Mathurin Hybrid Initiative

Global Advisory Report

The Global Sand Supply and the Middle East

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Global Sand Supplies:

Sand in in short supply. While this may seem bizarre and contrary to the multitude of beaches, deserts, rivers, and lakes present on the planet, there has been an increased surge in demand for sand which has been rapidly depleting global sand stocks. Sand is a critical element in urban and infrastructural development – it is a key compound in building materials such as concrete and glass. One Leiden University study projects that sand demand is expected to rise by 45% in the next four decades. By 2060, the global construction sector is forecast to consume a breath-taking 4.6 billion tonnes of sand, especially fuelled by the appetites of population growth and economic development across MENA and Asia. As time marches on, international cooperation will be essential in global sand extraction, material recycling, and the development of technologies essential for addressing inequalities in access to shelter and infrastructural resources.

Why sand?

As a covert operator in daily life across the globe, sand is typically underappreciated and unrealised. It is everywhere and important in an almost uncalculatable manner. Besides water, is it the most-consumed natural resource on the planet.

The crux of the problem rests on the type of sand used for construction purposes. The sands we often typically associate with abundance – deserts being an example – are inappropriate. These sands are the wrong shape for construction as they have been eroded by wind and the particles are too rounded to lock together in a stable enough manner to form concrete. Deep sea sands are too high in chloride levels. The good stuff possesses more angular particles and is typically found in riverbeds and banks, as well as lakes and by the seashore. Resultingly, riverbeds, beaches, and lakes around the world are being decimated by sand demand. China's Poyang Lake is an illustrative example in which sand extraction has evidently decimated biodiversity and the ecosystem. What is equally concerning is the growing number of criminal gangs which have moved into the sand business, leading to the creation a lethal black market. Illegal sand mining has been reported in over 70 countries, often involving highly organised and violent gangs. A report from the South Asia Network of Dams, Rivers, and People – based in Delhi – has counted 193 dead through illegal sand mining networks in India over the last two years.

Sand mining and consumption is a poorly monitored industry in which policymakers have trouble gaining ground. Accurate data is practically non-existent, preventing the development of a sustainable limit on extraction. A UNEP report in 2019 had to rely on data on cement to estimate sand usage. The unregulated nature of the sand industry coupled with soaring demand will have a high environmental and human costs as ecosystems become more vulnerable to climate change.

The Middle East:

Although sand is, regionally speaking, abundant, many countries in the Middle East import sand. Saudi Arabia has imported sand from as far as Australia and Canada. As a side note, it is interesting to observe that Australia is the second largest exporter of sand on the planet. The 830meter-tall Burji Khalifa skyscraper in the UAE was built using imports from the other side of the world. Dubai's artificial Palm Islands were made from sand dredged from the bottom of the Persian Gulf.

The Middle East has a dynamic construction sector which reflects a combination of rapid population growth, urbanisation, and extensive infrastructural development across the region. Central to development is the cement market, an essential cornerstone in the ongoing economic and infrastructural transformations. Governments across the region continue to channel substantial resources into large infrastructural projects such as airports, ports, roads, and railways. The Saudi Arabian Riyadh Metro is testament to the scale and ambition of these projects. Cement demand in the region appears to be gearing up for sustained growth under the guiding hand of population growth and missions of development.

Yet, as this article has highlighted supply constraints and environmental concerns will present a persistent challenge to the region. Limited access to critical resources and high energy costs can and will hinder the expansion of local production capacities. Many countries will rely on cement imports in a growingly strained market. Furthermore, the international community is becoming fast aware of the environmental consequences of sand extraction and exploitation, placing the Middle East cement industry under heavy scrutiny.

The Midde East cement industry remains intrinsically tied to regional construction projects and economic growth. Demand continues to rise with sustained investment in infrastructure and urbanisation. A pertinent observer may find it beneficial to invest in the sand market, or failing that, explore opportunities in cement alternatives. Expansion will continue in the Middle East even as the region faces challenges related to sustainability, energy costs, and global supply constraints.

Reference material:

- https://commodityinside.com/middle-east-cement-market-analysis-navigatingconstruction-growth-supply-challenges-and-market-opportunities/
- https://theweek.com/news/science-health/960931/why-is-the-world-running-out-of-sand • https://www.dw.com/en/sand-crisis-shortage-supply-mafia/a-56714226#:~:text=Demand%20for%20construction%20sand%20is,away%20as%20Australia%20and%20Canada.&text=It%20makes%20up%20the%20concrete,silicon%20chips %20in%20our%20phones.
- https://www.universiteitleiden.nl/en/news/2022/03/urgent-shifts-in-building-practicesare-needed-to-tackle-the-global-sand-crisis
- https://oec.world/en/profile/bilateralproduct/sand/reporter/aus#:~:text=Exports%20In%202021%2C%20Australia%20exporte d,most%20exported%20product%20in%20Australia.