



COVID-19: Assessment of economic impact on construction sector in India

May 2020

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Executive Summary

As with most parts of the world, India is also trying to respond to the challenges of the post COVID-19 reality, which has come to define a new normal for our economy and the society at large.

The infrastructure and construction sectors, which are primarily responsible for India's growth story, are already facing the headwinds from the COVID-19 pandemic and cannot expect to be insulated from its damaging impact. Further, the unorganised and fragmented nature of the construction sector is likely to exacerbate this effect. Investment in capital projects drives the demand side of the construction sector, and hence the impact of the COVID-19 pandemic on Gross Value Added (GVA) and employment could be significant in the near to long term.

The demand for construction projects has already fallen due to poor business sentiments, lower operating surpluses and incomes, diversion of funds for COVID-19 management, and credit and liquidity problems. While low economic activity in other sectors will impact construction services through forward linkages, a fall in construction output will also have a multiplier effect through the sector's backward linkages, creating a vicious cycle in overall economic activity.

This paper attempts to quantify the impact of the COVID-19 pandemic on the construction GVA and employment under different investment and economic scenarios. The methodology uses income and employment multipliers based on input-output analysis. As per KPMG in India analysis, we have estimated impact on GVA and employment corresponding to a range of possible scenarios. COVID-19 pandemic is likely to reduce investment in construction related projects in the range of 13 to 30 per cent, which has a significant impact on GVA and employment in this sector. Construction-related GVA and employment are expected to reduce between **15 to 34 per cent** and **11 to 25 per cent** respectively when compared to pre-crisis projections for FY21.

We will further update the findings in this paper in a subsequent version by incorporating supply side impacts and modelling labour and investment demand shocks within a framework of computational general equilibrium model.

KPMG in India also conducted a survey to assess the cost impact of the ongoing COVID-19 pandemic on construction projects, considering essential aspects, such as manpower, plant and machinery, and material and their net impact on overall construction cost. As per survey findings, labour costs for skilled workers are expected to rise by 20-25 per cent while that for the semi-skilled and unskilled workers are expected to rise by 10-15 per cent. The project implementation cost may not vary much for linear projects like irrigation canals, pipelines, transmission lines, roads, etc., but for the non-linear projects, the cost may rise by 2-5 per cent. Projects that are under development are likely to take a severe hit with a minimum delay of two to three months depending on their geography and impact from the pandemic in and around the project site. The overall impact on economy including construction sector in India has been estimated to the tune of INR 300 billion per day of delay due to the lockdown.*

Clearly, there is no universal panacea for the sector. COVID-19 is a unique and one of a kind event that has impacted not just construction but halted all major businesses linked within the project value chain. Pivoting to the new normal and full recovery from this downfall is likely to be slow for the construction sector. Recovery in employment levels in the sector and meeting project timelines and budgets will be critical to the revival of overall economy. It will depend majorly on short-term revival actions and medium to long term resilience strategies implemented by various stakeholders. Government, developers and contractors will have to collectively play their parts to ensure a revival in the overall construction ecosystem.

The recommendations covered in this paper address many such measures under short, medium, and long term categories. These measures underline the need to improve systems and processes for adequately responding to the current changing environment, and effectively confronting such disruptions in the future.

*Economic Times, 29 Apr 2020

1

Construction Sector Landscape

The construction industry in India is the second largest employer after agriculture, and it is therefore critical to the country's economic stability. With an industry size of INR 10.5 trillion,¹ it accounts for around 8 per cent of the nation's GDP and employs close to 57.5 million people. Also, being a core sector, there are numerous industries that are dependent on the construction activity in the country. For example, the construction equipment manufacturing industry comprises around 500 companies and is estimated to be sized at INR 375 billion by 2020.²

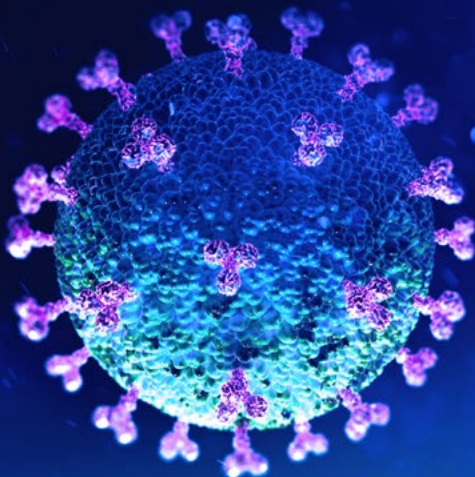
In India, the construction industry was the second largest recipient of Foreign Direct Investment (FDI) in 2017³ despite being quite fragmented. India has spent close to INR 82.5 trillion on infrastructure between 2008 to 2017. An additional investment of INR 337.5 trillion will be required in infrastructure by 2030 to sustain economic growth at current level. This is expected to create additional employment of 2.142 billion person years up to 2030 as

the sector has a high employment multiplier coefficient.

The construction sector is expected to face a simultaneous reduction in both supply and demand on account of this pandemic. As the sector is driven by infrastructure projects to a large extent, it is expected to be hit severely by the current levels of uncertainty, dismal business and consumer sentiments, loss of income as well as the diversion of government funds towards COVID-19 management.

Overall, low economic activity in other sectors would impact construction services through forward linkages. A fall in output of construction would also have a multiplier effect through backward linkage causing further shrinking of the overall economic activity. For economic sustainability in a post crisis reality, the construction industry will need to quickly devise ways to keep the masses employed, enhance quality of living, and more importantly, meet project timelines and budgets.

1. National Accounts Statistics, Ministry of Statistics and Program Implementation, Government of India, 2019-2020
2. Construction world Magazine – Digital Edition, April 2020
3. Building a sustainable future - Invest India, National Investment Promotion and Facilitation Agency, April 2020



Construction Sector Landscape

Roads and bridges, urban, digital infrastructure, railways, and irrigation sectors accounted for more than 94 per cent of the INR 82.5 trillion investment undertaken from 2008 to 2017.⁴

While the investment was significant, the quality of infrastructure called for improvement. This was reflected in the second pillar of the global competitiveness index. India ranked 70 out of 140 countries on infrastructure quality in the global competitive index.⁴

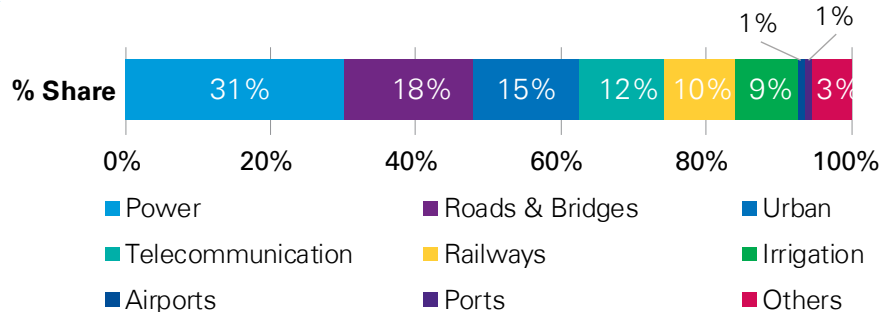


Exhibit-1: Sector wise share of Infrastructure investments of INR 80 Lakh Crore during FY 08 to FY19

Source: National Infrastructure pipeline

95% of the investment took place in six sectors alone namely Power, Roads and Bridges, Urban, Telecommunication, Railways and Irrigation



Construction in all sectors contributes to around 60 per cent of the total investments that take place in India. An investment of INR 100,000 in the sector contributes INR 150,000 for the GDP, generates INR 320,000 as total revenues and creates an employment for 0.68 person years.⁵

To address the lack of quality in infrastructure, there has been a focus on various schemes such as:

- Nal Se Jal
- Integrated Power Development Scheme (IPDS)
- Deen Dayal Upadhyay Gram Jyothi Yojana (DDUGJY) for improving the water and electricity utility infrastructure respectively
- Bharatmala
- Pradhan Mantri Gram Sadak Yojana (PMGSY) adopting standards in the quality of road infrastructure
- National logistics policy to improve the efficiency of transport services
- Atal Mission for Rejuvenation and Urban Transformation (AMRUT) scheme to enhance the quality of urban infrastructure
- Railway station redevelopment program
- Sagarmala for improving the port-based development
- Smart City Mission⁴ and others.

4. Report of the task force of National Infrastructure Pipeline for 2019 – 2025 released by Smt. Nirmala Sitharaman, December 2019

5. KPMG in India Analysis based on supply use tables of MOSPI 2015-1, as on 15 Apr 2020

As per the December'19 report published by the Ministry of Statistics and Program Implementation (MoSPI) on the status of the 1701 central sector infrastructure projects, 355 projects were on schedule, 583 were delayed, 401 projects reported cost overrun, and 205 projects reported both time and cost overrun. The cumulative time and cost overruns of these projects are mentioned below:

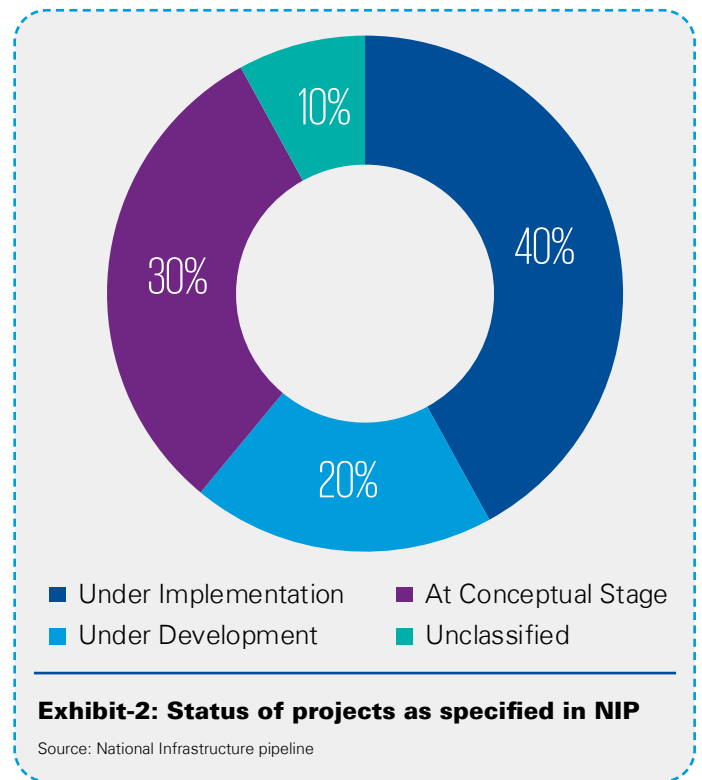
Total original cost of implementation of the 1701 projects was INR 20.65 trillion and their anticipated completion cost is likely to be INR 24.71 trillion.

Out of 583 delayed projects, 183 (31.39 per cent) projects have overall delay in the range of one to 12 months, 129 (22.13 per cent) projects have a delay in the range of 13 to 24 months, 146 (25.04 per cent) projects have a delay in the range of 25 to 60 months and 125 (21.95 per cent) projects have a delay of 61 months and above.⁶

There are nearly INR 111 trillion worth of projects in the National Infrastructure Pipeline (NIP), predominantly in the roads, gas, rural housing, renewable energy, etc. Around 40 per cent of these projects are in conceptual and unclassified stages, some part of which are likely to be reprioritised towards developing the social infrastructure like primary, secondary healthcare centres, enhancing the air cargo facilities, and building medical and pharma parks in the country.

The COVID-19 crisis is expected to hit labour-intensive sectors particularly hard. In the construction industry alone, migrant workers comprise a large part of the workforce and typically stay in labour colonies at construction sites. As per CREDAI, prior to the lockdown, there were around **20,000** ongoing projects across the country. The work was being undertaken in as many as 18,000 sites and more than 30 per cent of workers were staying away from sites due to the fear of coronavirus infection.⁶ Together these projects involved a workforce of **8.5 million**.

The 40-day lockdown in effect since 25 March 2020, which was further extended up to 03 May 2020 and subsequently to 17 May 2020, led to **reverse migration** with workers leaving cities and going back to their villages. It is estimated that around **6 lakh workers** walked on foot to villages, and around **10 lakh workers** are in relief camps, who are employed across multiple sectors as per the Centre's submission to petitions in the Supreme Court.⁷



6. Ministry of Statistics and Programme Implementation – 409th Flash Report dated Dec 2019.
7. Affidavit filed by Government of India with Supreme Court, April 2020





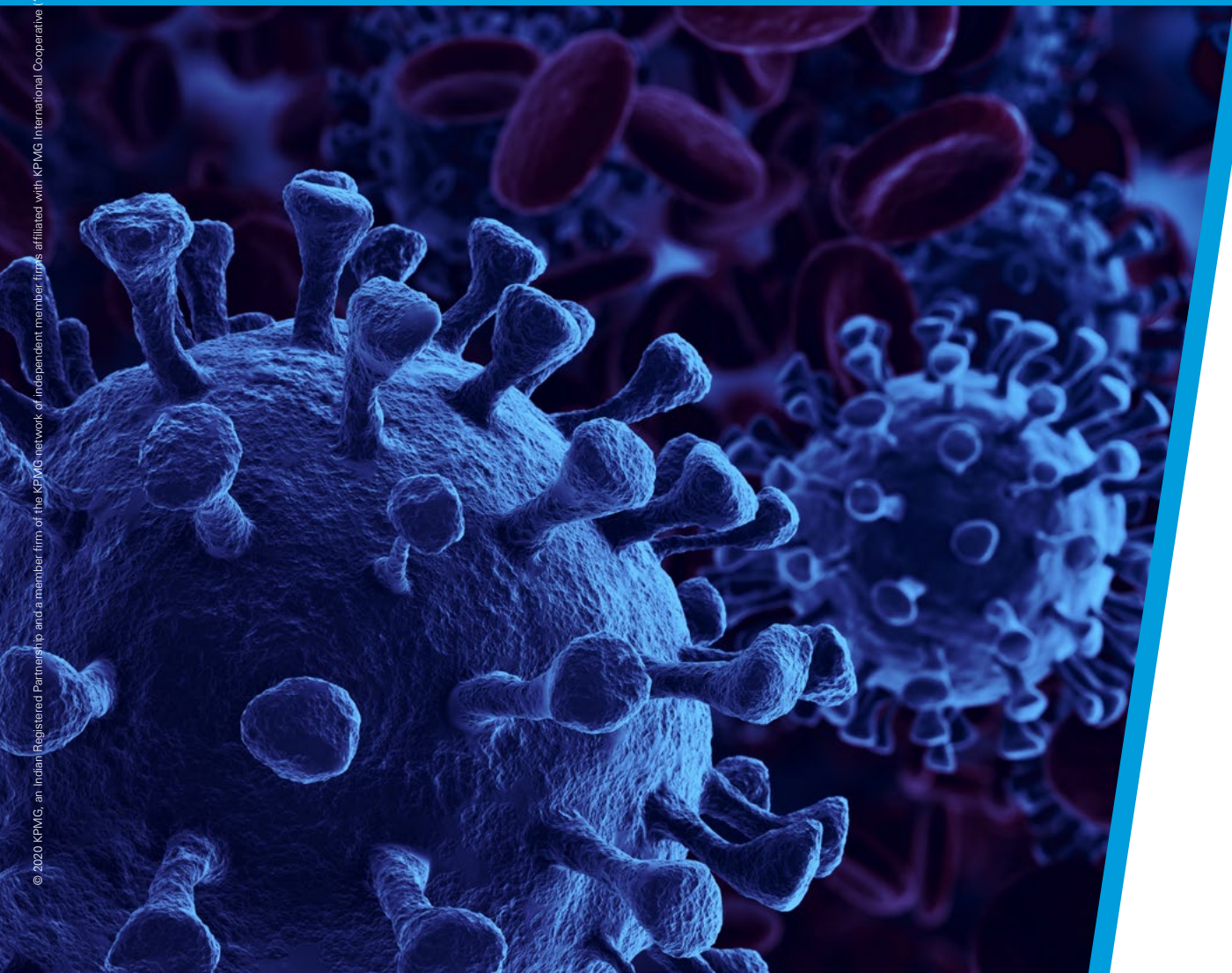
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COVID-19 and its impact

Coronavirus was recognised as a pandemic by the World Health Organization (WHO) on 11 March 2020. Globally, the pandemic has posed multiple challenges for various industries, including the construction and infrastructure sectors.

In view of this, GDP projections from IMF and various other rating firms and IMF have varied from 1.6 per cent

to 3.5 per cent. This factors in the uncertainty linked with COVID-19 and risks associated with stalled projects across multiple sectors. The forecast is likely to be reassessed continuously as the current crisis pans out and new information becomes available.



In comparison to the economic crisis of 2008, the government now has limited options to undertake corrective interventions, owing to the financial stress which was already prevalent in the pre-COVID period. Though funds are being allocated for various relief measures, the ability to fund and spend on infrastructure

projects in the coming one to two years is likely to be impacted.

KPMG in India conducted an analysis of the input-output table (2015-16) for 33 sectors and studied backward and forward linkages of the construction sector.

Overall, lower economic activity in other sectors would impact construction services through forward linkages. Additionally, a fall in output of construction would also have a multiplier effect through backward linkage causing further shrinking of the overall economic activity.

The backward linkage score of construction sector is 2.21 and its forward linkage score is 1.81.⁸ The backward linkage score being greater than the forward linkage score implies that construction sector has a greater 'pull' in the economy than the 'push' effect. It is an enabler for other sectors and its contribution to the overall economy is significant.

The scores mentioned in the Exhibit 3 are the backward linkage score of the construction sector with other sectors.

Eg: For 1 unit reduction in the construction sector investments, there would be a reduction of 0.18 unit in the metal products sector.

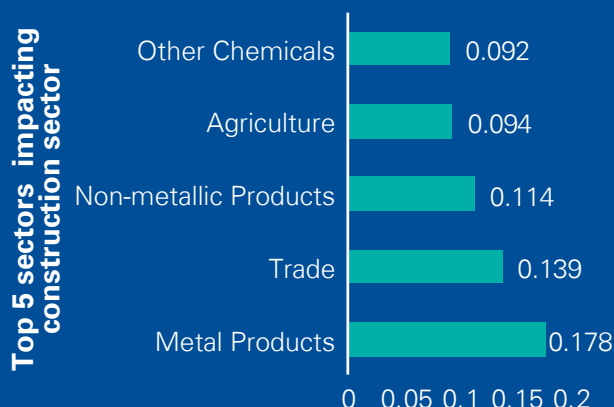


Exhibit-3: Sectors that feeds into construction sector

Source: KPMG in India Analysis

The top 5 sectors that are used as inputs in the construction sector are metal products, trade, nonmetallic products, agriculture and other chemicals. It implies that these sectors are enabled by the construction sector and demand from these is affected when the construction sector experiences a demand shock in the form of fall in investments.

The scores mentioned in the Exhibit 4 are the forward linkage score of the construction sector with other sectors.

Eg: For 1 unit reduction in the electrical sector demand, there would be a reduction of 0.05 unit in the construction sector.

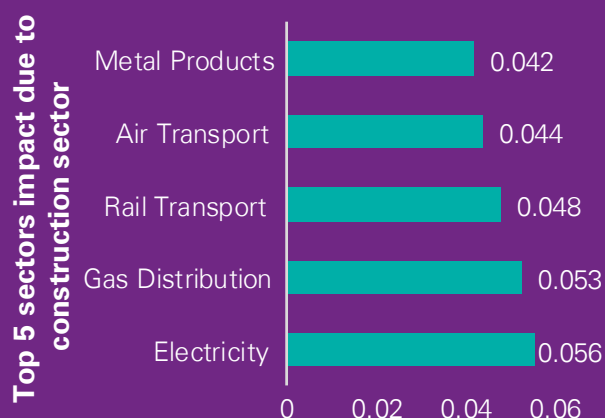


Exhibit-4: Sectors dependent on construction sector

Source: KPMG in India Analysis

Top 5 sectors that receive inputs from construction sector are electricity, gas distribution, rail transport, air transport and metal products. It implies that these enable the construction sector by demanding inputs such as repair and maintenance services, and when these sectors witness a shock, the demand for the construction sector output is affected.

8. KPMG in India analysis, as on 15 Apr 2020



The construction gross value added (GVA) in India was INR 10.51 trillion in the financial year 2019-20 and expected to grow at 4.9 per cent to INR 11.02 trillion¹¹ in the current financial year. This is considered as the baseline scenario and economic impact has been analysed on the GVA, investment and employment in multiple scenarios.

The impact of the COVID-19 pandemic on the GVA and employment of the construction sector has been studied under four different investment scenarios corresponding to four different economic scenarios using income and employment multipliers based on input-output analysis.

The extent of reduction would further vary based on the duration of the lockdown period.

Table 1: Construction sector snapshot for the previous year and for the baseline scenario (estimates are at constant prices (2011-12)⁹

Year	Investment in Construction Projects (INR trillion)	GVA for construction sector (INR trillion)	Employment in the construction sector (Million person year)
FY 2019-20	29.41	10.51	95
Baseline scenario for FY 2020-21	32.24	11.02	102

KPMG in India has analysed each of the following scenarios and estimated the impact on investment, employment and Gross Value Added (GVA) in each of these scenarios.

Baseline scenario: GVA of India is assumed to be growing at 6 per cent, while the GVA of the construction would be growing at 4.9 per cent (Assumption: Average year-on-year growth rate of construction sector is 4.9 per cent from 2015-16 to 2019-20 in terms of GVA). There is no COVID-19 pandemic consideration in this case.

Table 2: Description of various scenarios for which KPMG analysed the impact on the constructions sector

Scenario	1	2	3	4
GVA Growth (%)	3.5	1.6	3.5	1.6
Lockdown period up to	03 May 20	03 May 20	30 June 20	30 June 20

The investments in the construction related projects in all sectors are estimated to reduce by 13 per cent, 14 per cent, 29 per cent and 30 per cent⁹ respectively for each of the scenarios with respect to that of the baseline scenario as presented in Table-1.

The corresponding fall of GVA is estimated to be 15 per cent, 16 per cent, 33 per cent and 34 per cent respectively while that of employment is estimated to be reduced by 11 per cent, 12 per cent, 24 per cent and 25 per cent* respectively in each of the scenarios. In India where the unskilled workers depend on the construction sector for employment, the reduction in employment by approximately 1 crore person years needs to be acknowledged and addressed.

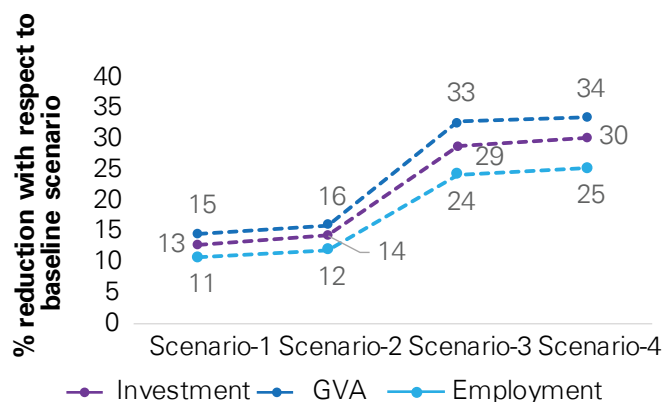


Exhibit-5: % Reduction in investments, GVA & employment for with respect to baseline scenario.

Source: KPMG in India Analysis

COVID-19 pandemic is likely to reduce investment in construction related projects in the range of 13 per cent to 30 per cent, GVA of the construction sector between 15 per cent to 34 per cent and employment of the construction sector between 11 per cent to 25 per cent as compared to the baseline scenario of FY 2020-21.

9. KPMG in India analysis, as on 15 Apr 2020

Sectoral Impact based on KPMG Survey

Survey Snapshot

KPMG in India conducted a survey across more than 30 construction sector professionals to assess the impact of the ongoing COVID-19 pandemic on construction projects and the results are tabulated in the impact assessment framework. The increasing trend in the manpower costs and reduction in the prices of commodities is common across most sectors, but their relative contribution in the overall construction cost of the project, dictates the impact on the overall project cost. For example, the impact of an increase in labour cost is more pronounced in a thermal power project which employs 14,000 people during its peak time in comparison to a road project where the work is typically executed in multiple sections and in multiple corridors.

Survey Outcome

The survey was conducted to understand the impact of COVID-19 on overall construction sector cost and essential aspects – manpower, plant and machinery and material. It was observed that projects which belong to select sectors, including power generation, real estate and transport could see a steep increase in overall project cost due to an increase in the manpower and plant and machinery costs, in comparison to other sector projects.

While the impact on the supply chain is based on the opinions of construction sector professionals, the actual impact would depend upon multiple factors, including the cost-benefit analysis of alternative supply chains identified for the risks mapped against tier one and tier two suppliers across the world. For firms whose supply chain is significantly dependent on countries like the U.S., Europe, China, South Korea and Japan, an impact on the cost of the supply due to delays or due to the costs of switching to a new supply chain exists.

For details, refer the impact assessment framework on next page.



Impact Assessment Framework



Sectors

Manpower

Plant & Machinery

Raw Material

Net Impact*

Power Sector

Generation	▲	○N	▼	▲
Transmission	▲	▲	▼	▲
Distribution	▲	○N	▼	▲





Water (supply, sanitation and treatment) & Irrigation

	▲	○N	▼	○N
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Transport

Railways & Metro	▲	▲	▼	▼
Ports	▲	○N	▼	○N
Roads	▲	▲	▼	▲
Airport	▲	○N	▼	○N



Sectors	Manpower 	Plant & Machinery 	Raw Material 	Net Impact* 
Real Estate	▲	○N	▼	▲
Urban Development	▲	○N	▼	○N
Oil & Gas	▲	○N	▼	○N
Metals & Mining	▲	○N	▼	▼
Manufacturing	▲	○N	▼	○N

Legends

- ▲ Increase in cost
- N Neutral/ No change in cost
- ▼ Decrease in cost

Exhibit-6: Sectoral impact on the 3 Ms i.e., manpower, materials and machinery due to the COVID-19 pandemic.

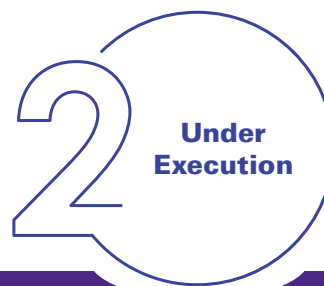
Source:KPMG Analysis

* The Net impact considers net impact on manpower, raw materials and machinery and does not indicate impact on overall Project cost



Impact on projects across the life cycle

Stages of projects



At the far end of completion:

The construction work is mostly completed for such category of projects and commissioning spares are available in the promised place of delivery. Hence, the supply chain shocks would be minimal. The kind of work needed to be done would also not be restricted to confined places. As a result, there would be minimal resistance offered by the workers and little changes would be needed in the execution methodology.

In case of non-liner projects, the challenges during the monsoon would be limited and could be mitigated by a proper monsoon preparedness plan. For linear projects like pipelines, canals, bridges and underground drainage (UGD) works, it is imperative to commission the projects before the onset of the upcoming monsoon, failing which the projects are likely to get extended up to the end of the year. For irrigation projects, the benefit would be lost for the entire Kharif and Rabi season in the catchment area and could impact the supply of water for the drinking water schemes.

Supply Chain	Raw Materials	Hiring charges for P&M	Labour costs
N	▼	N	▲

Projects under Execution:

Under this category of projects, construction would be in full swing with mobilised manpower, plant and machinery. Due to the lockdown, there has been considerable reverse migration to rural areas while many are also stuck in relief camps and labour colonies in the cities. Contractors or developers would have to create an incentive for labour now in the villages (in line with the notifications by Government of India) to move beyond their comfort zones and come to the project locations to work. While the skilled people like carpenters, welders, fitters, plumbers, electricians and riggers may demand higher wages to the tune of 20 per cent - 25 per cent, general unskilled and semi-skilled labour could demand a 10 per cent - 15 per cent increase. However, mining projects which are largely located in eastern India may not face labour shortage or an increase in the labour costs.

The hiring charges for the plant and machinery already deployed within the site may not vary but for the new equipment, there is a possibility that their cost may increase marginally due to the shortage of skilled manpower for operating that equipment. Due to the revised SOPs to come into play, social distancing will have to become a norm, and this shall push up the cost for building the required hygiene infrastructure related to the building of additional labour colonies, Personal Protective Equipment (PPE), seating norms in the vehicles etc.

The outlook for commodities seems to be bearish and hence prices may remain steady for key construction commodities like cement, sand, steel (structural and reinforcement), aggregate, aluminium etc. However, the supply chain for the sectors like steel, power, telecom, oil and gas etc., where specialised materials (like alloy steels) and electronics are to be used, is likely to undergo some disruptions and the mitigations need to be identified quickly.

Supply Chain	Raw Materials	Hiring charges for P&M	Labour costs
▲	▼	▲	▲

3 Development Stage

Projects in Development Stage:

Projects which have secured land, received all the requisite approvals from the concerned government, achieved financial closure and are about to commence execution would have to be re-estimated both from time and cost perspectives.

Prescribed labour density would pose constraints due to social distancing norms. A rework on effort estimation will be required to assess the time to complete, basis the labour productivity and availability, and the extent of the land/work-front available on a given project. The risks associated with supply chains would also need to be looked at and a proper crisis management plan/alternative will need to be factored in the project budget.

Supply Chain	Raw Materials	Hiring charges for P&M	Labour costs
▲	▼	▲	▲

4 Conceptual Stage

Projects in Conceptual Stage:

Governments should re-evaluate their portfolio of projects that are in the pipeline and may prioritise the social infrastructure projects, such as affordable housing, underground water drainage, water supply and healthcare projects. Hence, such projects need to be considered on priority. On the other hand, the private sector may consider reassessing the projects strategy to invest in lesser risky models like 'HAM, PPP etc. Few key factors to be considered for projects' prioritisation:

1. Ability to immediately kick start
2. Alignment with strategic intent and national cause
3. Interlinkages with the success of other projects
4. Ability to generate immediate and sustained employment
5. Ability to generate immediate revenue
6. Degree of supply chain disruptions
7. Capital requirement in short, medium and long term, and
8. Status of statutory approvals & other issues

Supply Chain	Raw Materials	Hiring charges for P&M	Labour costs
▲	▼	▲	▲

Legends

- ▲ Increase in cost
- N Neutral/ No change in cost
- ▼ Decrease in cost

Case Study; For COVID-19 Impact Assessment

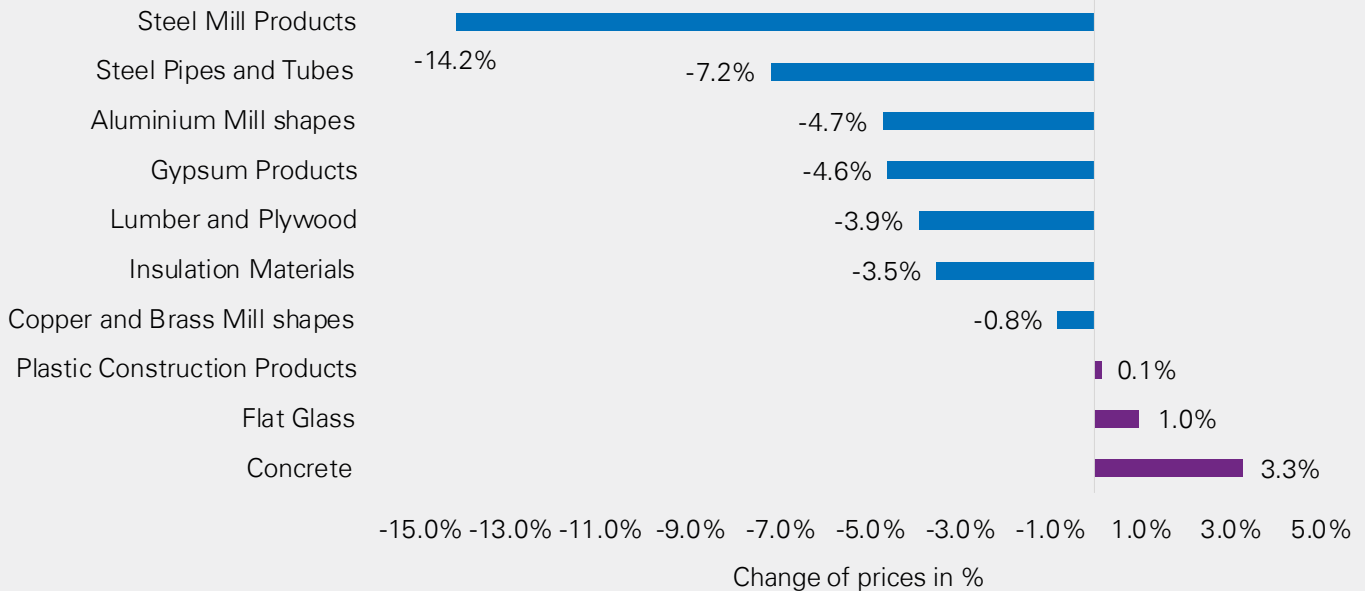


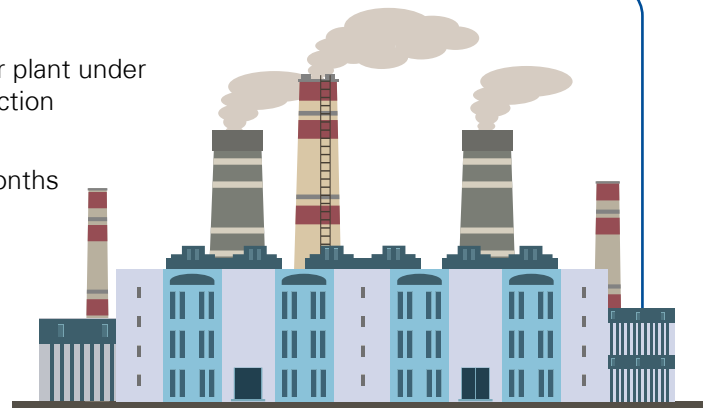
Exhibit-7: Impact on the material prices due to the COVID-19 pandemic induced demand shortfalls.

Source: JLL Construction Outlook, March 2020

Project Background

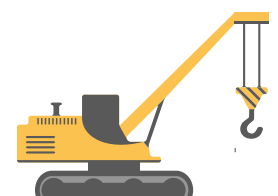
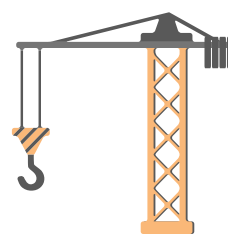
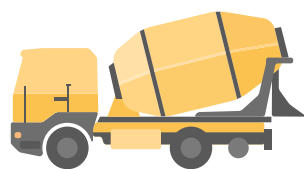
This case study was undertaken for a 660 MW thermal power plant under construction to exemplify the impact of COVID-19 on construction projects.

The project was scheduled for commercial operation in 38 months of time. The plant is powered using Chinese steam generator and turbines which were supplied to the site. The plant and machinery comprised cranes, mobile pick and carry cranes, concrete pumps, batching plants, boom placers, loaders, transit mixers, forklifts, excavators, welding machines, induction heating machines, winches, etc.



The accurate impact of COVID-19 pandemic is nearly impossible to predict, but any prolonged slowdown in Chinese or global economic and manufacturing activity is likely to have significant ramifications for material costs. If reduced construction activity due to virus containment efforts causes a major reduction in demand for materials, the reduction in demand may weigh heavily on material costs.

Materials which have displayed a downward trend in the last year may be expected to continue that trajectory, with additional fall of five per cent to ten per cent, whereas materials maintaining their growth may rise slightly in the range of one per cent to three per cent.



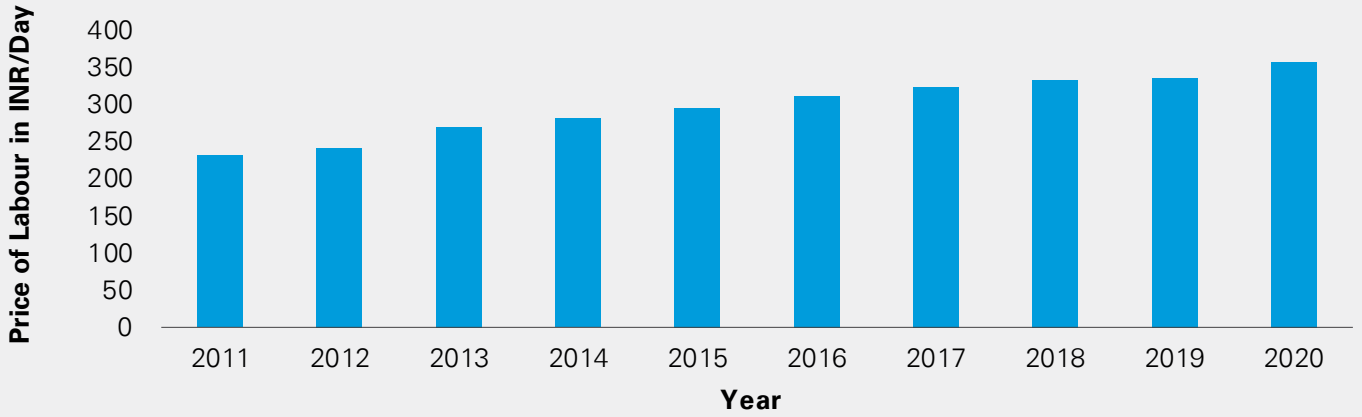


Exhibit-8: Impact on the prices of manpower due to the COVID-19 pandemic induced supply shortages.

Source: India Stat, Trading Economics, Labour Bureau (GoI)

Reduced labour at construction sites may lead to idling of the plant and machinery deployed for construction work. These machines have a fixed hiring cost, which is charged to the project regardless of machine utilisation. Considering the lockdown and future uncertainty, it may be a while before machines are operational again. The hiring charges per month for

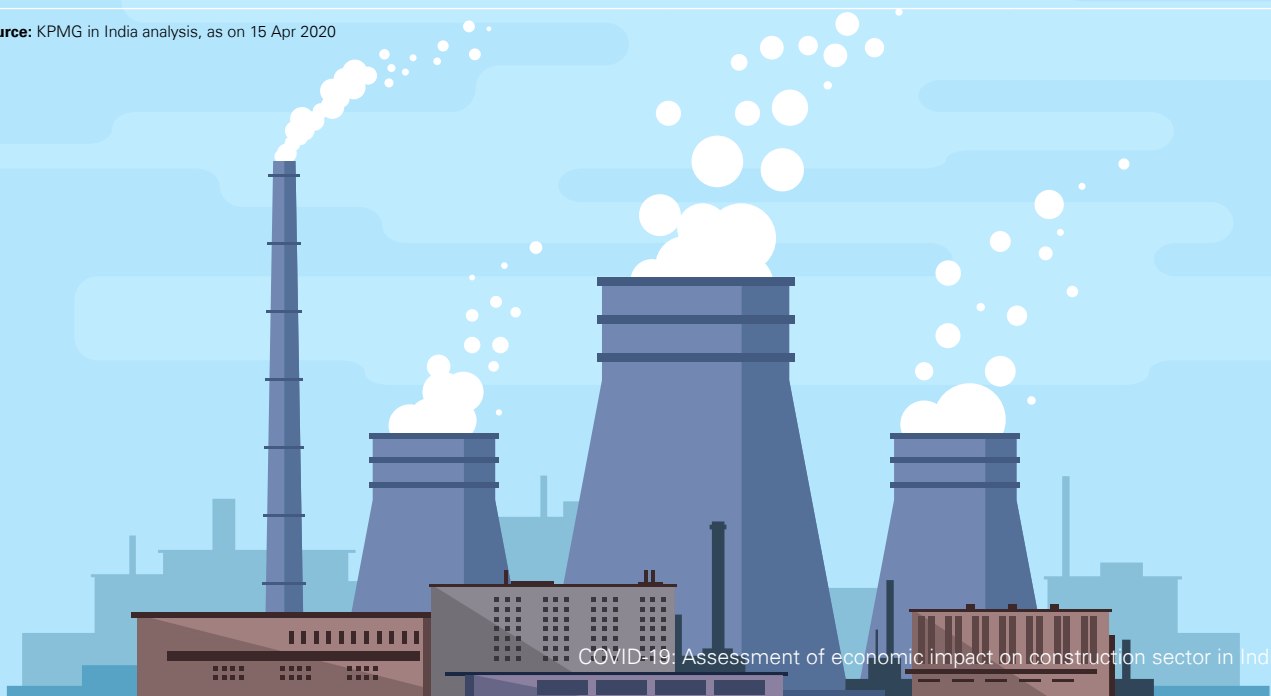
a typical set of machines deployed at a large thermal power plant construction site (660 MW) is around INR 0.0104 billion. In addition to these direct costs, the idling of machines may also have an indirect impact on the construction company in terms of unbilled revenue and ultimate revenue loss due to delayed project completion for the developer.

The likely impact of COVID-19 on the overall project cost is as follows:

Table 2: Impact of COVID -19 on overall project cost

Lockdown Period	Optimistic Case	Likely Case	Pessimistic Case
Up to 03 May 2020	1.59%	2.43%	3.28%
Up to 30 June 2020	2.94%	3.61%	4.28%

Source: KPMG in India analysis, as on 15 Apr 2020



Summary of Impact Assessment

1

Under development projects are the worst hit with a minimum impact of two to three months, which may be controllable with measures outlined in the recommendations section

2

Due to a delay in the construction period from the lockdown, there would be an additional interest cost on the working capital loans taken, which will be borne by the developers or the contractors depending upon the risk sharing mechanism

3

The labour costs for skilled workers are expected to rise by 20 per cent to 25 per cent while that for the semi-skilled and unskilled workers are expected to rise by 10 per cent to 15 per cent

4

Revised standard operating procedures duly incorporating social distancing, personal protective equipment and hygiene would drive up project cost in the short term

5

Implementation costs may not vary much for linear projects like irrigation canals, pipelines, transmission lines, roads, etc., but for non-linear projects the costs may rise by 2 per cent to 5 per cent

6

The projects dependent on specialised equipment, electronics and specialised materials are more likely to be hit by disruptions to the supply chain largely due to the force majeure clauses. The recovery of liquidated damages would not be possible for the developers unlike certain sectors, such as solar projects where the pandemic as a part of Force Majeure Clause (FMC) is not included in the Power Purchase Agreements (PPA) with some of the major solar power developers in India



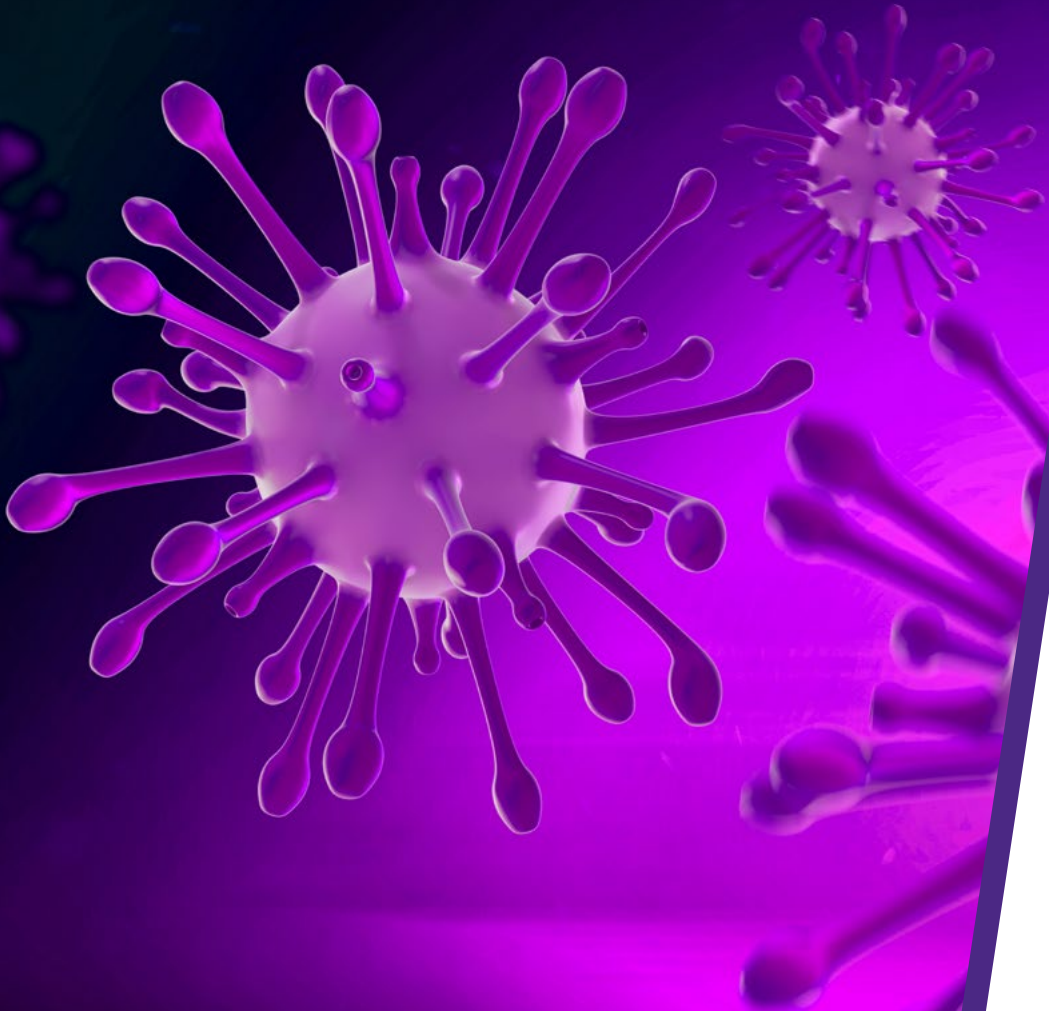


3

Recommendations

The impact assessment conducted in the previous section for projects at different stages require specific actions to be undertaken by key stakeholders. While few actions are critical to quickly recover or curb losses, other actions will be imperative for longer-term resilience in coping with pandemics or black swan events in the future. With the substantial capital investment plans

at stake, government departments including central, state, nodal ministries, and policy think tanks like NITI Aayog will play a critical role in implementing the suggested measures for the overall revival of construction sector so that India can achieve high trajectory growth in the near future.



Recommendations Summary



Compliance and protection

Revival and Recovery

Building resilience and agility

Short Term (1-2 Months)

Medium Term (3-6 Months)

Long Term (>6 Months)

Government

1. Release part retention amount, as applicable
2. Automatic extension of time, as applicable
3. Prioritize pending projects
4. Provide tax benefits
5. Minimum/waive Electricity charges

1. Commission a construction task force for full scale resumption of work
2. Amend model concession agreements/ contracts
3. Infuse one time national fund
4. Implement single window clearance

1. Strengthen early warning and response systems
2. Setting up of Construction city
3. Capacity building
4. Standard protocols
5. Housing and healthcare for workers

Technology

Owner/Developer

1. Implement MoHFW guidelines¹⁰
2. Implement risk management framework
3. Periodic staff trainings to become anti-fragile
4. Revisit project framework to remove inefficiencies

1. Joint re-planning with contractors & vendors
2. Relational contracts
3. Digital road map (Building Interface Modelling, Drones etc.)
4. Rapid Response Teams (RRT)
5. Tag team approach

1. Implement digital roadmap
2. Guidelines on facilities for workers
3. Structured risk management
4. Business continuity
5. Revisit project framework

Training and Awareness

EPC Contractor

1. Embrace pre-fabricated model
2. Wide reaching feedback loops
3. Robust communication
4. Flexible working for employees

1. Risk mapping of supply chains
2. Estimate time and cost to complete
3. Round the clock monitors
4. Mechanised solutions
5. Risk preparedness for such events in near future

1. Adapt to anti-fragile and agile practices as new norm
2. Encourage open communication
3. Flexibility for employees
4. Engage the employees
5. Implement employee engagement measures



10. Implement guidelines of MoHFW with reference to KPMG publication, May 2020

Short - Term Recommendations

Compliance and protection (1-2 Months)

Government

1. Instruct developers/owners to:
 - consider release of contractor retention and performance bank guarantee, as applicable depending on stage of project; institutionalise surety bonds as an alternative; expedite clearance of pending bills
 - grant default extension of time for projects under construction and classify COVID-19 as a force majeure event.
2. Undertake aggressive rate cuts by the central bank and prioritise clearance of the pending projects (under implementation stage) as they shall act as quick wins for reviving the economy
3. Consider providing benefits in the form of lower GST than the prevailing rates
4. Waiver of minimum electricity and other charges imposed during the closure of project sites.



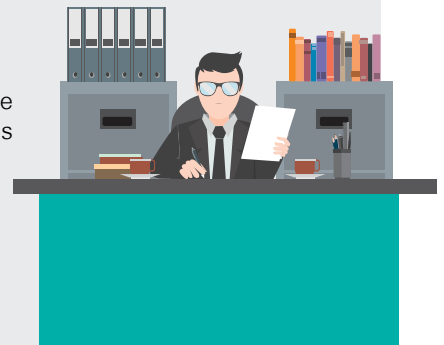
Developer/Owner

1. Implement a digital road map. Build such provisions in tenders and subsequently in contracts
2. Clear guidelines on facilities to be provided for workers by the contractors¹²
3. Conduct project staff trainings on becoming anti-fragile, which will assist organisations to thrive with volatility and assist in quick turnaround
4. Conceive construction projects to be an 'assembly site' instead of 'execution site' by promoting off-site fabrication, reworking standard designs, etc.
5. Plan for business continuity and benchmark with highly automated firms at international levels
6. Revisit project framework and processes to remove inefficiencies, identify and remove external stakeholder interface bottlenecks.



EPC Contractor

1. Work towards 'design for manufacturing' and 'design for assembly' and embrace prefabricated methodology. Implement digital platforms to catalyse this transition
2. Consider implementing artificial intelligence and machine learning for predicting safety incidents with improved accuracy
3. Conduct project staff trainings on becoming anti-fragile and resilience building. This would also involve conducting frequent stress testing of project teams to build resilience for such events
4. Implement wide-reaching feedback loops – reviews, learning and experience sharing
5. Encourage open and transparent communication for any violation
6. Foster a mindset of problem-solving thinking across the employees and ideate with them to co-create new opportunities created by the crisis
7. Offer support for navigating through family responsibilities of the workforce, such as telecommuting, flexible scheduling, virtual check-ins, and leave as needed.



Medium - Term Recommendations

Revival and Recovery (3-6 months)

Government

1. Commission a crisis management construction task force team for fast-tracking select projects impacted by COVID-19, re-prioritising projects portfolio, and suggesting policy interventions with the overall goal of keeping the infrastructure targets intact
2. Amend model concession agreements for the public-private partnership (PPP) projects to revive private sector interest
3. Infuse a one-time fund to expedite the completion of projects nearing completion
4. Due to travel restrictions (especially in hotspot zones), hot spot consider setting up a single-window clearance and monitoring authority, which would bring under its ambit all the government-to-business services
5. For infusing capital and required funds, a policy should be considered for harmonious substitution of special purpose vehicle (SPV) in consultation with lenders and concessionaire, subject to certain terms and conditions.



Developer/Owner

1. For ongoing projects, conduct an impact assessment, joint planning with contractors and vendors to re-establish baselines and re-evaluate project budgets
2. For new projects to be sanctioned, factor in the impact of such events and consider placing relational contracts for equitable risk-sharing
3. Prepare a digital road map for tools such as Building Information Modelling (BIM), drone-based updates, online platforms and Geo-Spatial Information Systems (GIS) / satellite-based imagery for reviewing project progress, without having to physically visit the sites. Assign budget for such tools/technologies in critical projects
4. Enable remote working facility and ramp up the required IT infrastructure. Promote regular teleworking
5. Set up rapid response teams (RRT) to monitor and deal with suspected cases
6. Create tag teams to build redundancies/buffers for all the ongoing jobs and provide adequate cover for the absence of the concerned supervisor.



EPC Contractor

1. Evaluate supply chains; identify and assess the impact on tier one and tier two suppliers and establish contingencies or alternative supply chains
2. Assess the estimated time and cost to complete the projects considering the revised guidelines and pursue contractual amendments in an amicable manner
3. Conduct risk management for such events during the project duration and build contingencies. This would also involve conducting simulations for lean periods/crisis and preparing teams upfront
4. The hiring of round the clock monitors to keep track of the employee's condition. Use IOT platforms and drones as much as possible to track health and safety
5. Adopt mechanised solutions for works in confined spaces and avoid clustering of labour to deliver the assigned tasks
6. For the subcontractors, deploy mutual risk and reward sharing contracts and facilitate cashflows
7. Keeping the employees engaged and provide platforms for upskilling virtually during the lockdown period.



Long - Term Recommendations

Building resilience and agility (6-12 Months)

Government

1. Strengthen the Integrated Disease Surveillance Programmes (IDSP) and Early Warning Response System (EWRS)
2. Undertake capacity building by setting up of independent empowered project monitoring groups
3. Establish a standard protocol to respond effectively during similar kind of pandemics
4. At state and municipality' levels, provide dedicated housing and healthcare facilities for construction workers at the project sites and disincentivise reverse migration in times of pandemics
5. Consider developing a construction city to cater to the construction equipment, skilling requirements and promulgate research on new technologies and build self-reliance.



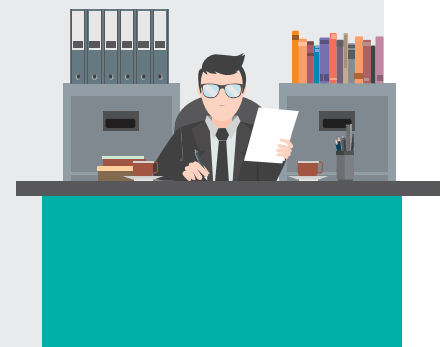
Developer/Owner

1. Implement digital road map. Build provisions in tenders and subsequently in contracts. For example, stipulate the usage of technology to track workers' movement and health in contracts
2. Design and implement risk management framework to provide early warnings
3. Plan for business continuity and benchmark with highly automated firms at international levels
4. Revisit project framework and processes to remove inefficiencies, identify and remove external stakeholder interface bottlenecks.



EPC Contractor

1. Bring agility in planning and plan for sprint-based mitigation
2. Consider implementing artificial intelligence and machine learning for predicting safety incidents with improved accuracy
3. This would also involve conducting frequent stress testing of project teams to build resilience for such events
4. Implement wide reaching feedback loops – reviews, learning and experience sharing
5. Encourage open and transparent communication for any violation
6. Processes and tools created during the crisis-management/ lockdown period should be codified into standard operating procedures with proper compliance across departments.



Acronyms

AMRUT	Atal Mission for Rejuvenation and Urban Transformation
BIM	Building Information modelling
CAPEX	Capital Expenditure
COVID	Corona Virus Disease
DDUGJY	Deen Dayal Upadhyay Grameen Jyothi Yojana
EPC	Engineering, Procurement and Construction
EWRS	Early warning response system
FDI	Foreign Direct Investment
FMC	Force Majeure Clause
GDP	Gross Domestic Product
GIS	Geo Spatial Information System
GST	Goods and Services Tax
GVA	Gross Value Added
HAM	Hybrid Annuity Model
ICT	Information and Communication technology
ICU	Intensive Care Unit
IDSP	Integrated Disease Surveillance Programme
INR	Indian Rupee
IoT	Internet of Things
IPDS	Integrated Power Development Scheme
MoHFW	Ministry of Health and Family welfare
MoSPI	Ministry of Statistics and Programme Implementation
NIP	National Infrastructure Pipeline
P&M	Plant and Machinery
PPE	Personal Protective Equipment
RRT	Rapid Response Team
SECI	Solar Energy Corporation of India
SOP	Standard Operating Procedure
UGD	Under Ground Drainage Works
USD	United States Dollar
WHO	World Health Organization

Acknowledgement

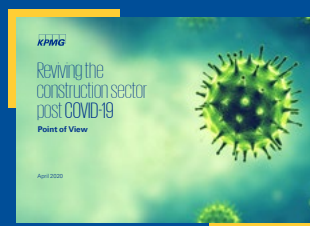
Aashneet Nagra
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Sundaresh Raja
Surangma Nagpal
Suruchi Uppal
Vikas Gaba
Yash Singh

Other Construction related publications on COVID-19 from KPMG in India



COVID-19: Construction workplace safety

Compendium of select best practices for strengthening implementation of worker safety at sites & workplace.



Reviving the Construction sector in India post COVID-19

First level blueprint to guide in prioritising a portfolio, making construction projects viable, making projects anti-fragile and business continuity for construction projects.



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**IN OUR ABILITY TO TRIUMPH OVER
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UNDYING ENTHUSIASM OUR DRIVE
TO ACHIEVE THE EXTRAORDINARY
UNMOVED BY FEAR OR CONSTRAINT
WE'RE DRIVEN BY JOSH AND IT SHOWS**

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