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Q20

What are the economic significance of discovery of oil in Arctic Sea and its possible environmental consequences?

UPSC Civil Services Mains 2015 · GS I · 12 marks · Natural Resources and Industries

Distribution of key natural resources across the world (including South Asia and the Indian sub-continent); factors responsible for the location of primary, secondary, and tertiary sector industries in various parts of the world (including India).

Core demand of the question

- State the economic meaning of Arctic oil discovery, then the likely environmental costs
- Keep a critical note on price, technology, and climate duty

Revision summary

Ice melt has made Arctic oil and shorter polar shipping economically imaginable.

Littoral states and high-cost offshore firms would gain if prices and technology allow.

India would feel it through import prices and routes, not as an owner of the shelf.

Spills, **black carbon on ice**, and ecosystem loss are the environmental bill.

Climate policy and costly ice operations may strand much of that oil anyway.

Introduction

Melting summer sea ice has opened talk of oil and gas under the Arctic Ocean and of shorter shipping along the **Northern Sea Route**. For the world economy that could mean new barrels, new routes, and a new geopolitical prize among Russia, Norway, the United States, Canada, and Denmark. For the planet it means drilling in the most fragile cold sea at the same time as climate science asks for less fossil fuel.

Body

Economic significance

- The Arctic is thought to hold a large share of the world's undiscovered conventional oil and gas, much of it offshore, which matters for energy-importing countries if it can be produced at a bearable cost.
- New reserves can shift bargaining power toward Arctic littoral states, especially Russia on the Eurasian shelf, and toward firms that can work in ice.
- The **Northern Sea Route** and, in longer dreams, a northwest passage, can cut days between East Asia and Europe compared with Suez, which is a shipping and insurance economy as well as an oil story.
- **Ports, icebreakers, pipelines, and search-and-rescue create a high-cost industrial frontier:** jobs and contracts, but also stranded-asset risk if oil prices fall or rules tighten.
- India, as a growing importer and an **Arctic Council** observer, watches energy access and polar science; Arctic oil is not India's to pump, but price and route changes would still reach Indian

import bills.

- Unconventional oil elsewhere (shale) and climate policy can make Arctic barrels uneconomic even if they exist on a map.

Possible environmental consequences

- A spill in cold, ice-covered water is extremely hard to clean; oil persists, and ecosystems recover slowly.
- Drilling, flaring, and extra shipping add **black carbon on ice**, which darkens the surface and speeds melt, a feedback that harms the climate that made the oil reachable.
- Noise, ice-breaking, and spills threaten polar bears, walrus, migratory birds, and unique cold-water food webs, and they hit Indigenous hunting and culture.
- Opening the Arctic fossil store fights the global need to keep warming in check; burning that oil is a climate cost even if no spill occurs.
- Onshore support roads and camps fragment tundra and permafrost, which can release methane, another climate risk.

Critical balance

- Discovery is not the same as cheap supply; ice, storms, and distance make Arctic oil among the costliest barrels.
- The economic prize is therefore uncertain; the environmental downside is certain if large-scale offshore production proceeds.

Way forward for the answer

- Treat Arctic oil as a strategic reserve with high ecological price, and stress that shipping and climate feedbacks matter even without a gusher.

Flow diagram

Sea ice retreat -> Arctic oil and routes
Arctic oil and routes -> Reserves routes geopolitics
Arctic oil and routes -> Spill soot melt wildlife
Spill soot melt wildlife -> Climate feedback
Price shale climate policy -> Reserves routes geopolitics

Conclusion

Arctic oil, if produced, would add high-cost barrels, new sea routes, and leverage for polar states, with knock-on effects on importers such as India. The environmental consequences-spills, soot on ice, wildlife loss, and more warming-are severe in a slow, cold sea. Economically tempting on a map, the frontier is a climate and ecology gamble more than a safe new Saudi Arabia.

Facts & figures

Arctic Council

Forum of Arctic states and Indigenous groups; India is an observer, not a littoral driller.

Northern Sea Route

Russian Arctic shipping lane that can shorten Asia-Europe voyages when ice allows.

USGS Arctic assessment

Widely cited estimate that the Arctic holds a large share of undiscovered oil and gas, much offshore.

Black carbon on ice

Soot from flaring and ships that reduces ice reflectivity and speeds melting.

Spill in ice

Oil cleanup is far harder in cold, ice-infested water than in temperate seas.

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