification toward Russia has genuinely reduced Gulf dependence — but it has introduced a different kind of geopolitical risk, and Russian supply routes do not transit Hormuz in the same way.

As shown in Figure 1, India's crude import sourcing has shifted considerably between 2018 and 2024, with Russian crude rising sharply while Gulf dependence as a combined share has moderated — though individual Gulf producers remain critical anchors of India's supply.

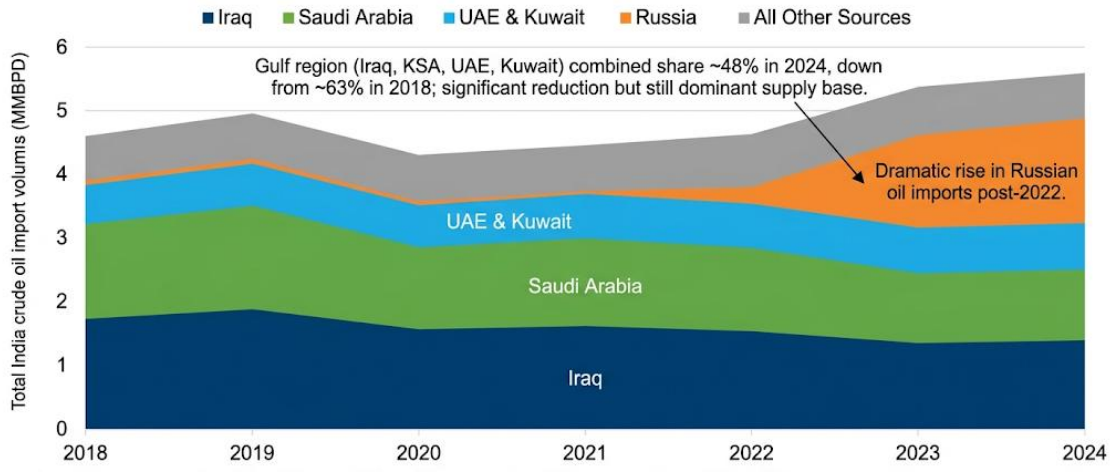

Fig. 1: India's Crude Oil Import Sources by Major Supplier Country, 2018–2024, Source: Author Generated

3.2 The Refining System's Vulnerability

India's refining sector exists as an unknown threat which the story about India currently overlooks. Indian public sector refiners — Indian Oil Corporation, Bharat Petroleum, Hindustan Petroleum — have built their processing infrastructure around specific crude grades. The refineries spent their development time to optimize operations for Gulf crudes which include the heavier sour grades from Iraq and Saudi Arabia. Refineries can switch to new crude grades which differ from their current operations by using West African light sweets and North Sea crudes, but this process creates operational problems and results in high operational

costs. The output of refineries becomes unpredictable because domestic demand does not match the actual output patterns of refineries and their production of different products.

The refinery system can only process replacement crude from non-Hormuz sources during a blockade at reduced efficiency. The storage situation will reach critical levels because of the disruption, which will first affect the domestic product supply chain.

IV. India's Strategic Petroleum Reserve: What Exists and What It Can Do

4.1 The Three Caverns

India's SPR programme, managed through Indian Strategic Petroleum Reserves Limited (ISPRL), operates three underground rock cavern storage facilities. The facility at Visakhapatnam on the east coast holds 1.33 million metric tonnes. On the west coast, Mangaluru holds 1.5 million metric tonnes and Padur — the largest — holds 2.5 million metric tonnes. The total comes to 5.33 million metric tonnes, which translates to roughly 39 million barrels of crude oil.

At India's current consumption rate of roughly 4.7 million barrels per day, those 39 million barrels represent approximately 8 to 9 days of total consumption. Set against the IEA standard — which recommends member countries hold 90 days of net import cover — this is a stark gap. India is not an IEA member, but the benchmark remains the most widely accepted measure of supply shock resilience.

To be fair, the SPR caverns are separate from the commercial stocks that refiners and fuel distributors hold. When you add industry stocks — which the Ministry of Petroleum estimates at roughly 65 days of forward demand — India's total petroleum buffer looks more like 73 to 75 days. That sounds more reasonable. But there are important caveats: commercial stocks are not strategically managed, they are distributed across hundreds of locations with no unified drawdown mechanism, and a significant portion is in-transit or operationally committed. In a genuine supply emergency, the portion of commercial stock that can be rapidly mobilised as a buffer is considerably lower than the headline figure suggests.

4.2 Comparing India to IEA Benchmarks and Peers

Figure 2 situates India's SPR capacity alongside selected major oil-importing nations, illustrating the gap between India's current position and both IEA norms and the storage levels maintained by peer economies.

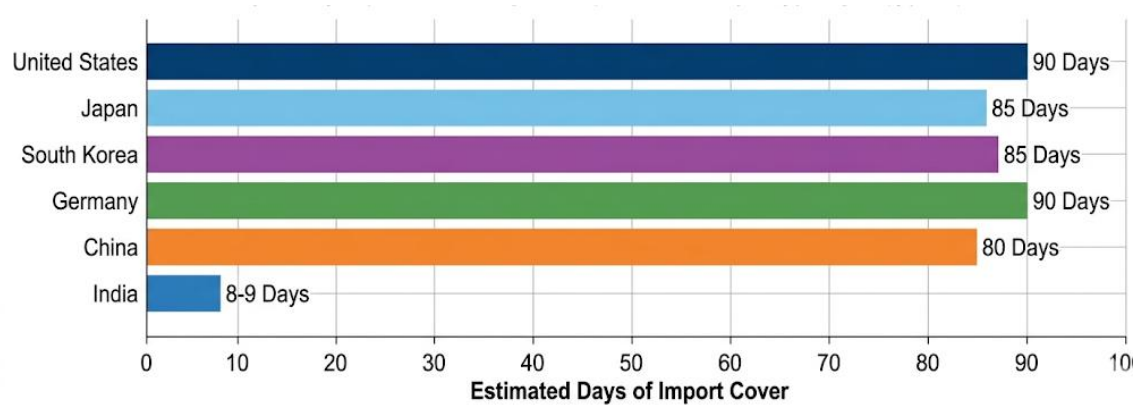

Fig.2: Strategic Petroleum Reserve Days of Import Cover — India vs Selected Major Oil Importers (2024), Source: Author Generated

Japan and South Korea — two other large oil importers heavily dependent on Gulf crude — have both invested heavily in SPR infrastructure over decades. Japan holds more than 90 days of reserve cover, partly in government facilities and partly in mandatory commercial inventories. South Korea similarly maintains close to 90 days. China's official SPR is estimated at 80 to 90 days, though the precise figures are state secrets. Against any of these comparators, India's SPR position looks underprepared.

The honest explanation is historical: India started late and invested cautiously. The ISPRL facilities were completed and filled progressively between 2014 and 2018. Phase II expansion — which would add storage at Chandikhol in Odisha and Padur — has been discussed for years but has moved slowly through approval, funding, and execution stages. As of 2024, Phase II remained incomplete, constrained by budgetary prioritisation and land acquisition challenges.

V. A Hormuz Blockade and India: Modelling the Impact

5.1 The First Two Weeks

In the early days of a Hormuz blockade, the immediate impact on India would be financial rather than physical. Oil prices would spike sharply on futures markets. The Indian rupee, which has a well-documented inverse relationship with crude prices, would depreciate. Inflation expectations would rise. The Reserve Bank of India would face difficult choices between defending the currency, managing inflation, and supporting growth.

Physically, Indian refineries typically carry between 15 and 25 days of crude inventory in their own tankage. That buffer, combined with SPR drawdown, could theoretically sustain operations for three to four weeks without new Gulf crude arrivals — though, as discussed above, the refinery system's ability to substitute different crude grades limits the practical flexibility of that buffer.

Airlines, trucking companies, and industrial consumers — all watching petroleum product prices spike — would begin rationing decisions within days. The government would face enormous pressure to intervene on pricing, potentially at serious fiscal cost given India's partially administered fuel price regime.

5.2 Weeks Three Through Eight

The current situation presents a genuine crisis through its core elements. The commercial crude stocks are approaching a critical shortage point. The SPR drawdown should have occurred but the caverns only maintain 39 million barrels which provides insufficient storage for India's refinery operations to continue. The government needs to obtain crude from West Africa and North Sea traders and US exporters while it controls domestic market requirements through rationing and price signals and administrative allocation methods.

The macroeconomic damage would multiply its effects. A 2022 IMF study on oil supply shocks found that a sustained 20 percent supply disruption can reduce GDP growth by 1 to 2 percentage points in heavily import-dependent economies within two quarters. India exists at the more exposed position of the energy dependency spectrum because it depends on energy resources while its currency value shows high correlation with oil price fluctuations.

The power sector serves as an important aspect. India has made real progress on solar and wind energy but thermal power which uses gas and certain oil-linked fuels remains a significant component of electricity generation especially during peak times. The electricity supply disruption that lasts for an extended period will create electricity shortages which will impact manufacturing operations and agricultural activities that need electricity for irrigation and the power needs of residential households.

VI. Policy Responses: What India Should Be Doing Differently

6.1 Expanding the SPR

The most direct response is accelerating SPR expansion. The Phase II additions at Chandikhol (4 million metric tonnes) and additional Padur capacity would roughly double India's strategic storage if completed. Getting to 30 days of SPR cover — still below IEA norms but a meaningful improvement — should be treated as a national security imperative rather than a budgetary line item to be deferred.

One funding model worth considering is the participation of private oil companies — both Indian and foreign — in building and co-owning storage capacity in exchange for priority access during non-crisis periods. This kind of public-private SPR architecture has worked reasonably well in Japan and is being explored in South Korea. It spreads the capital cost and creates commercial incentives for maintaining storage discipline.

6.2 Supply Diversification

India has done more on supply diversification than it often gets credit for. The Russian crude bonanza post-2022 was a genuine, if opportunistic, act of diversification. The government has also been cultivating relationships with West African producers — Nigeria, Angola, Gabon — and maintaining US crude as a periodic source of supply, particularly for refineries configured for lighter grades.

The deeper challenge is structural: Gulf crude is cheap, geographically proximate, and well-suited to India's refinery configuration. Any serious programme of diversification requires either accepting a cost premium for non-Gulf crude or investing in refinery upgrades to handle a wider range of grades efficiently. Neither is cost-free.

6.3 Demand-Side Buffers and the Renewable Transition

The most durable long-term hedge against Hormuz risk is reducing oil dependence itself. India's electric vehicle transition, if it proceeds at scale, will materially reduce petrol demand over the next decade. Natural gas substitution in industrial applications reduces the liquid fuel import bill. Expanding ethanol blending in petrol — which India has been doing aggressively, reaching 12 to 15 percent blend rates — cuts crude import volumes modestly but meaningfully.

None of these transitions will protect India from a Hormuz crisis in 2026 or 2027. But they change the structural exposure over a ten-year horizon in ways that SPR expansion alone cannot.

VII. Conclusion

The Strait of Hormuz is narrow, critical, and fragile. India's dependence on it is substantial and slow to change. The country's Strategic Petroleum Reserve, for all its genuine engineering achievement, provides a buffer measured in days when the plausible disruption scenarios are measured in weeks or months.

This is not a counsel of despair. India has real options — expanding storage, deepening supply diversity, accelerating the energy transition, building international cooperation frameworks. What it lacks is urgency. The gap between India's vulnerability and its preparedness is wide enough that a serious Hormuz crisis in the near term would expose not just physical supply shortfalls but a policy failure years in the making.

Energy security doesn't make headlines until it breaks down. By that point, the cost of the infrastructure that wasn't built, the reserves that weren't filled, and the partnerships that weren't formed becomes impossible to ignore — and impossible to quickly reverse. India has time to close that gap, but not unlimited time. The geography of the Gulf, and the geopolitics surrounding it, will not wait indefinitely for a more convenient moment.

References

[1]. Agrawal, S., & Sinha, P. (2022). India's strategic petroleum reserves: Adequacy, governance, and the path to expansion. *Energy Policy*, 161, 112743. https://doi.org/10.1016/j.enpol.2022.112743

[2]. Bhatia, R. (2019). *India-Gulf relations: A new chapter*. Gateway House Indian Council on Global Relations.

[3]. Bhattacharyya, S. C. (2015). *Energy economics: Concepts, issues, markets and governance*. Springer.

[4]. Bordoff, J., &Losz, A. (2020). Oil market shocks and strategic reserve policy: Lessons from the 2019 Saudi attack. *Columbia SIPA Center on Global Energy Policy*, Policy Brief. https://www.energypolicy.columbia.edu/research/report/oil-market-shocks

[5]. Clemente, J. (2021). India's growing oil import dependency and the geopolitics of Gulf supply. *Energy Security Journal*, 9(2), 44–62. https://doi.org/10.1080/17441692.2021.1876322

[6]. Dannreuther, R. (2017). *Energy security*. Polity Press.

[7]. Datta, P. K., & Mukherjee, A. (2023). Assessing India's petroleum reserve strategy under global supply uncertainty. *Journal of Asian Energy Studies*, 7(1), 18–35. https://doi.org/10.1080/09557571.2023.2043811

[8]. Economist Intelligence Unit. (2023). *Asia's energy security dilemma: Gulf dependence and the search for alternatives*. EIU.

[9]. Fattouh, B., & El-Katiri, L. (2015). Energy subsidies in the Middle East and North Africa. *Energy Strategy Reviews*, 2(1), 108–115. https://doi.org/10.1016/j.esr.2013.10.004

[10]. Goldthau, A., & Witte, J. M. (Eds.). (2010). *Global energy governance: The new rules of the game*. Brookings Institution Press.

[11]. International Energy Agency. (2024). *Oil security and emergency response: IEA 2024 update*. IEA Publications. https://www.iea.org/reports/oil-security-2024

[12]. Kalicki, J. H., & Goldwyn, D. L. (Eds.). (2013). *Energy and security: Strategies for a world in transition* (2nd ed.). Woodrow Wilson Center Press.

[13]. Kartha, T. (2018). India's energy security: Challenges, vulnerabilities, and the SPR imperative. *Strategic Analysis*, 42(5), 458–474. https://doi.org/10.1080/09700161.2018.1519221

[14]. Khatri, P., & Desai, M. (2024). Rupee depreciation and crude oil price shocks: Quantifying India's macro vulnerability. *Reserve Bank of India Working Paper Series*, No. 04/2024. https://rbi.org.in/scripts/PublicationsView.aspx

[15]. Mabro, R. (2007). Oil in the twenty-first century: Issues, challenges and opportunities. *Oxford Institute for Energy Studies Monograph*, No. T-3.

[16]. Pant, H. V., &Siwach, G. (2021). India and energy geopolitics in the Gulf: Navigating dependence and strategic ambiguity. *India Review*, 20(4), 357–379. https://doi.org/10.1080/14736489.2021.1976104

[17]. Rabinowitz, P. (2020). The Hormuz chokepoint and oil market resilience: Scenario analysis for importing economies. *Journal of Energy Security*, 12(3), 77–94. https://doi.org/10.1080/17441692.2020.1823719

[18]. Rajaraman, I. (2022). India's petroleum taxation and strategic reserve financing: A fiscal framework. *Economic and Political Weekly*, 57(18), 33–41.

[19]. Stokes, D., & Raphael, S. (2010). *Global energy security and American hegemony*. Johns Hopkins University Press.

[20]. Yergin, D. (2011). *The quest: Energy, security, and the remaking of the modern world*. Penguin Press.