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March 2026

India Engineering & Infrastructure Services Market Outlook to 2030F

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INDUSTRY OVERVIEW

Unless stated otherwise, the information in this section has been sourced from "India Engineering & Infrastructure Services Market Outlook to 2030F" (Ken Research Report, Mar 2026) and other publicly available publications. Neither our Company nor any other party associated with this Issue has independently verified this information. While such sources are generally regarded as reliable, we make no assurance as to the accuracy or completeness of the data presented. The information may include assumptions, projections, or estimates that are inherently uncertain and could differ materially from actual outcomes. Data points may have been reformatted or reclassified by us for ease of presentation.

The Ken Research Report (Mar 2026) was commissioned specifically for this study. The report is based on secondary research, drawing from government publications, infrastructure project databases, ministry budget documents, company filings, trade association reports, and proprietary datasets. These sources provide insight into the value of contracts awarded, execution timelines, market activity by region, and contractor participation. Market estimates for all segments- Railways, Mining & Raise Boring, Dredging & Reclamation, and O&M for Industrial and Power Plants are based on publicly disclosed project-level and policy-level data up to Mar 2026.

Granular data for niche segments such as Raise Boring and Industrial O&M was limited due to the absence of centralized market disclosures. To address these gaps, the analysis incorporates financials of listed/unlisted contractors, industry publications, and supply-side assessments. Proxies such as order book sizes, project awards, and market participation were used to estimate size and share. The methodology includes triangulation across sources to maintain internal consistency.

The study relies on observed market activity and validated secondary sources. Insights have been synthesized from multiple public datasets and infrastructure trackers, supplemented by professional judgment and historical trend mapping. While stakeholder views are not the primary input, the report reflects a sector-wide perspective derived from available facts.

Ken Research affirms that the study was prepared independently and objectively. While every effort was made to ensure factual accuracy, data constraints in certain sectors (particularly unorganized or contract-based services) may affect granularity. The report offers a broad, industry-level perspective on India's infrastructure services market and is not meant to serve as a forecast for any single company.

This section should not be considered investment advice. The intention is to offer directional clarity on capex trends, contract values, and emerging market dynamics across core infrastructure verticals in India.

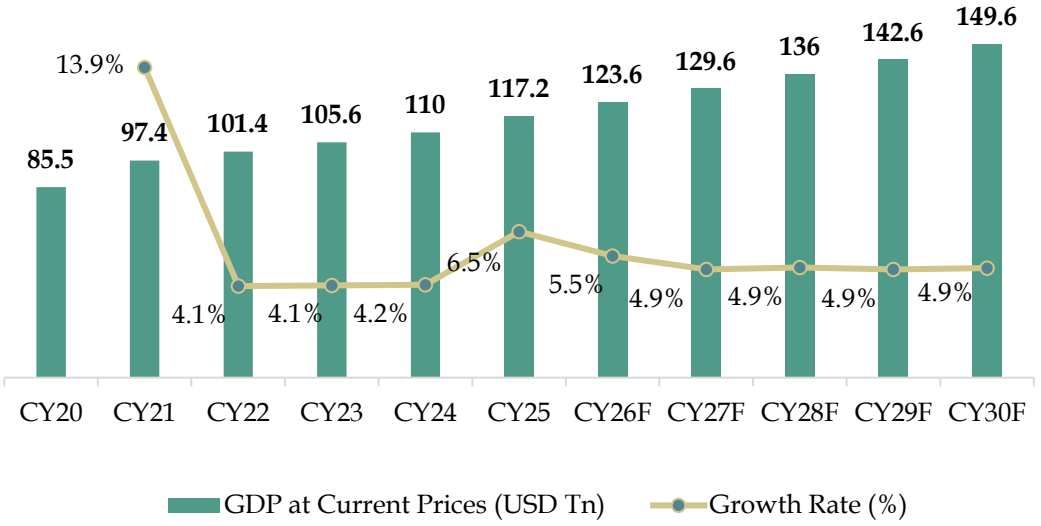
1. Macroeconomic Overview

1.1 Global Macroeconomic Scenario

The global economy continues to demonstrate resilience amid a complex environment of moderating inflation, tight monetary policies, and evolving geopolitical dynamics. Between CY20 and CY25, the global economy registered a CAGR of **6.5%**, stabilizing after a period of heightened volatility driven by post-pandemic recovery efforts, supply chain realignments, and policy tightening cycles.

Higher interest rates, tighter financial conditions and geopolitical conflicts, including Russia's war in Ukraine, evolving conflict in the Middle East and turbulent US tariff policy have introduced uncertainties for short period of time, however long-term growth stays intact.

Figure 1-1 Global GDP (current prices) in USD Tn & Growth Rate (%) Outlook, CY20-CY30F



Source: Ken Research Analysis and World Economic Outlook, 2025 (IMF)
Note: F represents Forecasted figures

Global GDP is expected to grow at a stabilized rate of **5.0%** from CY25 to CY30, driven by **technological advancements**, **digital transformation**, and **infrastructure investments**. The rise of **green technologies** and the shift toward **sustainability** will further support growth, alongside **rising consumer demand** in emerging markets and a growing **youthful labor force**.

Between CY23 and CY25, global GDP trends varied significantly across major economies due to a mix of domestic challenges and international factors.

- US and China remain the largest economies, with GDPs expected to reach **USD 35.9 Tn and USD 26.2 Tn**, respectively, by 2030F.

- India's economy is expected to experience one of the fastest growth trajectories globally, with its GDP set to grow from USD 4.3 Tn in 2025 to USD 6.8 Tn by CY30F, fueled by an expanding labor force and increased domestic consumption.

- In Europe, recovery is expected to continue into CY25, supported by stronger household consumption, as energy price pressures ease & inflation decreases, resulting in real income growth. Germany & UK are the top 2 nations, with GDPs expected to reach USD 5.5 Tn and USD 4.8 Tn, respectively, by 2030F.

Table 1-1 GDP at Current Prices of Major Economies (USD Tn) CY20-CY30F

Countries	CY20	CY21	CY22	CY23	CY24	CY25	CY28F	CY30F	CAGR (CY20-25)	CAGR (CY25-30)
USA	21.3	23.6	25.7	27.4	29.2	29.8	33.6	35.9	6.9%	3.8%
China	14.8	17.8	17.9	17.7	18.3	19.8	23.6	26.2	6.0%	5.8%
Germany	3.8	4.3	4.1	4.5	4.6	4.8	5.2	5.5	4.8%	2.8%
Japan	5.1	5.1	4.3	4.2	4.1	4.3	4.8	5.1	(3.4%)	3.5%
India	**2.4**	**2.8**	**3.2**	**3.5**	**3.9**	**4.3**	**5.8**	**6.8**	**12.4%**	**9.6%**
UK	2.7	3.1	3.1	3.3	3.6	3.7	4.4	4.8	6.5%	5.3%
France	2.6	2.9	2.8	3.0	3.2	3.2	3.5	3.7	4.2%	2.9%
Brazil	1.5	1.7	1.9	2.2	2.2	2.4	2.9	3.2	9.9%	5.9%
Canada	1.7	2.0	2.7	2.1	2.2	2.4	2.7	2.9	7.1%	3.9%
Italy	1.9	2.2	2.1	2.3	2.4	2.4	2.6	2.7	4.8%	2.4%
Australia	1.4	1.7	1.7	1.7	1.8	1.9	2.1	2.3	6.3%	3.9%

Source: World Economic Outlook, 2025, IMF, Ken Research Analysis
Note: F represents Forecasted figures, all figures are reported for the calendar year, starting from January 1st to December 31st.

1.2 INDIAN ECONOMIC OUTLOOK

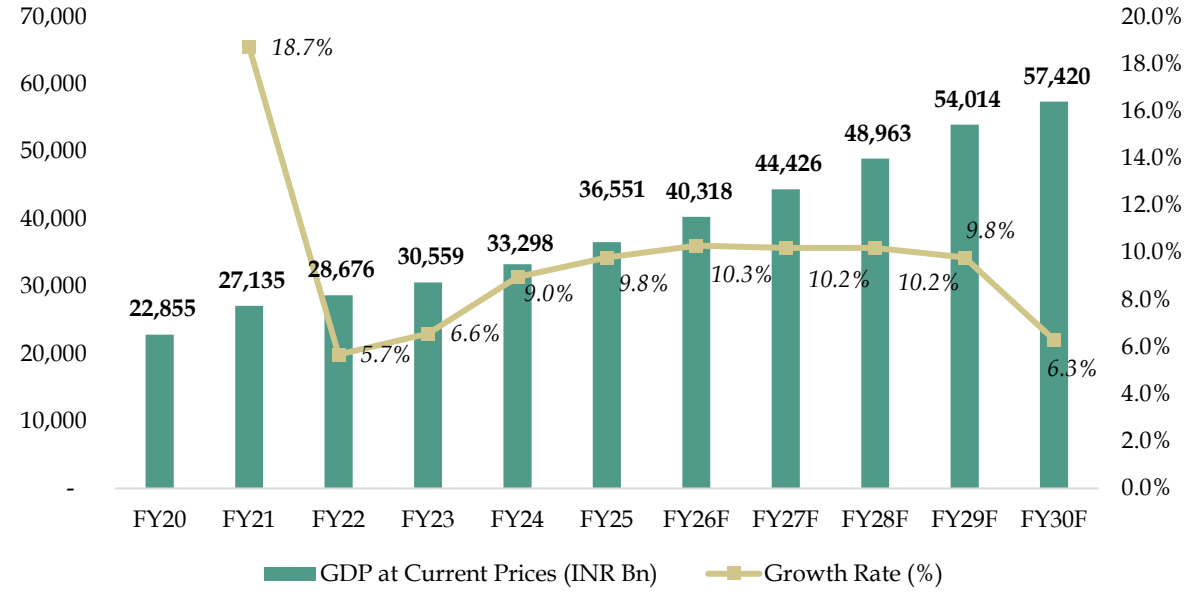
GDP Growth and Outlook

"India continues to assert its position as the fastest-growing major economy in the world, with a nominal GDP growth rate of 9.8% y-o-y for FY25, driven by its resilient democratic framework and deepening global partnerships."

Following its post-pandemic recovery and ascent to the position of the fourth-largest global economy, India has sustained momentum through FY25. The surge in capital inflows, coupled with a favorable demographic dividend and policy-led reforms, has enhanced India's investment attractiveness. The global macroeconomic volatility has only reinforced investor

confidence in the 'Invest in India' story, evidenced by the record-breaking funds raised by India-focused investment vehicles in recent years.

Figure 1-2 India's GDP (at current prices) Outlook, in INR Bn FY20-FY30F



Source: Ministry of Statistics and Programme Implementation (MoSPI), World Economic Outlook, 2024 (IMF), Ken Research Analysis
Note: F represents Forecasted figures, FY represents the Financial Year ending on March 31

In FY21, the economy rebounded sharply from the pandemic-induced contraction as mobility restrictions eased and economic activity normalized, leading to a nominal GDP growth of **18.7%**. In FY23, GDP expanded by **6.6%**, supported by sustained investment momentum and a revival in private consumption. The share of investments in GDP reached an 11-year high of **34%**, while private consumption hit an 18-year high of **58.5%**

In FY24, nominal GDP grew at 9.0% and was INR 33,298 Bn - driven by continued strong investment and subdued private consumption growth. Additionally, India is expected to grow faster than China as well as the global average in CY2024.

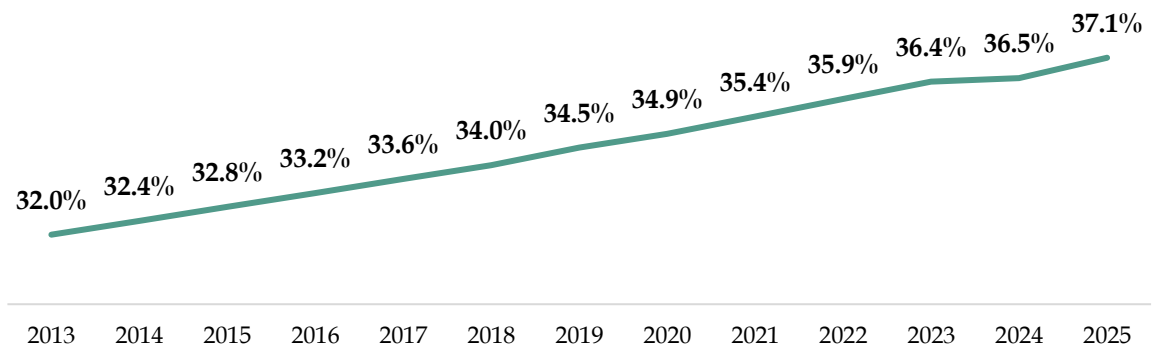
In FY25, India's GDP at current prices is expected to reach INR 36,551. This reflects steady momentum backed by healthy capital inflows and policy support.

Overview on Key Demographic Parameters

"By 2036, India's towns and cities will be home to 600 million people, or 40% of the population, up from 31% in 2011, with urban areas contributing almost 70% to GDP." (Source: World Bank)

The urban population is significantly growing in India. It is estimated to have increased from 403 million (31.6% of total population) in 2012 to 508 million (35.9% of total population) in the year 2022. (Source: Ministry of Housing and Urban Affairs)

Figure 1-3 Urbanization Trend (%) in India, 2013-2025



Source: World Bank Database & Ken Research Analysis
Note: E refers to Estimated figures

India's urbanization level reached 37.1% by 2025, indicating a steady shift of population and growth towards urban cities. Urbanization creates the need for jobs, thereby attracting investment and development of multiple business sectors, including manufacturing and services. Growth in business and business opportunities due to increased urban-led activity is **evidenced by the surge in air traffic, expansion of real estate development, and rising demand for urban infrastructure across metro cities, as well as emerging primary and secondary cities and towns. These trends underscore the urgent need for enhanced transportation systems, civic amenities, digital connectivity, and sustainable urban planning to support growing economic activity and population density.**

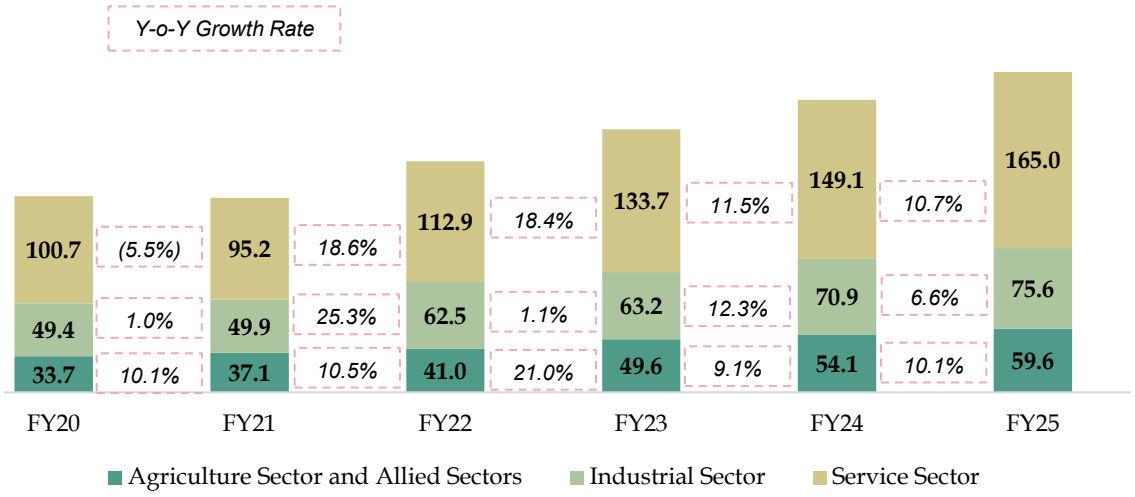
Sectoral Gross Value Addition Composition

"Infrastructure has become a key pillar of India's economic growth, enabling industrial recovery, supporting agricultural logistics, and accelerating service sector expansion. Investments in transport, energy, and urban development continue to drive productivity and resilience across sectors."

The agriculture sector was holding growth momentum till FY18. In FY19, the acreage for the rabi crop was marginally lower than the previous year, which affected agricultural performance. FY20 witnessed growth on account of improved production. During the pandemic-impacted period of FY21, the agriculture sector was largely insulated as timely and proactive exemptions from COVID-induced lockdowns facilitated uninterrupted harvesting of rabi crops and sowing of kharif crops. However, supply chain disruptions impacted the flow of agricultural goods, leading to high food inflation and an adverse initial impact on some major agricultural exports. Performance remained steady in FY22.

In FY23, the agriculture (including livestock, forestry & fishing) sector performed well despite weather-related disruptions, such as uneven monsoon and unseasonal rainfall, impacting yields of some major crops. It clocked a growth of 9.3% y-o-y, garnering INR 49.6 trillion. In FY24, this sector expanded at a slower pace of 5.6%, with the weakest monsoon experience caused by El Nino conditions.
In FY25, the agriculture sector have grown by 10.1% y-o-y, with recovery by favourable monsoon forecasts, which have recorded high wheat and rice production, and continued government interventions such as higher MSPs and improved irrigation support.

Figure 1-4 Sectoral Gross Value Addition to Indian Economy in INR Tn and Growth Scenario, FY20-FY25



Source: Ministry of Statistics and Programme Implementation (MoSPI) & Ken Research Analysis
Note: FY represents the Financial Year ending on March 31

In the Budget 2024-25, the government planned to boost private and public investment in post-harvest activities and expand the application of Nano-DAP across agro-climatic zones. Strategies for self-reliance in oilseeds and dairy development are to be formulated, alongside ramping up the Pradhan Mantri Matsaya Sampada Yojana and establishing Integrated

Aquaparks. Allocation for the PM-Formalisation of Micro Food Processing Enterprises scheme increased from INR 639 crores in FY24 to INR 880 crores in FY25.

The industrial sector witnessed a CAGR of 9.8% for the period FY16 to FY19. From March 2020 onwards, the nationwide lockdown due to the pandemic significantly impacted industrial activities. In FY20 and FY21, this sector experienced turbulence due to the pandemic, recording growth rates of -1.0% and 1.0% respectively, on a y-o-y basis. With the opening up of the economy and resumption of industrial activities, it registered y-o-y growth of 25.3% in FY22.

The industrial output in FY23 grew by 1.1%, with an estimated value of INR 63.2 trillion, owing to a rebound in manufacturing activities and healthy growth in the construction sector. The industrial sector grew by 12.3% in FY24 **owing to strong infrastructure investments, including transport networks, energy projects, and urban development, alongside positive business optimism and manufacturing output.** In FY25, the industrial sector is expected to grow by **6.6%**, reaching **INR 75.6 trillion**. This growth is likely to be driven by **continued momentum in infrastructure spending**, and **supportive government policies under the Production Linked Incentive (PLI) scheme. The industrial growth was mainly supported by sustained momentum in the manufacturing and construction sectors.** Within manufacturing, industries such as pharma, motor vehicles, metals, and petroleum witnessed higher production growth during the quarter.

India's industrial sector is experiencing strong growth, driven by significant expansion in manufacturing, mining, and construction. This growth is supported by positive business sentiment, declining commodity prices, beneficial government policies like production-linked incentive schemes, and efforts to boost infrastructure development. These factors collectively contribute to the sustained buoyancy in industrial growth.

The expansion of industrial sector is also coupled with privatization in railways, India's railway "privatisation" agenda is increasingly being executed through **private participation/PPP models and liberalised investment norms**, creating a sustained pipeline for **Railway EPC** (civil, track, S&T, electrification and station works). Under the Union Budget **2026–27**, Indian Railways' **total capital expenditure** is budgeted at **INR 2,93,030 crore**. The policy focuses to attract private capital by allowing **100% FDI under the automatic route** in specified **railway infrastructure** activities. On the freight side, Indian Railways' Gati Shakti Multi-Modal Cargo Terminal push has **approved 251 GCTs**, of which **115 have been commissioned**, alongside **81 operational Private Freight Terminals (PFTs)**—all of which translate into terminal civil works, track connectivity, MEP/S&T, and systems scope. Collectively, these measures are shifting procurement from purely departmental execution to **asset-creation programs with larger packaged contracts**, where EPC players can differentiate on delivery capability, safety/quality compliance, and multi-discipline integration

The Services sector recorded a CAGR of 11.2% for the period FY16 to FY20, led by trade, hotels, transport, communication, services related to broadcasting, finance, real estate, and professional services. This sector was the hardest hit by the pandemic and registered an -5.5% y-o-y decline in FY21. The easing of restrictions aided a fast rebound in this sector, with y-o-y growth of 18.6% and 18.4% witnessed in FY22 and FY23 respectively.
Overall, in FY24, benefiting from pent-up demand, the service sector was valued at INR 149.1 trillion and registered growth of 11.5% y-o-y. In FY25, the services sector is expected to grow by 10.7%, reaching INR 165.0 trillion, driven by strong performance in Financial Services, real estate, digital platforms, along with transport and hospitality. Within services, there was a broad-based improvement in growth across different sub-sectors. However, the sharpest jump was seen in financial, real estate, and professional services. **Rebound of services in transport, hospitality, and financial services was underpinned by expanding infrastructure such as upgraded airports, metro systems, digital connectivity, and the rapid expansion of fintech platforms and digital public infrastructure like UPI and Aadhaar-enabled services.**

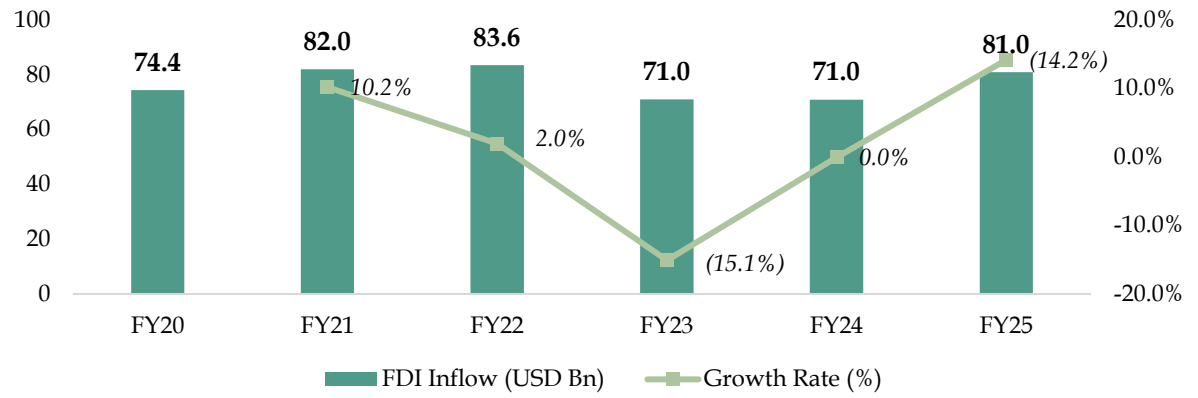
Growth Trend in Investment

India is one of the most attractive FDI destinations in the world today with a total FDI inflow of USD 81 Bn in FY25.

With an increase of 14.2% over the FY24, India continues to witness sustained investor interest, driven by country's macroeconomic resilience and ongoing reforms. The Government has put in place an investor friendly Foreign Direct Investment (FDI) policy under which most sectors except certain strategically important sectors are open for 100% FDI under the automatic route.

Measures taken by the Government on FDI Policy reforms have resulted in increased FDI inflow in the country over the years. FDI inflow in India stood at USD 36 billion in 2013-14 and registered its highest ever annual FDI inflow of USD 84 billion in FY22.

Figure 1-5: Foreign Direct Investment in USD Billion and Y-o-Y Growth Rates, FY20-FY25



Source: Invest India, Make in India, Press Information Bureau & Ken Research Analysis
Note: FY represents the Financial Year ending on March 31

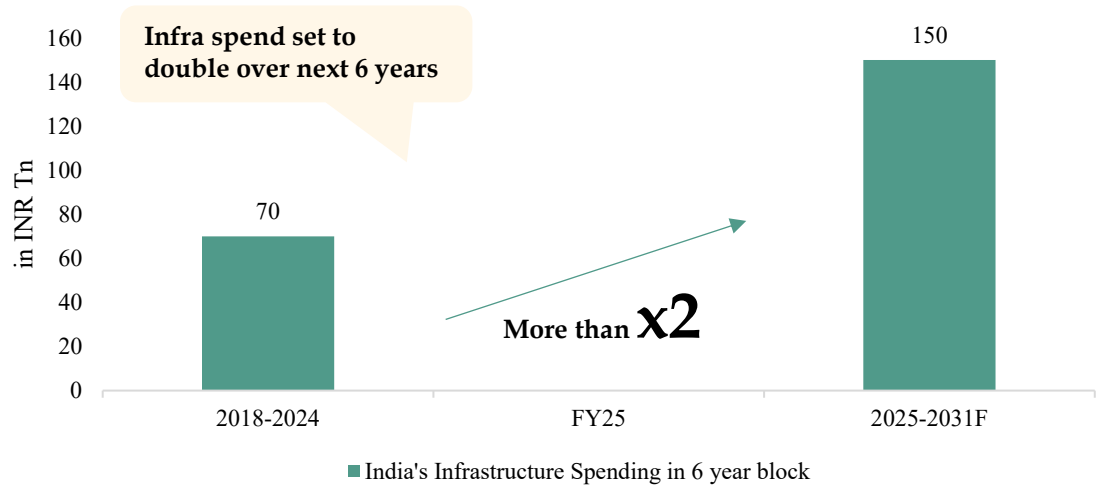
In FY24, total FDI inflows stood at USD 70.95 billion, and FDI equity inflows amounted to USD 44.42 billion, further expanding to USD 81 billion in FY25. Top 5 States receiving highest FDI Equity Inflow during FY 2023-24 are Maharashtra (30%), Karnataka (22%), Gujarat (17%), Delhi (13%), and Tamil Nadu (5%). (Source: Press Information Bureau)

FDI in infrastructure remained robust, supporting key sectors like transport, energy, logistics, and urban development amid ongoing policy reforms.

1.3 Investment in India's Infrastructure Industry

India's infrastructure buildout is one of the largest globally, with public investment leading the way. Between **2018 and 2024**, Infrastructure investments about **~INR 70 trillion took place in India**, and over **INR 143 trillion** is expected between **2025 and 2031**. This highlights more than a two-fold increase (Source: CRISIL). Government agencies, both central and state, account for nearly 80% of this expenditure, underscoring the state's dominant role in funding and executing projects.

Figure 1-6: India's Infrastructure Spend in terms of Value (in INR trillion), 2017-2024 & 2025-2031F



Source: 2023 Infrastructure Yearbook of CRISIL Limited, Ken Research Analysis
Note: F represents Forecasted figures

This commitment to infrastructure development driven by the Government of India creates opportunities for **engineering, procurement, construction (EPC)**, and **O&M players**. Programs like the National Infrastructure Pipeline (NIP), and the National Monetization Pipeline (NMP) are enabling structured private participation, asset monetization, and long-term contracting models. Further, PM Gati Shakti - National Master Plan for Multi-modal Connectivity, has amalgamated 14 Government departments to just one, effectively reducing the rework, and delays in approval process. Earlier, it used to take 33 approval process which has been reduced to 14 approvals, making the infrastructure sector increasingly attractive for service providers, investors, and technology firms and streamlined approval processes, and accelerated infrastructure deployment.

These developments are directly benefiting the logistics sector by improving efficiency and reducing operational bottlenecks. Logistics, accounting for 14-15% of GDP, is higher than the recommended 7-8% spend on logistics in developed countries. Over the next 10-15 years, this figure needs can be reduced, with noticeable gaps in rail logistics and national waterways to be reduced to 7%. With continued infrastructure advancements and a focus on multi-modal connectivity, India is well-positioned to bring its logistics costs in line with global standards, boosting overall economic growth in its current INR250 Lakh Crore economy.

Trajectory of Spending on Infrastructure in India

As the Indian Government **pursues infrastructure development** as a part of its growth strategy, there has been a strong focus on capital expenditure, long-term planning, and private participation.

This is seen through the **Budget allocations, government initiatives, and policies to boost private investment which are enabling infrastructure expansion to meet rising urban and industrial demand.** With the urban population projected to reach 600 million by 2036, demand for mass transit, housing, energy, and digital connectivity is surging. The World Bank estimates nearly USD 840 billion will be required to meet this urban infrastructure need. This growth also supports industrial sectors like manufacturing and mining, which depend on reliable transport, energy, and logistics.

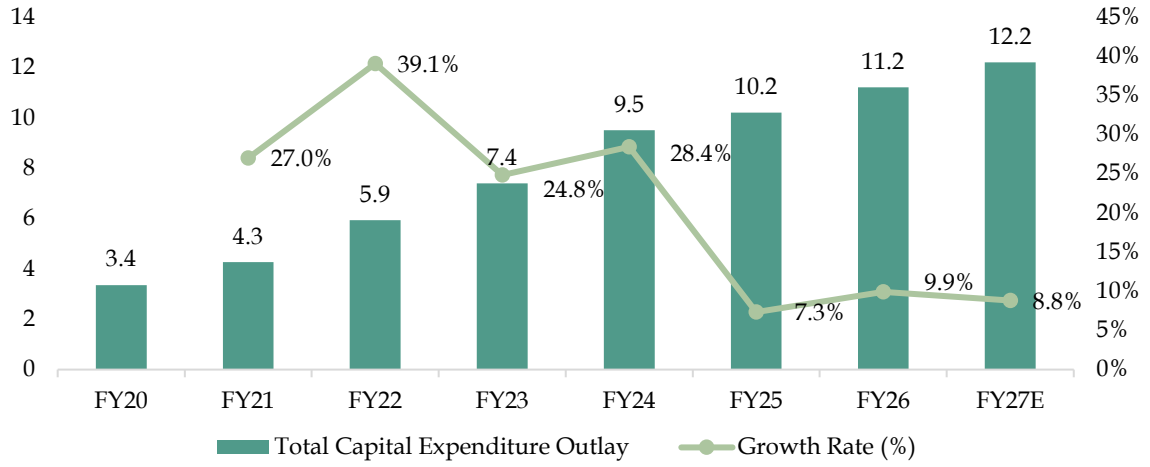
Public investment, backed by policies like the Gati Shakti National Master Plan and National Infrastructure Pipeline (INR 111 lakh crore across 57 sectors), is expected to deliver high economic returns. According to the World Bank, **public investment yields the highest economic returns among spending categories**, where every dollar spent generates $1.5 in economic activity (Source: World Bank). This is significantly higher than the returns **from tax cuts and fiscal transfers**.

India has also scaled up Public–Private Partnerships (PPPs), combining private efficiency with public oversight. Liberalized FDI norms further attract global capital, positioning infrastructure as a key enabler of jobs, competitiveness, and long-term growth.

Budgetary Allocations

India's infrastructure growth trajectory is fundamentally shaped by the scale and direction of public capital outlay, making Union Budget allocations a critical indicator of long-term policy priorities and execution capacity. Capital expenditure has been raised to INR 12.2 lakh crore for FY27, up from INR 11.2 lakh crore in FY26, reinforcing the government's infrastructure-led growth strategy.

Figure 1-7: Total Capital Expenditure Outlay Under Union Budget of India (in INR lakh crore) and Y-o-Y Growth Rate (%), FY20-FY27E



Source: Union Budget, Ken Research Analysis
Note: FY27E indicates estimated figures

India Port Rail Corporation budget

State Company with Railway - for instance, Haryana rail vikas nigam ltd, all state govt. are setting up SPV with Indian Railways - 20 corporations - 50:50% Railways and State govt. ownership [for instance, GJ, MH] have been incorporated like this to promote the outlay spend.

Capital outlay under the Union Budget has grown at a CAGR of ~22% from FY20 to FY26, **rising from INR 3.36 lakh crore to INR 11.21 lakh crore**. The capital outlay saw its steepest annual jump in FY22 at 39.1%, followed by a continued double-digit increase in FY23 (24.8%) and FY24 (28.4%). While the pace of growth has moderated to 7.3% in FY25 (RE). It has increased again to 9.9% in FY26.

Despite the decreasing growth rate, the capital outlay sits at an all-time high in FY26, where the fiscal deficit is projected to decline steadily to **5.1% of GDP signaling a balanced fiscal approach that supports long-term growth without compromising macroeconomic stability** (Source: Union Budget FY26). **From the total capital expenditure by the Government of India, a portion has been allocated to infrastructure ministries.** The key target ministries in focus include the Ministry of **Railways**, **Ports, Shipping and Waterways**, **Power**, and **Mines**, which have been discussed below:

Capital outlay represents spending on physical asset creation. Shifts in ministry-level allocations serve as a direct reflection of sectoral focus and investment direction.

The **Ministry of Railways** continues to receive one of the highest capital support, with allocations increasing from INR 67.8 thousand crore in FY20 to INR 2.60 lakh crore in FY26BE. This has been provided for multiple projects under execution including installation of new lines **Dedicated Freight Corridors, Amrit Bharat Station redevelopment, electrification, and safety system**s.

Additionally, capital investments are being made through targeted spending under the India Port Rail Corporation budget. State governments, in collaboration with Indian Railways, are setting up Special Purpose Vehicles (SPVs) to drive infrastructure development. For example, corporations like Haryana Rail Vikas Nigam Ltd are being established with a 50:50 ownership between the Railway and State Governments, with similar models adopted in states such as Gujarat and Maharashtra. These efforts aim to promote increased infrastructure spending, especially in railways, with a focus on state-level expenditure mapping through initiatives like GRIDC (Gujarat Infrastructure Development Corporation Limited), which involves multi-billion dollar investments.

The **Ministry of Ports** saw the fastest growth in capital allocation from INR 259 crore in FY20 to INR 3.4 thousand crore in FY26BE, driven by the **Sagarmala Programme and inland waterway** enhancement. **The Ministry of Power's** allocation declined from INR 1.6 thousand crore in FY20 to INR 658 crore in FY26BE, indicating a policy shift toward private sector led investments in the energy sector. **The Ministry of Mines** witnessed a drop from INR 81 crore to INR 79 crore during the same period. With a focus on regulatory functions and exploration support under the National **Mineral Exploration Policy (NMEP).**

Table 1-2: Capital Outlay to Target Infrastructure Ministries under Union Budget (in INR crore), FY20-FY26BE

Capital Outlay w.r.t. Ministry	FY20	FY25RE	FY26BE	CAGR (FY20-FY26)
Railways	67,842	2,52,000	2,60,200	25.1%
Ports	259	1,078	3,471	54.1%
Power	1,615	1,127	658	(13.9)%
Mining	81	46	79	(0.5)%

Source: Union Budget, Ken Research Analysis
Note: RE: Revised Estimates, BE: Budget Estimates

These targeted allocations are part of the government's broader capex strategy to **crowd-in private and foreign investment** by anchoring early-stage infrastructure projects. This

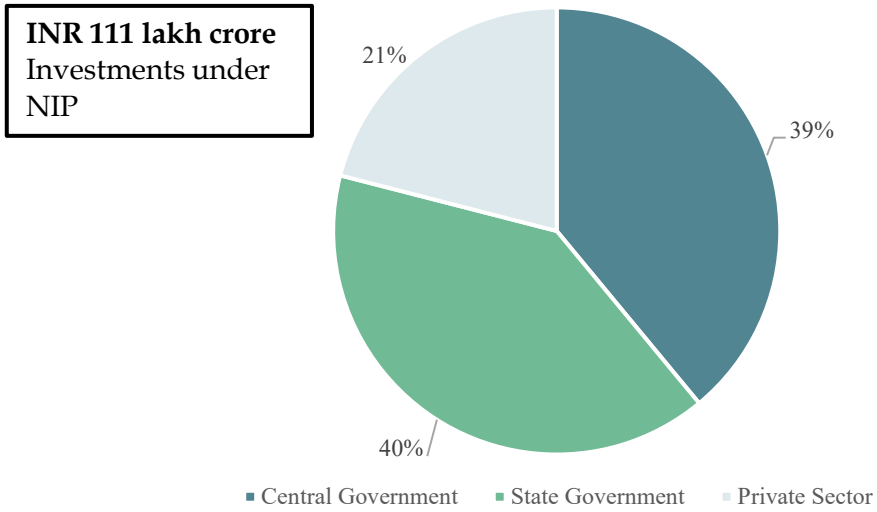
approach not only builds investor confidence but also aims to **boost productivity and long-term GDP growth**.

National Infrastructure Pipeline (NIP) as a Growth Driver

The **National Infrastructure Pipeline (NIP)** was launched in **2019** as a five-year initiative (FY2020–2025) by the Government of India to invest **INR 111 lakh crore** in social and economic infrastructure projects across sectors like energy, transport, water, and housing. Its objective is to drive India's long-term infrastructure growth by enhancing project execution, attracting private investment, and supporting broader goals like urban transformation, climate resilience, and sustainable mobility. It is responsible for rising budgetary allocations particularly to infrastructure ministries and as of June 2025, the pipeline has expanded to over **14,000 projects across 61 sub-sectors** (Source: India Investment Grid).

The funding mix comprises **39% from the central government**, **40% from state governments**, and **21% from the private sector**, with instruments like **Infrastructure Investment Trusts (InvITs)**, **Public-Private Partnerships (PPPs)**, and **asset monetization** frameworks enabling greater private sector participation.

Figure 1-8: Share of Centre, State & Private Sector in NIP implementation



Source: National Infrastructure Pipeline, Ken Research Analysis

NIP's outlined targeted investments, offering a structured pipeline to guide capital allocation.

The NIP is closely integrated with the PM **Gati Shakti National Master Plan**, a digital coordination platform enabling synchronized infrastructure execution across 44 ministries and all states/UTs.

- **Energy was allocated the largest share** (~INR 26.9 lakh crore), reflecting a strategic focus on renewables, grid modernization, and energy access.
- **Railways** received ~INR 13.7 lakh crore to support high-speed corridors, freight optimization, and safety upgrades.
- **Ports** were allocated ~INR 1.2 lakh crore aligned with Sagarmala's modernization and coastal connectivity goals.

Some of the opportunities in 4 key infrastructure segments of India are:

Table 1-3: Overview of Spend on Target Infrastructure Segments in India under NIP as of July 2025; Value and Mode of implementation (in USD Billion), FY2020–2025

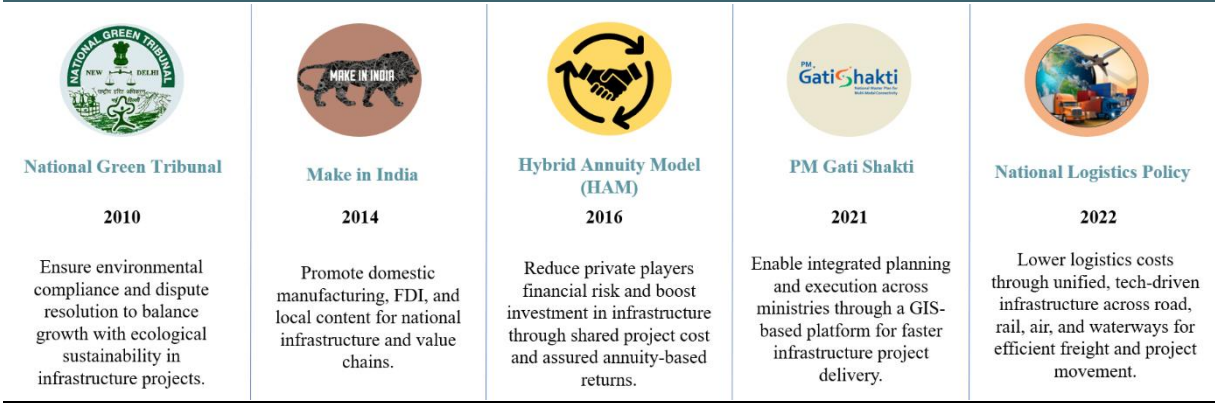
Sector	Sub Sector	No. of Opportunities	Value of Opportunities (USD Billion)	Mode of Implementation
Railways	Railway Track	804	224.6	627 EPC, 92 To be Finalized, 35 PPP, 19 Pure Private
	Railway Terminal	42	3.7	26 EPC, 3 To be Finalized, 2 PPP, 1 Pure Private
	Rolling Stock	75	46.2	65 EPC, 2 To be Finalized, 6 PPP
Mining	Metals and Mining	30	7.3	18 EPC, 4 To be Finalized, 8 Pure Private
Ports and Shipping	Inland waterways	136	14.4	22 EPC, 2 To be Finalized, 48 PPP
Power	Energy Generation (Renewable)	385	214.9	288 EPC, 22 To be Finalized, 38 PPP, 62 Pure Private
	Energy Generation (Non-Renewable)	181	127.4	100 EPC, 36 Pure Private, 6 PPP, 4 To Be Finalized

Source: India Investment Grid website, Ken Research Analysis

1.4 Regulations & Policy Driving Growth in India's Infrastructure Sector

India's infrastructure sector is being transformed by targeted policies and reforms that boost self-reliance, streamline execution, and improve Ease of Doing Business. Initiatives like Make in India, PM Gati Shakti, PPP reforms, and digital compliance systems are accelerating approvals, enhancing project visibility, and attracting private investment. These efforts strengthen India's position as a competitive global infrastructure hub.

Figure 1-9: Major Policy and Reforms Driving Infrastructure Growth in India



Source: Ken Research Analysis

Impact of 'Make in India' on Infrastructure Sector

Launched in 2014, Make in India **targeted 25 priority sectors** to boost domestic manufacturing and infrastructure, with railways, power, ports and shipping, and mining as core focuses.

- **In railways**, the Ministry of Railways and its supporting arms-initiated PPP station redevelopment via design-build-finance-operate-transfer models, awarded long-term locomotive manufacturing joint ventures, and fast-tracked EPC contracts for Dedicated Freight Corridors with local-content rules.
- **In power,** the Ministries of Power and New & Renewable Energy eased FDI caps, launched the National Solar Mission and green hydrogen incentives, and offered production-linked incentives for solar panel and transformer production.
- **For ports**, the Ministry of Ports, Shipping and Waterways rolled out Sagarmala coastal economic zones, simplified DBFOT projects and long leases, and relaxed coastal shipping norms.
- **In mining**, the Ministry of Mines enacted the Mineral Laws Amendment Act, held commercial coal auctions, and standardized EPC procurement with Make in India preferences. By standardizing procurement, mandating local content and enabling PPP frameworks, Make in India has broadened EPC firms' market access, scale and integration into domestic value chains.

Better project visibility and execution through PM Gati Shakti

Launched in October 2021, PM Gati Shakti is a national infrastructure master plan aimed at integrated planning and synchronized execution across 30+ ministries. It operates through a GIS-based platform with 1,400+ data layers, enabling real-time project tracking, utility mapping, and faster clearances. While Gati Shakti has no standalone capital outlay, it directly

guides and supports capital-intensive programs like the National Infrastructure Pipeline, Bharatmala, Sagarmala, and dedicated freight corridors. For EPC players, it streamlines site selection, right-of-way access, and inter-agency coordination, helping reduce delays and cost overruns. Gati Shakti has become vital to improving execution efficiency in infrastructure projects.

Reducing Compliance Burden through the National Single Window System

The National Single Window System (NSWS), operational since 2021, is a vital component of PM Gati Shakti's vision to streamline infrastructure development in India. This integrated online portal consolidates approvals from 32 central ministries and 29 state governments, significantly reducing the complexity of obtaining clearances across sectors like railways, power, ports, and mining. Through the Know Your Approvals (KYA) tool, EPC contractors can easily identify and track necessary environmental clearances, land-use permissions, and other sector-specific filings online, eliminating the need for physical visits and paperwork. By improving compliance and providing clarity on approval timelines, NSWS reduces execution risks and enhances project predictability, accelerating infrastructure deployment in line with PM Gati Shakti's objective of boosting multi-modal connectivity and infrastructure growth across the country. This system supports the broader goals of Ease of Doing Business and Make in India, further enabling faster project execution under the Gati Shakti framework.

Bridging Infrastructural Gaps through Private Public Partnership (PPP) and Hybrid Annuity Model (HAM)

India formally adopted the Public-Private Partnership (PPP) model in the early 2000s to bridge infrastructure gaps using private capital and execution. Initially driven by Build-Operate-Transfer (BOT) models, PPPs gained traction but faced setbacks by the early 2010s due to land acquisition delays and traffic risk, leading to stalled projects and reduced investor interest. To address this, the Ministry of Road Transport and Highways introduced the Hybrid Annuity Model (HAM) in 2016. Under HAM, 40 percent of the project cost is paid by the government during construction, while the remaining 60 percent is repaid through annuities, reducing financial and revenue risk for developers. HAM has since expanded to ports, renewable energy, and urban infrastructure. By offering predictable cash flows, faster execution, and lower project risk, PPP reforms including HAM have revitalized private participation. For EPC players, these frameworks have improved project viability and created stronger opportunities across India’s core infrastructure sectors.

Balancing Growth and Compliance through National Green Tribunal (NGT)

Established in 2010 under the NGT Act, the National Green Tribunal is a specialized judicial body aimed at fast-tracking environmental dispute resolution and enforcing key laws such as the Environment Protection Act and Forest Conservation Act. While over 570 major infrastructure projects have faced delays due to environmental bottlenecks (Source: Ministry of Statistics and Programme Implementation), NGT has also helped revive stalled developments—such as NHPC's Subansiri hydro project in 2019 and the Rishikesh–Karnaprayag rail line in 2024. In the long term, NGT reinforces environmental accountability while enabling more balanced infrastructure growth. Hence in the Infrastructure sector of India, for project developers and EPC contractors, it brings greater regulatory clarity, helping improve planning, approvals, and execution certainty across core sectors.

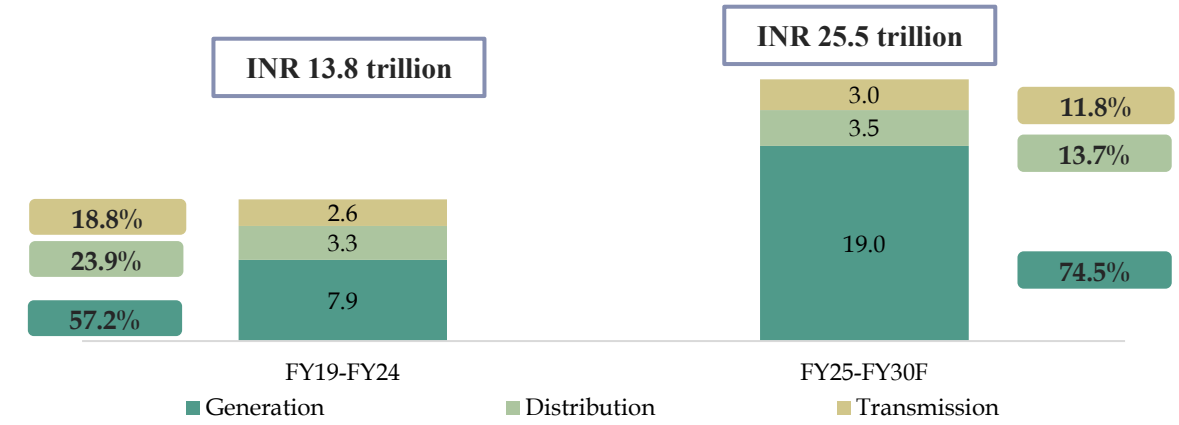
Furthermore, NGT is actively making amendments to improve environmental standards in infrastructure projects. The Tribunal has amended a rule that mandates that pollution in hydropower projects be curtailed, with specific provisions banning blasting activities. To mitigate environmental impacts, raise boring techniques are now being encouraged as an alternative. This further strengthens NGT's role in promoting sustainable development in infrastructure.

1.5 Historical and Projected Power Sector Expenditure in India

Between **FY19 and FY24**, India's power sector investment totalled **INR 14.6 trillion**, distributed across generation, transmission, and distribution infrastructure. **Funding during this period came from public utilities, private developers, and increasing inflows from multilateral banks and foreign investors. Renewable energy emerged as the primary driver**, reflecting both policy prioritization and a marked shift in capital allocation. **As of FY25, renewables led 89% of India's installed power capacity addition**, with **clean energy attracting record FDI inflows of USD 3.4 billion**—an **eightfold increase in RE's share of FDI since FY21**—and raising India's renewable installed base to **220 GW out of 475 GW total**. (Source: CEEW, CRISIL).

For **FY25 to FY30**, sectoral investment is projected at **INR 25–26 trillion (cumulative, or around INR 4.2–4.3 trillion per year)**, reflecting a **CAGR of 9–10%**. **Generation is expected to lead, with renewables accounting for over 70% of new capacity additions (projected at 220–225 GW),** supported by innovation in auction formats and continued overseas investment. **Transmission infrastructure will require INR 2.5–3.5 trillion** for grid expansion and RE integration, while **distribution investment is projected at INR 3–4 trillion**, anchored by government schemes such as RDSS. **Policy-linked funding, private capital, and program outlays ensure progress remains aligned with national targets for capacity and clean energy transition.** (Source: CRISIL, CEEW). **This investment trajectory positions India's energy sector as a catalyst for industrial expansion, rural development, and climate goals, supported by private-public synergies and technological innovation**

Figure 1-10: Segment-wise break-up of Total Investments in Power Sector of India (in INR trillion) % share of total, FY20-FY31F



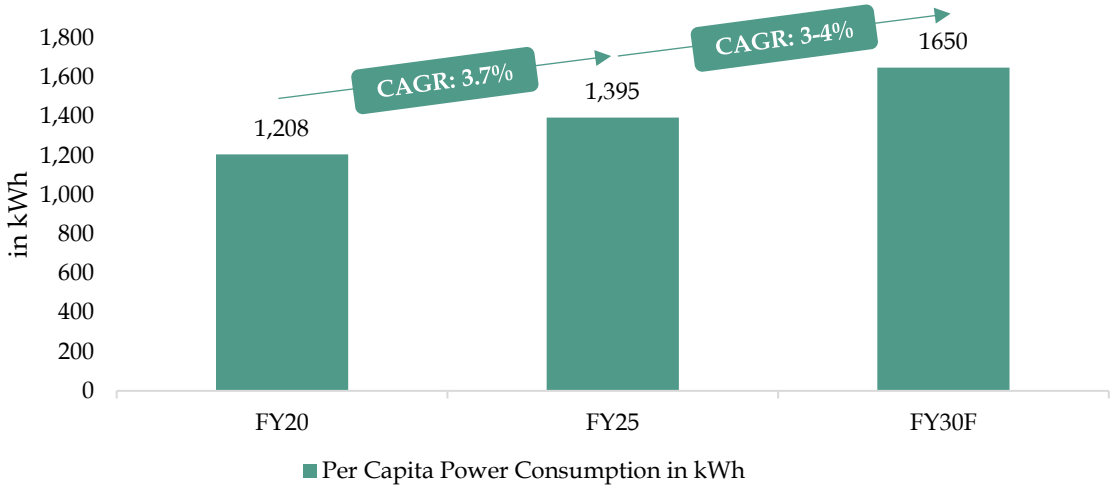
Source: CRISIL Intelligence & Ken Research Analysis

Per Capita Power Consumption

Per capita electricity consumption in India increased from 1,208 kWh in FY20 to 1,395 kWh in FY24, representing a **CAGR of 3.7%**. **Consumption is projected to reach approximately 1,650 kWh by FY30**, continuing the upward trajectory driven by sustained economic growth and infrastructure development. Despite this progress, **India's consumption remains significantly below the global average of approximately 3,600 kWh**, indicating substantial headroom for continued infrastructure expansion and network development.

This consumption growth reflects expanding infrastructure requirements through **railway electrification programs, industrial expansion, and urban development**. **Each growth driver creates specific infrastructure demands: railway electrification requires extensive EPC work; industrial expansion drives mining operations and specialized boring services; urban development necessitates dredging and reclamation projects; and expanding power infrastructure creates sustained O&M demand** across generation, transmission, and distribution assets. (Source: CRISIL)

Figure 1-11: Per Capita Power Consumption in India (in kWh), FY20-FY30F



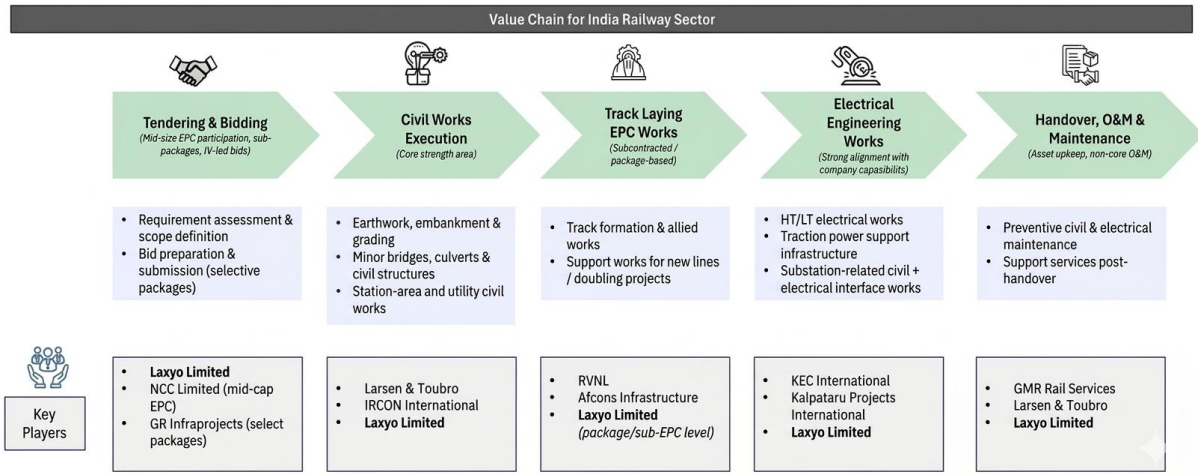
Source: Central Electricity Authority of India (CEA), Ken Research Analysis

2. Railway Infrastructure Market Analysis

2.1 Value Chain of Railway Sector

The railway sector value chain starts with tendering and bidding, where project requirements are defined and EPC contractors participate in selective, package-wise bids. This is followed by on-ground civil execution covering earthwork, structures, stations, and allied infrastructure. Track laying EPC forms the core of project delivery, supporting new lines, doubling, and capacity expansion works. Electrical engineering works run in parallel, including traction power systems, substations, and electrical interface works. The process concludes with handover and post-commissioning support, including preventive maintenance and limited O&M activities, typically under asset-light models.

Figure 2-1: Value Chain Analysis of Railway Sector



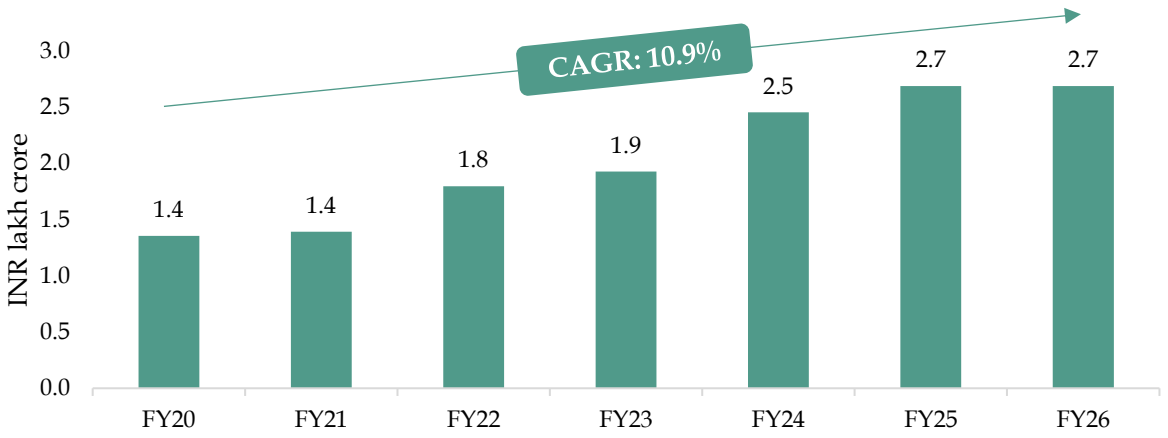
Source: Ken Research Analysis

2.2 Overview of Investments in Railways Sector of India

Investments in the railway sector are largely driven by public funding, as the Central and State governments make majority investments in Indian railways through **budgetary support**. These allocations have surged, with **over INR 2.7 lakh crore allocated in recent budgets to modernize and expand the network**. This drives a robust pipeline of EPC & Manufacturing opportunities in new line construction, gauge conversion, doubling projects, rolling stock, and key civil works like bridges, tunnels, and station upgrades. These efforts, supported by initiatives such as **PM Gati Shakti and the National Rail Plan,** aim to enhance connectivity, reduce congestion, and boost freight capacity, making railways a high-growth area in India's future.

Net capital expenditure represents the actual spend by the Ministry of Railways on asset creation such as: new lines, gauge conversion, track doubling, bridges and tunnels, station upgrades, electrification, signaling and telecom modernization, and rolling stock procurement.

Figure 2-2: Actual Net Capital Expenditure by Indian Railways in (INR lakh crore), FY20-FY26



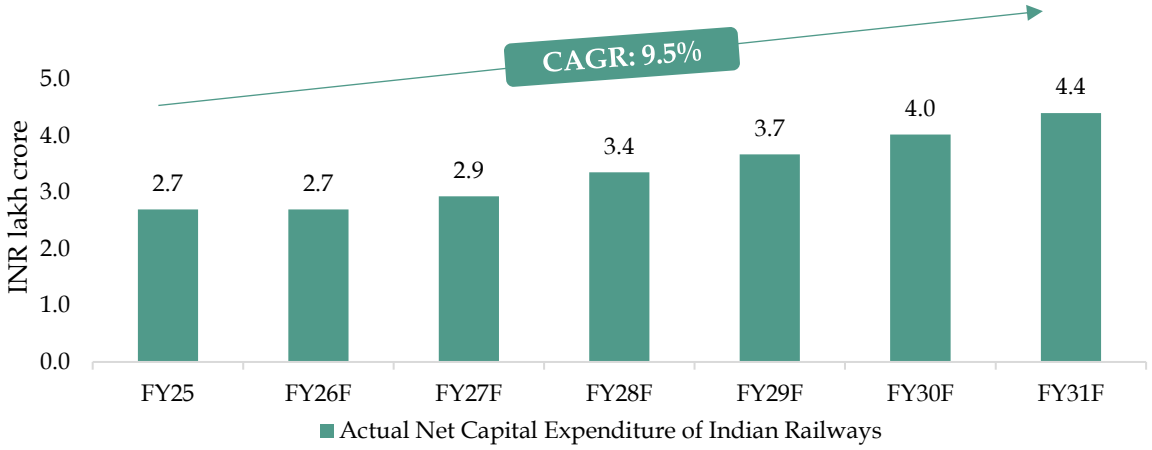
Source: Annual Reports of Ministry of Railways, Ken Research Analysis
Note 1: F represents Forecasted figures, E represents Estimated figures
Note 2: Actual Net Expenditure has been considered as it represents the actual flow of money going into railways

The capital expenditure of Indian Railways has seen a significant increase over the past decade, with the actual net capital expenditure rising from **INR 1.4 lakh crore in FY20** to a budgeted **INR 2.7 lakh crore in FY25, indicating a growth at a CAGR of 10.9% between FY20 & FY26**.

It is projected to **reach INR 4.4 lakh crore by FY31, reflecting a CAGR of 9.5% over FY25E–FY31F.** This growth rate reflects a moderation compared to the rapid expansion

during FY20-FY25E, as future increases in capital allocations are expected to normalize, focusing on completing ongoing projects and ensuring operational sustainability. **This includes completion of key small and large-scale projects including the 44,488 km Doubling/Gauge Conversion/New Line laying goal, Vande Bharat Manufacturing goals, Complete Track Renewal (CTR) goals, High Speed Rail Network of ~7,000km by 2035, Dedicated Freight Corridors and Regions specific railways projects like the NE Rail Connectivity Mission and more.**

Figure 2-3: Actual Net Capital Expenditure by Indian Railways (in INR lakh crore), FY25-FY31F



Source: Annual Reports of Ministry of Railways, Ken Research Analysis
Note: F represents Forecasted figures, E represents Estimated figures

2.3 Railway Infrastructure Market Definition

Typically, the Indian Railway's carries out capital expenditure over two main categories:

1. Railway Mechanical Assets (Rolling Stock)

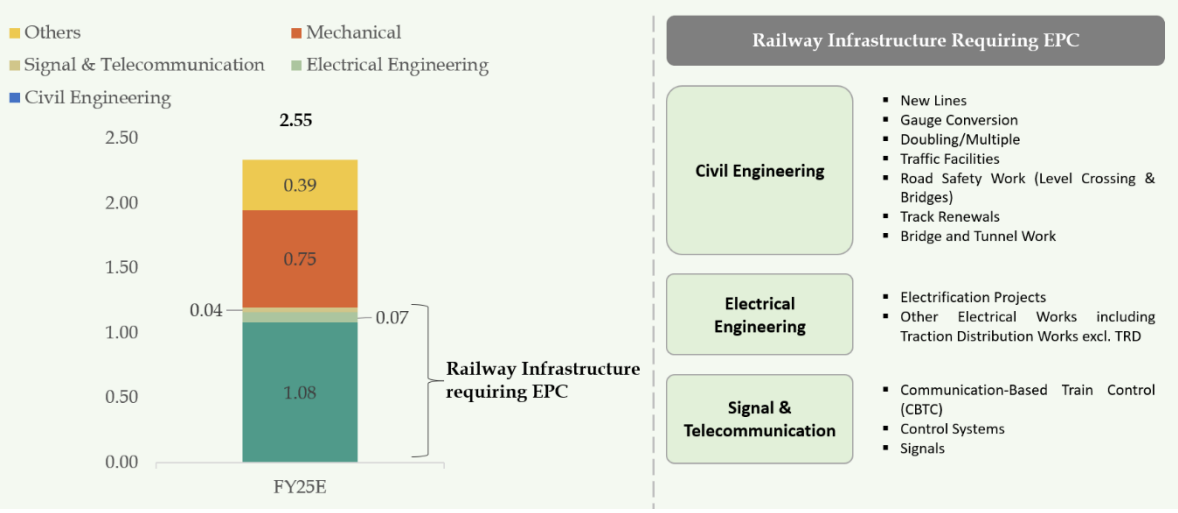
This segment covers acquisition and upgrades of locomotives, coaches, wagons, and workshops key assets for freight and passenger movement driven by traffic growth, modernization, and electrification.

2. Railway Infrastructure

This segment covers the construction of capital works under **Civil Engineering** *(which includes new lines, gauge conversion, doubling, yard remodelling, road safety works, level crossings elimination work, road over bridge work, under bridge work, complete track renewals - CTR, bridge and tunnel work)*, **Electrical Engineering** *(including: electrification projects, Traction and distribution works etc.)* and, **Signaling and telecommunication works**

(incl. signaling and telecommunication upgradation work). These works are usually carried out by EPC players, and where majority of third-party contracting takes place.

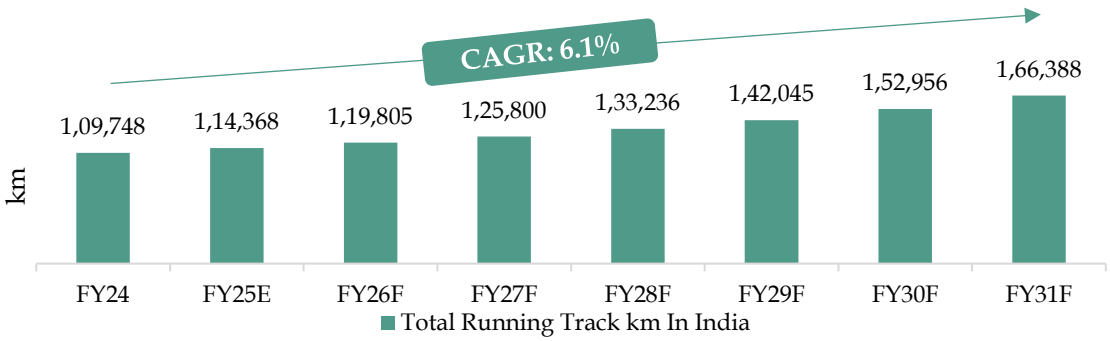
Figure 2-4: Actual Net Capital Expenditure Breakup by Indian Railways, FY25E



Source: Annual Report of Ministry of Railways, Ken Research Analysis
Note: Track Maintenance has not been included as it is a part of Revenue Expenditure; FY25E: E represents that data for FY25 has been estimated

Railway infrastructure also includes **track maintenance**, but its cost is classified under Revenue expenditure rather than Capital expenditure due to its operational nature. These contracts are outsourced to third party EPC players. **Track Maintenance demand correlates with total running track length, meaning growth is expected as tracks extend seen growing at a CAGR of 6.1% reaching 166 thousand km+ by 2030**. Typically, maintenance involves regular inspection, preventive care, and periodic maintenance and renewal work to maintain safety and efficiency, and begins almost instantaneously after the track is laid and comes under operation.

Figure 2-5: Indian Railways Total Running Track km, FY24-FY31F



Source: Annual Reports of Ministry of Railways, Ken Research Analysis
Note: F represents Forecasted figures, E represents Estimated figures

2.4 KEY INITIATIVES, POLICIES & REGULATIONS DRIVING GROWTH OF RAILWAY INFRASTRUCTURE SPEND

To achieve economic growth targets and reduce logistics costs, the Government of India has launched strategic initiatives aimed at **expanding railway capacity and improving freight efficiency**. The policies listed below are driving capital investment and project rollout in Indian Railways, increasing infrastructure requirements and EPC service demand in the market.

Union Budget 2026-27

The Government of India continues to prioritise railway infrastructure capex, with Indian Railways' total capital expenditure budgeted at ~ INR 2.93 lakh crore for FY2026–27. This capex is predominantly financed through central budgetary support, indicating sustained public funding for network expansion, capacity augmentation and asset replacement. Within the capex mix, key infrastructure heads include New Lines (INR 36,722 crore), Doubling of Lines (INR 37,750 crore), Track Renewals (INR 22,853 crore), Signaling & Telecom works (INR 7,500 crore), and Road Over/Under Bridges (INR 8,225 crore) all of which directly contribute to creation/upgrade of rail infrastructure and corridor capacity.

National Rail Plan 2030

The National Rail Plan (NRP) 2030, launched by the Ministry of Railways in 2020-21, aims to build a future-ready rail network by 2030 with a long-term vision to 2050. A key target is raising rail freight's modal share from ~28% in FY22 to 45% by FY30 to reduce logistics costs (Source: National Rail Plan). The plan includes capacity expansion, network modernization (which includes electrification, multi-tracking, speed upgrades and more), PPP engagement, and various initiatives like high-speed rail projects, and Dedicated Freight Corridor (DFC) as well as modernization of stations and signaling through initiatives such as Kavach (Train

Collision Avoidance System). Backed by PPPs, green bonds, and bilateral aid, the NRP envisions INR 41.75 trillion investment through FY51.

National Railways Expansion Plan – 35,966 km Pipeline

As of April 2025, Indian Railways is implementing a National Railways Expansion Plan covering **431 infrastructure projects** with an aggregate planned length of **35,966 km**. The program comprises **154 new line projects** spanning **16,142 km**, **33 gauge conversion projects** covering **4,180 km**, and **244 doubling/multitracking projects** accounting for **15,644 km**. Of the total planned network, **12,769 km has been commissioned up to March 2025**, with doubling and multitracking works contributing the largest share of commissioned length. Cumulative expenditure on the expansion plan has reached approximately **INR 2.91 lakh crore as of April 2025** (Source: Ministry of Railways). The program is aimed at enhancing network capacity, easing congestion on high-density routes, and improving regional connectivity, creating sustained EPC opportunities across track laying, civil works, structures, and allied railway infrastructure packages.

Table 2-1: Status of 35,966 km National Railways Expansion Plan, (as of 1st April 2025)

Category	No. of Projects	Total Length (km)	Length Commissioned till March '25 (km)	Total Expenditure till March'25 (INR crore)
New Lines	154	16,142	3,036	49.9%
Gauge Conversion	30	4,180	2,997	7.8%
Doubling/Multitracking	244	15,644	6,736	60.70%
Total	**431**	**35,966**	**12,769**	**2,90,929**

Note: No update has been provided beyond this date, and is assumed all lines laid in FY25 contribute to National Railways Expansion Plan
Source: Ministry of Railways, Ken Research Analysis

Dedicated Freight Corridor (DFC)

The Dedicated Freight Corridor (DFC) finalised in 2020 under the NRP, aims to modernize freight transport and reduce logistics costs. The **Ministry of Railways**, is developing **DFCs which are** high-capacity rail networks exclusively for goods movement, it aims to reduce road congestion, and improve supply chain efficiency by using railways. The two main corridors under development are:

- **Western DFC (WDFC):** ~1,506 km from Dadri (Uttar Pradesh) to Jawaharlal Nehru Port (Mumbai)
- **Eastern DFC (EDFC):** ~1,874 km from Ludhiana (Punjab) to Dankuni (West Bengal)

(Source: Dedicated Freight Corridor Corporation of India Limited)

Integrated with major industrial corridors such as Delhi–Mumbai and Amritsar–Kolkata, the DFCs support seamless multi-modal freight. As of March 2025, 96.4% (2,741 km out of 2,843 km) has been commissioned (Source: Ministry of Railways).

High Speed Rail Corridor

The Ministry of Railways launched India's High-Speed Rail (HSR) initiative in February 2016 and appointed NHSRCL to lead its implementation, aiming to deliver fast, efficient, and eco-friendly rail travel across the country. The ministry has identified 12 high-speed rail corridors, spanning over 7,200 km. The flagship **Mumbai–Ahmedabad corridor**, remains the only HSR under construction with over 300 km of viaducts already completed as of May 2025. Full commissioning now expected by 2028–2030, with a push back from the original 2022 timeline due to delays in land acquisition and state-level approvals (Source:National High-Speed Rail Corporation Ltd). Under Union Budget 2026, the ministry announced seven high-speed rail corridors linking major economic centres, a new dedicated freight corridor between Dankuni and Surat. Other proposed HSR corridors, such as **Delhi–Varanasi, Delhi–Ahmedabad**, and routes within the Diamond Quadrilateral, remain at the feasibility or Detailed Project Report (DPR) stage. The long-term target is to operationalize 7,000 km of HSR by 2047 (Source: Ministry of Railways).

2.5 Railway Infrastructure Spend and Segmentation, FY20-FY31F

The **Railway Infrastructure Spend of India** comprises 5 main works:

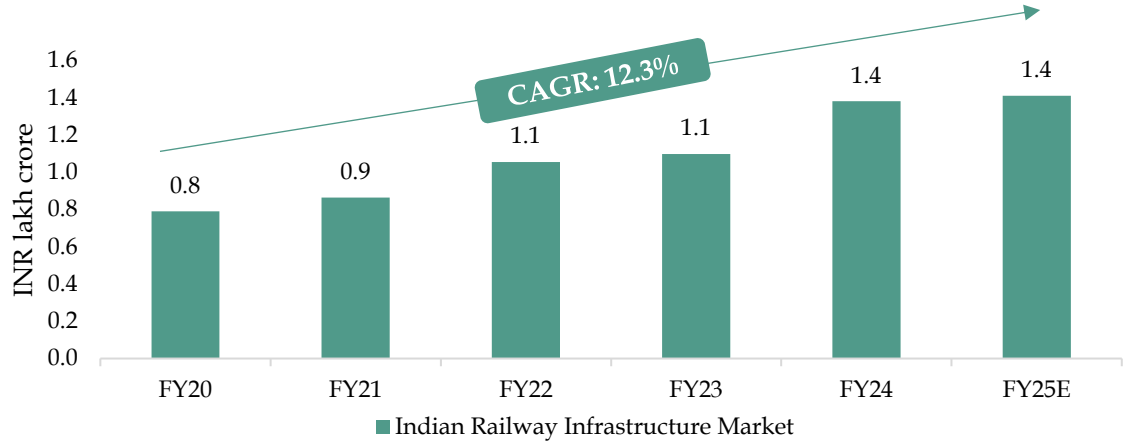
- **Track laying EPC Work** *(which includes new line, doubling/multiplying, gauge conversion, and complete track renewal)*
- **Track Maintenance Work**
- **Civil Works**
- **Electrical Engineering Work**
- **Signal and Telecommunication Work**

These works are essential for enabling the movement of rolling stock, freight and passenger train across India, and are fundamentals for the Indian Railways.

Between FY20 and FY25E, the Indian Railway Infrastructure Spend grew from **INR 0.8 lakh crore to INR 1.4 lakh crore** at a **CAGR of 12.3%**. This growth has been driven by the formalization of long-term targets under the **National Rail Plan and the launch of the PM Gati Shakti programme**, which has enabled multi-ministerial coordination. Execution activity has been further supported by large-scale infrastructure initiatives such as the

Dedicated Freight Corridors, comprehensive electrification programmes, and execution of Railway Ministry's Plan. **16,142 km of new lines, 2,997 km of gauge conversion and 6,736 km of doubling/ multi-tracking of lines had been commissioned till March 2025**. These projects along with enhanced budgetary allocations significantly accelerated infrastructure development during this period.

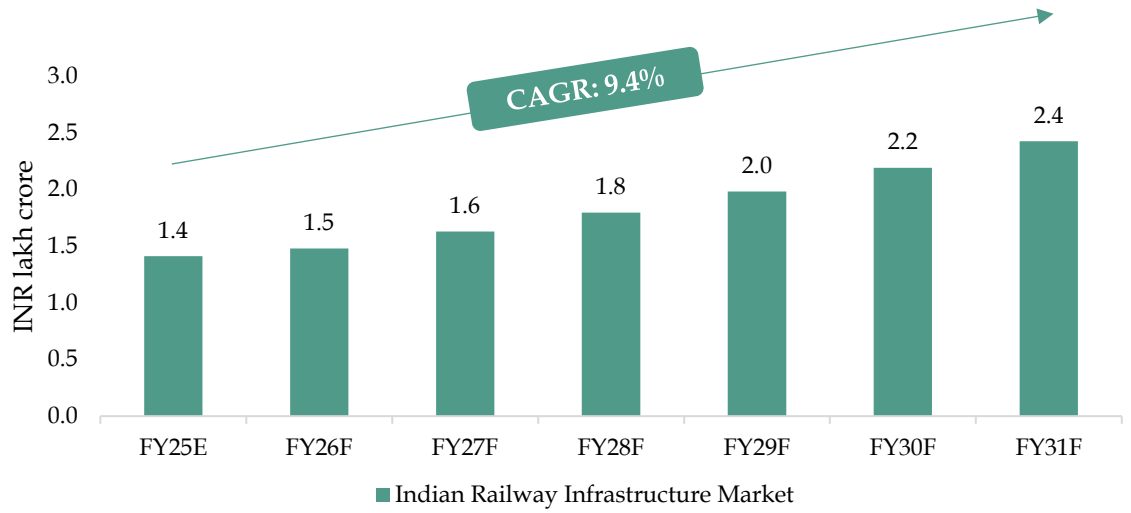
Figure 2-6: Indian Railway Infrastructure Spend (in INR lakh crore), FY20-FY25E



Source: Annual Reports of Ministry of Railways, Ken Research Analysis
Note: E represents Estimated figures

Further, between FY25E and FY31F, the market is projected to grow at a CAGR of 9.4%, reaching INR 2.4 lakh crore by FY31. This growth is expected to be led by corridor expansion, HSR projects completion, network decongestion, electrification of remaining non-electrified lines, deeper integration with multimodal logistics hubs under the Gati Shakti framework and execution of Railway Ministries. **Plan of completing works on 35,966 km of new lines, gauge conversion and doubling of track is also expected to be completed during this time period.** These projects along with their timelines significantly boost demand for EPC services in **track laying, civil works, and maintenance by expanding project volume**, accelerating execution timelines, and increasing opportunities in core infrastructure segments.

Figure 2-7: Indian Railway Infrastructure Spend (in INR lakh crore), FY25E-FY31F



Source: Annual Reports of Ministry of Railways, Ken Research Analysis
Note: F represents Forecasted figures, E represents Estimated figures

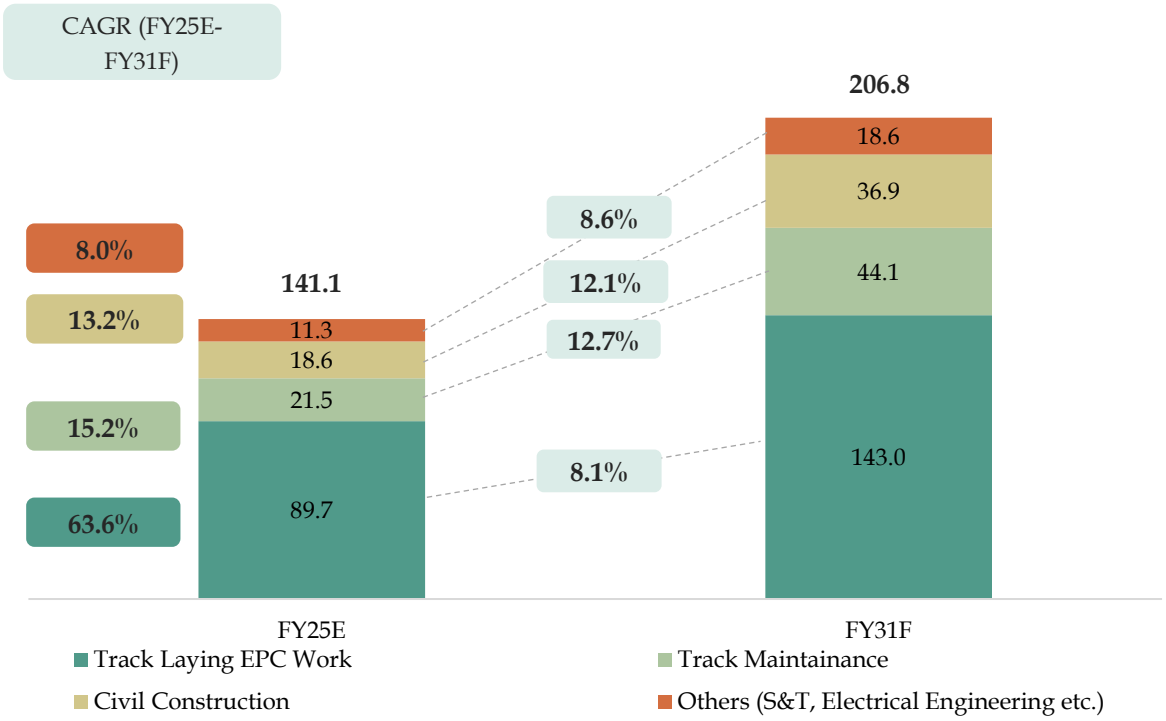
2.5.1 Railway Infrastructure Spend Segmentation

Railway Infrastructure Spend Segmentation by Work Type, FY25E-FY31F:

India's Railway Infrastructure Spend is driven by large-scale expansion and modernization. **Track laying** is the **largest segment (which includes new lines, doubling and gauge conversion)**, accounting for **63.6%** of the market in FY25E with an estimated value of **INR 89.7 thousand crore**. It grew strongly between FY20 and FY25E, supported by government plans to add **35,966 km** of new lines, gauge conversion, and doubling. With expenditure peaking, growth is expected to moderate to a CAGR of **8.1%**, reaching **INR 143 thousand crore** by FY31F. However, capacity expansion on congested routes such as the Gondia–Balharshah doubling project and Kharsia–Naya Raipur–Parmalkasa fifth and sixth lines under Central Railway and South East Central Railway zones will continue to support demand (Source: Cabinet Committee on Economic Affairs). These projects involve extensive track laying, civil works, and multitracking, directly aligning with the client's EPC focus areas

Track maintenance is the **second-largest segment**, contributing **15.2%** of the market with a size of **INR 21.5 thousand crore** in FY25E. It is projected to grow at the highest CAGR of **12.7%** to **INR 44.1 thousand crore** by FY31, driven by the recurring need for constant maintenance as the network expands.

Figure 2-8: Indian Railway Infrastructure Spend (INR '000 crore) by Work Type, FY25E & FY31F



Source: Ken Research Analysis;
Note: F represents Forecasted figures, E represents Estimated figures

Civil construction is the **third-largest and second fastest-growing segment**, valued at **INR 18.6 thousand crore** in FY25E with a **13.2%** share. It is expected to reach **INR 36.9 thousand crore by FY31F, growing at a CAGR of 12.1%.** Growth is led by station redevelopment, passenger amenities, safety infrastructure such as foot overbridges and boundary walls, and increased private participation through the PPP model.

Railway Infrastructure Spend Segmentation by Ownership Type, FY25E-FY31F:

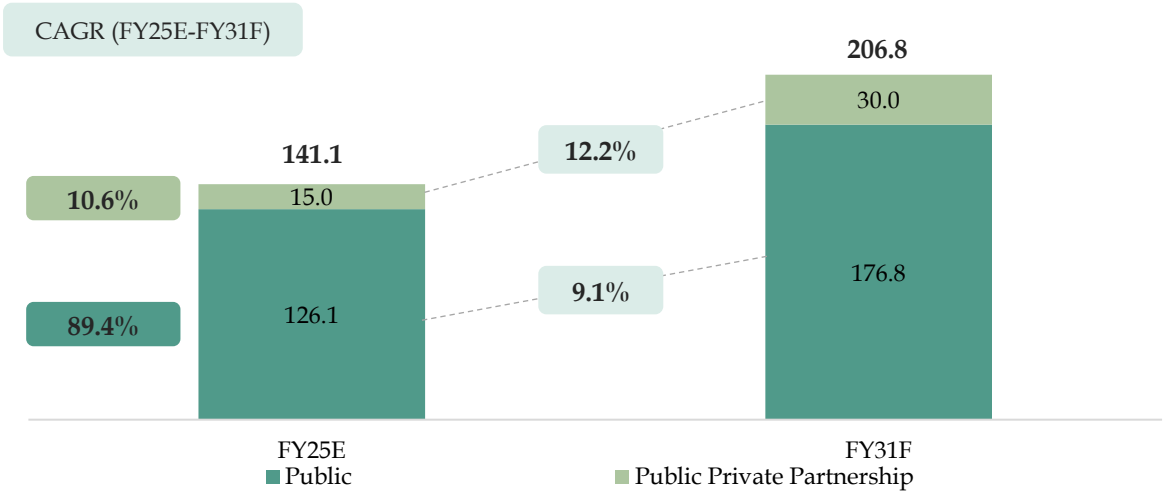
India's Railway Infrastructure Spend continues to be predominantly publicly funded, with public funds and PSU ownership accounting for **89.4% of the market in FY25E**, valued at around **INR 126.1 thousand crore**. Private players mainly participate through contracting and subcontracting, underscoring the market's public-driven structure.

However, the share of Projects under Public Private Partnership (PPP) are expected to rise, especially with the government's **station redevelopment initiative of 1,318 stations through**

the PPP model. With over 200+ stations currently under redevelopment, it is expected to create an opportunity of INR 30.0 thousand crore over FY25 and FY26 (Source: ICRA Limited).

The PPP segment, currently **10.6% of the market at INR 15.0 thousand crore in FY25E**, is projected to grow at a **CAGR of 12.2%**, reaching **INR 30.0 thousand crore** as more stations get redeveloped. Meanwhile, Projects under PSUs are expected to grow steadily at a CAGR of 9.1%, driven by PSU led and owned initiatives such as network doubling, gauge conversion, and expansion of freight corridors.

Figure 2-9: Indian Railway Infrastructure Spend (INR '000 crore) by Ownership Type, FY25E & FY31F



Source: Ken Research Analysis;
Note: F represents Forecasted figures, E represents Estimated figures

Railway Infrastructure Spend Segmentation by Region, FY25E-FY31F:

The Indian Railway Infrastructure Spend is reflected in region-wise project listings published annually in the Pink Book. In FY25E, the **Eastern** region emerged as the leading region with **32.5%** share and had been allocated **INR 46 thousand crore**. This allocation was driven by the Eastern DFC and 8 new railway line's development in Bihar and West Bengal. Its share is expected to decline to **28.9%** by FY31, growing at a **7.3% CAGR** to **INR 70 thousand crore**. Its market share is projected to decline due to even faster growth in investments across other regions, driven by broader national infrastructure priorities and emerging strategic corridors.

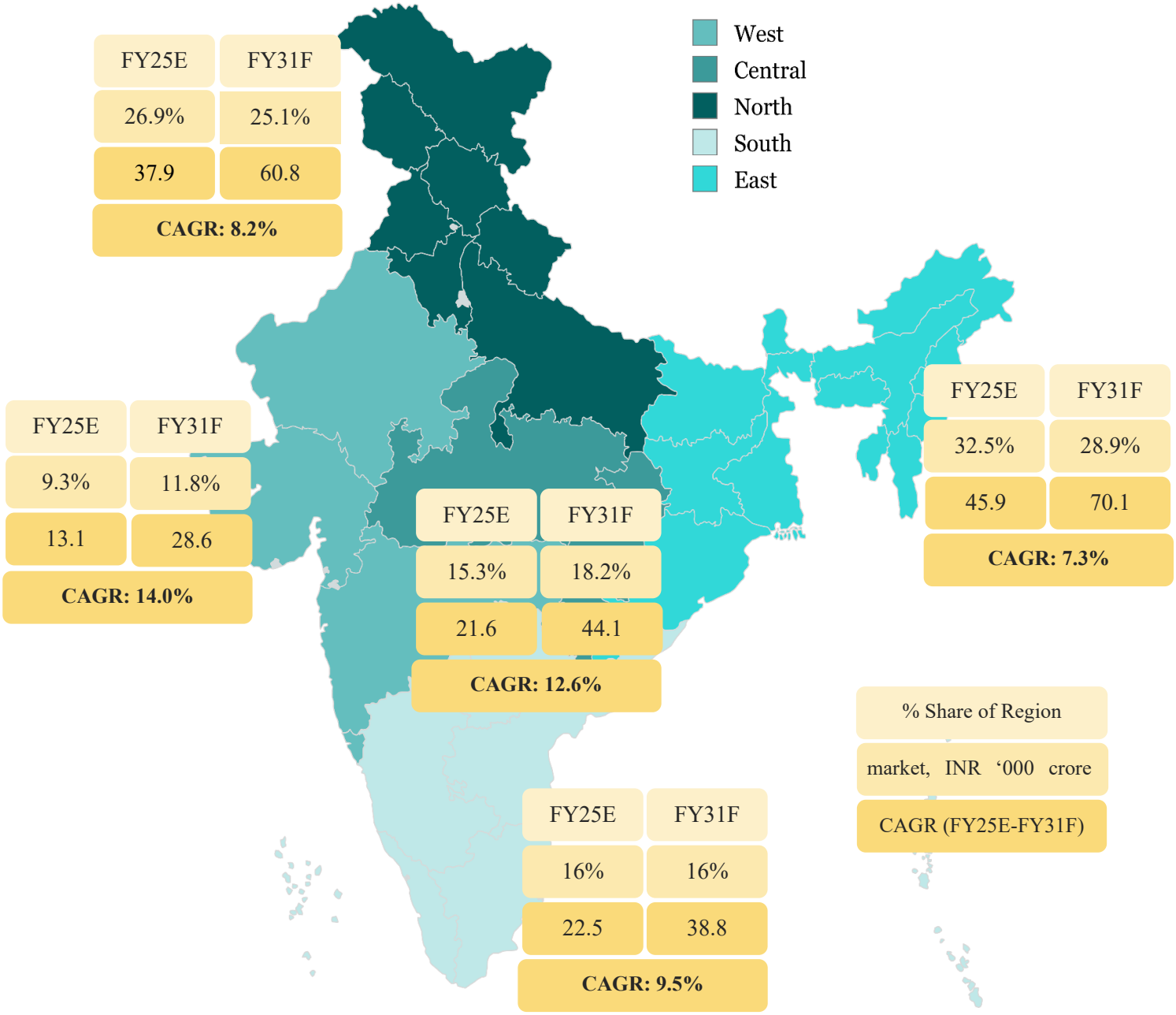
The **Central region**, covering states like Uttar Pradesh and Madhya Pradesh, is emerging as a high-growth zone. With **15.3%** share and **INR 22 thousand crore** in FY25E, it is projected to

reach **INR 44 thousand crore** by FY31, growing at a **12.6% CAGR**, driven by express freight zones, mineral connectivity corridors linking key industrial belts, and densification projects aimed at decongesting high-traffic routes such as the Delhi–Howrah and Delhi–Mumbai corridors.

The **Western region**, currently with the smallest at **INR 13 thousand crore** and **9.3%** share, is set to grow the fastest at **14.0% CAGR**, reaching **INR 29 thousand crore** by FY31. Growth is supported by strategic port–rail connectivity in Gujarat and Maharashtra, including the Mumbai–Vadodara HSR and Mundra–Vadhavan freight links.

The **Northern and Southern regions**, continue to receive steady investment due to ongoing urban rail integration, decongestion efforts, and legacy infrastructure upgrades. Their mature project pipelines ensure consistent EPC activity, though growth rates are expected to be more moderate.

Figure 2-10: Split of Indian Railways Infrastructure EPC Market by Regions (in INR '000 crore), FY25E



Source: Ken Research Analysis
Note: F represents Forecasted figures, E represents Estimated figures

*Note: cr: Crore; **North** includes Chandigarh, Delhi, Haryana, Punjab, Jammu and Kashmir, Ladakh, Uttar Pradesh, Uttarakhand; **West** includes Damam & Diu, Gujarat, Rajasthan, Maharashtra, Goa; Central includes Madhya Pradesh and Chhattisgarh; **East** includes Bihar, Sikkim, West Bengal, Odisha, Assam, Arunachal*

Pradesh, Mizoram, Tripura, Nagaland, Manipur, Meghalaya; ***South*** *includes Karnataka, Telangana, Andhra Pradesh, Kerala, Tamil Nadu, Puducherry, Andaman and Nicobar Islands and Lakshadweep*

Based on basis of separate regions, is a list of key projects provided for reference:

Table 2-2: Few Upcoming Railway Projects of Different Types (As of January 2026)

Project Name	Type	Cost (INR thousand crore)	Length (km)	Status	Key Drivers
Delhi–Chennai High-Speed Rail Line	High Speed	271	1754	Planning	Long-distance connectivity, economic corridor
Delhi–Agra–Lucknow–Varanasi High-Speed Rail	High Speed	191	860+	Planning	Multi-city integration, tourism, and business travel
Gonda–Bahraich New Line	New Line	2+	60	Planning	Regional access and tourism
Itarsi–Nagpur Third Line	Doubling/ Multiplying	10+	280+	Under Construction	High-density route decongestion
Mumbai–Ahmedabad Bullet Train	High Speed	108	508	Under Construction	Flagship HSR project, Japanese collaboration
Western Dedicated Freight Corridor	Freight Corridor	81*	1506	Near Completion	Freight efficiency, industrial corridor

Source: Dedicated Freight Corridor Corporation of India Limited, National High Speed Rail Corporation Limited, Ken Research Analysis
Note: The cost of Western Dedicated Freight Corridor is inclusive of Eastern & Western DFC

Freight Tonne Kilometres (FTK) represents the work done in moving freight over distances. India's FTK trends mirror cargo movement, with roadways leading due to extensive connectivity, while seaways show lowest FTK owing to limited infrastructure and usage.

2.6 Logistics Cost Comparison - Railway vs Road vs Waterways Freight

Roadways carried the majority of India's freight in FY25, accounting for **71%** of total volume. Railways followed with ~**27%**, while inland waterways contributed **2%**.

This reflects the dominant role of **road transport** in India's current logistics network, particularly for short-haul, regional, and last-mile delivery. **Railways**, though second in volume, is gaining traction for bulk and long-distance movement due to ongoing investment and network upgrades. **Inland waterways** recorded a record 145.5 MMT in FY25, growing at a CAGR of 20.86% since FY14 (Source: Press Information Bureau), but remain constrained by limited navigable infrastructure covering only ~4,894 km of operational waterway length.

The government targets increasing IWT's modal share from 2% to 5% under Maritime India Vision 2030.

Table 2-3: Throughput of Different Means of Transport, FY25 ending March

Transport	Volume (MMT)	Throughput (Bn tkm)	Modal Share (Tonne-km)
Railways	1,617.4	~1,700	~27%
Inland Waterways	145.5	~9	~2%
Roadways	3,970 (est.)	~3900 (est.)	~71%

Sources: Ministry of Railways PIB (April 2025) for Railways; IWAI / PIB (April 2025) for Waterways; Niti Aayog / MoRT for Roads and modal share. Roadways volume and tonne-km estimated based on Niti Aayog modal share benchmarks and FY24 base. Throughput (Bn tkm) for waterways estimated using average haul distance; Railways NTKM derived from monthly PIB data.

For every ₹100 spent on road freight, the same material can be transported for approximately ₹52 by rail and ₹61 via inland waterways with rail being the most cost-efficient mode for bulk and long-distance movement. Road transport costs ₹3.78 per tonne-km, significantly higher than rail at ₹1.96 and waterways at ₹2.30, while air freight remains an outlier at ₹72 per tonne-km.

Rail's cost advantage over road is most pronounced for distances exceeding 600 km and for bulk commodities such as coal, iron ore, cement, and fertilisers. Waterways, while cheaper than road, require proximity to navigable infrastructure and are limited to specific corridors. As per the NCAER assessment for DPIIT, India's logistics costs in FY2023-24 were 7.97% of GDP Press Information Bureau significantly lower than the commonly cited 13-14% figure, reflecting infrastructure improvements over the past decade.

To reduce logistics costs further, the Government of India is investing in railway modernisation and inland waterway development, promoting multimodal freight corridors, and targeting sub-8% logistics cost as a share of GDP under the National Logistics Policy 2022.

Table 2-4: Overview of Cost per Transport per Tonnage, FY2023-24

Transport	Cost (₹/tonne-km)	Relative Index (Road = 100)	Remarks
Railways	₹ 1.96	52	Most cost-efficient mode; optimal for bulk cargo over 600+ km; freight charges constitute 89.8% of total rail logistics cost

Inland Waterways	₹ 2.30	61	Second most cost-efficient; limited to navigable corridors (~4,894 km operational length); IWAI targeting 5% modal share by 2030
Roadways	₹ 3.78	100	Dominant mode; costliest per tonne-km; fuel accounts for ~42% of road logistics cost; critical for last-mile connectivity
Airways	₹ 72.00	1,905	High-value/time-sensitive cargo only

Source: NCAER–DPIIT, Assessment of Logistics Cost in India, September 2025 (FY2023-24 data; most recent official government estimate); Ken Research Analysis

2.7 EPC Opportunity in Railway Infrastructure of India

As the Capital expenditure is expected to grow from **INR 2.6 lakh crore in FY25** to **INR 4.4 lakh by FY31F,** India's Railway Infrastructure Spend continues to be a strategic growth segment, backed by long-term capital outlays and a shift towards execution-focused delivery.

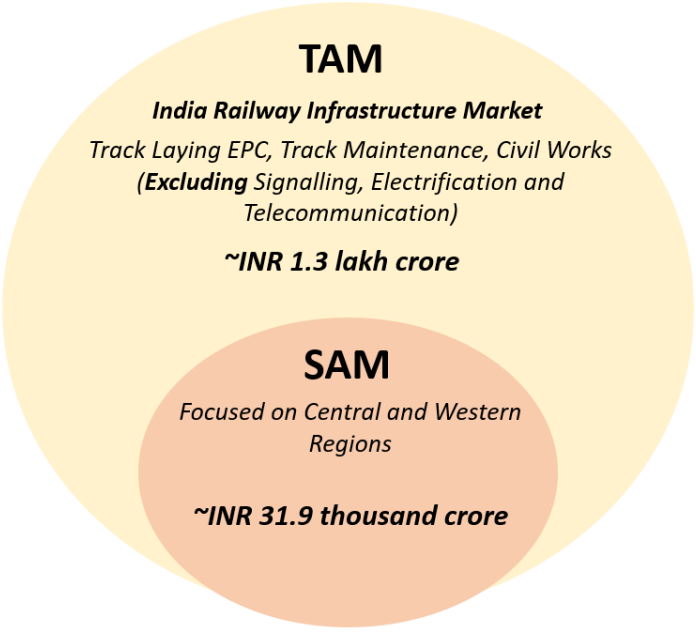
The Railway Infrastructure Spend of India, largely an EPC player space, currently sits at INR 1.4 lakh crore and is expected to reach INR 2.4 lakh crore by FY31F, growing at a CAGR of 9.4%. However, this means this represents the Total Addressable Market for EPC Players in the Railway Segment. And based on capabilities that players have with them and the locations they can serve; the **Serviceable Addressable Market** is established.

Further, Indian Railways has progressively moved track laying EPC, track maintenance and allied civil works towards **mechanised execution**, with tender conditions increasingly requiring contractors to **arrange/ensure availability of specified on-track machines** (owned/leased/exclusively deployed) and meet output and downtime-linked performance requirements. In parallel, Railway infrastructure funding has remained elevated, with **capex of INR 2,62,200 crore allocated for FY25**. Track renewal volumes have also scaled up. The Ministry of Railways has further disclosed **6,851 track km renewed in FY25**, with **>7,500 track km under way in FY26** and **7,900 track km planned for FY27**, reinforcing the scale of machine-intensive execution. This policy direction reduces reliance on departmental machinery and shifts execution responsibility to contractors, but it also raises **capital intensity, equipment utilisation risk and entry barriers**, thereby favouring scaled EPC players with established machine fleets and financing access.

Track renewal execution has scaled to **INR 5,000–6,000 track-km annually over the last few years**, predominantly through machine-intensive EPC and maintenance contracts (Indian Railways Year Book). In parallel, Indian Railways has adopted **surety bonds as an alternative to bank guarantees** for performance security in eligible works, in line with Government of India guidelines. Performance security in railway EPC contracts typically ranges from **3–10% of contract value**, and substitution through surety bonds can **release a substantial portion of equivalent cash or bank limits** otherwise blocked as guarantees. For capital-intensive track EPC players, this liquidity release improves working-capital efficiency and can be redeployed towards **machine procurement and fleet expansion**, partially offsetting the higher capex burden arising from the mechanisation-led contracting model (Ministry of Finance guidelines).

For Players specifically focused on Railway Infrastructure EPC in specific regions, the Market opportunity looks as below:

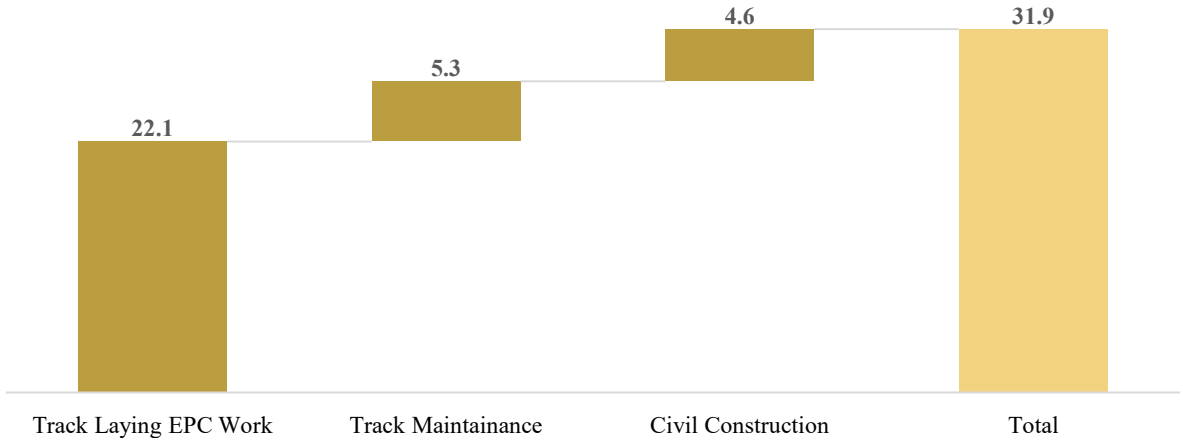
Figure 2-11: Market Opportunity for Railway EPC Players, FY25



Source: Ken Research Analysis;
Note: To arrive at SAM for Regions, market share of both regions has been considered from Railway Infrastructure Spend (excluding Signaling & Telecommunication and Electrification projects)
TAM = Total Addressable Market; SAM = Serviceable Addressable market

The SAM split can be seen across different work types as below:

Figure 2-12: SAM split across different work types in FY25 (in INR '000 Crore)



Source: Ken Research Analysis

Further, Operating margins for track laying and maintenance projects typically range from 12–20%, but can reach 25–30% when specialized machinery or traffic block conditions are

involved. Track-laying and Complete Track Renewal contracts span a 1.5 year execution period, structured around pre-approved 2–3 hour block windows between stations. Invoices are raised monthly against certified quantities laid via the Indian Railways' online portal.

Few key EPC opportunities to be looked out for track laying, track maintenance and civil works are:

Table 2-5: EPC Opportunity Overview of Investments in the Railway Infrastructure

Plan	Project Highlight	Total Financial Outlay
Track Works (New Lines, Doubling, Gauge Conversion)	As on 01.04.2025, 431 railway infrastructure projects (154 New Line, 33 Gauge Conversion, 244 Doubling) of total length 35,966 km, costing approx. Rs. 6.75 lakh crore are sanctioned; ~12,769 km commissioned up to March 2025. India Shipping News Commissioning over 2014-25 totalled 34,428 km at an average of 8.57 km/day - over twice the 4.2 km/day pace of 2009-14. Annual budget allocation of Rs. 68,634 crore in FY2024-25, nearly 6x the 2009-14 average.	Rs. 6.75 lakh crore (sanctioned project pipeline)
Track Renewal (CTR & TRR)	~54,600 km of track renewed during 2014-26 (up to Feb 2026). (Source: Press Information Bureau) In 2025: 6,880 track km of rails renewed; 7,051 track km of complete track renewal done; 9,277 sets of through turnout renewal completed. (Source: Press Information Bureau). Over 80% of the network is now capable of 110 kmph and above, up from 40% in 2014; tracks at 130 kmph and above have seen a 3.5x increase from 6.3% to 22.4% of total network.	Funded under Rashtriya Rail Sanraksha Kosh (RRSK) - Rs. 1 lakh crore corpus over 5 years (extended from 2022-23)
Station Redevelopment (Amrit Bharat Scheme)	1,337 stations identified for development/redevelopment under the Amrit Bharat Station Scheme; works completed at 180 stations as of March 2026. (Source: Press Information Bureau) Fund allocation of Rs. 12,118 crore made for FY2025-26 under Plan Head-53 (Customer Amenities); Rs. 7,253 crore expended up to October 2025. (Source: Press Information Bureau); 103 stations inaugurated by PM in May 2025. Scheme is primarily EPC-mode with 15 stations being explored under PPP.	Est. Rs. 1.5 lakh crore+ (full programme outlay)
Dedicated Freight Corridors (DFCs)	EDFC (Ludhiana to Sonnagar, 1,337 km) and WDFC (JNPT to Dadri, 1,506 km) both commissioned and operational except the 102 km Vaitarna-JNPT Mumbai section, which is under progress. (Source: Press Information Bureau) Full WDFC commissioning targeted by FY2025-26; EDFC fully operational; DFCs collectively running over 400 trains daily.	Rs. 2 lakh crore+ (new corridors); EDFC+WDFC project cost ~Rs. 1.4 lakh crore

	Swarajyamag Three new corridors (East Coast, East-West, North-South) have DPRs prepared; combined project value est. Rs. 2 lakh crore+.	
High-Speed Rail (HSR)	As of January 2026, 334 km of viaduct installation, 415 km of pier work, 17 river bridges, and 292 track km of RC track bed completed on the 508 km Mumbai-Ahmedabad corridor; ~57% physical progress as of January 2026. (Source: Indian Infrastructure). First passenger operations targeted on Surat-Bilimora (50 km) by 2027-28; full Gujarat section by 2028; Mumbai connectivity by 2030. Project cost revised upward to est. Rs. 1.98 lakh crore. Budget 2026-27 proposes 7 additional HSR corridors.	Rs. 1.08 lakh crore (original; revised est. Rs. 1.98 lakh crore)
Signaling Upgrades (Kavach / ATP)	Kavach 4.0 commissioned on 1,452 route km covering high-density Delhi-Mumbai and Delhi-Howrah routes as of February 2026; trackside work taken up on 24,427 rkm covering GQ, GD, HDN and other identified sections. Kashmir Despatch Kavach v3.2 legacy base: 1,465 rkm on South Central Railway. 4,154 locomotives fitted with onboard Kavach units; bids issued for 9,069 additional locomotives. Target: 5,000-5,500 km/year from FY2025-26; 44,000 km over 5 years. Rs. 2,763.9 crore spent on Kavach up to February 2026; Rs. 1,673 crore allocated for FY2025-26. DD News	Rs. 1.08 lakh crore (FY2024-25 budget allocation for nationwide rollout)
Electrification of BG Network	~99.2% of Broad Gauge network electrified as of November 2025 Press Information Bureau; 99.4% (69,744 of 70,117 rkm) electrified as of January 2026; residual ~373 km across 5 states under active work. Target is 100% (Mission 100% Electrification); net-zero carbon emissions target by 2030. 14 Railway Zones and 25 States/UTs have achieved 100% electrification. Indian Railways' electrification level now exceeds UK (39%), Russia (52%), and China (82%).	Rs. 464 bn+ invested since 2014
Rolling Stock Manufacturing (Linked EPC)	164 Vande Bharat express services operational as of December 2025; 42,600+ LHB coaches manufactured in 2014-25 (18x growth vs. prior decade); 41,929 wagons produced in FY2024-25 (highest in 3 years). (Source: Press Information Bureau). Vande Bharat Sleeper at speed-testing and safety-certification stage. Target: 400+ Vande Bharat trains and 3,000 MT annual freight loading by 2029-30.	Integrated within Rs. 2,65,200 crore FY2024-25 Capex (Rs. 50,903 crore earmarked for rolling stock)
Railway Bridges & Tunnels	1,161 ROBs and RUBs completed in 2025; 13,600+ bridges built over 11 years (3x the pace of 2004-14). (Source: Press Information Bureau) Landmark	Included within project-level allocations

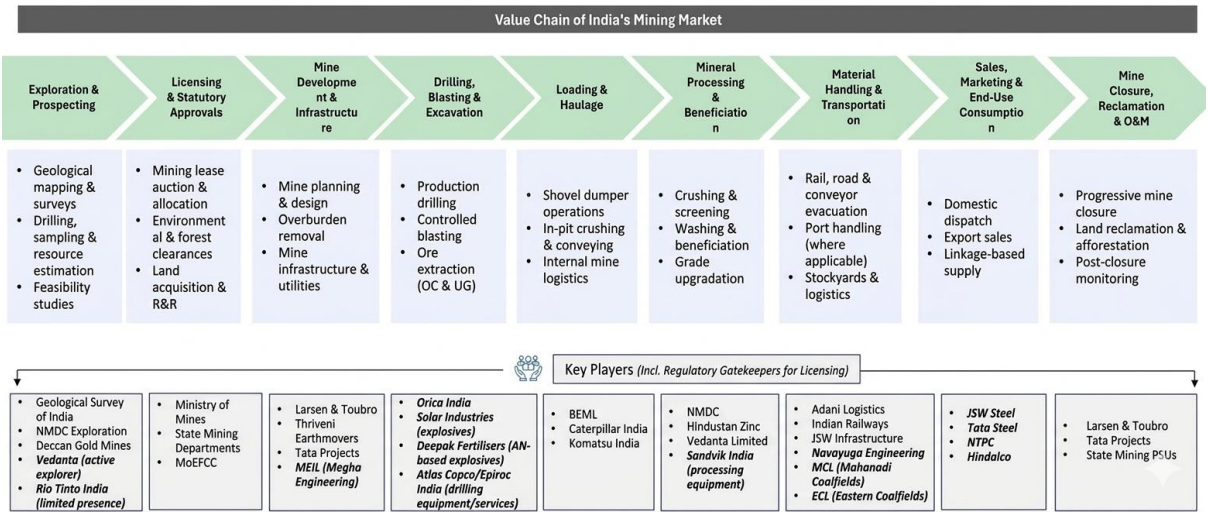
	completions in FY2025: Chenab Bridge (world's highest railway bridge, 359 m), Anji Bridge (India's first cable-stayed rail bridge), New Pamban Bridge (India's first vertical-lift sea bridge), and the USBRL Himalayan rail link (272 km, 36 tunnels, 943 bridges). Increasing share of long-span structures in hilly, coastal, and Northeast corridors.	(USBRL alone ~Rs. 35,000 crore)
Multimodal Logistics Parks & Gati Shakti	434 projects identified under 3 economic corridors with cost outlay of Rs. 11.17 lakh crore; 121 projects (12,133 km, Rs. 2,02,551 crore) sanctioned; 162 projects (16,910 km, Rs. 3,30,545 crore) under appraisal/inter-ministerial consultation. (Source: Press Information Bureau) DFC-linked Gati Shakti Cargo Terminals operational and scaling; DFCs running 400+ trains/day.	Rs. 11.17 lakh crore (economic corridor programme)
Private Rail-linked Infrastructure EPC	Growth in private logistics and industrial rail assets - ICDs/CFS rail handling yards, private sidings (steel/cement/power), port-rail connectivity, warehouse + rail spur integrated parks, and in-plant rail systems. GCT (Gati Shakti Cargo Terminal) policy enabling private terminal development on DFC network.	NA
Track Works (New Lines, Doubling, Gauge Conversion)	As on 01.04.2025, 431 railway infrastructure projects (154 New Line, 33 Gauge Conversion, 244 Doubling) of total length 35,966 km, costing approx. Rs. 6.75 lakh crore are sanctioned; ~12,769 km commissioned up to March 2025. India Shipping News Commissioning over 2014-25 totaled 34,428 km at an average of 8.57 km/day - over twice the 4.2 km/day pace of 2009-14. Annual budget allocation of Rs. 68,634 crore in FY2024-25, nearly 6x the 2009-14 average.	Rs. 6.75 lakh crore (sanctioned project pipeline)

Source: Ministry of Railways, Ken Research Analysis

3. MINING AND RAISE BORING MARKET ANALYSIS

The India mining value chain begins with exploration and prospecting, involving geological surveys, drilling, and resource estimation to assess mineral viability. This is followed by licensing and statutory approvals, including mine auctions, environmental and forest clearances, and land acquisition. Mine development and infrastructure creation form the next stage, covering mine planning, overburden removal, and development of utilities and support infrastructure. Core operations include drilling, blasting, excavation, and subsequent loading and haulage of mined material within and outside the mine. The value chain further extends to mineral processing and beneficiation, material handling and transportation, and concludes with sales, end-use consumption, and mine closure, reclamation, and post-closure monitoring, in line with statutory requirements.

Figure 3-1: Value Chain of India Mining Market



Source: Ken Research Analysis

3.1 Overview Of The Indian Mining Market, FY20-FY31F

India's mining sector is overseen by four ministries, the Ministry of Mines, the Ministry of Coal, the Department of Atomic Energy, and the Ministry of Petroleum & Natural Gas. This analysis focuses only on the first two, which regulate the bulk of India's mining operations.

Mining activity under the 2 key ministries i.e. **Ministry of Mines** and **Ministry of Coal** is typically carried out either by **surface** or **underground mines**. **As of FY25, the Ministry of Mines oversees 2,033 surface mines and 48 underground mines**, while the **Ministry of Coal manages 170 surface mines, 150 underground mines, and 22 mines employing both methods**.

Table 3-1: Current Operational Surface & Underground Mines in India (as of July 2025)

Total Number of Operational Mines in India in FY25	Ministry Of Coal	Ministry of Mines
Underground	131	48
Surface	168	2,033
Both	14	-

Source: Ministry of Coal and Ministry of Mines

India's raise boring market is supported by **recent mining policy reforms, expanding cross-sector tunnelling acceptance, and localisation push under Make in India**. The **MMDR Act (amended in 2023)** and the **Ministry of Mines' consultation paper issued in December 2024** for further amendments are expected to accelerate deeper and more mechanised underground mining, directly increasing demand for raise boring applications such as ventilation shafts, ore passes, and access raises (Ministry of Mines). This is reinforced by the Cabinet-approved **National Critical Mineral Mission (₹34,300 crore outlay over seven years)**, which places underground mining infrastructure at the core of India's long-term mineral security strategy (PMO, 2024).

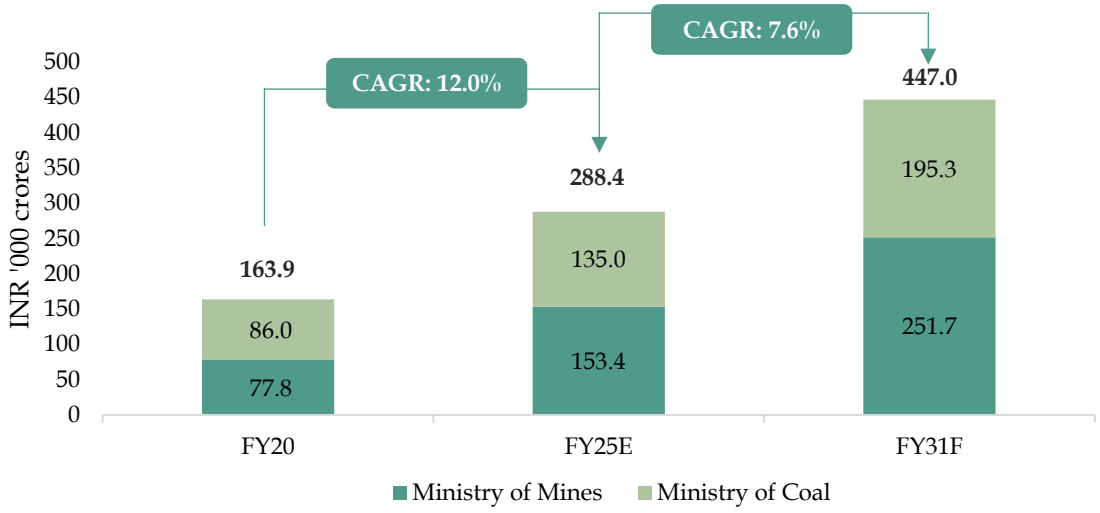
From a regulatory standpoint, **DGMS' draft OSHWC (Coal Mines) Regulations, 2026** modernise provisions governing shaft construction and underground mechanised equipment, creating a clearer compliance framework for raise boring operations in coal and non-coal mines (DGMS).

In parallel, the Ministry of Coal and Coal India have reiterated their intent to promote indigenous mining machinery through vendor development and trial procurement, supporting gradual localisation of raise boring machines and critical sub-systems (Department for Promotion of Industry and Internal Trade; Ministry of Coal)

Between **FY20 and FY25E**, India's mining industry grew at a **CAGR of ~12.0%**, reaching **INR 288.4 thousand crore** in FY25E. Growth was driven by a post-COVID commodity price surge, a rise in coal output from **~730 MT to over 1000 MT**, and policy reforms such as the **MMDR Amendment Acts of 2015 and 2021**, which enabled commercial mining and expanded private participation through auctions.

From **FY25 to FY31F**, production value is projected to grow to **INR 447.0 thousand crore**, at a slower **CAGR of ~7.6%**. The moderation reflects a transition toward underground and critical mineral mining. The **Ministry of Coal has set a 100 MT underground output target**, while the **Ministry of Mines has launched the National Critical Mineral Mission (NCMM)**. These projects involve longer timelines, and surface mining is seeing slower incremental gains due to permitting and land-related constraints.

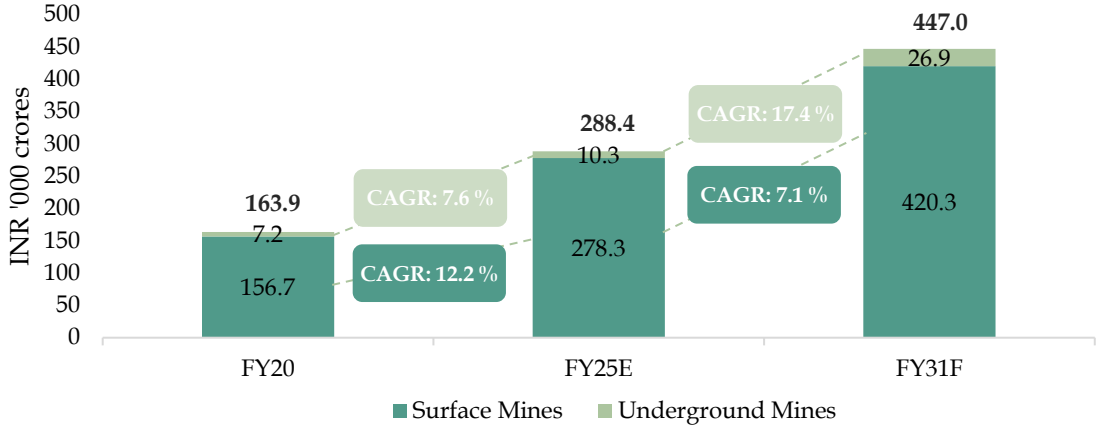
Figure 3-2: Indian Mining Market in terms of Production Value (INR '000 crore), FY20, FY25E & FY31F



Source: Ministry of Mines and Ministry of Coal, Ken Research Analysis;
Note: F represents Forecasted figures, E represents Estimated figures

Although underground mines account for a significant share of the total mine count, their contribution to production value remains limited i.e. **~3–5 times lower output per mine** compared to surface mines. **In FY25E**, underground mining contributed just **INR 10.3 thousand crore**, versus **INR 278.3 thousand crore** from surface mines.

Figure 3-3: Indian Mining Market in terms of Production Value (in INR '000 crore) by Type of Mine, FY20 & FY25E



Source: Ken Research Analysis;
Note: F represents Forecasted figures, E represents Estimated figures

This, however, is expected to change. Underground mining is projected to grow at a **CAGR of ~17.4%** over **FY25E–FY31F**, driven by targeted policy support. The **Ministry of Coal has set a target of 100 MT of underground coal production by FY31** (Source: Ministry of Coal Annual Report 2024), aimed at reducing land use and increasing recovery from deeper seams. Concurrently, the **Ministry of Mines** has introduced the **National Critical Mineral Mission (NCMM)** to accelerate exploration and development of strategic underground mineral resources such as lithium, cobalt, and rare earths.

Further benefiting underground mining sector, the government has prepared incentive plan for the mining of rare earth materials, with a subsidy of over INR1,300 crore. This initiative will continue in the future to reduce India's dependence on China. To further support the sector, a total incentive of INR 5,000 crore is being allocated. Within the underground mining sector, there has been a relaxation on machinery procurement requirements, including the adoption of raise boring techniques for underground mining. (Source: Niti Ayog)

Despite this policy momentum, execution risks remain particularly around high capital costs, technology adoption (e.g., longwall systems, continuous miners), and skilled workforce availability required to scale underground operations efficiently.

Contractual Mining Services in the Indian Market

Mines are usually allocated through competitive bidding conducted by the central or state governments, based on rules under the **Mines and Minerals (Development and Regulation)**

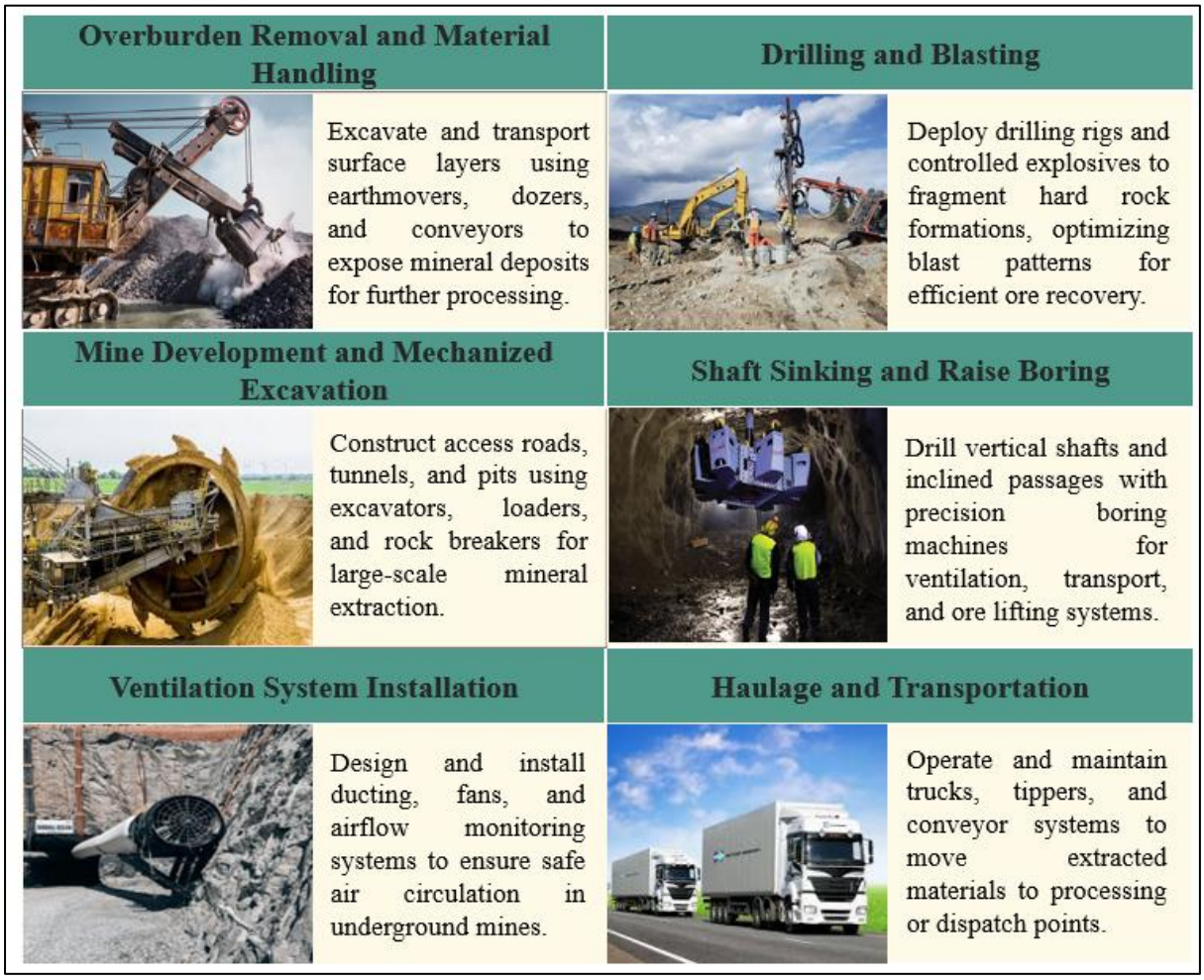
Act. Once a company wins the bid, it becomes the **mine owner**, meaning it has the legal right to extract minerals from that area.

Sometimes, **the mine owner also acts as the mine operator**, directly managing the mining work. In other cases, they hire specialized companies to handle operations. **These hired companies are known as Mine Developers and Operators (MDOs). MDOs take care of tasks like digging, transporting materials, and setting up mining infrastructure.** This helps mine owners reduce costs, speed up work, and bring in expert skills.

Alongside MDOs, there is a growing presence of **Mining Service Companies** that support specific parts of the mining process. These **companies are contracted** to perform specialized tasks as given in figure 3-4:

These services are often offloaded to third-party contractors depending on the mine owner's strategy, operational needs, and cost considerations. The range of work outsourced varies from company to company. For example, Coal India Limited (CIL) spends around 21% of its revenue on contractual mining services, MOIL spends about 6%, and Uranium Corporation of India Limited (UCIL) allocates roughly 14%. Private companies like Tata, Jindal, Adani, and Vedanta tend to rely more heavily on contractors to maintain flexible and scalable operations. Overall, most mining companies in India spend between 40% and 60% of their revenue on outsourced mining services. This outsourcing has created a strong network of mining service providers offering technical expertise and operational efficiency across both surface and underground mining.

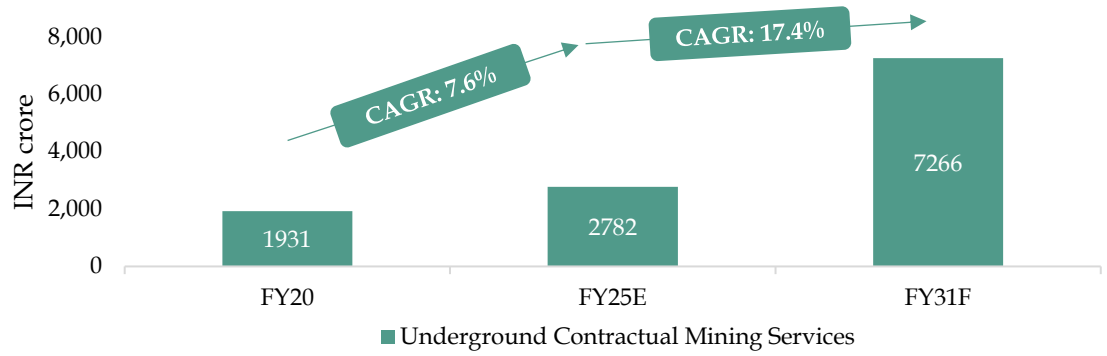
Figure 3-4: Typical Mining Service Company Offerings



Source: Ken Research Analysis;

Based on contracts offloaded by mine owners and MDOs, India's Mining Services Market is a growth driver. Specifically, **Underground Contractual Mining Services** is valued at **₹2,782 crore (FY25E)**, to grow at a CAGR of 17.4% by FY31F. This segment is part of outsourced mining market, where companies allocate 10-25% of revenue to specialized services.

Figure 3-5: Indian Underground Contractual Mining Services Market in terms of Value (INR crore), FY20, FY25E & FY31F

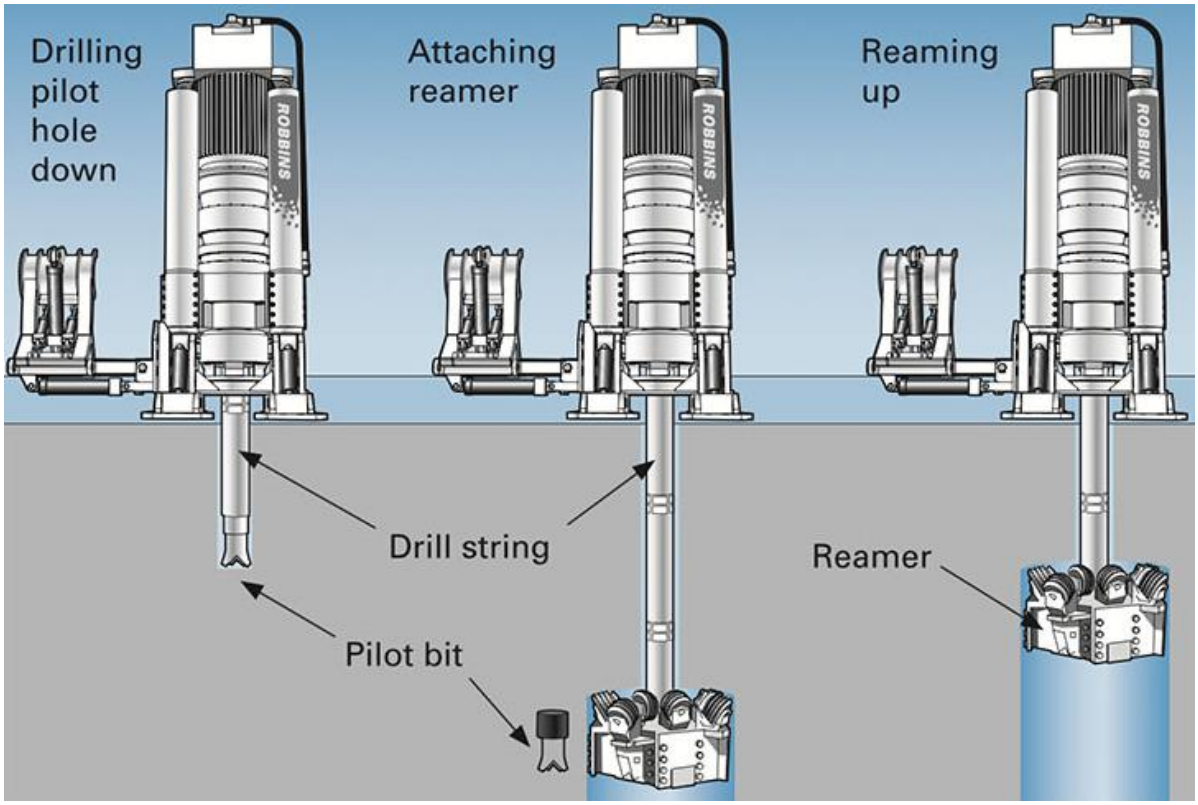


Source: Contractual Expenses % considered from Coal India Annual Report, Ken Research Analysis;
Note: F represents Forecasted figures, E represents Estimated figures

Raise Boring as an Underground Mining Service

In underground mining, raise boring is a key technique used to create vertical or inclined shafts without explosives, offering safer, faster, and more stable alternatives to drill-and-blast methods. It's commonly applied in ventilation, ore passes, and conveyor installations. Demand for raise boring is expected to rise as India targets 100 MT of underground coal production by FY31, driven by environmental concerns and policy support for mechanization. While the raise boring market benefits from a strong policy push and growing private participation, challenges arise from the side of project delays, cost overruns, and limited domestic capacity for specialized underground services.

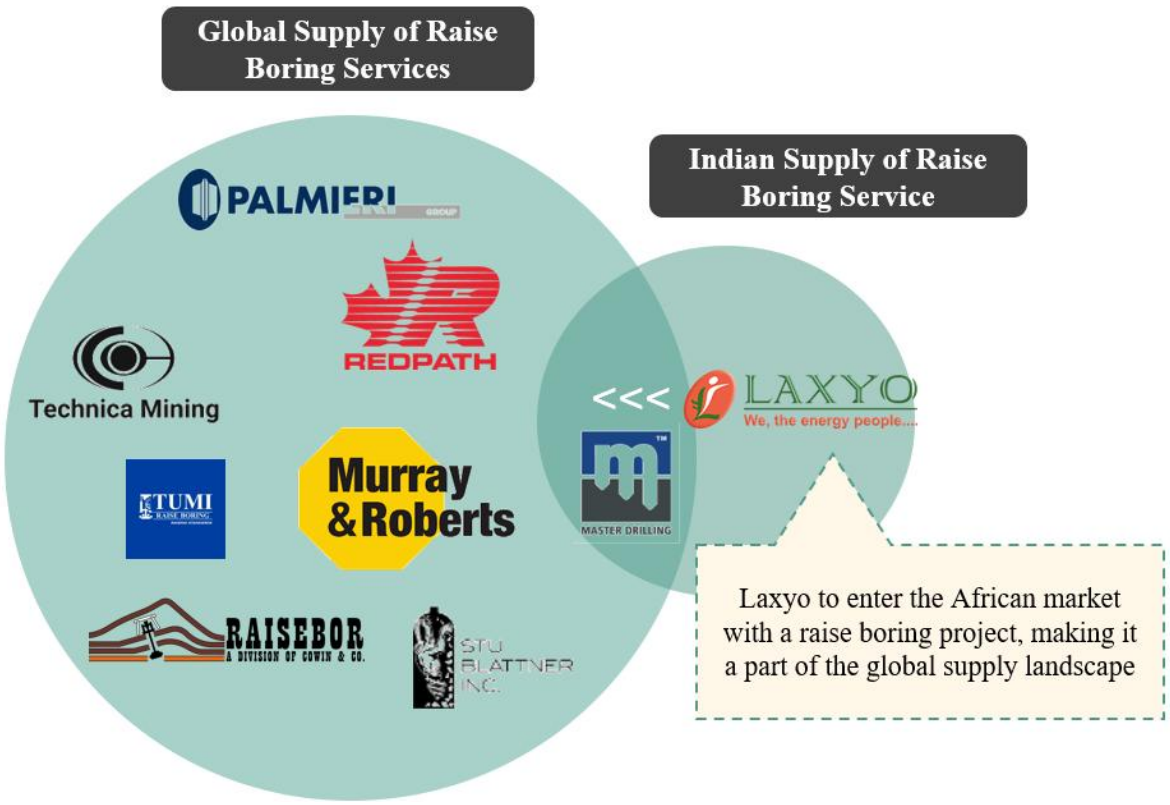
Figure 3-6: Raise Boring Process Illustration



Source: Pennsylvania State University, Ken Research Analysis;

Currently, the raise boring supply landscape in India is narrow, with only two major players operating at scale. **Master Drilling**, a global specialist in raise boring, has executed several key projects in India - most notably for **Vedanta's underground zinc mine** in Rajasthan, where it deployed advanced rigs to develop vertical shafts for ventilation and ore handling. **Laxyo Ltd. is the second largest domestic player offering raise boring services across multiple Indian states**. While specific client associations are not publicly disclosed, the company provides full-scope solutions including blind, vertical, and inclined boring. Laxyo Ltd. is also transitioning toward becoming an international contractor, having secured a raise boring project in **Zambia**, its first overseas contract. With only a handful of players and limited domestic expertise, the supply landscape currently remains shallow.

Figure 3-7: Raise Boring Services Supply Landscape



Source: Ken Research Analysis;

3.2 EMERGING OPPORTUNITY FOR RAISE BORING IN INDIA

Raise boring opportunities are expected to grow in India's mining sector. While current policies may not explicitly specify raise boring, the broader developments outlined below indirectly point to a rising demand for this technique:

Growth of Underground Mining in India

Regulatory pressure, **sustainability goals**, and **dwindling surface reserves** drive India's underground mining expansion. The **Ministry of Coal targets 100 MT underground output by 2030** via **mechanisation** (continuous miners, longwall systems), boosting productivity while reducing land disruption and emissions under the **National Mineral Policy (2019)** and **ESG norms**. **Forest-adjacent bans** (e.g., **Sariska Reserve**) and rulings like **State of UP v Gaurav Kumar (2025)**, mandating District Survey Reports, further shift operations underground, aided by incentives such as **reduced revenue share**. Consequently, demand for **raise-boring technology** in shaft and ventilation construction rises as firms prioritise low-impact, compliant extraction.

Tighter Environmental Mandates to Accelerate Raise Boring Adoption in India

India's new environmental rules are steering mining companies toward cleaner excavation methods like raise boring. A 2022 MoEFCC guideline speeds up approvals for expanding existing mines but also demands stricter checks on dust, noise, and land disturbance. Alongside this, the National Mineral Policy (2019) and 2021 updates to the MMDR Act offer tax breaks and faster clearances for mechanized, low-impact mining.

Raise boring creates shafts from below, cutting dust, vibration, and spoil compared to open-cut methods. That's why we see it being used in:

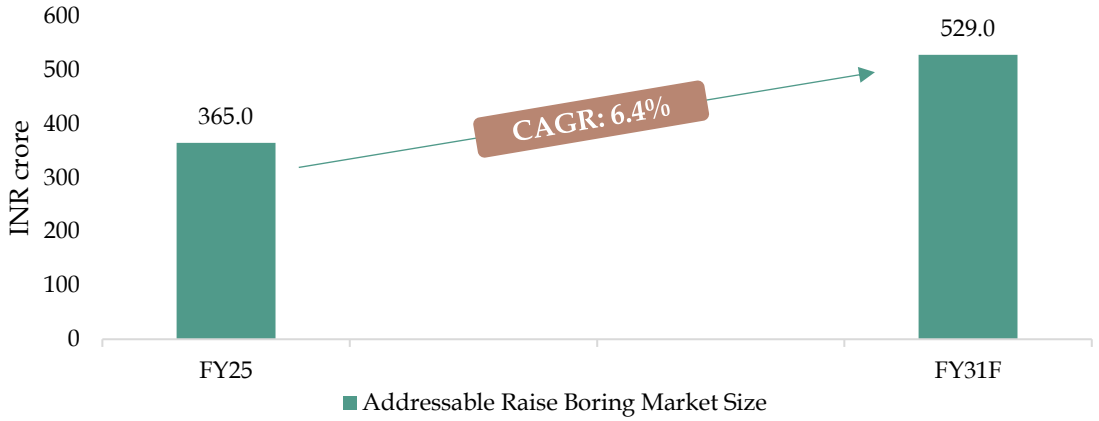
- Northern Coalfields Limited has used it for ventilation and access shafts in Singrauli, and
- Tata Steel for deep shafts at Noamundi and Jharia. Now,
- New upcoming mine projects in Odisha, Jharkhand, and coal blocks under NTPC and SAIL, Hindustan Copper Ltd plan to use raise boring as a safest option for vertical shafts.
- NHPC and other hydropower producer companies are also making Raise boring compulsory vs conventional drill and blasting as a safest option to avoid landslides and accidents.

With strong policy support and proven examples, raise boring is set to become the go-to choice for safer, greener underground mining in India.

3.3 India's Addressable Raise Boring Market Size, FY20, FY25 & FY31F

India's addressable raise boring market reflects the demand side potential of raise boring business in India. It is expected to expanded from **INR 365 crore in FY25** to grow to **~INR 529 crore by FY31F**, exhibiting a CAGR of 6.4%. The growth is driven by **mining-led tunnelling as around 75 new mines are set to auction/reponed by 2030 from reaching 262 mines by 2030** (Source: Coal India, Ministry of Coal). Further, on India's domestic coal production, the government has a targeted of **1.5 billion tonnes by FY2030**, indicating sustained capex on mine development, including underground headings, raises and shafts where raise boring is integral (Ministry of Coal). Policy measures such as **commercial mining auctions, Single Window Clearance for mines, and 100% FDI under the automatic route for commercial mining** are expected to accelerate project execution and expand the addressable tunnelling pipeline (Ministry of Coal).

Figure 3-8: Indian Addressable Raise Boring Market Size in terms of Value (in INR crore), FY25-FY31F

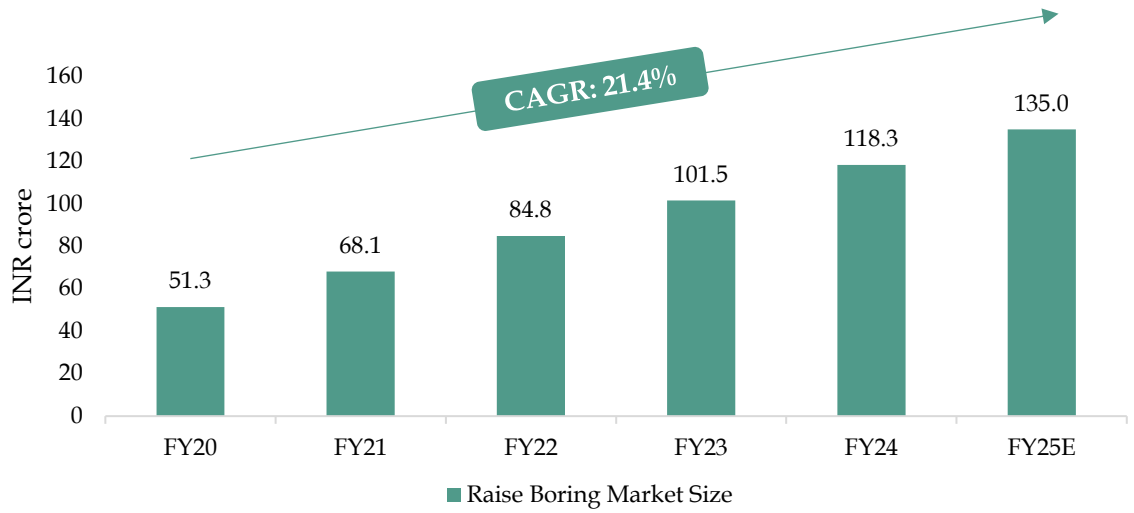


Source: Ken Research Analysis
Note: F represents Forecasted figures

3.4 India's Raise Boring Market Size and Market Segmentation, FY20-FY31F

India's raise boring industry is an expanding market as underground mining gains traction. Between FY20 and FY25E, the raise boring market grew from INR 51.3 crore to INR 135 crore, **growing at a CAGR of ~21.4%.** Growth has been driven by two key players: **Laxyo Ltd.** and **Master Drilling India Pvt. Ltd.** which have established themselves as preferred vendors for raise boring services in India. This market won its first contract in 2017 as Master Drilling won its first contract in India with Vedanta to carry out raise boring at its mine in Rajasthan. Limited competition in the market is currently seen due to high asset cost and financing challenges associated with capital machinery.

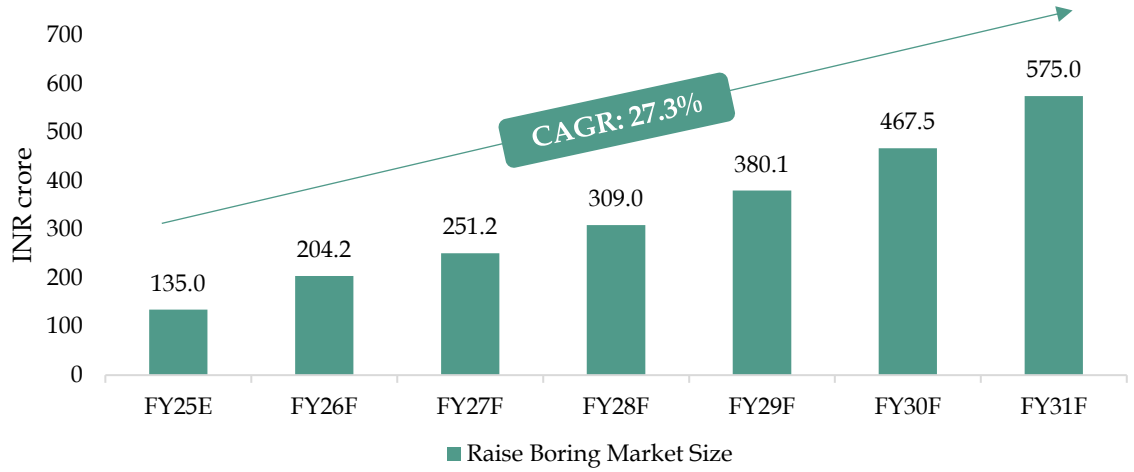
Figure 3-9: Indian Raise Boring Market Size in terms of Value (in INR crore), FY20-FY25E



Source: Ken Research Analysis
Note: E represents Estimated figures

The raise boring market of India is projected to grow at ~27.3% CAGR over FY25E–31F, reaching INR 575 crore by FY31F. The industry order book is expected to expand further on the back of government targets to increase underground coal production to 100 MT by FY31. Higher underground mining coupled with stricter environmental norms and regulatory changes like the 2022 MoEFCC memorandum and MMDR Act amendments, are expected to drive adoption of raise boring for ventilation shafts and ore passes. This low-impact method reduces dust, vibration, and waste, aligning with India's green goals and ESG standards and is expected to grow at fast pace.

Figure 3-10: Indian Raise Boring Market Size in terms of Value (in INR crore), FY25E-FY31F



Source: Ken Research Analysis;
Note: F represents Forecasted figures, E represents Estimated figures

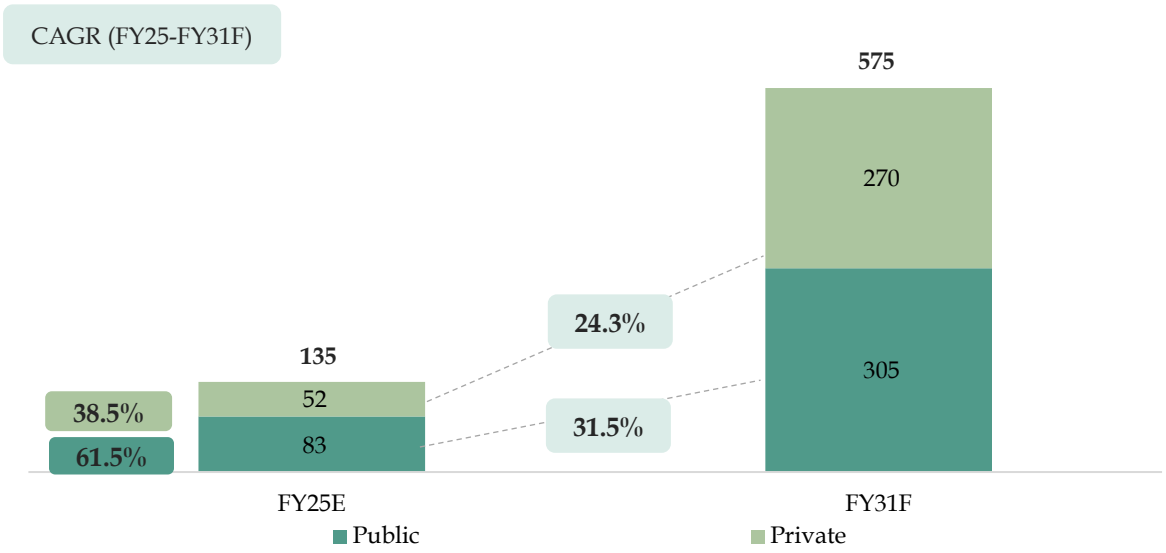
3.4.1 RAISE BORING MARKET SEGMENTATION

Raise Boring Market Segmentation by Ownership Type, FY25E-FY31F:

In FY25, public sector operators are expected to dominate ~61% of the raise boring market INR 83 crore, majorly led by Coal India subsidiaries.

- Private owned mines by the likes of Vedanta, JSW and Tata Steel account for INR 52 crore, driven by early adoption of mechanized shaft sinking for safety and speed.
- By FY31, private sector share is projected to rise to ~47%, growing at a CAGR of ~31.5% versus ~24.3% for the public sector.
- Higher growth rate for private companies is supported by commercial mining reforms where companies are expected to invest in compliant mining solutions so as to minimize project risks due to competitive and investor pressures.
- The push for 100 MT underground coal production by FY31 will further boost demand for raise boring for public sector undertakings (PSUs).

Figure 3-11: Indian Raise Boring Market in terms of value (in INR crore) by Ownership Type of Mine, FY25E & FY31F



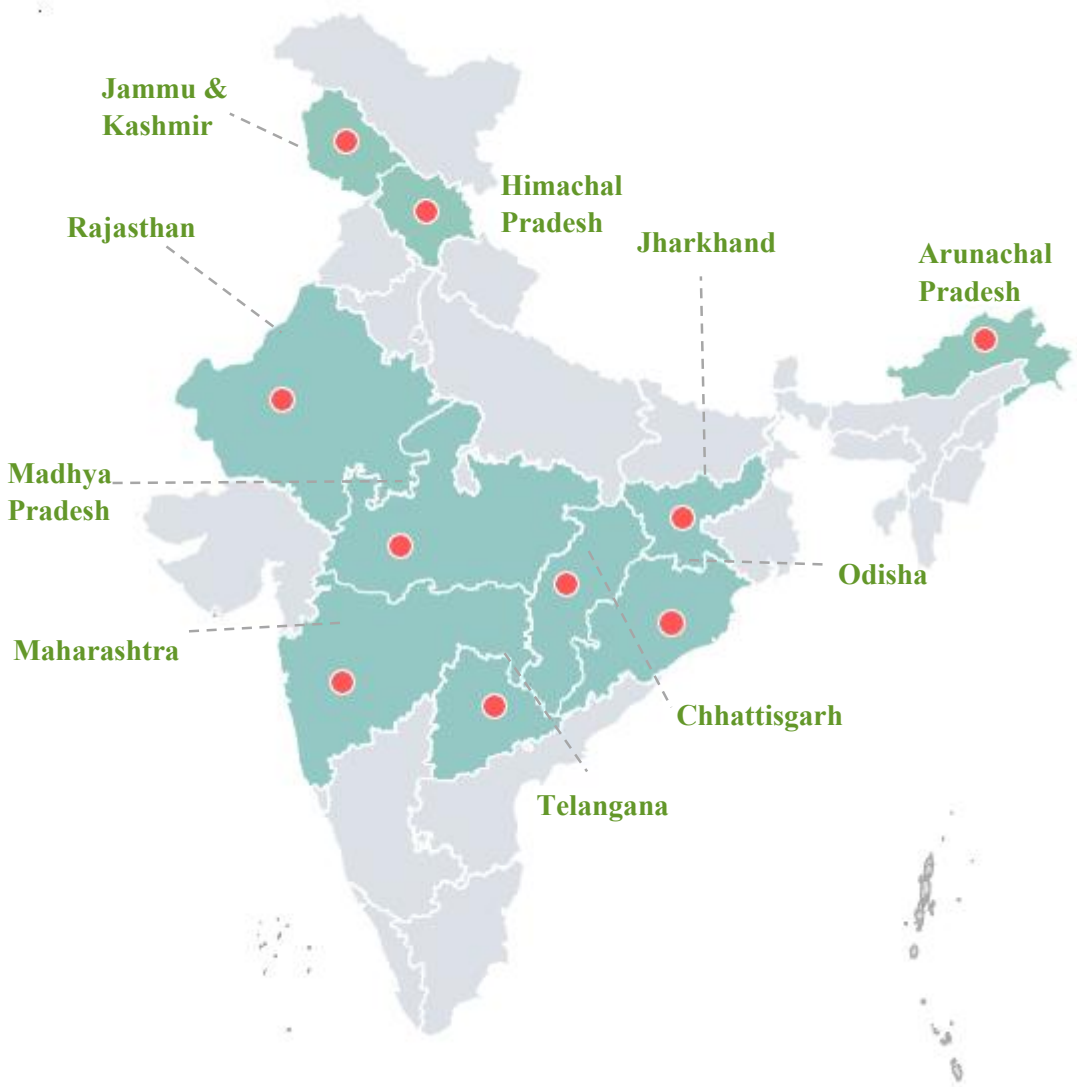
Source: Ken Research Analysis;
Note: F represents Forecasted figures, E represents Estimated figures

3.5 Regional Analysis of Raise Boring Market in India

India's underground mining landscape is already anchored by states like **Odisha, Chhattisgarh, Jharkhand, Maharashtra, Madhya Pradesh and Rajasthan, J&K, Himachal and Arunachal Pradesh**, which house a majority of the country's **deep mineral reserves and operational underground mines.** These are not new entrants but well-established mining hubs especially for iron ore, coal, limestone, and manganese.

However, activity is seen increasing in the same regions. Around **500 mineral blocks** since 2015 (Source: Ministry of Mines) and 125 coals mines since 2020 (Source: Ministry of Coal) have been auctioned, many of them being in these very states.

Figure 3-12: Key Regions with upcoming Underground Mining Projects in India



Source: Ministry of Coal, Ministry of Mines and Ken Research Analysis

Odisha alone contributes **60% of total mining revenue for Ministry of Mines**, with 48 auctioned blocks **since 2015 (Source: Ministry of Mines) and 23 mine blocks from 2020 with Ministry of Coal (Source: Ministry of Coal), it is** expected to deepen its underground mining footprint. Similarly, operations are expanding in **Chhattisgarh, Jharkhand, Maharashtra, Telangana and Rajasthan**, **Jammu & Kashmir, Himachal Pradesh, and**

Arunachal Pradesh with high-value minerals including precious metals and coal assets under exploration and development.

- The mines near Jodhpur, with prospects of uranium extraction for the nuclear power project, are looking at underground mining with a focus on raise boring techniques. The project requires significant machine involvement, and a tender has already been issued.
- Additionally, for all precious metals—such as copper, zinc, gold, silver, lead, and manganese—raise boring is mandatory for underground mining, as opposed to traditional drill and blast methods.

This growing push toward deeper resource extraction is driving demand for **raise boring**, a safer and more mechanised shaft development method compared to traditional drill-and-blast techniques. With **underground development gaining momentum** in existing high-potential states, raise boring is poised to become a critical enabler of India's mining ambitions.

Table 3-2: Recent Mine Auctions Taken Place in India

Mine Block	Mineral	State	Year of Auction
Nahardih-Maghaipur Block Tehsil-Tilda, District- Raipur	Limestone	Chhattisgarh	2021
Diggaon Block (G-3)	Limestone	Karnataka	2022
Ramsthan- Ghunchihai (G-2) Jamodi- Mahanna Part-A (G-2)	Limestone	MadhyaPradesh	2021
Purheibahal Block (G-2)	Iron	Odisha	2021
Chandiposhi Block (G-2)	Iron	Odisha	2021
Jumka- Pathiriposhi (G-2)	Iron	Odisha	2021
Gothra-Parasrampura East Block (G-3)	Limestone	Rajasthan	2022
Gothra-Parasrampura West Block (G-3)	Limestone	Rajasthan	2022
Mandri-Panchala Block, District-Nagpur, Maharashtra	Manganese	Maharashtra	2022
Sonrai Phosphorite Block II-IV	Phosphorite	UttarPradesh	2022
Lanjera- Futala	Manganaese	Maharashtra	2022
Jaisinghpura North Block	Iron	Karnataka	2023
Jaisinghpura South Block	Iron	Karnataka	2023

South of Damuda	Coal	Jharkhand	2024
Lamatola/North URTAN	Coal	Madhya Pradesh	2024
Preliminary exploration for Phosphorite in Pahadi Kalan-Gora Kalan Block, District Lalitpur	Phosphorite	Uttar Pradesh	2024

Source: Ken Research Analysis;

3.6 Global Analysis of Raise Boring Market

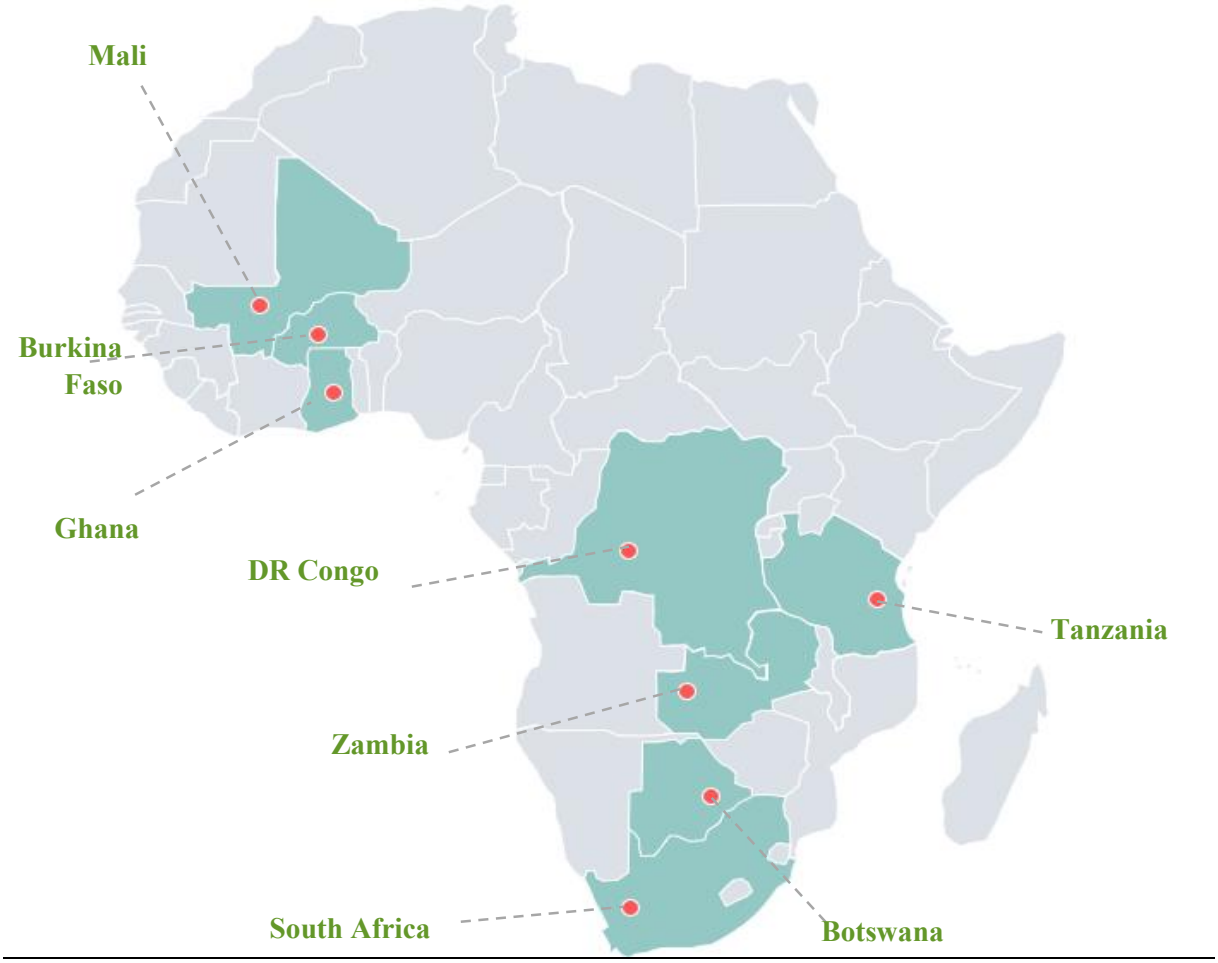
The global raise boring services market (in INR crores) is estimated at **INR 10,231.9 crore in CY25** and is forecast to expand to **INR 15,355.3 crore by CY31F**, implying a CAGR of **7.0% during CY25F–CY31F**. Key growth drivers include sustained underground mine development and brownfield expansions (driving demand for ventilation shafts, ore passes, and shaft infrastructure), increasing depth and complexity of mining operations, and wider adoption of mechanised excavation methods that can improve safety and execution timelines versus conventional alternatives.

In addition, large-scale tunnelling and underground infrastructure programmes (urban transit, hydropower and water infrastructure) may contribute to demand for specialised vertical/auxiliary shaft construction. Technology improvements in raise boring rigs, tools and guidance systems, along with higher contractor availability across mining regions, are also expected to support market penetration. Notwithstanding the above, demand remains linked to project execution schedules, permitting timelines and capex cycles in mining and infrastructure, which may result in periodic volatility in annual market additions.

3.7 Regional Analysis of Raise Boring Market in the African Continent

The African mining market is one where raise boring continues to play a vital role, owing to the scale and diversity of mineral resources across the continent. Countries with significant underground mining operations include **South Africa, DRC, Tanzania, Zambia, Botswana, Ghana, Mali, and Burkina Faso**. These regions are host to some of the largest underground mines globally, driving consistent demand for raise boring. Global leaders such as **Master Drilling**, **Murray & Roberts** and **Redpath** dominate nearly **90%** of this market, creating space for new entrants to tap into this mature but opportunity-rich space.

Figure 3-13: Regional Analysis of Raise Boring Market in African Continent

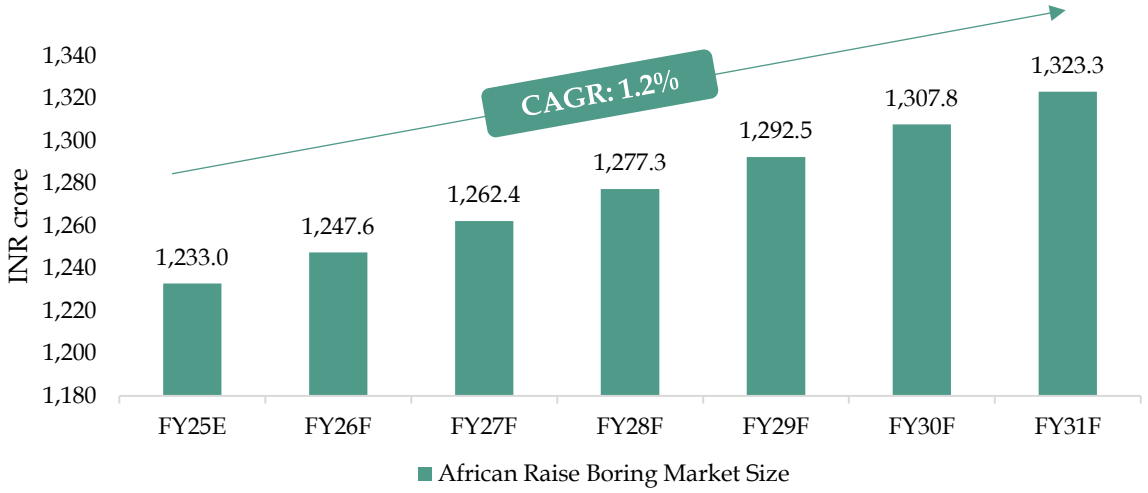


Source: Ken Research Analysis

In **FY25E**, Africa's raise boring market was estimated at **INR 1,233 crore**, growing steadily from **INR 823 crore** in **FY20** at a **CAGR of 8.4%**. Growth during this period was driven by new underground developments, automation trends, and increased private sector participation in mineral extraction. **Commodity demand and investor confidence in African mineral projects** drove investments from junior miners and global majors, scaling operations to meet rising resource needs.

However, the market faces structural challenges. A large number of African nations continue to rank low on mining attractiveness due to regulatory volatility, **high energy costs**, **unreliable supply**, and increasing scrutiny over environmental and social impacts. These factors have begun to limit investor appetite and slow new project development across several regions. (Source: Boston Consulting Group)

Figure 3-14: African Continent Raise Boring Market Size in terms of Value (in INR crore), FY25E-FY31F



Source: Ken Research Analysis; Note: F represents Forecasted figures, E represents Estimated figures

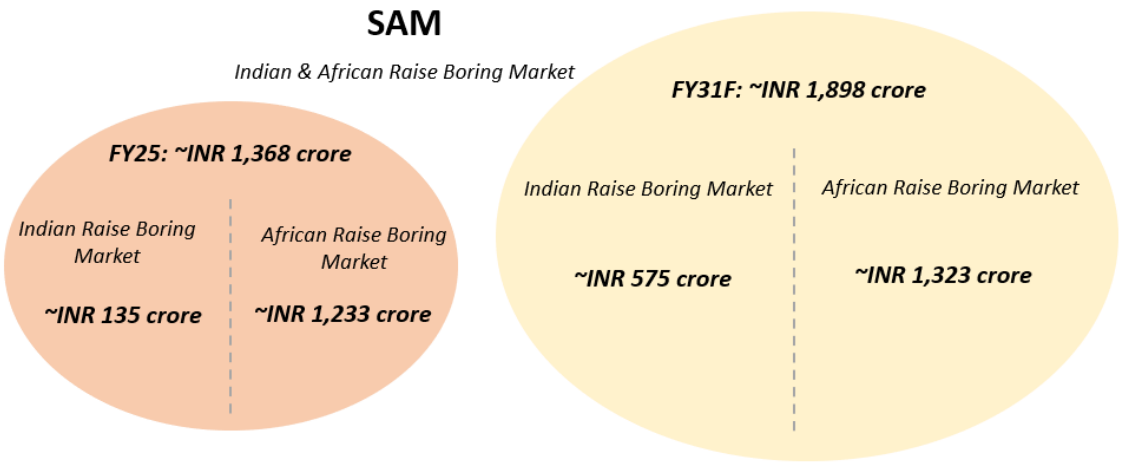
This has led to a more cautious growth outlook, with the market expected to grow at a slower pace of **1.2% CAGR from FY25E to FY31F**, reaching **INR 1,323.3 crore**. Still, the long-term demand for transition minerals, combined with emerging government support and innovation in financing and operations, keeps Africa a **lucrative and strategically important** market where competitive intensity is likely to rise.

3.8 Raise Boring Opportunity in Mining Industry in India & Africa

India's mining sector is shifting from surface mining (~97% of production value) toward underground mining (~3%). Government targets from the Ministry of Mines and Ministry of Coal are driving this transition, necessitated by surface mining's adverse ecological impact. Consequently, non-intrusive and sustainable practices are being prioritized. While high energy costs, unreliable supply, and increasing scrutiny over environmental and social impacts is seen slowing down mining activity in Africa.

For players participating in underground mining, raise boring represents a strategic subset. **Raise boring**, is a safer and faster method for developing vertical shafts. The Indian and African raise boring market, valued at **INR 135 crore & INR 1,233 crore in FY25E respectively**, is projected to grow at **~27.3% CAGR** to reach **INR 575 crore by FY31 for India**, and **projected to grow at a CAGR of 1.2% to reach INR 1,323 crore for Africa by FY31**.

Figure 3-15: Raise Boring Opportunity for Mining Service Providers, FY25 and FY'2031



Source: Ken Research Analysis;

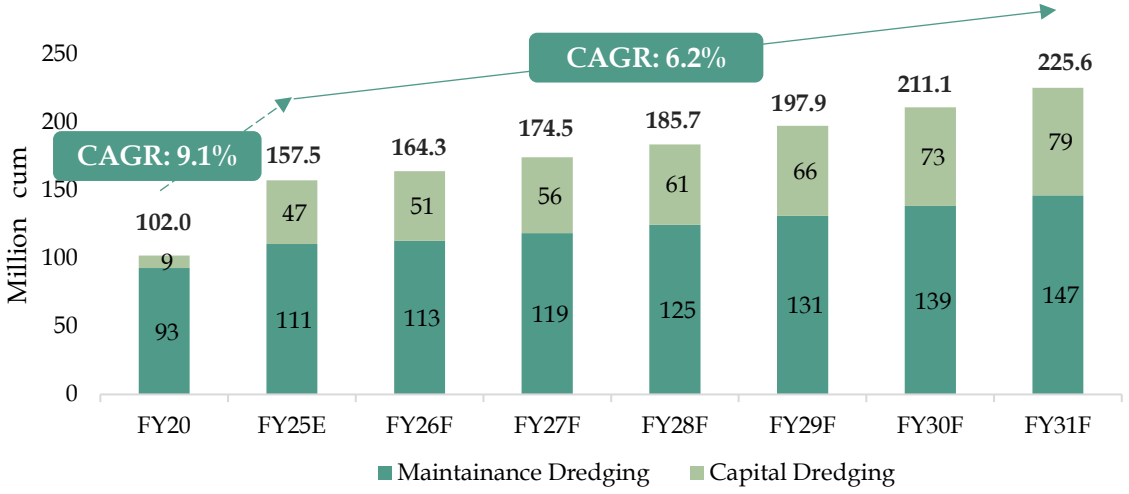
4. Dredging & Reclamation Market Analysis

4.1 Overview of the Dredging & Reclamation Market in India

India's dredging and reclamation market is vital for maritime and inland water infrastructure, enabling deeper navigation, safe berthing, and land reclamation. Typically, there are 2 main types of dredging in the market: **capital dredging,** used for port creation and expansion, requiring high investment. And the other, **maintenance dredging**, which ensures navigability through periodic sediment removal. These activities span **12 major ports, 200+ minor ports, 111 national waterways and a few water bodies, supporting larger vessel docking and improving last-mile connectivity for coastal and inland shipping** (Source: Ministry of Ports, Shipping and Waterways)**.**

Between **FY20 and FY25**, India's dredging and reclamation market grew significantly from around **102 million cubic meters (mcum) to an estimated 157 million cubic meters (mcum)**, driven by strong government initiatives such as **Maritime India Vision 2030**, **Jal Marg Vikas**, and new greenfield port projects like **Vadhavan and Vizhinjam**. **Maintenance dredging volumes consistently exceed capital dredging** due to the continuous need to keep waterways and ports navigable amidst increasing trade and larger vessel traffic.

Figure 4-1: Indian Dredging and Reclamation Market Size in terms of Volume (in mcum), FY25E-FY31F



Source: Ken Research Analysis;
Note: F represents Forecasted figures, E represents Estimated figures

From FY25E to FY30F, the market is projected to grow at a **CAGR of ~6.2% to ~226 mcum**, a slower pace than the previous period due to a higher starting base and the maturity of major projects. Growth will be supported by ongoing port upgrades, expanded maintenance requirements, new logistics corridors, tougher environmental standards, and more private sector participation. However, the **Dredging Guidelines 2021** set a target of **3 billion cubic meters of cumulative dredging in the next decade**, which is unlikely to be met at the current pace. This shortfall is mainly due to **delays in project execution, slow inland waterway and port expansion**, and persistent regulatory and operational hurdles. As a result, the market is shifting from rapid expansion to **steady, efficiency-focused growth**, driven by operational needs across India's ports and waterways.

Dredging contracts in India typically follow three invoicing models: by volume (cubic meter), by weight (ton), and by operational hours. Around 50–70% of mandates are invoiced on a cubic meter basis, 15–20% by weight (especially in sand-rich jobs), and 5–10% by hours—often when project uncertainty is high or timelines are tight. Based on contract type and urgency of work, margins lie anywhere between 20%-80% due to limited supply in the market.

4.2 Government Initiatives Driving Growth in the Dredging and Reclamation Market of India

India's seaport and inland waterway infrastructure is being reshaped by strategic policy initiatives which are aimed at enhancing multimodal connectivity, promoting sustainable transport, expanding port capabilities and reduce logistics costs as in line with NLP 2022**.** Such initiatives include:

Figure 4-2: Government Initiatives Driving the Dredging and Reclamation Market of India

Source: Ken Research Analysis;

- **Sagarmala Programme:** Launched in 2015 with an outlay of ₹5.8 lakh crore, Sagarmala aims to modernize 12 major and over 200 non-major ports through mechanization, digital port management systems, and capacity augmentation. It also includes 5,000 km of new coastal shipping routes and road-rail linkages to ports, plus coastal economic zones to drive export-oriented industrial growth. To date, over 80 projects are under implementation, with completed port projects already cutting logistics costs by up to 20%.

- **National Waterways Act, 2016 & Jal Marg Vikas Project:** The 2016 Act notified 111 National Waterways, including NW-1 (Ganga), and paved the way for the Jal Marg Vikas Project—a World Bank–supported scheme with $500 million financing. Running through 2023, JMV enhances navigability on NW-1 (from Haldia to Varanasi), building terminals, improving channel depth to 2.5 m, and deploying river information systems. Early results show a 5–7 % modal shift of cargo from road and rail to inland waterways.

- **Maritime India Vision (MIV) 2030:** Unveiled in 2021, MIV 2030 outlines a ₹3 lakh crore investment plan to transform ports into Smart Ports with real-time monitoring, shore power, and integrated logistics parks. It sets targets of doubling India's port capacity to 3,500 MMTPA, tripling coastal shipping share to 20 %, and boosting shipbuilding output to ₹70,000 crore annually. The initiative also earmarks funds for green shipping corridors and cruise terminals at key tourist hubs.

- **Amrit Kaal Maritime Vision 2047:** Framed in 2022 as a 25-year strategic horizon, this vision seeks ₹80 lakh crore in cumulative investments across ports, inland waterways, shipbuilding, and maritime logistics. Its goals include achieving a 5 % share of global shipping tonnage, phasing in zero-emission vessels, and scaling Indian shipyards to handle LNG carriers, VLCCs, and offshore platforms. Key milestones include setting up 4 global ship repair hubs and fostering a domestic maritime services industry.

- **India Inland Waterways Strategy (2025–27):** Published in early 2025, this roadmap aims to operationalize all 76 National Waterways by December 2027, expanding inland navigation across 23 states and 4 union territories. It prioritizes dredging, terminal upgrades, and vessel upgradation, supported by a ₹15,000 crore central allocation. The strategy dovetails with MIV 2030 and Amrit Kaal 2047, targeting a flagship inland water transport network capable of handling 250 MMT of cargo annually.

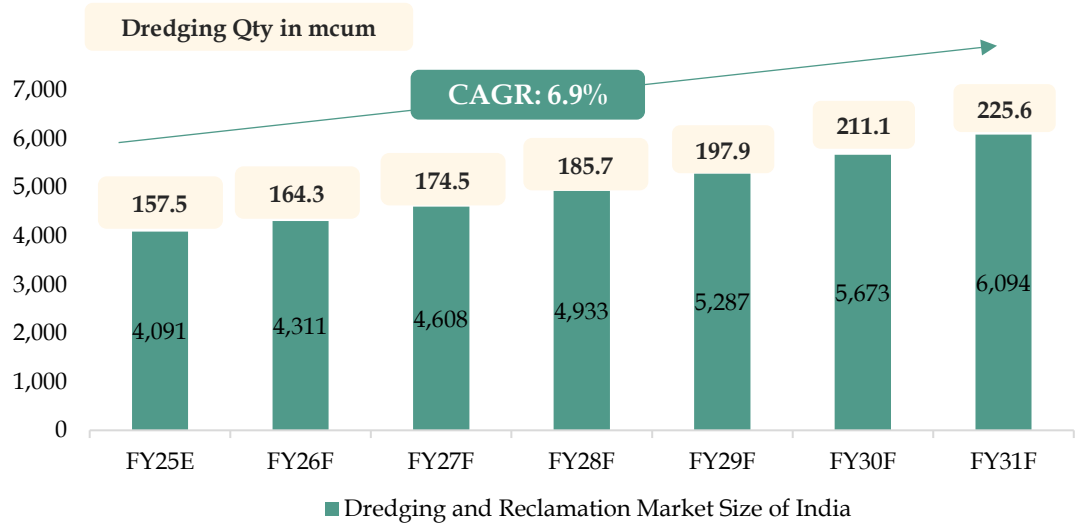
- Projects such as **Namami Gange Programme, the Yamuna Action Plan, and river restoration projects like those for the Musi, Coum, and Sabarmati rivers** are focused on reducing pollution, afforestation, and riverfront development - necessitating dredging and reclamation as central to these projects. Dredging operations, particularly under the

Namami Gange and Yamuna Action Plans, will remove sediment and debris, increasing river depths to accommodate larger vessels. Through the coordinated efforts, the government aims to significantly enhance the rivers' navigability, enabling greater waterway transport while improving environmental conditions and ensuring long-term sustainability for India's rivers.

4.3 Dredging & Reclamation Market Size & Segmentation, FY25E-FY31F

The Indian dredging and reclamation market is estimated at **INR 4,091 crore in FY25E**, with dredging volume at ~**157 million cubic meters (mcum)**. This is currently driven by initiatives like **Sagarmala, Maritime India Vision 2030**, **Jal Marg Vikas**, and development of greenfield ports as discussed above. The Dredging and Reclamation market is fairly consolidated, with **4–5 major international players** and **20–25 domestic suppliers**. Dredging Corporation of India (DCI) leads the Indian market, especially at major ports.

Figure 4-3: Indian Dredging and Reclamation Market Size in terms of Value (in Crore), FY25E-FY31F



Source: Ken Research Analysis;
Note 1: F represents Forecasted figures, E represents Estimated figures
Note 2: Capital dredging is estimated at INR 300–400 per cubic meter, and maintenance dredging costs range between INR 150–200 per cubic meter; CAGR – industry revenue CAGR for the future period.

From FY25E to FY3F1, the market is expected to **grow at a CAGR of ~6.9% to reach INR 6,093 crore by FY31F,** supported by **continued port modernization, inland waterway development, stricter environmental standards, and increased private sector**

involvement. Key projects include capital dredging for new ports and inland waterways, as well as, maintenance dredging for waterways and port expansions, sustaining steady demand for dredging services.

Further, 20 new National Waterways (NW) are expected to be operationalized during FY26-FY31, starting with NW-5 in Odisha to connect mineral rich areas of Talcher and Angul and industrial centres like Kalinga Nagar to the Ports of Paradeep and Dhamra.

Capital dredging typically accounts for 10–12% of a port or waterway's CAPEX, while maintenance dredging forms about 7–8% of annual OPEX. Most contracts prefer volume-based invoicing, with profitability commonly at 20% operating margin across the sector rising to 80% in rare cases billed per hour on urgent, unpredictable jobs. This creates plenty of opportunities for players providing dredging in the Indian market.

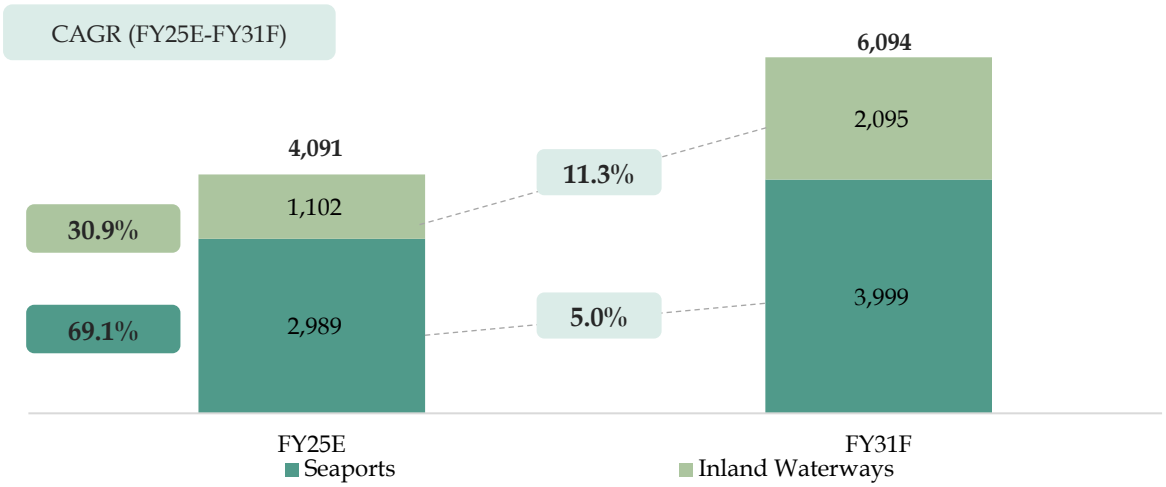
4.3.1 Dredging and Reclamation Market Segmentation

Dredging and Reclamation Market Segmentation by Port Type, FY25E-FY31F:

In **FY25E**, **seaports** accounted for **69.1%** of India's dredging and reclamation market, valued at **INR 2,989 crore**, driven by deepening and expansion works under **Sagarmala** followed by **Maritime India Vision 2030**. Capital dredging at major ports like **Vadhavan** and **Paradip** is supported through **PPPs**, aligned with broader logistics programs such as **PM Gati Shakti**. **Inland waterways** made up the remaining **30.9%**, valued at **INR 1,102 crore**, backed by the **Jal Marg Vikas Project** and the goal to operationalise over **100 national waterways**, which require capital and maintenance dredging to ensure **expansion and year-round navigability**.

Between **FY25E and FY31F**, inland dredging is expected to grow significantly faster at a **CAGR of 11.3%** compared to **5.0% for seaports**, reflecting rising emphasis on **shifting freight to inland routes**, **multimodal connectivity**, and **expanded government support** for water-based logistics.

Figure 4-4: Indian Dredging and Reclamation Market Size in terms of Value (INR crore) by Port Type, FY25E & FY31F

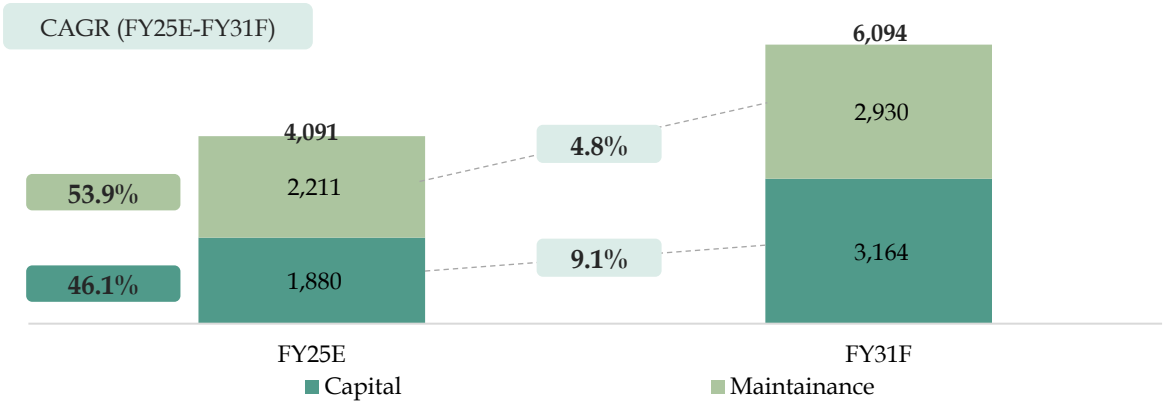


Source: Ken Research Analysis;
Note: F represents Forecasted figures, E represents Estimated figures

Dredging and Reclamation Market Segmentation by Dredging Type, FY25E-FY31F:

Maintenance dredging is the largest segment in India's dredging market, accounting for **53.9%** of the total in FY25E, valued at around INR 2,211 crore. It supports ongoing operations at India's expanding ports and waterways through long-term contracts with public ports and IWAI. Maintenance dredging is expected to grow at a **CAGR of 4.8%**, reaching INR 2,930 crore by FY31, driven by continued activity at key locations like JNPT, Paradip, National Waterway-1, Kolkata Port, and sections of the Brahmaputra.

Figure 4-5: Indian Dredging and Reclamation Market Size in terms of Value (INR crore) by Dredging Type, FY25E & FY31F



Source: Ken Research Analysis;

Note: F represents Forecasted figures, E represents Estimated figures

Project duration and complexity vary widely: capital dredging for new ports may last 9–12 months, while maintenance is shorter at 4–6 months per cycle but highly recurring.

Capital dredging holds **46.1%** of the market in **FY25E**, valued at about INR 1,880 crore, focused on new port development, berth deepening, and reclamation projects requiring significant investment. Growth is fueled by greenfield ports like Vadhavan and Vizhinjam, major expansions at Paradip Eastern Dock and Kandla Outer Harbour, driven by major infrastructure programs such as Maritime India Vision 2030, National Infrastructure Pipeline, and Gati Shakti. Capital dredging is forecasted to grow at a **CAGR of 9.1%**, **reaching INR 3,164 crore by FY31F,** supported by private-sector investments and logistics hubs like DMIC and upgraded terminals at JNPT and Mormugao.

Maintenance dredging accounts for a larger share by volume and value because it is recurring and ongoing, while capital dredging has a higher cost per cubic meter due to specialized equipment and large-scale projects. This leads to faster value growth in capital dredging despite maintenance having higher volumes. Overall, capital dredging drives new infrastructure, and maintenance ensures continued operability across India's waterways.

4.4 Emerging Regions for Dredging and Reclamation in India

India's major and minor ports are predominantly located along the west and east coasts, forming the core of the country's maritime trade. Dredging and reclamation activities at these seaports are largely concentrated in these coastal regions to maintain deep drafts and expand capacity, essential for handling increasing cargo volumes.

- **On the west coast,** key ports such as Jawaharlal Nehru Port (JNPT), Deendayal (Kandla), Mundra port and Mangla port, Mumbai and Mormugao regularly undertake capital and maintenance dredging to support container and bulk trade.
- **On the east coast ports** like Dhamra, Enmore port, Chennai, Visakhapatnam, Paradip, and Kolkata/Haldia require continuous dredging to address siltation and accommodate larger vessels.
- **Minor ports along both coasts** also engage in dredging activities to support regional trade growth and navigability.

This focus on the east and west coasts, **which have a roughly equal share in trade**, ensure India's major maritime gateways remain efficient, supporting smooth cargo movement and

strengthening the overall trade infrastructure. The concentrated dredging efforts are vital for sustaining port operations and enabling future expansion plans.

Regions with consistently high cargo movement on key **National Waterways** are also emerging as hotspots for inland dredging, driven by the need to maintain navigable depth and support growing freight demand. Among them, **NW-1, NW-97** and **NW-10** handle the **highest cargo volumes**, making them key hotspots for both **capital and maintenance dredging**.

West Bengal leads, supported by NW-1 and NW-97; both are critical for connecting industrial hubs to ports like Haldia and Kolkata. These rivers face high siltation, requiring continuous dredging. **Maharashtra**, served by NW-100 and NW-91 are emerging due to increasing multimodal connectivity and coastal cargo demand. **Uttar Pradesh and Bihar**, along NW-1, manage heavy bulk and agricultural cargo, while **Assam**, via NW-2, supports strategic Northeast logistics despite seasonal navigation challenges. These waterways handle some of the highest tonne-kilometre traffic in the country, making regular dredging essential for reliability and capacity enhancement.

Table 4-1: Cargo Movement on National Waterways in India in Tonne Km, FY24

Details of Waterways	States	Distance (in Kms)	Tonne Kms (In Lakh) (2023-24)
NW-1 (Ganga-Bhagirathi-Hooghly River System)	Uttar Pradesh, Bihar, Jharkhand & West Benga	1620	16,554.3
NW-2 (Brahmaputra River (Dhubri-Sadiya))	Assam	891	151.6
NW-3 (West Coast Canal)	Kerala	205	194.9
NW-4 (Krishna Godavari River Systems)	Andhra Pradesh, Telangana, Chhattisgarh, Karnataka, Tamil Nadu and Maharashtra	2890	190.7
NW-5 (East Coast Canal and Matai River/Brahmani-Kharsua-Dhamra Rivers)	Odisha and West Bengal	233	95.1
NW-8 (Alappuzha-Changanassery Canal)	Kerala	29	5.8
NW-9 (Alappuzha-Kottayam Athirampuzha Canal)	Kerala	40	4.8
NW-14 (Baitarni River)	Odisha	48	0.1
NW-23 (Budha Balanga)	Odisha	56	1.2
NW-31 (Dhansiri/Chathe)	Assam	114	57.0

NW-44 (Ichamati River)	West Bengal	63	362.1
NW-64 (Mahanadi River)	Odisha	98	94.0
NW-86 (Rupnarayan River)	West Bengal	72	54.8
NW-94 (Sone River)	Bihar	141	273.4
NW-97 (Sunderbans Waterway)	West Bengal	172	13,089.3
NW-68 (Mandovi River)	Goa	41	1,045.8
NW-111 (Zuari River)	Goa	50	580.9
NW-10 (Amba River)	Maharashtra	45	5,934.1
NW-83 (Rajpuri Creek)	Maharashtra	31	18.8
NW-85 (Revadanda Creek-Kundalika River System)	Maharashtra	31	0.2
NW-91 (Shastri River - Jaigad Creek System)	Maharashtra	48	3,139.8
NW-73 (Narmada River)	Maharashtra & Gujarat	226	3.8
NW-100 (Tapi River)	Maharashtra & Gujarat	436	3,562.9
Grand Total			**45,415.3**

Source: Inland Waterways Authority of India

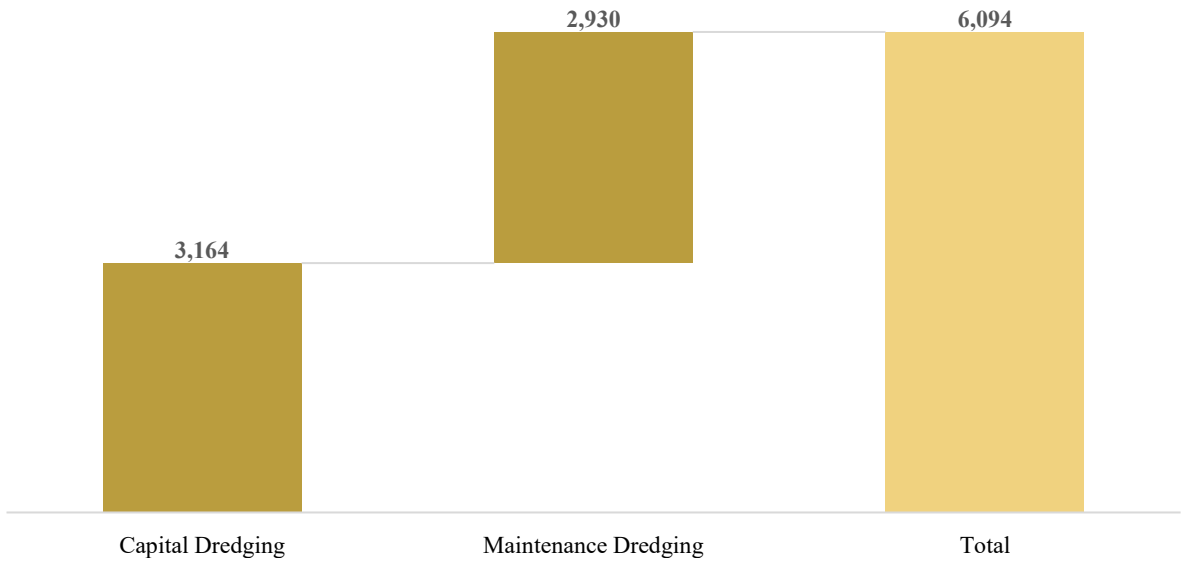
4.5 Opportunities in the Dredging & Reclamation Market of India

India's dredging and reclamation market presents robust dredging opportunities, anchored in a national push to reduce logistics costs and enable multimodal freight movement. The market is estimated at ~157 mcum in FY25E and is projected to grow to ~225.6 mcum by FY31, at a CAGR of 6.2% (Source: Niti Aayog). This volume growth is backed by infrastructure investments targeting 12 major ports, 200+ non-major ports, and 111 notified national waterways.

Between FY25E and FY31F, dredging and reclamation works are expected to benefit from over **INR 90+ lakh crore in planned investments** across maritime and inland transport initiatives by 2047.

From these planned investments on seaports and inland waterways, the **Serviceable addressable market (SAM)** for India's dredging and reclamation sector is expected to be **INR 6,094 crore by FY31F**, covering all capital and maintenance dredging across seaports, inland waterways, and coastal infrastructure. Key drivers include **Sagarmala, Maritime India Vision 2030**, and **Jal Marg Vikas**, along with greenfield port developments. The market is fairly consolidated, with a few large domestic and international players dominating. Companies with specialized equipment and regulatory expertise are best positioned to seize opportunities across both seaport and inland waterways dredging segments.

Figure 4-6: Market Opportunity (SAM) in the Dredging and Reclamation Market, FY31



Source: Ken Research Analysis
SAM indicates serviceable addressable market that covers India's dredging and reclamation market at major + minor seaports and inland waterways

As greenfield ports like Vadhavan and Vizhinjam, multimodal terminals, and key inland corridors progress, EPC players stand to benefit from high-value, long-duration capital dredging contracts as well as recurring maintenance packages—especially in sediment-heavy coastal and riverine zones.

TONNAGE TAX SCHEME AND ITS IMPACT

The Tonnage Tax Scheme, introduced through the Finance Act 2016 and effective from FY2017–18, allows eligible Indian-flagged shipping and dredging operators to opt for a fixed annual tax based on vessel net tonnage, replacing corporate income tax on profits. Designed to reduce tax volatility and simplify compliance, the scheme has improved financial predictability

and lowered effective tax rates for operators. Large dredging players have leveraged the scheme to reinvest in fleet expansion, improve bidding flexibility, and compete more aggressively across project sizes. This has blurred traditional market boundaries, with large firms now actively bidding for both large and mid-sized projects. As a result, smaller players face rising competition even in segments they historically dominated, intensifying pressure across the dredging value chain.

5. Operation & Maintenance in Industrial & Power Plants Market Analysis

5.1 Overview of O&M in Industrial & Power Plants in India

Despite the long lifecycle of Industrial Plants and Power Plants a major chunk of O&M contracts typically ranges for a few years only, indicating competition in the segment

Operations and Maintenance (O&M) refers to the ongoing activities required in Industrial and Power Plants to ensure infrastructure, equipment, or systems function efficiently and reliably throughout their lifecycle. This includes tasks such as inspections, repairs, servicing, and sometimes material handling where relevant.

O&M services are critical across sectors, with strong demand in **industrial facilities** and **power plants**. The **industrial segment** includes manufacturing units, process industries (cement, steel, chemicals), and utilities like water and wastewater plants. The **power segment** covers thermal stations, renewable energy (solar, wind), and captive generation. O&M in India currently follows 2 models: **in-house** and **outsourced O&M Models.**

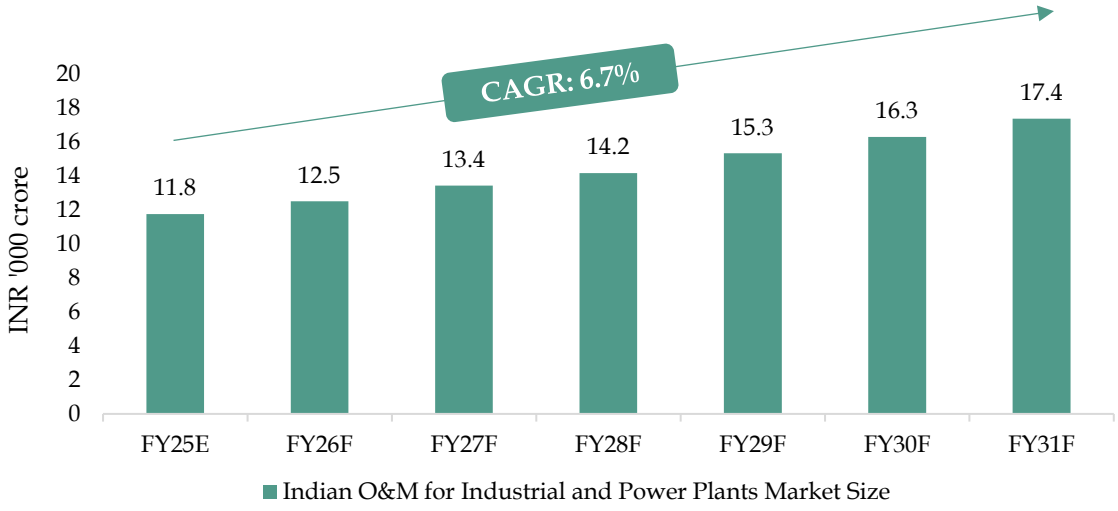
5.2 Market Size of O&M in Industrial & Power Plants, FY25E-FY31F

The following analysis represents only the outsourced O&M market and excludes the in-house O&M market size, as it is based on players actively providing outsourced services.

Typically, core O&M activities include **mechanical**, **electrical**, and **control & instrumentation (C&I)** maintenance to ensure reliable and efficient operations. O&M Service providers also support asset owners by deploying skilled workforce, offering operational assistance, and managing spares and consumables. This is dependent on the scope of work the asset owner plants to offload. **As asset complexity grows and uptime becomes vital**, structured O&M is increasingly seen as a key enabler of long-term performance and cost control.

In FY25E, the segment is estimated at INR 11.8 thousand crore and is expected to reach INR 17.4 thousand crore by FY31F, expanding at a CAGR of 6.7%. The current base has been shaped by the increasing complexity of industrial and energy assets, the rising preference for third-party service providers to reduce fixed overheads, and the shortage of skilled in-house maintenance staff. And, the Indian O&M market for industrial and power plants is projected to grow steadily over the forecast period.

Figure 5-1: Indian O&M for Industrial and Power Plants Market Size in terms of Value (in INR '000 crore), FY25E-FY31F



Source: Ken Research Analysis;
Note: F represents Forecasted figures, E represents Estimated figures

Looking ahead, key growth drivers include the expanding base of renewable and thermal power plants, aging industrial infrastructure requiring structured upkeep, and the government's push for *Make in India* and higher domestic industrial output—all of which are expected to generate consistent demand for contractual O&M services.

5.3 O&M Opportunity Overview in Industrial and Power Plants of India

Shift Towards Outsource O&M Strategy

India's industrial O&M market is undergoing a transformation as sectors like thermal power, mining, and process industries shift from in-house maintenance to outsourced, professionalized services. Larger industrial plants tend to prefer greater outsourcing of O&M services, while smaller plants typically retain more in-house arrangements. This shift is driven by rising asset complexity, cost-efficiency needs, regulatory compliance, and a shortage of skilled in-house staff.

A major driver of this shift is the increasing reluctance among factories to maintain permanent maintenance staff. Industry estimates suggest that only **5–6% of O&M personnel are permanent**, while **over 90% are outsourced**, reflecting a strong preference for flexible labor models. This trend is evident in large industrial setups like **Adani's cement plants**, where end-users are moving entirely to outsourced O&M contracts. Also, O&M operators price engineers

at **much lower costs borne by inhouse O&M players**, undercutting in-house costs by 15–30%. Negotiated **annual wage hikes (7–10%)** are passed to clients via **5–10% service price increases**, preserving **operating margins further**. Further, O&M operators absorb **HR costs** (interview travel, certifications) and **downtime risks**, offset by performance-linked clauses. Flexible staffing not only reduces overheads but also helps mitigate labor union challenges, making it a strategic choice for asset owners.

Future Evolution of the O&M Market

Looking ahead, the O&M services market is expected to evolve in several key ways:

- **Technology Integration:** Predictive maintenance using IoT sensors, AI-driven diagnostics, and digital twins will become standard, reducing downtime and improving asset performance.
- **Performance-Based Contracts:** Service providers will increasingly be evaluated on KPIs such as uptime, energy efficiency, and safety compliance, shifting from time-based to outcome-based models.
- **Specialized Skill Demand:** As industrial systems become more automated and digitized, demand for technicians with cross-disciplinary skills (mechanical + digital) will rise.
- **Sustainability-Linked Services:** O&M contracts will increasingly include energy optimization, emissions monitoring, and waste management, aligning with ESG goals.
- **Regional Expansion:** Growth will extend beyond industrial hubs to Tier 2 and Tier 3 cities, driven by decentralization of manufacturing and infrastructure development.

These trends present a compelling investment opportunity for service providers, technology firms, and staffing companies looking to tap into India's expanding industrial and energy sectors.

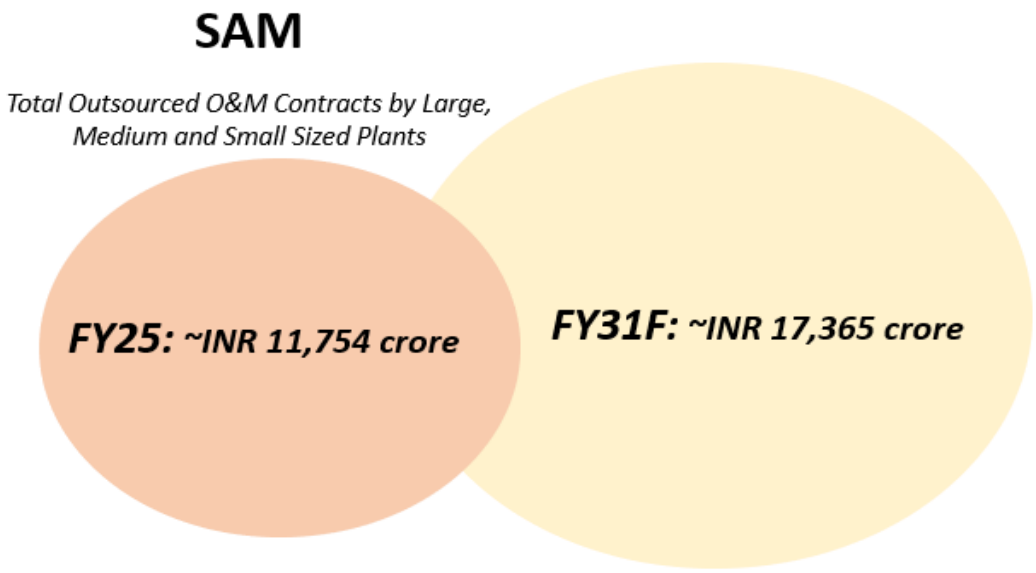
Market Opportunity for O&M Service Providers in the Market

Government offices and PSUs are increasingly adopting outsourcing for various operations, driving growth in the O&M service sector. For example, companies like Indian Oil Corporation (IOCL) and Bharat Petroleum Corporation Limited (BPCL) are outsourcing gas cylinder operations. Additionally, the Karnataka Mineral Corporation has outsourced its entire plant operations, with contracts typically lasting 5-10 years. The outsourcing model also extends to iron ore plants, where operational responsibilities are outsourced while royalty fees are shared during the operational phase. These developments are creating long-term opportunities for O&M service providers, as more government and public sector entities seek specialized expertise to manage their assets efficiently, ensuring a steady demand for O&M services in critical industries like energy, minerals, and infrastructure.

The Serviceable Addressable Market (SAM) for O&M services in industrial and power plants is expected to reach INR 17,365 crores by FY31. This growth is driven by the increasing

demand for O&M services from large industrial plants with higher contract sizes, as well as smaller O&M firms that, despite their competitive contracts, also require O&M services. Small sized contracts constitute approximately 40% of the O&M service market.

Figure 5-2: Market Opportunity (SAM) in the O&M Market for Industrial and Power Plants, FY25E



Source: Ken Research Analysis;
Note: Large Sized Industry: Revenue > INR 500 crore, Medium Sized Industry: Revenue INR 100-500 crore, Small Sized Industry: Revenue < INR 100 crore

6. Madhya Pradesh's Civil Construction Market Analysis

6.1 Madhya Pradesh's Civil Construction Market Overview and Size

The Civil Construction market is largely defined by the state's capital expenditure push in social and public infrastructure. As the focus of the report is on the state of Madhya Pradesh, Government-led programs focusing on **CM Rise schools**, **healthcare institutions**, and **administrative buildings specifically in MP** form the backbone of this market.

In FY26, the MP state government has increased its budget to **INR 4.21 lakh crore** from which capital expenditure accounts for **INR 85.1 thousand crore**, a 31% rise over the previous year. **This capital spend is planned for large-scale infrastructure development, irrigation expansion, water supply projects, women's welfare facilities, and education and skill-building initiatives** (Source: Madhya Pradesh Budget 2025-26).

Major civil construction potential lies in sectors such as education, health, rural development, and urban infrastructure. This includes allocations under various Programs like **CM Rise (INR 4.7 thousand crore)**, **Pradhan Mantri Awas Yojana (INR 4.4 thousand crore)**, and **National Health Mission (INR 4.4 thousand crore)** are driving civil construction activity. Madhya Pradesh's FY26 capital push sets a foundation for the public civil construction market, with state-driven project pipelines and operational advantages for locally-based players.

Table 6-1: Budget Allocations to Civil Construction Focused Sectors and Schemes in Madhya Pradesh in INR '000 crore, FY26

Sector/Scheme	Fund Allocation in '000 INR crore
Infrastructure Sector	70.5
Education	44.3
Urban & Rural Development	51.1
CM Rise School Program	4.7
National Health Mission (NUHM/NRHM)	4.4

Source: Budget of Madhya Pradesh Government

Moderate market growth is expected to be driven by increased capital expenditure and flagship schemes, alongside expanding PPP/private investment models. While regional contractor participation rises, execution risks and political factors require monitoring. The structural outlook remains positive despite these headwinds.

7. GROWTH DRIVERS IN THE INDUSTRY

The following trends observed are driving growth in the 4 key markets: **Railway Infrastructure, Mining & Raise Boring, Dredging & Reclamation, and Industrial and Power Plant O&M Market**. These are:

7.1 OUTLOOK ON INDIAN RAILWAY INFRASTRUCTURE SPEND

Increased Government Budget Pushing for Railway Network Expansion

The capital outlay supports critical areas such as new line construction, doubling and gauge conversion. In parallel, Ministry of Railways also plans to invest **INR 16.7 lakh** crore by 2031 toward freight corridors, electrification, high-speed rail lines, and the redevelopment of over 1,300 stations (Source: Economic Times). These efforts are being coordinated under the **PM Gati Shakti National Master Plan**, which has identified **434** railway projects across key logistics corridors (Source: Press Information Bureau Research Unit).

This government push for infrastructure development direction is can be seen through the targeted capital allocations for FY26 only outlined below:

Table 7-1: Union Budget key allocations within Ministry of Railways in INR crore, FY26

Purpose/Scheme	FY26 Fund Allocation in INR crore
New Railway Lines	32,235
Doubling and multi-tracking	32,000
Gauge Conversion	4,550
Broad-Gauge Electrification	6,500
Northeast Rail Connectivity Mission	10,440
High-Speed Rail (NHSRCL)	19,000
Dedicated Freight Corridors *(nearing completion)*	500

Source: Union Budget

A key growth driver for the **railway EPC market is the planned increase in axle load capacity for composite steel structures.** Currently, the axle load for composite steel is 18 tonnes (equating to an 80-ton payload), but it is set to rise to 25 tonnes (over 100 tons payload) with double-engine led operations, including players like Azgar Engineering Works, and Anaconda. This initiative is expected to spur significant growth in bridge work, as more robust infrastructure will be required to accommodate these heavier loads.

Additionally, **the demand for composite steel girders is anticipated to rise,** especially with factory approvals from authorities like RDSO (Railway Design and Standards Organization) in Lucknow, making it a more lucrative segment for EPC players. In parallel, the Indian Railway Institute of Civil Engineering (IRICEN) is enhancing its R&D and training efforts, providing critical expertise in civil and structural engineering. The integration of composite girders, combining steel beams with reinforced concrete slabs to function as a unified structural unit, will further support this market expansion by enabling the construction of more durable and efficient railway infrastructure.

Rising Focus on Specialized Projects including High-Speed Rail, Dedicated Freight Corridors, and Challenging Terrain Projects

India's Railway EPC sector is prioritizing niche and specialized projects such as tunnelling in difficult terrain, long-span bridges, high-speed corridors, and rail links in remote regions. This shift has been accelerated by the government's emphasis on modernization, rising urban transport needs, and strategic connectivity in sensitive regions like the Northeast. Several policy and Flagship initiatives under **National Rail Plan** have identified and allocated funding toward complex projects, including border connectivity, Himalayan rail links, and industrial corridor sidings. Some of the key niche and specialized railways EPC projects in India are:

Table 7-2: Key Niche and Specialized Railway EPC Projects in India

High Speed Rail Corridors	
Mumbai–Ahmedabad High Speed Rail	• 508 km bullet train corridor with 300 km+ viaducts and tunnels
Varanasi-Howrah High-Speed Rail Corridor	• 760 km route, expected to be completed by mid-2027
Delhi Amritsar High-Speed Rail Corridor	• 465 km route, at a speed of 350 km/hr
Dedicated Freight Corridors	
Eastern Dedicated Freight Corridor	• Route length of 1856 km consists of two distinct segments: • an electrified double-track segment of 1409 km between West Bengal & Uttar Pradesh • an electrified single-track segment of 447 km between state of Punjab, Haryana and Uttar Pradesh
Western Dedicated Freight Corridor	• 1,506 km, JNPT–Dadri; double-stack containerized freight
Difficult Terrains / Strategic Projects	
USBRL (Jammu–Baramulla Line)	• 272 km project, High-altitude tunnels & bridges, including world-high Chenab Bridge
Bairabi–Sairang (Mizoram)	• 51 km line with 48 tunnels, 55 major + 87 minor bridges

Rishikesh–Karnaprayag Rail Link	• 125 km Himalayan alignment with 16 tunnels

Source: Dedicated Freight Corridor Corporation of India Limited, Ministry of Railways

Private Participation and Semi-Privatization

India's railway EPC sector is shifting toward greater private participation through PPP and EPC contracts. This enables faster modernization and brings in private sector expertise. A notable example is the redevelopment of **Habibganj (Rani Kamlapati)** station in Bhopal under the PPP model, led by IRSDC at a cost of **INR 450** crore, featuring modern amenities and compliant with 'Green Building' norms (Source: Ministry of Railways). A total of 123 stations are being redeveloped under IRSDC and RLDA, with investments exceeding **INR 50,000 crore** (Source: Ministry of Railways).

This infrastructure push creates strong opportunities for mid-sized EPC firms. Public sector units like IRCON, RVNL, and DFCCIL are increasingly subcontracting civil, signaling, and electrification works under fixed-price, time-bound EPC contracts. IRCON's **INR 1,068 crore** order from **East Central Railway** and regular DFCCIL corridor tenders highlight this trend (Source: Economic Times).

Indian Railways has also framed a new PPP policy, identifying about **50** upcoming projects, which also include commercial lines such as mineral corridors. The subcontracting path provides a scalable path into railway infrastructure (Source: Ministry of Railways)

Technological Integration for Enhanced Efficiency

The Indian Railway EPC segment is adopting advanced technologies for safer, faster execution. Real-time modelling and electronic interlocking—now at over 6,600 stations—are enhancing civil works and signaling efficiency. The rollout **of 'Kavach', an Automatic Train Protection system**, has covered 1,548 route kilometres of the planned 3,000 km (Source: Ministry of Railways).

Condition Monitoring Systems are now used for bridges, tracks, and signaling to support predictive maintenance. For operations, more than 8,700 locomotives have been equipped with RTIS (Source: Ministry of Railways). Indian Railways also plans to expand GPS to freight wagons, improving coordination between project work and train movement, which is supported under PM Gati Shakti.

Zonal & Regional Tendering Digitization

Indian Railways has fully digitized its zonal and regional procurement through platforms like **the Indian Railways E-Procurement System (IREPS**) planned under **National Rail plan 2030**. This shift removes geographical and bureaucratic barriers, making it easier to submit bids, sign contracts, and receive payments.

The introduction of **automated prequalification** and **technical scorecards** favours firms with proven experience, and domain expertise in civil works, signaling, and electrification.
This benefits mid-sized EPC companies that may lack lobbying power but have strong execution records. **IRCON's INR 1,068 crore** EPC contract for East Central Railway, tendered via IREPS, included subcontracting opportunities for qualified regional players (Source: IRCON).

7.2 Mining and Raise Boring Market

Commercial Coal Mining Reform: Auction-Based Access and Revenue-Sharing Models

- India's commercial mining reforms began with the **Mines and Minerals (Development and Regulation) Amendment Act, 2015** and the **Coal Mines (Special Provisions) Act, 2015**, replacing discretionary allocations with transparent auctions.
- The Ministry of Mines operationalized this for non-coal minerals through the **Mineral (Auction) Rules, 2015**, while 2021 and 2023 policy changes removed end-use conditions and allowed surplus sales from captive mines, **unlocking new mining projects and expanding equipment demand**.
- The Ministry of Coal launched **commercial coal auctions** on 18 June 2020, ending end-use restrictions and permitting private, non-captive mining.
- A **revenue-sharing mechanism,** starting at 4% of gross sales, rising incrementally to 10%, replaced fixed premiums. This incentivized rapid production scaling and attracted new private entrants. EPC and MDO contractors responded by investing in **advanced rigs, draglines, and real-time monitoring systems** to boost productivity and compliance.
- **These efficiency-focused investments directly drive demand for mechanised excavation technologies like raise boring, as contractors seek faster, safer access to deeper coal seams to meet output targets and offset revenue-sharing costs.**

Underground Mining and ESG-Driven Transitions

India's underground mining expansion is primarily driven by **regulatory interventions**, particularly **National Green Tribunal (NGT) restrictions, that mandates raise boring under underground mining while banning drill and blast options.** This also prohibit new open-cast projects in eco-sensitive zones without exhaustive environmental impact studies. While not mandating underground mining explicitly, the Tribunal's strict application of the **precautionary principle** (NGT Act, 2010) has escalated compliance requirements for surface operations, rendering them legally and operationally challenging. This regulatory pressure is compounded by:

- **Regional bans on drill-and-blast methods** in areas like Rudraprayag and Joshimath
- Compelling projects such as **NHPC's Uri 2 hydropower tunnel** to adopt mechanized alternatives like raise boring for shaft construction.

- Concurrently, **PSU-led surface-to-underground conversions**, notably by **Hindustan Copper Limited (HCL)**, **MOIL**, and **Uranium Corporation of India (UCI)** are amplifying demand for ventilation and access infrastructure.

To mitigate the higher costs of underground operations, the government has implemented **fiscal incentives**, including **waived upfront fees** and a **2% revenue-share floor** for coal projects (Ministry of Coal, 2020). When combined with **ESG imperatives** to minimize land disturbance and displacement, these factors will generate substantial demand for **raise boring and shaft sinking services** by 2030.

Automation and Real-Time Mine Monitoring to Drive Indian Mining Market

The government has mandated digital monitoring through systems like CMPDI's Mine Surveillance System (MSS), requiring real-time oversight of production and environmental compliance. While aimed at transparency and safety, these mandates have also created opportunities for miners and EPC players to boost productivity through automation, data-driven planning, and reduced operational downtime. This has been seen at the mines of Hindustan Zinc, where these solutions have been implemented (Source: Tech observer).

Private Sector Engagement in Mineral Exploration

The government has opened mineral exploration to private players through reforms under the National Mineral Exploration Policy (NMEP, 2016) and amendments to the Mines and Minerals (Development and Regulation) Act in 2021 & 2023, ending the state monopoly in notified blocks. These changes introduced models like composite licenses and revenue sharing, enabling early-stage private sector participation in exploration activities. Recent auctions of critical mineral blocks are designed to attract technology-driven private firms and diversify the sector. This can be seen with firms like **Deccan Gold Mines**, **Vedanta Resources**, and **Adani Enterprises**, aligning with India's broader goals of resource security and industrial self-reliance.

7.3 Dredging & Reclamation Market

Demand for Specialized Dredgers

The demand for specialized dredgers is increasing since India's dredging needs are becoming more complex, deeper, and location-specific. As port and inland waterway infrastructure expands under the Sagarmala programme with over 800 projects. The focus is shifting from routine maintenance to high-precision dredging. For example:

- Ports like Kolkata, Paradip, and Visakhapatnam face tricky conditions such as shallow drafts, rocky beds, and high siltation that require advanced equipment like trailing suction hopper, grab hopper, and cutter suction dredgers fitted with GPS and sonar systems.

This trend is further driven by surge in coastal shipping by 118% and inland waterway cargo by 700%. With larger vessels, tighter navigational demands and higher traffic, demand for dredging increases. This promotes private players to invest in modern, multi-capability dredger fleets, in-line with the 'Guidelines on Undertaking Dredging At Major Ports' (Source: Ministry of Ports, Shipping and Waterways).

Sustainable Practices and Technological Advancements

Ports and waterways now face stricter rules on emissions, sediment control, and ecosystem impact. This has changed dredging in India; older methods are being replaced by modern dredgers using GPS, sonar, and automation that reduce fuel use, pollution, and disturbance to riverbeds. The Sagarmala programme and its next phase, Sagarmala 2.0, are pushing for the maritime ecosystem development, backed by budgetary support, which aims to leverage investments of INR 12 lakh crore. From which certain part is expected to invest on maritime innovation and sustainability. As cargo volumes grow, the demand for eco-friendly, tech-enabled dredging will increase (Source: Ministry of Ports, Shipping and Waterways).

Modernization and expanding of existing ports

Expansion and modernization of Indian ports is progressing with government backing under the Sagarmala programme, where port modernization is one of the five core pillars.

- A total of **234 projects worth INR 2.91 lakh crore** has been initiated for port modernization. Under new port development, 14 ports; including projects at Honavar (Karnataka), Chhara (Gujarat), and Kakinada SEZ (Andhra Pradesh) are being developed with an estimated investment of **INR 1.7 lakh crore**.
- Of the **166** modernization projects at major ports, **90 worth INR 26,098 crore** have been completed**, 38 projects worth INR 22,232 crore** are under implementation. The Ministry is also focusing on improving operational efficiency through mechanization and digitization. As ports are deepened and new ones constructed, more and more opportunities for EPC players would be forthcoming in the market (Source: Sagarmala).

International Collaborations and PPP Models

India's dredging industry is shifting from PSU-led control to a competitive ecosystem shaped by private players and international partnerships. This trend is driven by the government's move from nomination-based contracts mainly awarded to PSUs like DCI, toward open, long-term PPP frameworks that offer better project viability and attract global interest. A key example is the Vadhavan Port project in Maharashtra, approved at INR 76,220 crore. Built under a PPP model, it has received bids from global dredging firms like Royal Boskalis and Jan De Nul, showing strong international interest. This model offers faster execution, better cost control, and access to advanced technologies.

7.4 O&M of Industrial and Power Plants Market

Life extension of thermal plants creating O&M demand for players in the market

Amid delayed renewable capacity additions and rising peak demand, utilities are investing in life extension programs for aging thermal plants. As of August 2023, the government identified **148 coal-fired units (~38 GW)** and **241 hydro units (~12 GW)** for potential life extension through 2030 (Source: Ministry of Power). These efforts involve boiler refurbishments, control system upgrades, and emissions retrofits—**typically executed by EPC and O&M contractors—to extend asset life by 10–15 years and enhance reliability, efficiency, and compliance.** Thus leading to more opportunities for companies providing O&M services, where life extension is required.

Ash Utilization increasing O&M requirements

The Ministry of Environment, Forest & Climate Change (MoEF&CC) mandates **100% fly ash utilization** by coal and lignite-based thermal power plants as per it **Gazette Notification** released on **31 December 2021** under the Environment (Protection) Act (Source: MoEFCC). Further 2022 and 2024 amendments have refined compliance timelines and implementation mechanisms. These mandates have led operators to partner with cement, brick, and infrastructure sectors, while increasingly outsourcing ash handling. **As a result, ash handling and disposal has emerged as a specialized O&M service, with many plant operators outsourcing tasks like dry fly ash collection, silo operations, and bulk logistics to third-party vendors.**

Privatization of O&M Contracts

Many state and central utilities are moving toward privatizing **O&M functions to improve efficiency and reduce internal workforce costs**. Long-term O&M contracts are being awarded to specialized players through competitive bidding, as can be seen with the Teesta Stage III hydroelectric plants whose 15 year O&M contract was awarded to Andritz (Source: Andritz). This trend has opened the market to private service providers offering bundled mechanical, electrical, and instrumentation services with performance-linked incentives and digital monitoring frameworks.

8. THREATS AND CHALLENGES IN THE INDUSTRY

All four key markets: **Railway infrastructure, Dredging & Reclamation, Mining & Raise boring, and O&M for industrial & power plants** face individual threats and challenges. The Threats and Challenges observed are:

Table 8-1: Threats and Challenges in the 4 Key Industries

Challenges & Threats	Description
Railway Infrastructure	
Execution and Operational Challenges	• Execution challenges are due to **limited site access** on live tracks, with works relying on **night blocks and traffic shutdowns.** In **dense corridors, civil works are complicated** by space limits, underground utilities, and encroachments. Projects involving new development may also face delays due to land acquisition and local disruptions. • Track maintenance projects are further complicated by operational requirements such as short block conditions—often restricted to 2–3 hours between stations for safety—necessitating rapid execution and intense resource coordination. • **These factors lead to delays, increased costs, and safety risks, ultimately reducing project efficiency and profitability.**
Regulatory and Policy/ Institutional Threats	• Challenges include **slow tender finalization** due to lengthy approvals. Project timelines depend on Union and zonal budgets, making them prone to delays. Changing procurement norms, such as stricter eligibility criteria or e-tendering updates, can slow bidding and cause re-tendering. **These uncertainties lead to rework, missed opportunities, and sunk bid costs for EPC suppliers, affecting pipeline visibility and resource planning.**
Financial and Commercial Challenges	• Financial challenges include **payment delays** and **high bank guarantees**, which **lock-in working capital**. Indian Railways contracts typically require contractors to bill monthly based on quality-verified work quantities, **with no advance payments**. The payment process involves multiple approvals & verifications before funds are released, often causing lags.

	• L1 bidding leads to **thin margins**, while **performance security requirements** add pressure and, **Complex work** in live corridors further increases cost exposure. • **These financial pressures strain liquidity, reduce profitability, and limit the ability of EPC companies to scale or invest in better technologies.**
Market and Competitive Threats	• **Reliance on government and PSU projects**, make EPC players vulnerable to shifts in public spending. Limited private investment in rail infrastructure restricts market diversification. • **This overdependence exposes EPC companies to policy volatility and reduces resilience during budget cuts or tender slowdowns.**
Raise Boring and Mining	
Execution and Operational Challenges	• EPCs face **extended lead times** due to capital-intensive imported equipment (INR 30–45 crore per unit) requiring 10-month delivery cycles and customization and a **shortage of skilled operators**. • **Geological risks** like hard rock, faults, or aquifers can damage rigs or cause collapses. Land acquisition and local resistance further disrupt execution. • **These factors increase project risk, delay timelines, and raise cost overruns, directly impacting EPC companies profitability and reputation.**
Regulatory and Policy/ Institutional Threats	• Challenges include **delayed environmental clearances**, **frequent policy changes**, and **stringent NGT/ESG norms**. • **Public tender** finalizations are often **slow**, and PSU linked projects depend on **Union** and **zonal budget disbursal** and evolving **procurement norms**, further add to execution complexity. • **EPCs face challenges in participating in tenders for the same. And, uncertainty exists in project timelines and scope, leading to idle resources and reduced operational efficiency.**
Financial and Commercial Challenges	• **High capex demands** (₹30–45 crore per machine, based on diameter of boring machinery) and lack of bank financing precedent strain liquidity. • **Margins** worsen due to delayed PSU payments and irregular cash flows, while subsurface complexity increases operational costs.

	• **These constraints erode working capital, limit bidding flexibility, and threaten EPC sustainability.**
Market and Competitive Threats	• Surface mining dominates in India due to lower costs and simpler execution. While underground mining policies are evolving, **raise boring hasn't been directly prioritized**. It remains niche, capital-intensive, and limited to a few players. The market also lags in automation and rig availability. • **Limited policy focus and demand make it hard for EPC suppliers to invest and scale in raise boring.**
Dredging and Land Reclamation	
Execution and Operational Challenges	• **Restricted Work Windows:** Tidal schedules and dense port traffic severely limit working hours, forcing EPCs to optimize around short access windows. • **Specialized Equipment Risks:** Projects depend on complex, high-maintenance dredgers requiring custom deployment and frequent upkeep. Delays and breakdowns happen when unpredictable subsurface conditions are encountered. This raises downtime, repair costs, and overall execution risk • **Idle Asset Burden:** High-cost dredging equipment frequently remains underutilized between projects. Only 60-80 dredgers are present in India and with such schedules firms struggle to earn adequate returns and face capital lock-in.
Regulatory and Policy/ Institutional Threats	• **Slow Clearances and Stringent Oversight:** Agencies like NGT and ESG, along with the Ministry of Fisheries, impose stringent compliance on dredged material disposal, driving up costs and causing delays. • **Tendering Pressures and Compliance:** Public tenders prize the lowest bid, sometimes at the expense of quality. Firms face significant compliance delays, must respond to evolving ESG standards, and risk project quality—and reputation—due to forced cost-cutting or process shortcuts under margin pressure.
Financial and Commercial Challenges	• **Expensive, Hard-to-Finance Assets:** Procuring, maintaining, and upgrading dredgers is capital-intensive. Banks are reluctant to fund dredging asset purchases, particularly given limited resale markets and the specialized nature of equipment. • **Liquidity Strain from Guarantees:** Securing large bank guarantees and performance securities for public contracts ties up capital. Further, need for significant upfront

Market and Sustainability Threats	investment, with payments linked to physical milestones **impacts cash flow negatively**. • **Margin Compression:** L1 (lowest) bids continue to erode margins, which currently sit around 15-20% • **Reliance on Government and PSU Projects:** The market remains heavily dependent on government and PSU-driven mandates, particularly in major ports and inland waterway dredging. This exposes EPCs to policy risk • **Technology and Modernization Gaps:** Indian dredging operators lag behind global peers in precision dredging and sediment management technology. Investing in upgrades is difficult due to capital restrictions and thin margins, hindering modernization. • **Competitive Concentration:** With only 30 firms competing in the market and the top five controlling 70% of the market, competition is both limited and fierce. **Mid-sized players like Laxyo, Divine Dredging, and United Dredging struggle against well-capitalized incumbents, higher entry barriers, and client preferences for proven capability and scale.**
O&M in Industrial Plants	
Asset Aging and Legacy Systems	• Many industrial plants increasingly rely on **outsourced O&M** due **to aging infrastructure and complex legacy control systems, which pose challenges in maintenance and sourcing spare parts.** • Lack of Operators to deploy where need of skilled mechanical, electrical, and control & instrumentation engineers is there to manage diverse maintenance needs efficiently.
Performance-Based Contract	• O&M contracts, often valued between INR 1 crore and INR 50 crore and spanning 1–4 years, require multidisciplinary capabilities across mechanical, electrical, and control systems to meet stringent KPIs such as uptime, energy efficiency, and emissions compliance. • Wage inflation and operational cost increases (7–10% per year) are required to be managed by operators to manage their margins • Operators to bear penalties for underperformance, increasing operational risks, while also managing HR expenses like employee acquisition and travel reimbursements.

Market and Competitive Threats	• The O&M market is highly fragmented, with numerous agencies and operators like Vaman Engineering, Powermach, Thermax, and Teamlease competing for contracts, especially at medium and large plants that outsource 60–95% of their operations. • Even after a typical 25 year O&M lifecyle, contracts exist between 1-4 years. This is because as competition intensifies due to frequent cost-based tendering, pushing firms to maintain operational efficiency and skilled teams.

Source: Ken Research Analysis

9. KEY REGULATIONS AND POLICIES

This section outlines the key regulatory frameworks and policy developments relevant to focus industries, including Railway Infrastructure Spend, Dredging and Reclamation, Raise Boring, and O&M in industrial plants.

Railway Infrastructure Market

The Railways Act, 1989

Enacted in 1989 and amended multiple times, this Act provides the legal foundation for railway development, safety, and land use. It empowers authorities to acquire land, regulate construction, and oversee operations. Compliance requires executing works strictly as per notified procedures for acquisition, design, and safety, ensuring no deviation from statutory railway standards.

Railway Board Circulars and Manuals

Issued periodically and updated over time, these circulars and manuals define technical standards, engineering practices, and SOPs for civil, electrical, and mechanical works. Compliance entails incorporating the latest specifications into planning, design, and execution to meet operational and safety benchmarks.

Indian Railways General Conditions of Contract (GCC)

Launched as a standard contracting framework and updated regularly, the GCC prescribes obligations, timelines, penalties, and quality norms for executing works. Alignment involves adhering to contract timelines, quality standards, and documentation requirements to avoid disputes and penalties.

Indian Railways Works Manual / Unified SSR

Introduced to standardize estimation and execution of works, these documents lay down cost norms and procedural workflows. Compliance includes using prescribed rates, preparing accurate estimates, and following established procedures for budgeting, approvals, and execution.

Manual for Procurement of Works (MoF)

First issued by the Ministry of Finance in **2019** and updated in **2022**, this manual sets rules for tendering, contracting, and execution of public works. Compliance requires transparent bidding, adherence to timelines, and following prescribed procurement protocols during all project stages.

Dredging & Reclamation Market

Inland Vessels Act, 2021

Introduced in **2021**, this Act regulates inland waterway operations by mandating vessel registration, safety certification, and pollution control. Compliance involves securing necessary certifications and maintaining operational and environmental standards for vessel use.

Merchant Shipping Act, 1958 & 2020

First enacted in **1958** and revised through the **2020 Bill**, this legislation governs marine vessel safety, accident reporting, and pollution control. Compliance requires vessel certification, adherence to safety standards, and reporting as per maritime conventions.

Dredging Guidelines for Major Ports, 2021

Issued by the Ministry of Ports in **2021**, these guidelines standardize cost estimation, surveys, and tendering for major port dredging. The addendum promotes reuse of dredged material, requiring compliance with reporting and reuse/disposal protocols.

Coastal Regulation Zone (CRZ) Notification, 2011

Issued in **2011** under the Environment Act, this notification protects ecologically sensitive coastal areas by restricting activities in buffer zones. Compliance requires securing CRZ clearances and adopting mitigation strategies to reduce environmental impact.

Mining & Raise Boring Market

Mines Act, 1952

Enacted in **1952** and amended periodically, this Act governs underground mining safety and worker welfare. Compliance entails appointing safety officers, maintaining rescue infrastructure, and meeting Directorate General of Mines Safety requirements.

Coal Mines Regulations, 2017

Issued under the Mines Act in **2017**, these regulations prescribe technical and safety standards for coal and non-coal underground operations. Compliance involves securing DGMS approvals and following operational safety protocols.

Mines Rescue Rules, 1985

Introduced in **1985**, these rules ensure emergency preparedness in underground mining. Compliance requires establishing rescue stations, training personnel, and conducting regular drills as directed by DGMS.

Cross-cutting Regulation (Applicable to O&M Market and more)

Environment Act, 1986 & EIA Notification, 2006

Enacted in **1986**, with the **EIA Notification introduced in 2006** and updated since, this legislation regulates environmental impacts of projects. Compliance requires obtaining prior environmental clearances, conducting impact assessments, and implementing mitigation measures before initiating site activities.

Air Act, 1981 & Water Act, 1974

The **Air Act of 1981** and **Water Act of 1974** regulate emissions and effluent discharges through State Pollution Control Boards. Compliance includes securing consents to establish and operate, installing pollution controls, and regularly monitoring outputs as per statutory limits. These activities include dredging and raise boring.

Forest Act, 1980 & Forest Rules, 2022

Introduced in **1980** and updated through **2022 Rules**, this Act restricts diversion of forest land for non-forest purposes. Compliance involves applying for forest clearances, submitting detailed assessments, and adhering to conditions and timelines for land use approvals.

Hazardous and Other Wastes Rules, 2016

Enacted under the Environment Act in **2016**, these rules govern the handling, storage, transportation, and disposal of hazardous wastes. Compliance entails registration with authorities, maintaining inventories, and ensuring disposal through authorized channels.

Public Liability Insurance Act, 1991

Brought into effect in **1991**, this Act mandates insurance coverage for handling hazardous substances and contributions to the Environment Relief Fund. Compliance ensures adequate insurance coverage and readiness for immediate compensation in case of accidents.

Labour Welfare & Occupational Safety Laws

These laws, enacted between **1936 and 1996**, include the BOCW Act, Contract Labour Act, EPF Act, ESI Act, and Payment of Wages Act. Compliance requires registration, maintaining employment records, ensuring statutory benefits, and providing safe working conditions.

10. Competition Landscape

10.1 Indian Railway Infrastructure Spend

10.1.1 Key Factors Shaping Competition

Competition in India's railway infrastructure EPC market is shaped by stringent eligibility requirements, operational capability, and technological readiness. Since projects are awarded with no advance payments, participating firms must have the ability to mobilize significant working capital upfront.

Key competitive factors include:

- **Financial Strength and Liquidity:**
  - Most major railway EPC tenders require bidders to demonstrate an average annual turnover of at least **150% of the tender value**, ensuring only well-capitalized firms can participate.
  - Strong liquidity and balance sheet health are critical for managing project cash flows, as payments are only made following milestone verification, with no provision for early or advance payment.
- **Execution Experience:**
  - Bidders must typically show evidence of having completed **at least 35% of the advertised scope in similar works**—a criterion that favors established players with proven records in large-scale railway EPC (track laying, doubling, electrification, etc.).
  - Experience navigating Indian Railways' SOPs, approvals, and compliance procedures is essential for winning and executing contracts efficiently.
- **Ownership of Specialized Equipment:**
  - Possession of key railway construction assets, especially high-value machinery such as **PQRS track renewal machines**, is now a major differentiator.
  - With Indian Railways no longer providing PQRS machines, only a handful of contractors—those able to invest substantial capital in such equipment (which banks typically do not finance due to their movable, unregistered nature)—can qualify for and profitably execute large-scale mechanized renewal projects such as Complete Track Renewal (CTR).
  - Access to proprietary machinery not only enables faster mobilization and execution reliability, but also supports higher operating margins (up to **25–30% on CTR contracts**, compared to 12–20% for conventional track laying).
- **Organizational and Operational Capacity:**

- Competitiveness is further enhanced by a skilled workforce, established subcontractor and vendor networks, and deep familiarity with railway project quality and billing processes.

Together, these factors create a high bar for entry and sustain competitive advantage for established players—especially those with scale, machinery ownership, and a strong record of timely, quality delivery on railway EPC contracts.

10.1.2 Ecosystem Of Players In The Market

The Indian Railway Infrastructure Spend operates under the oversight of apex authorities—the **Ministry of Railways (MoR)** and the **Railway Board**—which define sector vision, set technical and commercial norms, and allocate projects. Critically, these bodies assign large-scale works to Public Sector Undertakings (PSUs) such as **IRCON, RITES, and RVNL**. These PSUs serve as nodal agencies, handling project preparation, tendering (via platforms like GeM, CPPP, and PSU portals), quality supervision, and, at times, direct execution as EPC contractors themselves.

The market is highly competitive, with an estimated **150–200 EPC players**—primarily Indian firms, alongside select global participants like Siemens, Alstom, and Hitachi in signaling and electrification.

EPC contractors are broadly split into two categories:

- **Fully integrated EPC players** deliver end-to-end projects across track laying, electrification, bridges, signaling, and station upgrades—either independently or in partnership with PSUs. Examples include **Larsen & Toubro (L&T), KEC International, Tata Projects, Texmaco**, and **GR Infraprojects**, which regularly execute large multi-domain packages.
- **Domain-specific contractors** specialize in a particular vertical or work package (track laying, electrification, signaling, etc.). These firms, such as **AFCONS, Rahee, and Laxyo** (track/civil); **Siemens, Transrail, ABBICO** (electrification); and **Kalindee, Bharat Rail** (signaling), focus on tenders from PSUs or integrated EPCs and often achieve higher efficiency within their niche.

Players are further classified by annual revenue sizing bands. This also indiscates the single-project tender value the players can achieve in Railway Infrastructure Spend.

Table 10-1: Players classification by annual revenue

Player Segments	Large	Medium	Small
Integrated Railway EPC	> ₹2,500 Cr	₹750 Cr – 2,500 Cr	< ₹750 Cr
Track Laying + Maintenance	> ₹1,500 Cr	₹400 Cr – 1,500 Cr	< ₹400 Cr

Player Segments	Large	Medium	Small
Signaling, Electrification & Telecom	> ₹1,200 Cr	₹300 Cr – 1,200 Cr	< ₹300 Cr
Station Redevelopment & Modernization	> ₹1,000 Cr	₹250 Cr – 1,000 Cr	< ₹250 Cr

Source: Ken Research Analysis

Figure 10-1: Ecosystem of India Railway Infrastructure Spend

Source: Ken Research Analysis
Notes: Definition of Small, Medium and Large Size Players as given in Table 10.1: Players classification by annual revenue

Positioning of Laxyo Ltd.. In Railway Infrastructure Market:

Laxyo is positioned as a small-sized, domain-specific contractor working in the track laying EPC, track maintenance and civil works segment, with annual revenues generally in the INR 100–500 crore range. It operates in a space having presence of small and medium sized players, and works mainly in central and western region. It is one of the few players (~5 players) in India with PQRS machine for CTR projects.

10.1.3 Cross-Comparison of Peers in India Railway Infrastructure Spend

Some of the key competitors competing in the country's India Railway Infrastructure players are benchmarked on the basis of operational and financial parameters as follows:

Table 10-2: Cross-Comparison of Peers in India Railway Infrastructure Spend on basis of Operational Parameters, as on Mar 2026 (1/4)

Players	Geographical Presence & Reach	Presence in Sector	Project Portfolio
Laxyo Ltd.	**Domestic only** Present in over 8 States of India, with one corporate office & 2 regional offices	• Railway Construction • O&M Work • Surface Mining Service • Raise Boring/ Underground Mining • Dredging & Reclamation • P Way Material Supply • Material Handling • Rental Services	• **Mainline & Freight Line projects** track laying, maintenance along with civil works **at Ratlam, Mumbai, Jabalpur, Bikaner and more.** This is complemented by further civil works at the same stations and railways lines. • **Complete Track Renewal Projects** using PQRS in Central and Western Regions at Khurda, Mumbai and Kota **Ongoing Projects of INR 700 crore+**
Larsen & Toubro	**Domestic & International** Operations in over 50 Countries	• Heavy Engineering • Construction & Infrastructure • Finance • Power • Hydrocarbons • Technology • Mining • Real Estate • Defence • Shipbuilding • Precision Engineering & Systems	• **Mumbai-Ahmedabad High-Speed Rail (MAHSR) Project** - covering high-speed electrification, viaducts, stations, river bridges and allied civil works • **Rewari-Iqbalgarh (Phase 1) (DFCCI)** - civil, track, E&M, and S&T works, including 228 major bridges and communication systems • **CTP 1&2** - Constructing 342-km double (DFCCI) -line link between Western & Eastern DFCs
Afcons Infrastructures	**Domestic & International** Over 30 Countries across Asia, Africa, Middle East	• Marine & Industrial • Surface Transport Urban infrastructure • Oil & Gas • Hydro & Underground	• **Mumbai-Ahmedabad High-Speed Rail (MAHSR) Project** - Constructing undersea tunnel (7 km long) HSR Corridor • **East West Metro Tunnelling, Kolkata-** Construction of tunnels below Hooghly River • **Chenab Bridge Project-** Construction of a 1,315 m single arch railway bridge over the River Chenab on the railway line
IRCON International Ltd	**Domestic & International** Over 20 Countries	• Railways • Highways • Bridge • Buildings	• **Mumbai–Ahmedabad High-Speed Rail (MAHSR)-** Package C-7 – more than INR 22000 crore

Players	Geographical Presence & Reach	Presence in Sector	Project Portfolio
		• Electrical • Signaling • Mechanical • Coach Factory • Aviation	• **Katni–Singrauli Third Line Project** – EPC execution of track doubling with associated civil • **Sivok–Rangpo New BG Line, Sikkim** – EPC work involving tunnels, bridges, and track laying for connectivity
Texmeco Rail & Engineering Limited	**Domestic & International** Over 13 Countries	• Rolling Stock • Steel Foundry • Bridges & Structural • Hi-Tech • Hydro mechanical • Equipment • Traction & Coaching • Rail EPC	• **RVNL Project, Assam**- Jointly controlled operations with TATA projects civil, signaling and electrification • **Ballastless Track, Nagpur** • **Metro division of MMRC, Maharashtra**
GR Infraprojects Limited	**Domestic Only** Over 23 States	• Highways & Bridges • Railways & Metro Hydro & Tunneling • Ropeways • Power T&D • Multi-Modal Logistic Parks • Manufacturing & Fabrication • Operations & Maintenance	• **Adenigarh – Purunakatak; & KhurdaBolangir New Rail Line Project-** Development of Tunnels & allied works • **Nagpur Metro Rail Project**– with length of 17.62 km viaduct and 1.14 km double-decker road

Source: Ken Research Analysis, Companies' Websites, Annual Reports

Table 10-3: Cross-Comparison of Peers in India Railway Infrastructure on basis of Strength and Weakness, as on Mar 2026 (2/4)

Players	Strengths	Weakness
Laxyo Ltd.	• Executes railway works including track laying, earthwork, OHE, and minor bridge works • Engaged in O&M and manpower contracts with Indian Railways • Group firm Yolax Infranergy offers signaling and railway consultancy	• Focused on small to mid-sized packages; limited exposure to large turnkey EPC projects • Signaling and electrification experience is primarily consultancy-driven • No current international presence
Larsen & Toubro	• Executed high ticket projects such as freight corridor projects • In-house capacity across civil, track, electrification, and signaling • Strong qualification for high-value public contracts	• Primarily targets large-value packages; limited participation in smaller or regional projects • Higher organizational overhead compared to mid-size players
Afcons Infrastructures	• Experience in underground and marine rail infrastructure • Executed urban metro and overseas rail projects in South Asia and Africa	• Less active in mainline railway projects - Often part of consortiums; fewer independent EPC awards

Players	Strengths	Weakness
IRCON International Ltd	• Longstanding PSU with specialization in bridges, electrification, and international rail contracts. • Regularly executes government-funded projects in India and abroad	• Decision-making and execution timelines can be affected by public sector regulations. • Dependence on government allocations for project flow
Texmeco Rail & Engineering Limited	• Presence in wagon and bridge fabrication • Supplies components for metro and suburban rail infrastructure	• Limited presence in full-scope EPC projects • Business model more manufacturing-oriented than project-based
GR Infraprojects Limited	• Transitioned from highways to rail with focus on civil and track works • Known for timely delivery in linear infrastructure	• Limited experience in signaling and OHE systems • Still building credentials for complex rail EPC contracts

Source: Ken Research Analysis, Companies' Websites, Annual Reports

10.2 Raise Boring Market

10.2.1 Key Factors Shaping Competition

Competition in India's raise boring niche is defined by **technical specialization**, **regulatory alignment**, and **high financial entry barriers**, creating a concentrated market with fewer than **3 active specialized firms in India**. Success hinges on ownership of advanced equipment by the likes of Epiroc/Sandvik drills and mastery of precision shaft construction in complex geologies (e.g., hard rock, coal seams). The major factors are:

- **Equipment and Technical Barriers:** Raise boring machines (₹30–45 crore/unit) must be imported from 4–5 global OEMs (Sandvik, Epiroc, TUMI etc.), with 10-month lead times and 40% advance payments. Customization for geological conditions (e.g., deep mines >1 km with high temperatures) necessitates foreign technical staff (e.g., Zambia/South Africa experts), as India lacks domestic manufacturers. This makes players access to machinery and skilled workforce relatively difficult
- **Financial Strength and Liquidity:** Banks resist funding specialized movable assets (e.g., raise boring drills) due to **illiquidity risks** (easily relocated/hidden if defaulted), **valuation ambiguity** (no secondary market benchmarks), and **repayment mismatches** (5–7-year loans vs. short project cycles). This restricts liquidity, forcing firms to rely on equity or vendor financing, consolidating the market among few capital-rich players.

As regulatory mandates increasingly favor raise boring over explosive methods in urban/sensitive zones, with agencies like DGMS and MoEFCC enforcing strict non-blasting policies. **The market may eventually attract more players. However, current operators will have cemented a strong foothold by then.**

10.2.2 Ecosystem of Players in the Market

India's mining sector operates under the oversight of **apex regulatory bodies**—the **Ministry of Coal**, **Ministry of Mines**, and the **Indian Bureau of Mines (IBM)**—which govern licensing, environmental compliance, and operational safety. These authorities enforce strict norms (e.g., blasting bans in eco-sensitive zones) and drive project allocation through public-private partnerships. The market structure centres on three core stakeholder categories:

- **Mine Owners**: Entities like **SAIL, Tata Steel, Vedanta, NTPC, and Odisha Mining Corporation** hold mining leases and if possible, could also outsource operations to developers. They focus on regulatory adherence, lease management, and high-level project oversight while contracting execution to specialized firms.
- **Mine Developers and Operators (MDOs)**: Firms such as **Adani and Thriveni** execute end-to-end mine development under long-term contracts with mine owners. Their scope covers exploration, infrastructure setup, extraction, and processing, acting as primary contractors for large-scale projects.
- **Mining Service Providers**: India's mining service providers deliver specialized technical solutions, categorized into:
  - **General mining contractors** (e.g., JMS Mining, Reliant Mining) executing drilling, blasting, and excavation.
  - **Raise boring specialists** (e.g., Master Drilling, Laxyo Ltd.) deploying imported rigs for precision vertical shafts in deep mines (>1 km), replacing explosive methods under regulatory bans.

Raise boring is not currently being provided by mining service providers due to lack of experience in the market, creating opportunities for this category of players.

Figure 10-2: Ecosystem of India's Mining and Raise Boring Market

Source: Ken Research Analysis

Positioning of Laxyo Ltd. In Raise Boring Market of India and Africa:

Laxyo provides mining services to mines in India **s**uch as material handling. It is positioned as **the only Indian company having raise boring machinery in India and is the 2nd largest raise boring operator with market share of 22% in India after Master Drilling as of FY'25.** It is currently entering into the African markets, through a contract won in Zambia, where it will be competing with legacy players such as Master Drilling, Murray & Roberts, Red Path and more.

10.2.3 Cross-Comparison of Peers in India Raise Boring Market

Some of the key competitors competing in the country's Raise Boring Market are benchmarked on the basis of operational and financial parameters as follows:

Table 10-4: Cross-Comparison of Peers in India Raise Boring Market on basis of Operational Parameters, as on Mar 2026 (1/4)

Players	Geographical Presence & Reach	Presence in Sector	Project Portfolio
Laxyo Ltd.	**Domestic only** Present in over 8 States of India, with one corporate office & 2 regional offices	• Railway Construction • O&M Work • Surface Mining Service • Raise Boring/ Underground Mining • Dredging & Reclamation • P Way Material Supply • Material Handling • Rental Services	• **Current Projects:** Raise Boring project in Zambia for INR 200 crore, **Project carried out for Hindustani Zinc** • **Expected projects:** Hydropower project of NHPC, Malanjkhand Copper Project, Madhya Pradesh
Master Drilling India Private Limited	**Domestic & International** Present in over 28 Countries on 5 Continents	• Rock Boring • Exploration Drilling • New Technologies • Mining Services	• **Vedanta at Hindustan Zinc Contract** has been extended until 2028, covering 7,000 meters of raise boring annually

Source: Ken Research Analysis, Companies' Websites, Annual Reports

Table 10-5: Cross-Comparison of Peers in India Raise Boring Market on basis of Strength and Weakness, as on Mar 2026 (2/4)

Players	Strengths	Weaknesses
Laxyo Ltd.	• Active in vertical shaft development for mining and infrastructure • Owns and operates raise boring machines	• Operates mostly in domestic projects; no international exposure • Still scaling operations in comparison to global standards

Players	Strengths	Weaknesses
	• Executes turnkey packages including drilling, mucking, and lining	• Limited OEM-level technology integration
Master Drilling India Private Limited	• Subsidiary of global raise boring leader Master Drilling Group • Access to advanced raise boring rigs and automated boring systems • Experience across multiple shaft diameters and depths, globally and in India	• Higher project cost structure due to imported equipment and global overheads • Limited execution presence beyond mining sector in India

Source: Ken Research Analysis, Companies' Websites, Annual Reports

10.3 Dredging and Reclamation Market

10.3.1 Key Factors Shaping Competition

Competition in India's dredging and reclamation market is **shaped by a mix of technical, regulatory, and commercial factors.** The **type of dredger required, depends on** regional seabed conditions such as **soft silt, clay, or hard bedrock, as well as project depth and volume**. Players with specialized fleet and equipment suited for both shallow inland waterways and deep-sea or rocky terrains hold a distinct advantage.

Pricing remains a critical driver, especially for government contracts. The presence of global players with advanced capabilities and economies of scale intensifies competition. Additionally, a growing regulatory push and stricter environmental norms have expanded the market while raising entry barriers; favoring technically sound and financially robust firms with experience in environmentally compliant operations.

Competition in India's dredging market is shaped by high technical, financial, and operational standards that favour financially sound and technically capable firms.

- **Financial Strength and Liquidity:** Firms must demonstrate strong annual turnover and liquidity to mobilize dredgers and sustain cash flows, as payments are milestone-based and advances limited.
- **Execution Experience:** Proven track records in capital and maintenance dredging under strict environmental and regulatory frameworks are critical. Making it difficult for new players to enter.
- **Specialized Equipment Ownership:** Based on dredging requirements of ports, having large flets of specialised dredgers (trailer suction, cutter suction etc.) and advanced echo-sounder survey machines, allow for competitive advantage over other bidders. High CAPEX, banking restrictions, and limited second-hand markets raise entry barriers.

Currently, in a landscape where 25-30 players are participating, the top five firms hold about 80% market share. **With only 60–80 domestic dredgers in total, the sector remains highly concentrated and capital-intensive, presenting significant barriers to entry.** This market structure primarily benefits established firms with strong financial resources, equipment ownership, and regulatory expertise.

10.3.2 Ecosystem of Players in the Market

The Indian dredging market comprises a mix of **pure-play dredging specialists** and **diversified marine contractors**. **Dredging Corporation of India (DCI)** is the only true pure-play operator, focused exclusively on maintenance and capital dredging, land reclamation, and beach nourishment. In contrast, **Jan De Nul, DEME, Van Oord,** and **Adani Ports** are diversified marine contractors that integrate dredging into broader portfolios, including offshore works and port infrastructure. The **fleet sizes referenced here include only dredgers** (TSHDs, CSDs, backhoe dredgers).

By revenue:

- **Large players** (₹500 cr+): **DCI, Jan De Nul, DEME, Van Oord, Adani Ports** – dominate capital and reclamation works for major ports.
- **Medium players** (₹100–500 cr): **Sahara** and **KMEW** – execute mid-sized port and riverine dredging, balancing capital and maintenance projects.
- **Small players** (<₹100 cr): **Laxyo, Amrut, Meka, Reach Dredging** – focus on maintenance dredging and subcontracted assignments.
-

By fleet size:

- **10+ dredgers: DCI, Jan De Nul, DEME, Van Oord, Adani Ports** – capable of multi-port, high-volume capital projects.
- **5–10 dredgers: Sahara, KMEW** – regional mid-scale operators for specialized port and inland works.
- **<5 dredgers: Laxyo, Amrut, Meka, Reach** – niche contractors for localized maintenance and support roles.

This **tiered ecosystem** shows global majors and large domestic entities handling capital-intensive, multi-port assignments, while mid- and small-scale players focus on localized or support dredging. However, it as these localised fronts, that local players are able to gain highest margins anywhere in the range between 20%-80%.

Figure 10-3: Ecosystem of India's Dredging and Reclamation Market

Source: Ken Research Analysis;
Note: Revenue only from Dredging

Positioning of Laxyo Ltd.. In Dredging and Reclamation Market:

Laxyo is positioned as a small player in the Dredging and Reclamation market competing against and odd ~30 players (both global and domestic). As financing of dredging machinery acts as an entry barrier, and the dredging market of India is expected to grow till 2047 consistently, Laxyo is positioned to take part in that growth as a supplier. Currently, Laxyo does not deal with hardrock beds, but **plans to procure 550mm dredger** and increase capabilities for the same.

10.3.3 Cross-Comparison of Peers in India Dredging & Reclamation Market

Some of the key competitors competing in the country's Dredging Market are benchmarked on the basis of operational and financial parameters as follows:

Table 10-6: Cross-Comparison of Peers in India Dredging & Reclamation Market on basis of Operational Parameters, as on Mar 2026 (1/4)

Players	Geographical Presence & Reach	Presence in Sector	Project Portfolio	Categories Serviced
Laxyo Ltd.	**Domestic only** Present in over 8 States of India, with one corporate office	• Railway Construction • O&M Work • Surface Mining Service • Raise Boring/ Underground Mining • Dredging & Reclamation • P Way Material Supply • Material Handling • Rental Services	• **Ongoing Projects:** Dredging Projects at Bujh, Digah Port and Bharuch • **Past Projects:** Desilting for Industrial plants such as Rourkela Steel Plant, Dredging at Kochi LNG petro net terminal, Dredging at TS Canal between Padmanbhan jetty and the mine at Vattakyal and more Ongoing projects worth INR 10 crore	It is involved in **dredging during port development & dredging for inland waterways**
Knowledge Marine & Engineering Works Limited	**Domestic & International** Present in over 10 Domestic and International ports	• Owning and Operating Marine Crafts • Dredging • Repairs and Maintenance	• **TSHD at Kolkata Port:** Knowledge Infra Ports Pvt. Ltd. Secured a contract of INR 87.89 crores and Indian Ports Dredging Private Limited Port contract for INR 23.69 crores	It is involved in both **port development & inland waterways**
Dredging Corporation of India (DCI)	**Domestic & International** Catering to 10 of the 12 major ports in India	• - Maintenance Dredging • Capital Dredging • Land Reclamation and Beach Nourishment • Inland Waterways • Shallow Water Dredging • Project Management Consultancy	• **Haldia Channel of Kolkata Port Trust** • **New Sand Trap and Visakhapatnam Port Trust** • **Cochin Port** • **River Muriganga in P. S. Kakdwid & Sagar, District South 24 Parganas**	DCI provides services across **port development, inland waterways, and coastal erosion control**.

Source: Ken Research Analysis, Companies' Websites, Annual Reports

Table 10-7: Cross-Comparison of Peers in India Dredging & Reclamation Market on basis of Strength and Weakness, as on Mar 2026 (2/4)

Players	Strengths	Weaknesses
Laxyo Ltd.	• Executes inland dredging and desilting contracts across riverbeds, reservoirs, and canals • Operates in both government and industrial contracts • Asset-backed operations with in-house dredgers and excavation equipment	• Operates mostly in shallow water, inland, and mid-sized projects • Limited marine engineering expertise
Knowledge Marine & Engineering Works Ltd	• Specialized in maintenance dredging for ports, harbors, and navy dockyards • Asset-light model with leased and owned dredgers • Diversifying into underwater repairs and reclamation services	• Relatively small fleet size • Limited presence in capital dredging and offshore reclamation • Higher dependence on select government clients
Dredging Corporation of India (DCI)	• Largest public-sector dredging company in India • Extensive experience in capital and maintenance dredging for major ports • Owns large trailing suction hopper dredgers (TSHDs) and cutter suction dredgers (CSDs)	• Slower fleet modernization and high maintenance costs • Limited operational flexibility due to PSU structure • Faces competition from foreign firms in large contracts

Source: Ken Research Analysis, Companies' Websites, Annual Reports

10.4 Operations & Maintenance in Industrial & Power Plants Market

10.4.1 Key Factors Shaping Competition

Competition in India's industrial plant O&M market hinges on technical expertise, regulatory compliance, and reliable performance. Different sectors such as power, steel, cement, chemicals demand specialized knowledge of boilers, turbines, material-handling units, and effluent systems. Providers with multi-sector experience and the ability to manage critical assets gain a clear edge.

Contracts are often **performance-linked**, focusing on equipment availability, efficiency, and output, making preventive maintenance and reliability as important as cost.

Key differentiators:

- **Technical expertise** in complex plant systems
- **Regulatory compliance** with safety and environmental norms
- **Proven reliability** in minimizing downtime
- **Preventive and predictive maintenance** capability

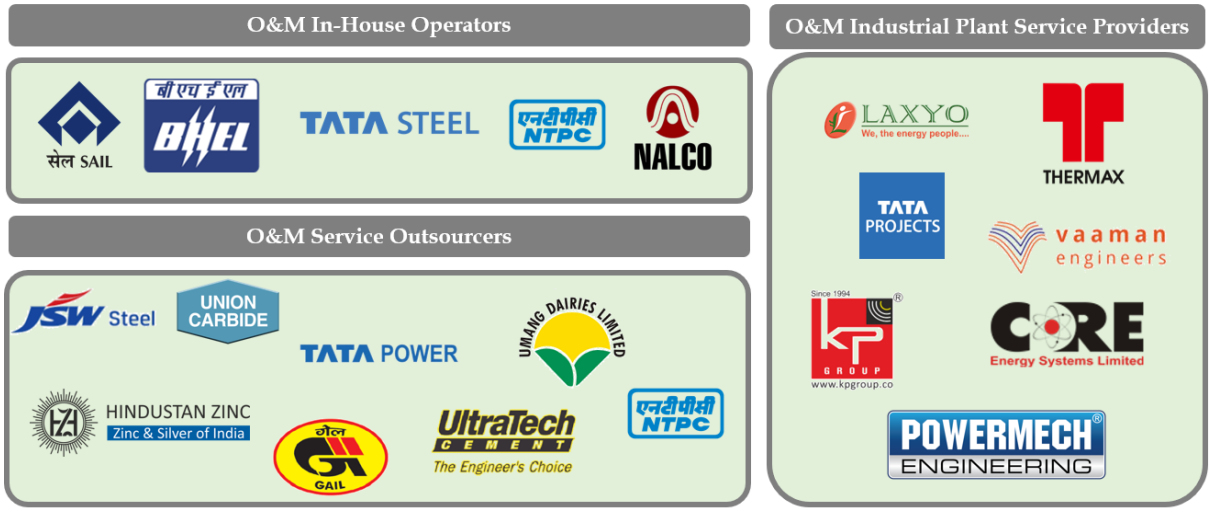
10.4.2 Ecosystem of Players in the Market

The ecosystem of India's Operations and Maintenance (O&M) services in industrial plants comprises three key segments.

- **O&M In-House Operators**: such as **SAIL, BHEL, NTPC, Tata Steel,** and **NALCO** manage critical plant operations internally.
- **O&M Service Outsourcers:** including **Hindustan Zinc, Ultratech Cement, Union Carbide etc.** engage third-party providers for maintenance of their industrial plants.
- **O&M Industrial Plant Service Providers** features specialized companies like **Laxyo, Thermax, Vaaman Engineers, KP Group, CORE Energy,** and **Power Mech**, offering tailored solutions across sectors such as power, metals, chemicals, and infrastructure.

Typically, larger players with industrial and power plants, majorly outsource their O&M operations based on cost consideration as discussed above in market analysis, smaller players tend to keep inhouse operations. **However, the supply landscape for O&M service providers is highly competitive with ~ 300+ players participating at regional and national levels.**

Figure 10-4: Ecosystem of India Operations and Maintenance in Industrial & Power Plants Market



Source: Ken Research Analysis

Positioning of Laxyo Ltd. In O&M Market for Industrial and Power Plants:

In the O&M market, Laxyo is competing in a highly fragmented market with more than 300+ players, with varying degrees of capabilities serving different sizes of industries. Laxyo has capabilities to provide mechanical, electrical and control/instrumentation maintenance, and

execute project sizes of INR 1 to 50 crore. It has previous experience of providing O&M services to cement plants in India. As more and more factories, especially smaller inexperienced ones shift to O&M outsourcing strategy, Laxyo is well positioned to serve the needs of the market.

10.4.3 Cross-Comparison of Peers in India Operations and Maintenance in Industrial Plants Market

Some of the key competitors competing in the country's O&M Market are benchmarked on the basis of operational and financial parameters as follows:

Table 10-8: Cross-Comparison of Peers in Operations and Maintenance in Industrial Plants Market on basis of Operational Parameters, as on Mar 2026 (1/4)

Players	Geographical Presence & Reach	Presence in Sector	Clients
Laxyo Ltd.	**Domestic only** Present in over 8 States of India, with one corporate office	• Railway Construction • O&M Work • Surface Mining Service • Raise Boring/ Underground Mining • Dredging & Reclamation • P Way Material Supply • Material Handling • Rental Services	• **Current Projects:** Vedanta • **Past Projects:** • Umang Dairies Ltd. • Birla Cement • JSW Cement • JK Cement
Thermax Ltd	**Domestic & International** Present in over 30 Countries, over 31 states and 92 Countries served	• Energy • Environment • Chemicals • Services • Power O&M Industries	• **Birla Century** • **Sharjah Cement** • **Isabella Biomass Energy Corporation** • **Sudarshan Chemical Industries** • **TARA Metaliks** • **Wonder Cement**
KP Energy Ltd.	**Domestic only** Operates across 33 locations in districts	• EPC • O&M • IPP	• **UPL Limited** • **L&T–MHI Power Boilers Private Limited** • **Meghmani Organics Ltd.** • **Colourtex Industries Pvt. Ltd** • **Jaisal Silk Mills Pvt. Ltd.** • **Gandhar Food Products Pvt. Ltd.**

Source: Ken Research Analysis, Companies' Websites, Annual Reports

Table 10-9: Strength and Weakness of Peers in Operations and Maintenance in Industrial Plants in India, as on Mar 2026 (2/4)

Players	Strengths	Weaknesses
Laxyo Ltd.	• Provides O&M services across power plants, material handling systems, and mining equipment • Active in government and private-sector industrial contracts • Offers integrated staffing, mechanical maintenance, and repair services	• Services mostly limited to mechanical and field-level O&M • Lower presence in automation, control systems, and high-end utility maintenance
Thermax Ltd	• Strong O&M expertise in boilers, water treatment, captive power plants, and energy systems • In-house engineering, procurement, and commissioning capabilities • Offers performance-based O&M and energy audits	• Focused mainly on O&M of systems supplied by Thermax • Higher service cost structure due to technology-intensive offerings
KP Energy Ltd	• Specializes in O&M for wind energy assets including turbines, substations, and evacuation infrastructure • Provides SCADA-based monitoring and fault diagnostics • Involved in lifecycle management of renewable energy plants	• Sector-specific focus; limited exposure to non-renewable industrial O&M • Lower scale in conventional power or manufacturing plant O&M services

Source: Ken Research Analysis, Companies' Websites, Annual Reports

Table 10-10: Operational and Financial KPI comparison of all the Peers of Laxyo Ltd. in all the segments

Unit		KM	KM	KM	Amount in Cr.	No. of Holes	MT	MT	Amount in Cr.	Amount in Cr.	%	%	%	No.	No.	No.	Amount in Cr.	Amount in Cr.	Amount in Cr.
Company	Financial Year	Railway Tracks Laying - Manual	Specialized Track Laying Job PQRS Machine	Track Maintenance	Consolidated Order Book	Length of Holes drilled	O&M - Production	Quantity of Material Dredged	Revenue From Operations**	EBITDA	EBIDTA Margin	PAT Margins	Return on Equity	Debt-Equity Ratio	Current Ratio	Asset Turnover Ratio	Net working capital	Gross Debt	Net Worth
Laxyo Ltd.	FY26 H1	16	44.6	18	1,255	203	4,76,797	0	110.8	13.9	12.50%	5.64%	9.48%	1.3	1.2	0.63	9.96	86.4	65.81
	FY25	24	70	32	1,148	587	9,01,585	38,814	211.1	29.9	14.16%	5.52%	19.36%	0.9	1.6	1.47	20.08	53.2	60.19
	FY24	38	0	27	744	694	9,13,833	1,93,810	174.3	19.4	11.11%	3.63%	13.04%	0.9	1.1	1.31	3.41	45.5	48.54
	FY23	75	0	38	292	350	9,40,183	2,59,061	133.8	16.3	12.21%	3.68%	11.67%	1.0	1.1	1.04	2.18	42.3	42.21
Larsen & Toubro	FY26 H1	N/A	N/A	N/A	N/A				1,31,662.5	13,136.0	9.98%	6.83%	7.58%	1.09	1.25	0.34	50,175.32	1,30,621.77	1,01,383.55
	FY25	N/A	N/A	N/A	5,79,137				2,55,734.5	26,435.0	10.34%	6.91%	16.34%	1.12	1.21	0.18	43,213.37	1,29,559.34	97,655.60
	FY24	N/A	N/A	N/A	4,75,809				2,21,112.9	23,494.0	10.63%	7.03%	14.87%	1.11	1.23	0.17	40,473.78	1,14,039.77	86,359.24
	FY23	2,801	N/A	N/A	3,57,595				1,83,340.7	20,753.0	11.32%	6.84%	12.28%	1.14	1.36	N/A	59,149.53	1,18,513.38	89,325.95
Afcons Infrastructures	FY26 H1	N/A	N/A	N/A	32,681.00				6,358.8	925.1	14.55%	3.81%	9.11%	0.64	1.34	0.35	3,037.61	3,472.10	5,282.89
	FY25	N/A	N/A	N/A	36,869.00				12,548.4	1,661.8	13.24%	3.88%	10.99%	0.42	1.36	0.22	3,021.22	2,235.72	5,136.65
	FY24	N/A	N/A	N/A	30,961.00				13,267.5	1,583.1	11.93%	3.39%	13.28%	0.80	1.06	0.26	1,091.80	2,455.01	3,597.51
	FY23	N/A	N/A	N/A	30,406.00				12,637.4	1,373.8	10.87%	3.25%	13.97%	0.59	1.03	0.28	725.03	1,562.83	3,177.25
IRCON International Ltd	FY26 H1	N/A	N/A	N/A	23,865.00				4,168.0	620.9	16.50%	6.57%	9.49%	0.78	1.63	0.19	4,380.93	5,084.07	6,458.51
	FY25	N/A	N/A	N/A	20,346.65				10,759.6	1,276.0	11.86%	6.76%	11.93%	0.67	1.59	0.15	4,245.21	4,264.32	6,237.43
	FY24	N/A	N/A	N/A	27,208.00				12,330.9	1,510.0	12.25%	7.54%	16.77%	0.43	1.60	0.19	4,875.85	2,567.16	5,771.76
	FY23	N/A	N/A	N/A	35,195.00				10,367.9	1,116.5	10.77%	7.38%	15.50%	0.29	1.49	0.17	3,951.96	1,504.21	5,178.48
Texmaco Rail & Engineering Limited	FY26 H1	N/A	N/A	N/A	N/A				2,168.7	142.9	6.59%	4.30%	3.26%	0.31	2.28	0.44	2,016.03	883.53	2,864.19
	FY25	27	N/A	4,000	N/A				5,106.6	524.9	10.28%	4.87%	6.68%	0.32	2.36	0.28	2,012.11	925.42	2,797.22
	FY24	N/A	N/A	N/A	N/A				3,502.9	326.1	9.31%	3.23%	4.56%	0.25	2.63	0.23	2,143.24	629.72	2,530.32

	FY23	*N/A*	*N/A*	*N/A*	*N/A*			2,243.3	156.6	6.98%	1.15%	1.48%	0.73	1.59	*N/A*	995.34	982.50	1,389.77
GR Infraprojects Limited	FY26 H1	*N/A*	*N/A*	*N/A*	*N/A*			3,589.9	785.2	21.87%	12.09%	4.98%	0.63	3.42	0.22	3,221.87	4,966.16	8,874.67
	FY25	*N/A*	*N/A*	*N/A*	19,179.90			7,394.7	1,831.7	24.77%	13.73%	12.61%	0.66	3.42	0.13	3,732.97	5,588.21	8,434.00
	FY24	*N/A*	*N/A*	*N/A*	16,780.61			8,980.2	2,225.1	24.78%	14.73%	19.08%	0.50	2.97	0.17	3,793.26	3,802.76	7,602.40
	FY23	*N/A*	*N/A*	*N/A*	19,530.00			9,481.5	2,641.0	27.85%	15.34%	26.26%	*N/A*	*N/A*	0.19	*N/A*	*N/A*	6,172.80
Master Drilling India Private Limited	FY25				*N/A*	*N/A*		157.5	54.3	34.46%	18.64%	22.37%	0.14	2.69	0.21	72.80	15.00	104.99
	FY24				*N/A*	*N/A*		162.1	66.5	40.99%	26.69%	31.82%	0.10	4.53	0.21	97.22	15.00	157.60
	FY23				*N/A*	*N/A*		143.7	56.9	39.59%	24.25%	36.00%	0.00	2.54	0.23	75.83	0.00	114.33
Thermax Ltd	FY26 H1				*N/A*		*N/A*	4,631.4	548.2	11.84%	5.87%	*N/A*	*N/A*	N/A	0.38	1,817.89	1,757.99	5,060.43
	FY25				*N/A*		*N/A*	10,388.7	1,160.0	11.17%	6.11%	15.25%	0.02	1.38	0.23	1,677.77	1,693.34	4,942.58
	FY24				*N/A*		*N/A*	9,323.5	1,030.0	11.05%	6.92%	12.95%	0.09	1.29	0.25	1,722.73	1,255.95	4,439.80
	FY23				*N/A*		*N/A*	8,089.8	757.7	9.37%	5.57%	10.59%	0.07	1.36	0.25	1,663.26	805.54	3,870.22
KP Energy Ltd.	FY26 H1				2,000+		*N/A*	520.2	114.3	21.97%	11.80%	17.83%	0.74	1.25	0.41	149.56	276.70	376.22
	FY25				2,260+		*N/A*	938.8	196.1	20.89%	12.29%	36.96%	0.73	1.39	0.26	206.17	227.59	312.01
	FY24				*N/A*		*N/A*	473.0	98.5	20.82%	12.33%	31.62%	0.54	1.38	0.24	118.00	100.49	184.43
	FY23				*N/A*		*N/A*	437.8	75.6	17.26%	10.03%	34.46%	*N/A*	1.22	0.32	30.68	40.27	127.40
Dredging Corporation of India	FY26 H1				*N/A*			*N/A*	454.0	71.9	15.83%	-12.67%	N/A	0.94	0.94	0.17	-43.41	1,059.38	1,158.06
	FY25				1,005.00			7,58,46,000	1,142.1	139.7	12.23%	-2.40%	-2.00%	0.76	0.98	0.11	-12.61	922.93	1,221.49
	FY24				*N/A*			8,40,37,500	945.5	201.8	21.31%	3.51%	3.00%	0.44	0.78	0.10	-178.60	558.00	1,263.02
	FY23				*N/A*			9,92,22,000	1,164.8	175.0	15.02%	1.08%	-16.00%	0.23	0.71	0.13	-282.30	381.60	1,229.24
Knowledge Marine & Engineering Works Limited	FY26 H1				1,749.89			*N/A*	98.6	39.9	40.46%	22.77%	9.00%	*N/A*	1.57	0.23	110.49	145.68	242.61
	FY25				882.00			*N/A*	200.7	78.2	38.97%	24.72%	18.00%	0.48	1.62	0.15	92.08	133.48	219.89
	FY24				733.00			*N/A*	163.6	49.9	30.49%	18.61%	16.00%	0.06	3.00	0.17	82.78	60.20	170.25

FY23		202.84		N/A	201.5	68.7	34.08%	23.42%	35.00%	0.18	2.01	0.33	86.16	24.14	136.62

Source: Companies' Websites, Annual Reports, ROC Fillings

Note 1: FY23 indicates financial year which starts from 1st April 2022 and ends on 31st March 2023.

Note 2: FY24 indicates financial year which starts from 1st April 2023 and ends on 31st March 2024.

Note 3: FY25 indicates financial year which starts from 1st April 2024 and ends on 31st March 2025.

Note 4: FY26 (H1) indicates half-yearly figures for the period April 2025 to September 2025 (unaudited).

Note 5: N/A indicates not available or not applicable; metric not reported / not disclosed for the stated period.

Note 6: The financials include business numbers from all the segments of their business unless stated otherwise.

Note 7: Laxyo Ltd. numbers represent consolidated figures from all business segments.

Note 8: Master Drilling India Pvt. Ltd.'s revenue includes income from raise boring, slot hole boring, pilot drilling, reaming, and related mining support services.

Note 9: Texmaco Rail & Engineering Ltd. FY25 consolidated financials include Texmaco West Rail Ltd. (amalgamated effective 1st April 2025); FY25 figures are therefore not directly comparable to FY24.

Note 10: DCIL (Dredging Corporation of India Ltd.) and Master Drilling India Pvt. Ltd. financials are on a standalone basis; all other companies are on a consolidated basis.

Note 11: Quantity of Material Dredged (MT) for DCIL is derived from disclosed volumes in Lakh Cubic Metres (LCuM) using a density conversion factor of 1.50 t/m³.

Note 12: Order Book is as of fiscal year end (31st March) unless stated otherwise. KP Energy Ltd. order book figures are management-guided estimates in INR Crores; the company primarily reports its pipeline in GW terms. DCI orderbook as of Aug 2024

Return on Equity (ROE) = PAT / Average Total Shareholders' Equity

Debt-Equity Ratio = Total Debt / Total Equity (considered disclosed data wherever available and computed if disclosed data is matching); IRCON Debt to Equity = Gross Debt / Total Equity

EBITDA Margin (%) = EBITDA / Revenue from Operations × 100

PAT Margin (%) = PAT / Revenue from Operations × 100

Net Working Capital = Total Current Assets − Total Current Liabilities; Afcon infra and Thermax ratio is computed on standalone fig as disclosed by the board

Asset Turnover Ratio (Times) = Revenue from Operations / Average Total Assets (Opening + Closing Total Assets / 2); H1 figures use closing Total Assets; Dredging Corporation of India data reports closing total asset for FY'2025 and H1'2026

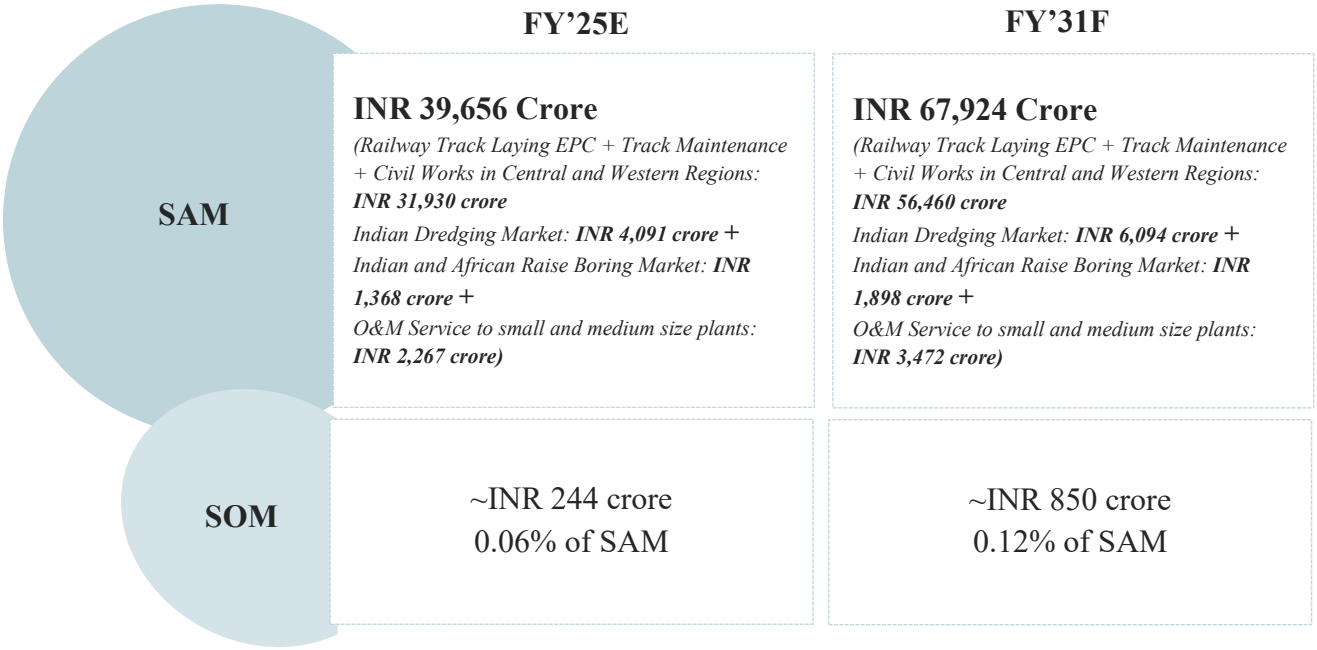
Net Worth is taken as Net Worth - per Sec 2(57) (disclosed) wherever available otherwise considered as Total Equity (incl. NCI)

11. CONCLUSION: WAY FORWARD

Laxyo Ltd. has capabilities across **Railway Infrastructure EPC, Dredging, Mining & raise boring, O&M services to Industrial and Thermal plants as well experience in construction of civil works in India *(and Raise Boring in Africa)*.** This positions the Laxyo as an integrated EPC player.

Currently, Laxyo Ltd. has a **Serviceable Addressable Market (SAM) of ~₹39,656 crore in FY25E, expanding to ~₹67,924 crore by FY31F**. Presence across critical spaces such as railway EPC, raise boring and dredging which has a consolidated ecosystem position the company to tap a **Serviceable Obtainable Market (SOM) of INR 850 crore by FY31F**.

Figure 11-1: Positioning of Laxyo Ltd. as per SAM and SOM for 4 Key Markets



In the four **service lines, Laxyo Ltd. would concentrate its efforts over FY25E-31F to:**

- **Rail EPC & Track Maintenance**
  - Central and Western Railway zones from the government target of 44,488 km have over **5,000+ km** of new-line, doubling and gauge-conversion work in the pipeline, with less than 30% commissioned so far
  - Laxyo Ltd. is one of the 5 contractors in India that own PQRS machine, providing opportunity to execute Complete Track Renewal (CTR) projects across the country

- **Inland Dredging & Reclamation**

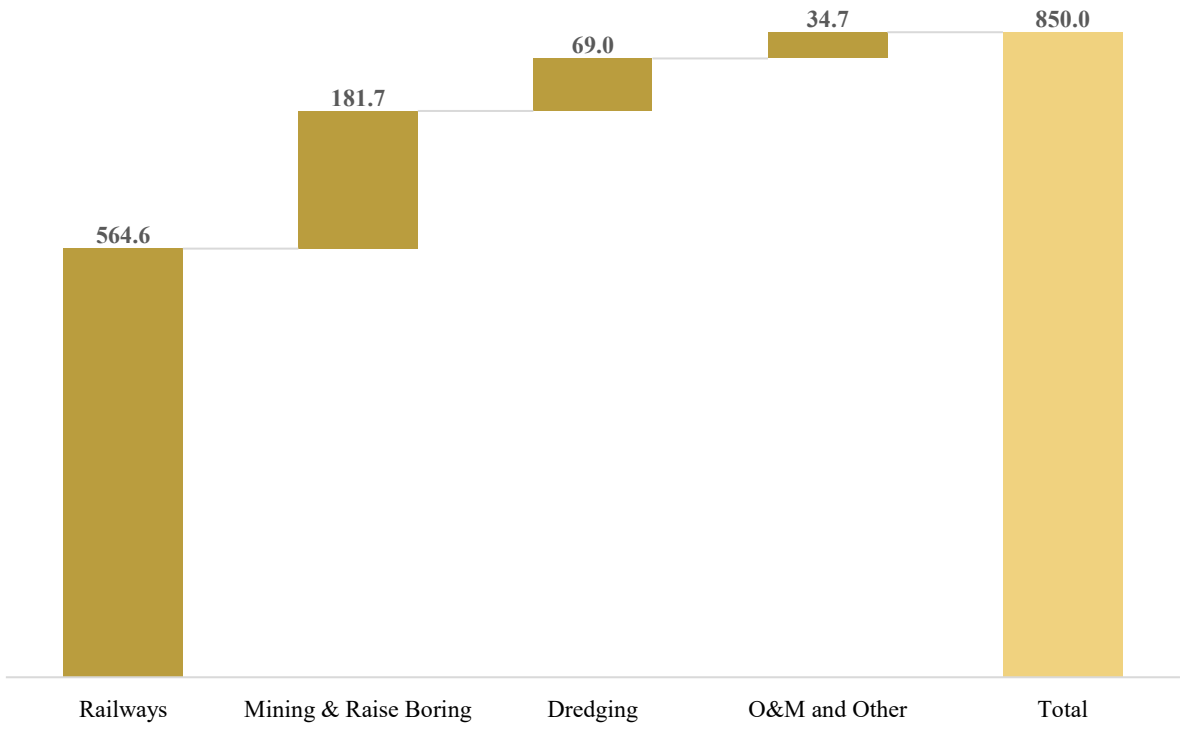
- Under IWAI there exists over 35 mcum of capital and maintenance dredging capacities exist that require dredging. This offers Laxyo Ltd. to compete with small sized players allowing it to execute more projects in Inland Dredging.
- Maintenance dredging which takes place pre and post monsoon are typically 4–6-month long contracts. They also offer opportunities for recuring contracts to come up.

- **Raise-Boring & Underground Mining Services**
  - Typical rigs cost ₹30–45 crore and require 10-month import lead times. Laxyo is among the 2 players in the country with existing raise boring machinery and operators, will allow them to tap into this space

- **O&M for Small & Medium Industrial Plants**
  - Ageing assets and companies moving towards outsourced O&M models to cut on costs are pushing owners toward **performance-based, multi-disciplinary O&M bundles** (mechanical, electrical, C&I) where Laxyo's EPC skills translate into uptime guarantees

Assuming a market share of 1-2% in rail EPC and ~3-5% in niche markets such dredging/raise-boring, the company can realistically secure a serviceable obtainable market of INR **850 crore by FY31F**, led by rail EPC but with higher-margin contributions from specialised mining and dredging scopes.

Figure 11-2: Potential Serviceable Obtainable Market Opportunity Split for Laxyo Ltd. (SOM) by FY'31F (in INR Crore)



Source: Ken Research Analysis

12. RESEARCH METHODOLOGY

12.1 MARKET DEFINITIONS

This study defines the **Engineering & Infrastructure Market in India as comprising four distinct segments:** Railway Infrastructure Spend, Mining Services and Raise Boring, Dredging & Reclamation, and Operations & Maintenance (O&M) for Industrial & Power Plants. Each of these markets has been sized based on the total value of EPC and O&M contracts awarded domestically, with all figures presented in INR crore and INR '000 crore to reflect the commercial scale of infrastructure development and outsourced operational services.

- **Indian Railway Infrastructure Spend:** focuses primarily on civil engineering works and track-related activities, including doubling of railway lines, construction of new lines, gauge conversion, and Complete Track Renewal (CTR). While signaling, electrification, and telecommunication are part of the broader scope of railway EPC, they are not the central focus of this study. The sizing reflects the value of contracts awarded for these core civil works.

- **Mining Services and Raise Boring Market:** captures the value of contractual services offered by specialized mining companies. These services include material handling, drilling and blasting, overburden removal, and raise boring operations for underground mines. The market sizing is based on the contract values awarded for these services across various mining regions in India.

- **Dredging & Reclamation Market:** includes both capital and maintenance dredging activities carried out at seaports and inland waterways. The market size is determined by the value of dredging and reclamation contracts awarded, as well as the volume of dredging conducted, measured in million cubic meters (CuM). This provides a comprehensive view of the scale and intensity of dredging operations within the country.

- **Industrial Operations & Maintenance (O&M) Market:** refers to outsourced O&M services for industrial facilities and power plants. This includes mechanical and electrical maintenance, utility operations, and facility management services. The market sizing reflects the value of long-term service

All market estimations in this study have been primarily derived from **extensive secondary research**, with a strong reliance on publicly available data from **government sources**, including annual budgets, project award databases, ministry reports, and infrastructure

development plans. These sources provided a comprehensive and credible foundation for assessing the value of contracts awarded across the four markets. For more niche segments such as Raise Boring and Industrial O&M, where granular public data is limited, additional insights were drawn from company disclosures, industry publications, and supply-side assessments of key market participants. A triangulation approach was used to ensure consistency across data points and to align the estimations with actual market activity and contract flows within India.

Additional comments:

1. More color on the reginal data and players
2. On civil construction in railway and nhai amendment in relation to 20% net worth lock from bidding perspective
3. Broad level data on railway and how much more work expected in various railway segments like
   - Repair of railway track to extend the life
   - New railway track laying
   - Things which are getting privatized and railway's take on this
   - Etc.
4. Refer recent industry reports from financial and operational benchmarking / competitive analysis flow perspective

12.2 ABBREVIATIONS

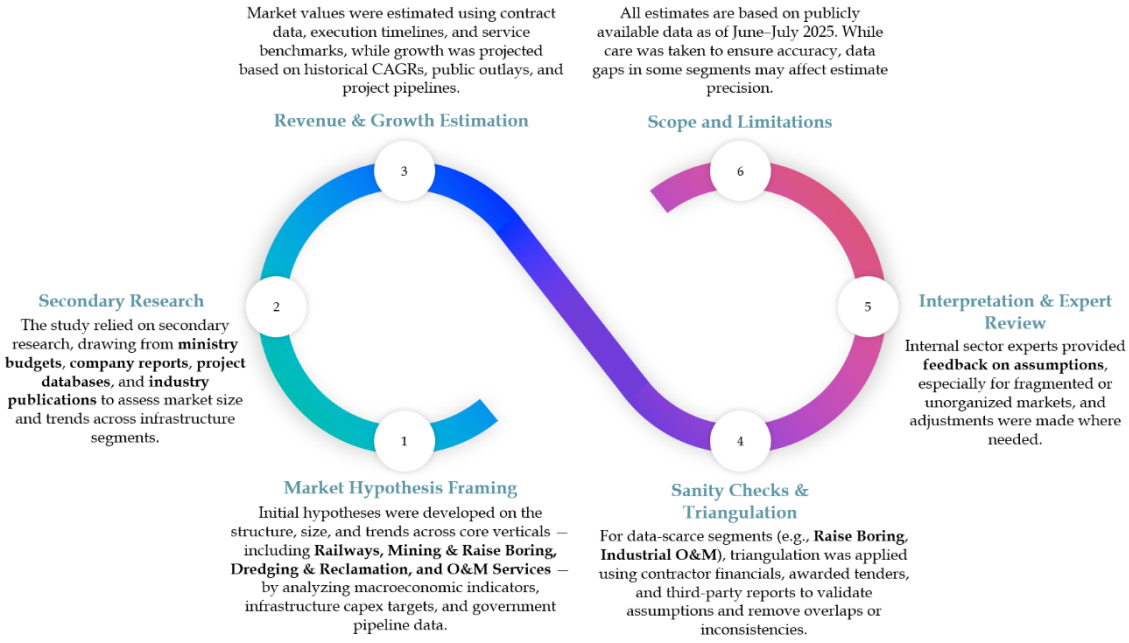
AI	Artificial Intelligence
AMRUT	Atal Mission for Rejuvenation and Urban Transformation
ATUFS	Amended Technology Upgradation Fund Scheme
BHEL	Bharat Heavy Electricals Limited
BOCW	Building and Other Construction Workers Act
BOO	Build Own Operate
CBTC	Communications-Based Train Control
CEA	Central Electricity Authority
CPSE	Central Public Sector Enterprise
CRISIL	Credit Rating Information Services of India Limited
CRZ	Coastal Regulation Zone
CTR	Complete Track Renewal
DBFOT	Design Build Finance Operate Transfer
DFCCIL	Dedicated Freight Corridor Corporation of India Limited
DFC	Dedicated Freight Corridor
DPR	Detailed Project Report
EIA	Environmental Impact Assessment
EPC	Engineering Procurement Construction
ESG	Environmental Social and Governance
EV	Electric Vehicle
FTK	Freight Ton-Kilometre
FY	Financial Year
FY BE	Financial Year Budget Estimates
FY RE	Financial Year Revised Estimates
GDP	Gross Domestic Product
GBS	Gross Budgetary Support

GCC	General Conditions of Contract
GOI	Government of India
GPS	Global Positioning System
HAM	Hybrid Annuity Model
HSR	High Speed Rail
INR	Indian Rupee
InvIT	Infrastructure Investment Trust
IT	Information Technology
JV	Joint Venture
KPI	Key Performance Indicator
MIDC	Maharashtra Industrial Development Corporation
MMDR	Mines and Minerals (Development and Regulation) Act
MMLP	Multi-Modal Logistics Parks
MNP/NMP	National Monetization Pipeline
MNRE	Ministry of New and Renewable Energy
MoF	Ministry of Finance
MoHUA	Ministry of Housing and Urban Affairs
MoR	Ministry of Railways
MoSPI	Ministry of Statistics and Programme Implementation
MSME	Micro Small and Medium Enterprises
MSP	Minimum Support Price
MTPA	Metric Tonne Per Annum
NMEP	National Mineral Exploration Policy
NIP	National Infrastructure Pipeline
NLP	National Logistics Policy
NMP	National Monetization Pipeline
NSWS	National Single Window System
NTPC	National Thermal Power Corporation
O&M	Operations and Maintenance
PMAY	Pradhan Mantri Awas Yojana
PMGSY	Pradhan Mantri Gram Sadak Yojana
PPP	Public-Private Partnership
PSU	Public Sector Undertaking
PVT	Private
R&D	Research and Development
RDSS	Revamped Distribution Sector Scheme
SAM	Serviceable Addressable Market
SOM	Serviceable Obtainable Market
TAM	Total Addressable Market
RVNL	Rail Vikas Nigam Limited
IRCON	IRCON International Limited
IRSDC	Indian Railway Stations Development Corporation
RLDA	Rail Land Development Authority

IREPS	Indian Railways E-Procurement System
NHSRCL	National High Speed Rail Corporation Limited
JNPT	Jawaharlal Nehru Port Trust (now JNPA)
IWAI	Inland Waterways Authority of India
DCI	Dredging Corporation of India
MIV	Maritime India Vision 2030
AMKV	Amrit Kaal Maritime Vision 2047
NCMM	National Critical Mineral Mission
DGMS	Directorate General of Mines Safety
MoEFCC	Ministry of Environment, Forest & Climate Change
NGT	National Green Tribunal
CIL	Coal India Limited
MOIL	MOIL Limited (formerly Manganese Ore India Limited)
UCIL	Uranium Corporation of India Limited
NMDC	National Mineral Development Corporation
NHPC	NHPC Limited (formerly National Hydroelectric Power Corporation)
CEEW	Council on Energy, Environment and Water
NRP	National Rail Plan 2030
GCT	Gati Shakti Cargo Terminal
PFT	Private Freight Terminal
RTIS	Remote Tracking and Information System
SPV	Special Purpose Vehicle
OHE	Overhead Equipment / Electrification
RKM	Route Kilometre
mcum	Million Cubic Metres
MMT	Million Metric Tonnes
MDO	Mine Developer and Operator
DEME	DEME Group
TSHD	Trailing Suction Hopper Dredger
BOT	Build Operate Transfer
SEZ	Special Economic Zone
GVA	Gross Value Added
FDI	Foreign Direct Investment
CAPEX	Capital Expenditure
EBITDA	Earnings Before Interest, Tax, Depreciation & Amortisation

12.3 Market Sizing and Modeling

CONSOLIDATED RESEARCH APPROACH



This study relies on **secondary research**, drawing from a wide range of publicly available and credible sources to estimate market sizes and understand sectoral dynamics. Data was collected from government publications, ministry reports, infrastructure project databases, annual budget documents, and industry white papers. These sources provided detailed insights into contract awards, project execution timelines, and regional distribution of infrastructure activities. Additional information was gathered from company websites, investor presentations, and trade association reports to understand market participation, service offerings, and competitive landscape. This approach enabled a comprehensive understanding of market trends, demand drivers, regional variations, and operational models across the four segments. The use of structured and validated secondary data ensured that the findings are aligned with actual supply-side activity and reflect the evolving nature of India's engineering and infrastructure ecosystem.

LIMITATIONS

Due to the niche and fragmented nature of certain focus markets within India's engineering and infrastructure ecosystem, comprehensive datasets were not consistently available. Markets such as **Raise Boring** and **O&M for Industrial and Power Plants** lack centralized reporting, making it difficult to obtain granular data on contract values and market participation. In the case of **Dredging & Reclamation**, challenges stemmed from fragmented market structures and limited transparency, further complicated by **varying cost structures across projects and inconsistent financial disclosures** from executing agencies. These factors made it difficult to confirm the aggregate market value with precision. To address these gaps, financial data from large listed and unlisted companies, along with industry reports and supply-side assessments, were used as proxies to estimate market size. While every effort was made to ensure accurate representation across segments and regions, the fragmented nature of these markets and limited public data may result in estimation variances. These projections, though robust and grounded in validated secondary inputs, may not fully account for raw material price fluctuations or service costs.

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