



सत्यमेव जयते
GOVERNMENT OF INDIA
MINISTRY OF SKILL DEVELOPMENT
& ENTREPRENEURSHIP



N·S·D·C
National
Skill Development
Corporation

Transforming the skill landscape

Human Resource and Skill Requirements in the Building Construction and Real Estate Sector

(2013-17, 2017-22)



cutting through complexity

This report is prepared by KPMG Advisory Services Pvt Ltd (KASPL).

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In addition, we convey our gratitude to all those who have, in some way or other, contributed towards the successful completion of this study.

Executive Summary

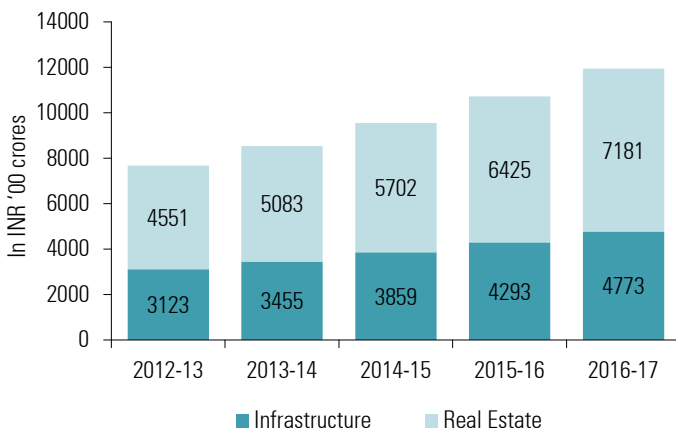
Industry Overview

Construction Sector is projected to grow to INR 11,954 billion by 2017 and is expected to contribute 8.2% to Indian GDP

Key Growth Drivers

- Demand for affordable housing is more likely to increase from current level of 29 million households to more than 38 million households by 2030
- Rapid growth in the Information technology and financial services space and upcoming expansion plans of businesses into Tier-II and Tier-III cities
- Investments required in key infrastructure segments' including power, road, railways, ports and civil aviation is expected to reach \$1 trillion during the 12th Plan period
- Demand for warehousing space (ambient and cold chain) in the country in major Tier-I and Tier-II cities is expected to surge as industrial parks are being setup and food trends shifting to more processed food
- Increasing consumerism and relaxation of FDI in multi-brand retail has surged aggressive growth among Indian retailers

Construction Sector Growth Forecast till 2017 (Rs. Billion)



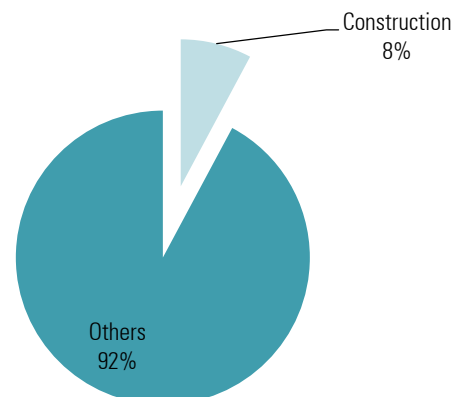
- The market value of construction sector in India is projected to expand up to INR 11954 billion by 2017.
- Sector witnessed cumulative foreign direct investments to the tune of Rs 40,399 million from 2000 till 2013 of which 91% was in real estate development.
- Indirectly, the sector generates 5 times higher value for the other sectors.
- Infrastructure constitutes 40% of the market value and real estate the remaining 60%. This percentage is expected to remain constant during the projected period.

Contribution to Indian Economy

Industry highlights

- Construction sector is the largest contributor to central exchequer
- Construction sector is the 2nd largest employer in the country.
- It creates more than 45 million jobs either directly or indirectly among various classes of individuals in the country.
- Between 2000 and 2013, the sector attracted USD 40399 million as foreign direct investment. It is expected to attract FDI of USD 180 billion by 2020
- The sector grew at a CAGR of 9.42% between 2003-04 and 2012-13.
- Capital investments in the sector is anticipated to rise from USD 651 billion in 2012-13 to USD 1181 billion in 2019-20.

Contribution of Construction to GDP in 2012-13

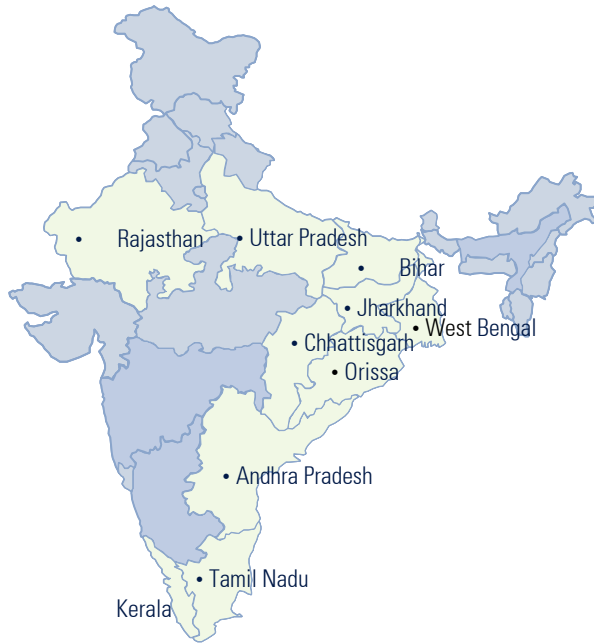


Sources: KPMG in India analysis

Demographic characteristics of workforce

Majority of workforce is from Eastern India

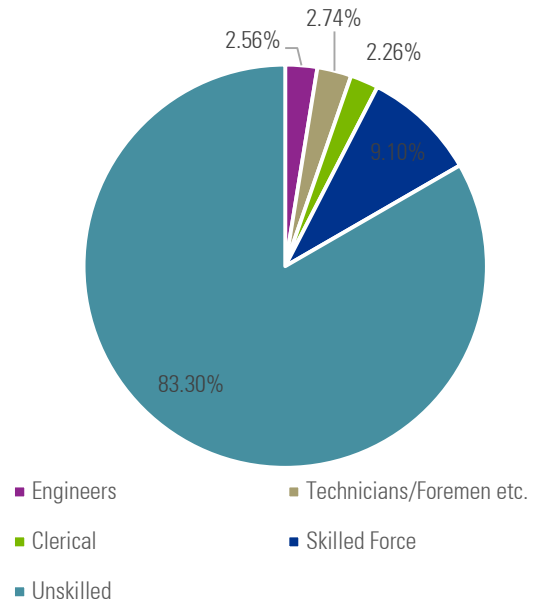
Major Sources for Resources - Labour



- The construction sector is one of the largest seasonal employment providers in India next only to agriculture.
- The sector is also highly unorganised and is the principle industry employing short duration out-migrant
- Of the total estimated 15.2 million short duration out-migrants, more than 36.2 percent are employed in the construction industry alone.
- According to 64th NSSO round, there were 58.6 million casual workers in non-agriculture sector of which construction industry alone employed around 58 percent of the casual workers in non-agriculture (i.e. 32 million).

- More than 80% of the employment in Building and Construction sector is minimally skilled workforce
- In terms of employment, technicians/foremen have had the maximum growth of 95% between 2005 and 2011 followed by unskilled workforce (34%).
- Only a meagre 9.8 million construction workers of the total 32 million workers are registered in the country.
- Tripura, Manipur and Lakshadweep are the states/UT that employ the highest number of registered workers in construction sector
- Interestingly, significant number of female workforce form a part of unorganised construction

Employment across work classes in 2011



Incremental Human Resource Requirement (2013-22)

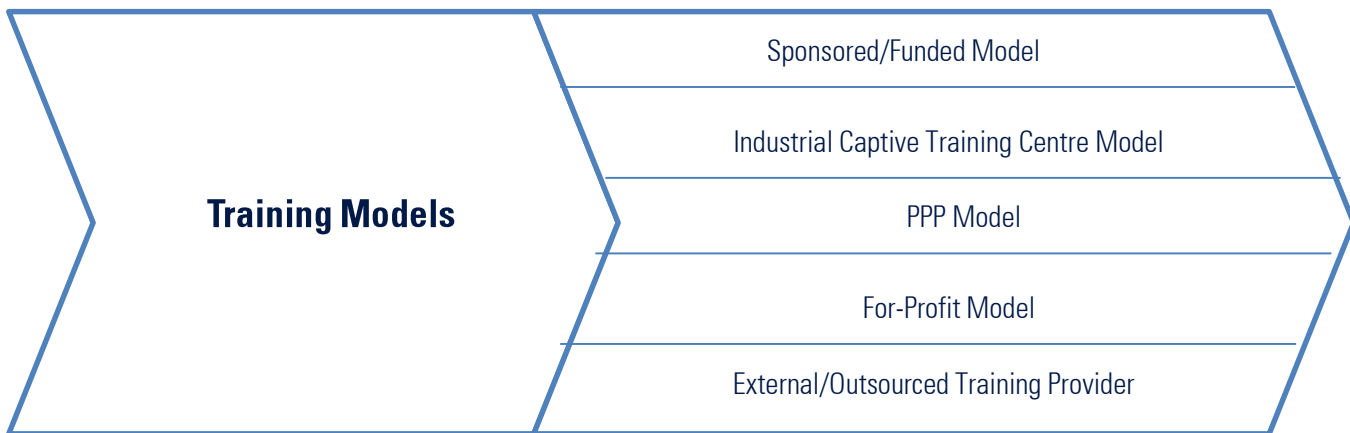
Current workforce of 45 million (2013) is expected to increase to ~76 million by 2022

Segment	Employment Base in million		
	2013	2017	2022
Building , Construction & Real Estate	40.14	51.95	66.62
Construction of Buildings	35.52	45.97	58.96
Demolition and site preparation	0.34	0.45	0.57
Electrical plumbing and other construction installation activities	1.00	1.29	1.66
Building completion and finishing	3.27	4.24	5.44
Infrastructure	5.28	7.45	9.93
Construction of roads and railways	4.28	6.04	8.05
Construction of utility projects	0.79	1.12	1.49
Construction of other civil engineering projects	0.18	0.26	0.35
Other specialized construction activities	0.02	0.03	0.04
Overall Sector	45.42	59.40	76.55

Changing skill set requirements	
Job Role	Skills Required
Project Managers	<ul style="list-style-type: none"> Project Management Skills, understanding of nuances of multi industry complexities, aptitude, attitude, intellect to react in uncertain times, communication skills, planning and risk management, vision and focus on the , end results, leadership & motivation skills
Site/Project Engineers	<ul style="list-style-type: none"> Analytical, communication skills, project management skills like, planning, scheduling, engineering, designing, procurement & contracting, execution, understanding of Project Risks and legal issues, safety Management Skills, Preventive Maintenance Skills
Supervisors	<ul style="list-style-type: none"> Technical Skills (Domain Knowledge), planning skills - ability to Anticipate & Forecast Material, tools, manpower & Machinery needs, materials scheduling, labour management skills, goal Setting
Bar-Bender, Mason, Plumber, Painter, Welder, Equipment Operator	<ul style="list-style-type: none"> Basic knowledge of construction engineering, Trade Skill – e.g. Bar Bending, Formwork carpentry, plastering, painting, plumbing, etc., Coordination Skills with unskilled workmen, Ability to comply with safety and quality measures, Knowledge of machine operations and basic machine troubleshooting, Ability to operate key equipment such as cranes, especially tower crane operations, and also mechanisms for loading and unloading of cranes

Shortage of talent in the construction sector is a long term problem and will continue to push up project costs and risks

There are different types of training models currently prevailing in the country varying in terms of their sizes, operating structure, industry associations, revenue model etc.



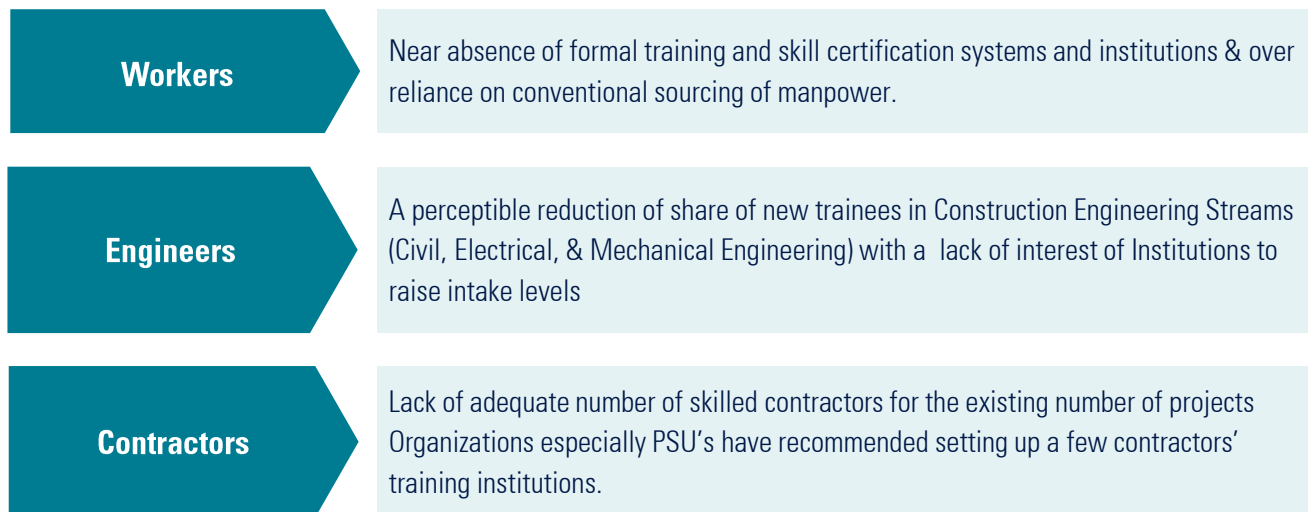
The education and training capacity offered through various schemes currently are inadequate to meet the demand of the large percentage of unskilled workers in the Indian labour market. The education system is often not delivering the required number of specialists across project management, engineering, surveying, contract management and the skilled/semi-skilled labor.

The NSSO findings also reconfirmed that over 97% of individuals between 15 and 65 have no exposure to any training. So the imminent need is to expand the reach of training providers, set up models and institutes with the capability to scale.

Select training institutes

- Construction Skills Training Institute
- Construction Industry Development Council
- National Academy of Construction
- National Institute of Construction Management and Research

Different employment levels and the current training/skill scenario



Recommendations

Select recommendations & implications

Recommendation	Implications
Govt. and industry body to incentivize and promote collaborative training	<ul style="list-style-type: none"> ▪ Government should give incentives to private players for letting the training providers use their assets for training. ▪ Industry Body should ensure that there is a market for collaboration and use of scarce capital resources. For e.g. there could be a network of employers who commit to train a certain percentage of their workforce and tie-up with training providers for the same making it commercially viable for the training providers.
Financial assistance to be offered to trainees	<ul style="list-style-type: none"> ▪ Corporate sponsored apprenticeship-where the organization bears the training expenses. ▪ Providing scholarships/grants to a certain percentage of trainees ▪ Workers could be provided an interest free loan to afford their training expenses.
National level certification and accreditation body should be set-up	<ul style="list-style-type: none"> ▪ Government should develop a nationally recognized framework for qualification and also work with industry to ensure that the qualification framework is recognized. ▪ A system of 'Graded Certification' depending upon levels of proficiency achieved with a seamless integration with the Higher Education programs should be enforced.
Govt. should enforce conditions on manpower quality and certification while selecting EPC contractors	<ul style="list-style-type: none"> ▪ Pre-qualification process in selection of contractors with a focus on the quality of manpower supplied should be strictly enforced and should form a part of contractual agreements ▪ Govt. should enforce Labor inspection framework to audit major EPC projects by government/private players for upholding minimum labor standards/quality
Industry should foster and nurture strong linkages with Training providers	<ul style="list-style-type: none"> ▪ Industry players and training bodies should initiate steps to develop strong linkages which would serve their collective interest and provide mutual support. This linkage could help the industry in overcoming skill shortage and improving productivity and would help the institutes in various ways like content development, low fixed expenditure etc.
There should be focus on imparting higher order skills training as well	<ul style="list-style-type: none"> ▪ Institutions/Training providers should also impart generic skills such as project management and should also develop and promote executive and management development programmes to solve the problem of higher-order skill shortage
Govt. and industry should make efforts to transform perception about construction and motivate youth to join the sector	<ul style="list-style-type: none"> ▪ Strong and proactive need to portray the industry in a manner such that students/youth feel proud of working in such a space and do not show any hesitancy in joining ▪ Intensive marketing and media activities should be implemented by both Government and Industry players to improve the image and create awareness about the industry and training programs.
Incubation of education cell to address the challenge of qualified faculty for training	<ul style="list-style-type: none"> ▪ Industry Body could undertake measures to incubate an education cell with members support so that industry people can be trained to teach part time by the institutes. ▪ Institutes should follow Train the trainer Model and leverage technology enabled delivery

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Abbreviations

PPP	Public Private Partnership
ITI	Industrial Training Institute
ITC	Industrial Training Centres
CAGR	Compounded Annual Growth Rate
CIDC	Construction Industry Development Council
CWFI	Construction Workers Federation of India
NAC	National Academy of Construction
CSTI	Construction Skills Training Institute
NICMAR	National Institute of Construction Management and Research
MoLE	Ministry of Labor Employment
GDP	Gross Domestic Product
NSSO	National Sample Survey Organization
DGET	Directorate General of Employment & Training
MHRD	Ministry of Human Resources and Development
EPC	Engineering, Procurement and Construction
FDI	Foreign Direct Investment
RE&C	Real Estate & Construction
CAD	Computer aided design
HNI	High Net-worth Individuals
SEZ	Special Economic Zone
SBD	Secondary Business District
CBD	Central Business District
ICD	Inland Container Depot

Context and approach

Brief background

NSDC had conducted sector-wise skill gap studies for 19 high priority sectors in 2008–09 .

- KPMG has been engaged as a consultant to help evaluate the skill gap across 25 sectors and develop actionable recommendations for its stakeholders.
- Mandate includes sector and sub-sector level analysis, demand-supply projection, estimation of incremental man-power requirement between 2013-2017 and 2017-2022, identification of key-employment clusters, and SWOT analysis of each sector
- Study also aims to take qualitative insights from stakeholders on enablers and challenges for each sector, way forward in terms of specific policy level actionable recommendations,

Inclusions over the previous study

- Study led by industry – Sector Skill Councils and a panel of professionals from different sub-sectors were consulted for their inputs on industry trends, key takeaways in terms of skill requirement, qualitative insights to understand specific interventions required for each sector and to validate the quantitative results and recommendations

- 6 sectors were added to the list of NSDC priority sectors for studying the skill gaps

Updated study also includes

- Identification of top 20 job-roles in each sector, case studies around good training practices, sub-sector level indicators and growth factors
- Study also includes understanding of existing training infrastructure, work-force characteristics and employment clusters,
- Macro economic factors, central and state governments policies and their envisaged impact
- Synchronisation of the sector wise demand from the district level skill gap studies
- Recommendations for key stakeholders - Industry, NSDC, Training organizations and Government
- Environment scans every year till 2015-16 including SWOT analysis for the sector

Industry classification

Industry classification

Coverage as per NIC classification

Sector and subsectors as per NIC 2008 classification

Division 41 : Construction of buildings	
4100 Construction of buildings	41001 Construction of buildings carried out on own-account basis or on a fee or contract basis
	41002 Activities relating to alteration, addition, repair, maintenance carried out on own-account basis or on a fee or contract basis
	41003 Assembly and erection of prefabricated constructions on the site
	This class excludes: <ul style="list-style-type: none"> - erection of complete prefabricated constructions from self-manufactured parts not of concrete - construction of industrial facilities, except buildings - architectural and engineering activities - project management activities related to construction,
Division 42 : Civil Engineering	
4210 Construction roads and railways	42101 Construction and maintenance of motorways, streets, roads, other vehicular and pedestrian ways, highways, bridges, tunnels and subways
	42102 Construction and maintenance of railways and rail-bridges
	42103 Construction and maintenance of airfield runways
	This class excludes: <ul style="list-style-type: none"> - installation of street lighting and electrical signals - architectural and engineering activities - project management activities related to civil engineering works
4220 Construction of utility projects	42201 Construction and maintenance of power plants
	42202 Construction/erection and maintenance of power, telecommunication and transmission lines
	42203 Construction of long distance pipelines or urban pipelines
	42204 Construction and maintenance of water main and line connection, water reservoirs including irrigation system (canal)
	42205 Construction and repair of sewer systems including sewage disposal plants and pumping stations
	42206 Water well drilling
	42209 Construction of utility projects n.e.c. This class excludes: <ul style="list-style-type: none"> - project management activities related to civil engineering works

Industry classification

Coverage as per NIC classification

4290 Construction of other civil engineering projects	42901 Construction and maintenance of industrial facilities such as refineries chemical plants etc.
	42902 Construction of waterways, harbours and river works, dredging of waterways
	42903 Construction of dams etc.
	42904 Construction of outdoor sports facilities
	42909 Other civil engineering projects n.e.c.
	This class excludes: - project management activities related to civil engineering works
Division 43: Specialized construction activities	
4311 Demolition	This class includes demolition or wrecking of buildings and other structures
	43110 Demolition
4312 Site preparation	43121 Site preparation for mining including overburden removal and other development and preparation of mineral properties and sites except oil and gas sites
	43122 Site preparation including drilling, boring and core sampling for construction, geophysical, geological or similar purposes
	43123 Clearing of building sites, earth moving: excavation, landfill, levelling and grading of construction sites, trench digging, rock removal, blasting etc.
	43129 Other site preparation activities n.e.c.
	This class excludes: - drilling of production oil or gas wells - decontamination of soil - water well drilling - shaft sinking - oil and gas field exploration, geophysical, geological and seismic surveying
4321 Electrical installation	43211 Installation of electrical wiring and fittings
	43212 Installation of telecommunications wiring, computer network and cable television wiring, including fibre optic, satellite dishes
	43213 Installation of street lighting and electrical signals
	43214 Installation of fire alarm system and burglar alarm system
	43219 Other electrical electrical installation n.e.c.
	This class excludes: - construction of communications and power transmission lines

Sources: National Industrial Classification 2008, Central Statistical Organisation, Ministry of Statistics and Programme Implementation, GOI

Industry classification

Coverage as per NIC classification

4322 Plumbing, heat and air-conditioning installation	43221 Installation of plumbing for water, gas and sanitation equipments
	43222 Installation of heating systems (electric, gas and oil), furnaces, cooling towers, non-electric solar energy collectors etc.
	43229 Other plumbing, heat and air conditioning activities n.e.c.
	This class excludes: - installation of electric baseboard heating
4329 Other construction installation	43291 Installation of elevators, escalators
	43292 Installation of thermal, sound or vibration insulation system in buildings
	43299 Other construction projects n.e.c.
	This class excludes: - installation of industrial machinery
4330 Building completion and finishing	43301 Installation of doors, windows, door and window frames, fitted kitchens, of wood or other materials
	43302 Interior completion such as ceilings, wooden wall coverings, movable partitions etc. ; Laying of parquet and other wood floor coverings, carpets and linoleum, wallpaper; tiling with ceramic, concrete or cut stone ceramic etc.
	43303 Interior and exterior painting, glazing, plastering and decorating of buildings or civil engineering structures
	43309 Other building completion and finishing
	This class excludes: - general interior cleaning of buildings and other structures - specialized interior and exterior cleaning of buildings - activities of interior decoration designers
4390 Other specialized construction activities	This class includes construction activities specializing in one aspect common to different kind of structures, requiring specialized skill or equipment, subsurface work, construction of outdoor swimming pools, steam cleaning, sand blasting and similar activities for building exteriors, renting of cranes with operator
	43900 Other specialized construction activities
	This class excludes: - renting of construction machinery and equipment without operator

Industry overview

Construction sector has a strong multiplier effect on the overall economy and is the second largest employer in the country next to agriculture

- In 2012-13, the market value of the construction industry was estimated at INR 7674 Bn
- The sector grew at a CAGR of 9.42% between 2003-04 and 2012-13.
- The sector has multiple linkages with other sectors and has a strong multiplier effect on the economy. Indirectly, the sector generates 5 times higher value for the other sectors.
- It is highly unorganised and employs most labourers, second only to the agriculture sector
- Labour is highly migratory and largely unskilled.
- The sector creates more than 45 million jobs either directly or indirectly among various classes of individuals in the country.
- Driven primarily by increase in demand for residential real estate and rising infrastructure expenditure.
- Need for huge office space by the IT/ITeS companies has led to the evolution of secondary business district (SBD) model leading to multiple developments in city outskirts and suburban regions like Gurgaon, Electronic City, Bandra and Malad etc.
- Skill gap is pronounced in Managers and Engineers. They lack leadership and management qualities along with technical knowledge like CAD designing.
- The incremental human resource requirement in the sector is estimated to be 13.98 million and 31.13 million for the periods 2013-2017 and 2013-2022 respectively.

Stable demand

- Rising urbanization: Urbanization is expected to increase from 31% to 51% by 2050
- Smaller families: A steady decline in average household size is driving demand for new housing in metro cities
- Existing shortage: there are 29 million fewer houses in urban cities

Innovation/Sector specific points

- The need for reduced cost overruns, fast track completion of construction projects is demanding high scale mechanization across all segments using pre-fabricated structures that easily cut down the installation time and cost
- Highly dependent on migrant labour and hence subject to seasonality, wage mismatch and ageing workforce

Sector trends

Reform wave

- Real Estate Bill - Instills an authority to regulate the sector
- Land Acquisition Act, 2013 - Addresses issues of developers and land-owners
- Relaxation of FDI in RE&C sector - New policy relaxes several provisions such as minimum lock in period, minimum investment and development size

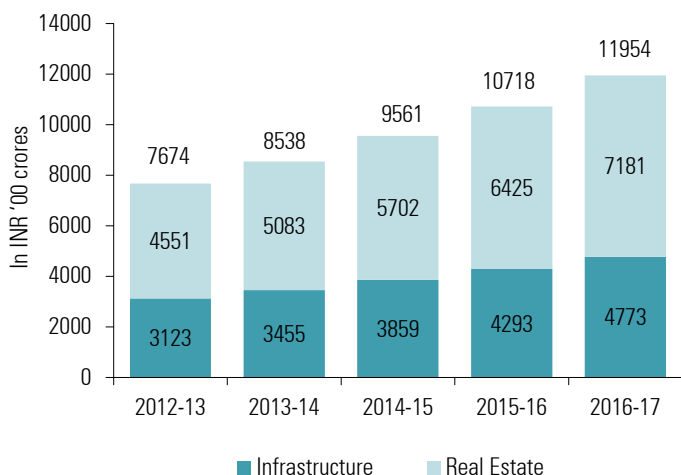
Attractive returns

- Developers offering at least 18-20 percent return in commercial and residential projects
- Foreign funds venturing after partnering with local funds to reduce risk
- Branded and luxury residences (at least US\$1.5 million) driven by HNIs who are increasing at a fast rate provide strong returns

Industry overview

Construction Sector is projected to grow to INR 11954 billion by 2017 and is expected to contribute 8.2% to Indian GDP

Construction Sector Growth Forecast till 2017 (Rs. Billion)



- The market value of construction sector in India is projected to expand up to INR 11954 billion by 2017.
- Continuously increasing infrastructure spending levels of the government has made the industry highly attractive among foreign investors in the recent years.
- Sector witnessed cumulative foreign direct investments to the tune of Rs 40,399 million from 2000 till 2013 of which 91% was in real estate development.
- Indirectly, the sector generates 5 times higher value for the other sectors.
- Infrastructure constitutes 40% of the market value and real estate the remaining 60%. This percentage is expected to remain constant during the projected period.

Source: BMI India Infrastructure Report, 2013

Construction Sector Growth Forecast till 2017 (%)



- During the period between 2006 and 2011 the sector contributed to 8 percent of the national GDP.
- In order to kick start rapid economic growth India has prioritised the Construction sector and has envisaged planned infrastructure investments equivalent to USD 1 trillion during the 12th Plan period.
- The Construction sector's growth is expected to reach 7.5 percent by 2016-17 from current growth rates of 5.6 percent and is expected to contribute significantly to the country's GDP in the next five years thereby showing its vital importance for the economic growth of the nation.

Source: Business Monitor International, 2012-13

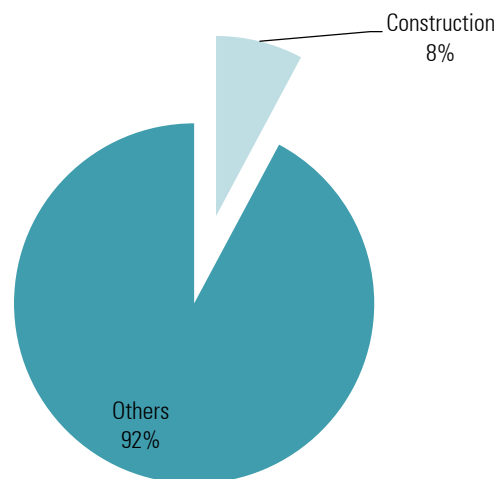
Industry overview

Construction sector is the largest contributor to central exchequer

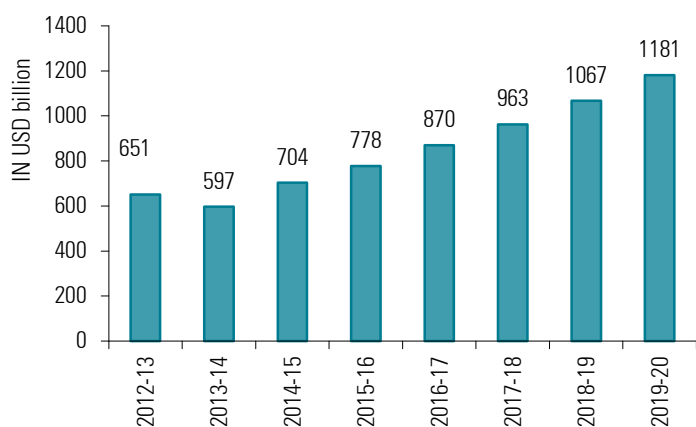
Key information

Sector-specific indicators	
Market Size (FY 13)	~ INR 7674 Billion
FDI (2000-13)	~ USD 40,399 Million
Organised %	20%
Unorganised %	80%
% of GDP	~8.0 (2012-13)

Contribution of Construction to GDP in 2012-13



Estimates of Capital investment in Construction sector



Industry highlights

- Construction sector is the 2nd largest employer in the country.
- It creates more than 45 million jobs either directly or indirectly among various classes of individuals in the country.
- The sector is also the largest contributor to central exchequer.
- Between 2000 and 2013, the sector attracted USD 40399 million as foreign direct investment. It is expected to attract FDI of USD 180 billion by 2020
- The sector grew at a CAGR of 9.42% between 2003-04 and 2012-13.
- Capital investments in the sector is anticipated to rise from USD 651 billion in 2012-13 to USD 1181 billion in 2019-20.

Source: RBI DBIE, KPMG Analysis

The sector is experiencing a paradigm shift due to increased rate of mechanization coupled with increasing demand for construction activities in real estate and infrastructure

Massive Shift in the rate of Mechanization

- Need for reduced cost overruns, fast track completion of construction projects is demanding high scale mechanisation
- Construction of half a million sq.ft required for about 700-800 labourers during 2002. But as the industry started transforming into a partially mechanised sector, the requirement of labour force to construct the same half a million sq.ft has fallen to about 200 by using pre-fabricated structures.

Urban Infrastructure development due to increased urbanization

- Urban population is expected to reach 40 percent of the total population soon and it will contribute to 70 percent of the country's GDP.
- Such rapid progress of urbanisation will demand extensive infrastructure facilities including congestion free transportation network, high speed metros, efficient sanitation and waste management which eventually leads to increased labour demand.

Increase in Residential Affordable Urban Housing

- The urban housing shortage is estimated to be more than 29 million.
- Significant influx of population into the urban areas has increased the population concentration by more than 73%.
- The demand for affordable housing is more likely to increase from current level of 29 million households to more than 38 million households by 2030. This will increase the need for labour in construction.

Focus moving towards SBD from CBD

- Need for huge office space by the IT/ITeS companies has led to the evolution of secondary business district (SBD) model leading to multiple developments in city outskirts and suburban regions like Gurgaon, Electronic City, Bandra and Malad etc.
- More than 445 million sq. ft of real estate development is planned in the office space across 10 major cities with NCR and Bengaluru regions itself accounting for more than 53 percent.

Consolidation of Players in Road Infrastructure

- With smaller and more aggressive bidders piling up orders that have run into viability issues, the field is clear for bigger players to shop around for distressed projects.
- Cash-strapped infrastructure developers are in the market looking for equity investment in as many as 40 projects. Many of these projects are up for sale because of lower-than-expected toll collection, rising cost of credit and bottlenecks in land acquisition.

Industry overview

Value chain in the construction sector is sub-sector agnostic and 75% - 80% of labour is concentrated in the bottom of the pyramid



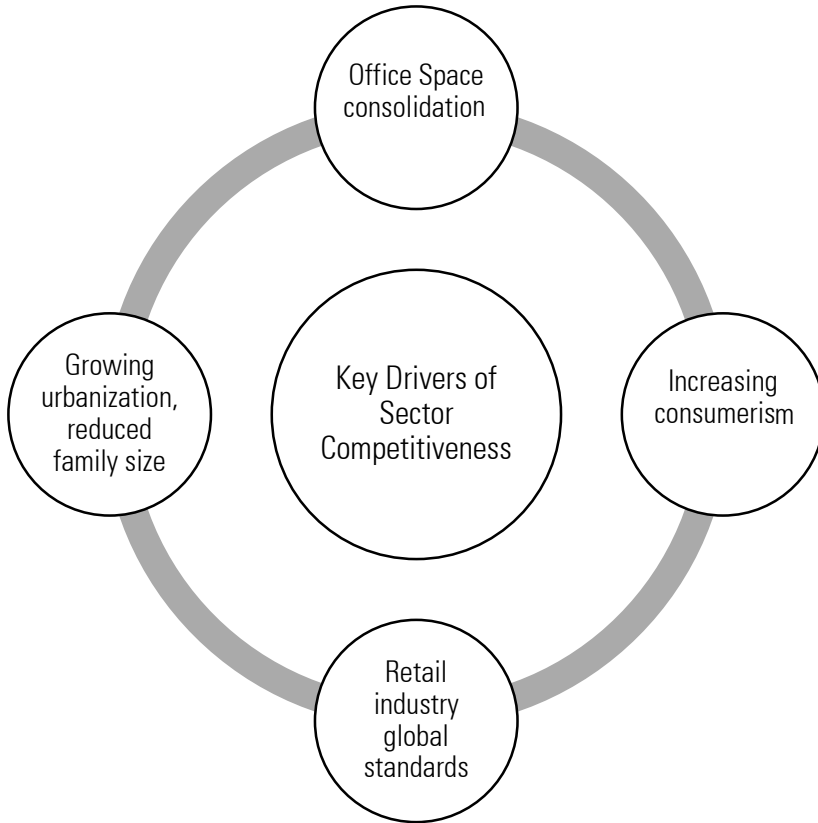
Key activities under each of the value chain element are as follows

Site Preparation and Development	Design and Engineering	Procurement	Construction	Operations and Maintenance
Site Investigation	Project Management	Preparation of bid packages	Project Management	Electrical
Site Organization	Resource Management	Contract administration	Change Management	Hydraulics
Storage and protection of materials	Workforce Management	Identifying qualified contractors	Procurement	Mechanical
Trial Boreholes	Contract Billing	Organize or participate in pre-bid conference	Billing	Fire Systems
Site Fencing and hoardings	Change Management	Review and evaluate competitive bids	Workforce Management	FF&E (Furniture, Fitments & Equipment)
Excavation and site clearance		Assist client in contractor interviews for obtaining	Document Management	Lifts and Escalators
Levelling		negotiated proposals	Schedule	Security and Communications
Setting Out		Award contract for construction		Civil Works

Industry overview

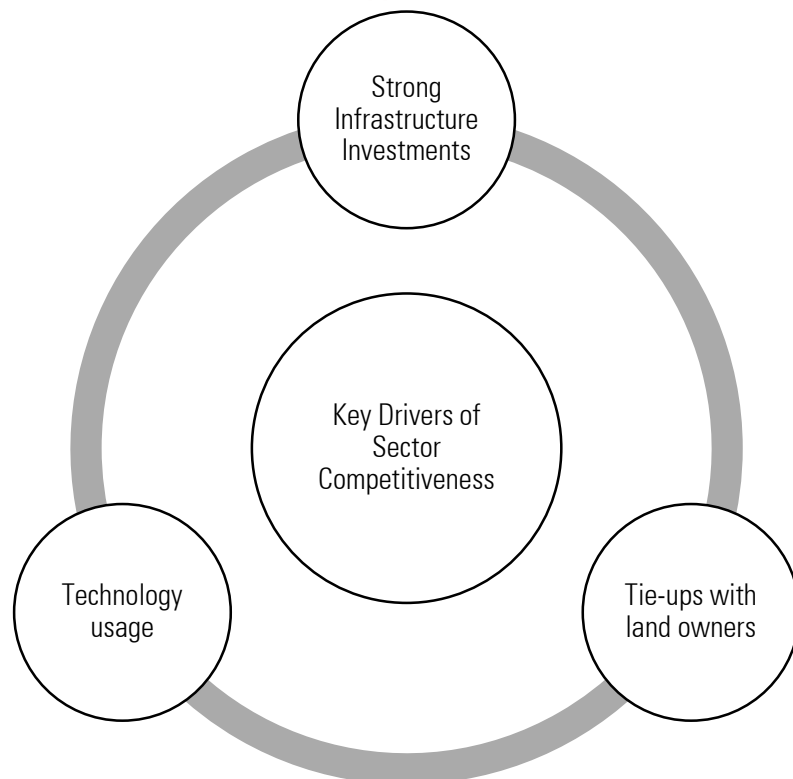
Some of the key drivers of sector competitiveness are

Demand-side



- Demand for affordable housing is more likely to increase from current level of 29 million households to more than 38 million households by 2030
- Rapid growth in the Information technology and financial services space and upcoming expansion plans of businesses into Tier-II and Tier-III cities
- Increasing consumerism and relaxation of FDI in multi-brand retail has surged aggressive growth among Indian retailers
- Demand for warehousing space (ambient and cold chain) in the country in major Tier-I and Tier-II cities is expected to surge as industrial parks are being setup and food trends shifting to more processed food

Supply-side



- Investments required in key infrastructure segments' including power, road, railways, ports and civil aviation is expected to reach \$1 trillion during the 12th Plan period
- Usage of new techniques and prefabricated structures is reducing time-cost and effort
- Most of the large land owners are seeking development of land banks and properties which are old

Central Policies Promoting Real estate and Housing

1. **100 Percent FDI through Automatic Route:** Government of India has allowed 100 percent FDI through automatic route in the Construction sector mainly in townships, housing, resorts, hotels, hospitals, educational institutions, commercial premises, recreational facilities, city and regional level built-up infrastructure
 - 1.Recent advancements
 - a.To boost investments in the real estate sector in low and affordable housing, Cabinet plans to ease the minimum capitalization for wholly owned subsidiaries from \$10 million to \$5 million
 - b.Cabinet plans to replace the concept of Built-up area with Carpet area in line with real estate (regulation and development) bill, 2013 to curb unfair trade practices
 2. **Financial Incentives:** Government of India has announced low interest rates for home loans up to Rs 2 million to enable growth of low and affordable housing in the country
 3. **ECB Norms for Low cost Housing Projects:** External Commercial Borrowings (ECB) is allowed in low cost affordable housing projects and the aggregate limit is extended for 2013-14 and 2014-15 with a ceiling of \$1 billion.
 4. Funds to the tune of USD833 million is sanctioned for Rural Housing in FY13 budget
 5. A Mortgage Risk Guarantee fund is sanctioned under the Rajiv Awas Yojana to enhance creditworthiness of economically weaker sections
-

Infrastructure

1. **Income Tax Holiday:** Ten year income tax holiday under section 80-IA of the Income Tax Act for new infrastructure projects within first 15 years of operation
 - 1.Recent advancements
 - a.Tax Holiday benefit for power projects extended till 2014
2. **100% FDI:** Government of India has allowed 100 percent FDI under the automatic route for enterprises engaged in the infrastructure sector
3. **Duty Free imports:** Government has provided free import structure for importing specific high capacity equipments for construction of highway projects
4. Government of India has launched Maritime Agenda 2010–20 with planned outlay of USD11.8 to develop infrastructure and investments in ports
5. Government has provided approval for Financial institutions to raise money through bonds for infrastructure projects
6. New policy of “participative models for rail-connectivity and capacity augmented projects” to promote private sector participation through increased private capital inflows in the railways sector
7. For the rapid development of roads in the country, NHAI has planned to provide capital grants of up to 40 percent of the project cost

Industry overview

State wise policy initiatives: Real Estate

UP	
Policy	Description
Urban Housing Policy	<p>Encourages private and cooperative sectors and individual beneficiaries to construct their own houses</p> <p>Resources including land, infrastructure facilities, loans, and building materials are provided</p> <p>Master Plan regulations relating to EWS/LIG housing</p> <p>At least 5 per cent of developable land is to be earmarked for EWS housing facility</p> <p>Incentives in terms of waiver of fees and other charges have been made available to developers</p>
Gujarat	
Gujarat Town Planning & Urban Development Act (GTPUDA)	<p>Schemes for development of land on public-private partnership basis and reservation of land for EWS housing</p> <p>Low-cost housing for socially and economically weaker sections</p> <p>Slum redevelopment and rehabilitation</p>
Madhya Pradesh	
State Housing and Habitat Policy 2007	<p>30 per cent of developed land will be reserved for EWS/LIG segment</p> <p>Additional Floor Space Index (FSI) for EWS/LIG housing</p>
Maharashtra	
State Housing Policy 2007	<p>Creation of adequate housing stock for Lower Income Group (LIG), Economically Weaker Section (EWS) on ownership or rental basis</p> <p>Incentives for different options of rental housing for weaker sections</p> <p>Slum Rehabilitation Authority (SRA) under the Maharashtra Slum Areas Act, 1971 for the purpose of slum rehabilitation</p> <p>Scheme to promote rental housing under Mumbai Metropolitan Regional Development Authority (MMRDA)</p>

Industry overview

State wise policy initiatives: Real Estate

Rajasthan	
Policy	Description
Affordable Housing Policy 2009	<p>Target to construct 1,25,000 houses for EWS, LIG and MIG in the next four years</p> <p>50 per cent of the land will be earmarked for the construction of EWS/LIG flats</p> <p>Slum redevelopment with participation of Private Developers</p>
Kerala	
Housing and Habitat Policy, 2007	<p>To eradicate homelessness and provide housing for 10 lakh families</p> <p>Unique section on special housing needs for different working groups</p> <p>Initiatives in the areas of FDI, PPP, financial and regulatory measures, pro-poor partnerships, and resource conservation</p>
Andhra Pradesh	
Infrastructure Development Enabling Act, 2001	An Act to provide for the rapid development of physical and social infrastructure in the State and attract private sector participation in the designing, financing, construction, operation and maintenance of infrastructure projects
Assam	
Policy on Public Private Partnership in Infrastructure Development	The key objective of the policy is to leverage the resources of the State Government to invite private sector investment in infrastructure at best possible terms. It also enables for setting up a efficient administrative mechanism to ensure selection of private sector developer through transparent bidding criteria
Bihar	
Infrastructure Development Enabling Act, 2006	An Act to provide for the rapid Development of Physical and Social infrastructure in the State and attract private sector participation in the designing, financing, construction, operation and maintenance of infrastructure projects in the State and provide a comprehensive legislation for reducing administrative and procedural delays, identifying generic project risks.

Goa	
Policy	Description
Policy on Public Private Partnership	The key objective of the policy is to leverage the resources of the State Government to invite private sector investment in infrastructure at best possible terms. It also enables for setting up a efficient administrative mechanism to ensure selection of private sector developer through transparent bidding criteria
Gujarat	
Infrastructure Development Act, 1999	To provide for a framework for participation by persons other than the State Government and Government agencies in financing, construction, maintenance and operation of infrastructure projects and for that purpose to establish a Board and to provide for the matters connected therewith.
State Viability Gap Funding Scheme 2007	The Scheme will be for financial assistance to the infrastructure projects having Public Private Partnership
Karnataka	
Infrastructure Policy, 2007	The main objective is to provide a fair and transparent policy framework to help facilitate this process and encourage Public Private Partnership (PPP) in upgrading, expanding, and developing infrastructure in the State
Madhya Pradesh	
Scheme and Guidelines for Madhya Pradesh Projects Development Fund	To facilitate development of economically or commercially viable projects through a revolving fund
Orissa	
Public Private Partnership Policy 2007	To leverage State and Central Government funds, support private investment and to create a conducive environment so as to utilise the efficiencies, innovativeness and flexibility of the private sector to provide better infrastructure and service at optimal cost.

Punjab	
Policy	Description
Infrastructure Development and Regulation Act, 2002	To provide for the partnership of private sector and public sector, participation of private sector in the development, operation and Maintenance of infrastructure facilities and development and maintenance of Infrastructure facilities through financial sources other than those provided by the State budget by following modern project management systems and for matter connected therewith or incidental thereto.
Rajasthan	
Social Sector Viability Gap Funding Scheme	<p>This Policy intends to address viability gap for meeting two kinds of service provision in the social sector:</p> <ol style="list-style-type: none"> 1) Establishment of new social service facilities i.e. expansion of existing social sector facilities like opening of colleges, hospitals, hostels, etc; 2) Operation and management of existing government facilities like PHCs, veterinary hospitals, agriculture extension work, etc.

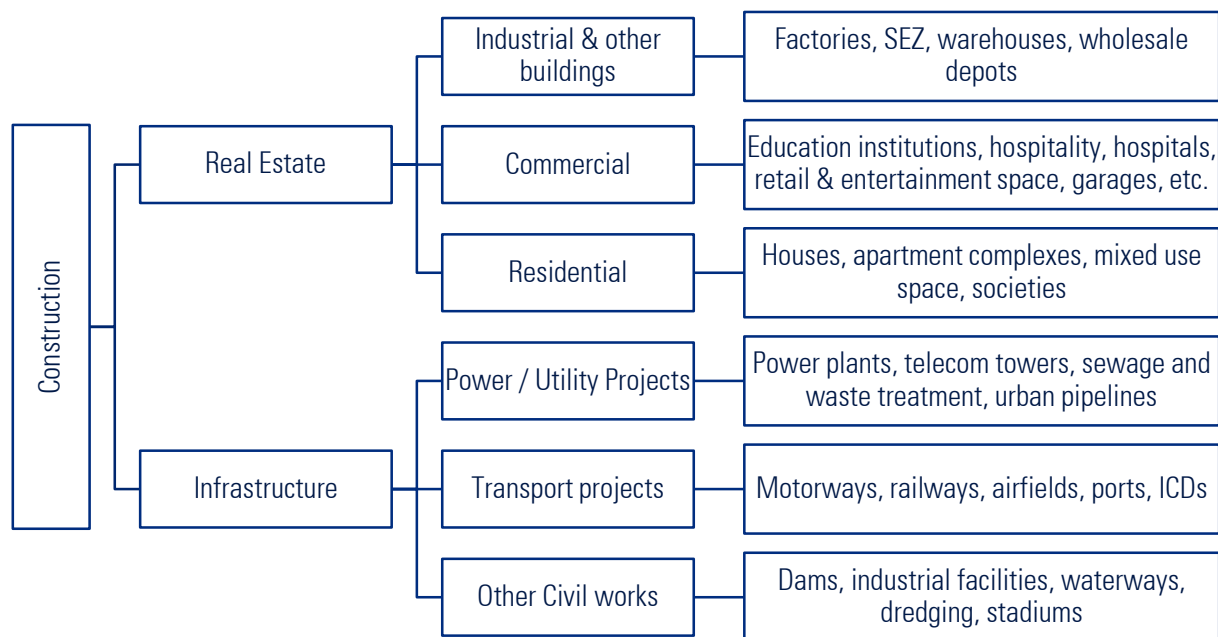
Strengths	<ul style="list-style-type: none"> ▪ Low cost well educated labour is now widely available across the country, especially in technical cadre ▪ Sufficient raw material availability ▪ Policies are set in place to ensure long-term security of raw material supply ▪ Land Acquisition Act, 2013 - Addresses issues of developers and land-owners ▪ High degree of mechanization will mean less reliance on labour ▪ Usage of prefabrications resulting in reduced cycle time and better quality ▪ Increased automation will mean less reliance on labour ▪ Evolving efficiency in supply chain management ▪ Better information availability on labour availability ▪ Improved business climate ▪ Availability of training for various kinds of construction activities ▪ Standardized wages
Weaknesses	<ul style="list-style-type: none"> ▪ Highly unorganised sector ▪ Changing skill requirements and requirement of different and very high degree of specialization for various construction activities may accentuate skills gap ▪ Lack of clearly defined processes and procedures for construction and its management ▪ High degree of informal and contract employment. ▪ Difficulty in attracting labour ▪ Lack of trained manpower ▪ Highly migratory nature of labour. People switch between agricultural and construction jobs especially contracted labourers. ▪ No standardized market wages ▪ Extremely high level of attrition of labour ▪ Most of the lower rung professions like painter, mason, electrician would amalgamate into a single profession. Workforce need to be adequately trained. ▪ Cost and availability of skilled workforce will be a severe challenge since the supply pool is rapidly drying up ▪ Highly capital intensive sector. Will need major support from govt. policies and regulations

Opportunities	<ul style="list-style-type: none">▪ Continuous private sector housing boom will create more construction opportunities.▪ Expanding middle income group with larger pockets that drive demand▪ Tax incentives for housing investments▪ Public sector projects through Public Private Partnerships will bring further opportunities▪ Government's focus on large scale infrastructure investments in the twelfth five year plan is likely to drive the sectors growth▪ Emergence of advanced technologies like pre-fabrication that speeds up production▪ Unexploited research and development capability▪ Renewable energy projects will offer opportunities to develop skills and capacity in new markets
Threats	<ul style="list-style-type: none">▪ Small and medium contractors do not have the wherewithal to upgrade their capability.▪ Quality, safety, environment and social aspects are also not being addressed appropriately▪ Sector is highly sensitive to policy changes▪ Rise in cost of construction may affect margins - The rise in crude prices, will increase the cost of transportation.▪ Extreme bureaucratic delays in clearing investment proposals especially relating to infrastructure projects▪ Highly bureaucratic and unreliable business environment▪ Obtaining capital for projects and high interest on loans

Sub-sectoral overview

Sub-sectoral overview

The two main sub-sectors in construction are Real Estate and Infrastructure Construction



Real Estate

Real estate in India is one of the largest and fastest growing sectors at a CAGR of 10 percent in the last five years. It is expected to expand at a CAGR of 19 percent in the next five years. The sector contributed to 4.8 percent of the total GDP of the nation in 2012-13. Industry estimates valued the Indian real estate sector to be INR 4551 billion in 2012-13 and is projected to reach INR 13,250 billion by 2023. By 2025 the sector is expected to generate employment for more than 17 million individuals in the country. Projected levels of urban and rural housing shortage, expansion plans of offices within Tier-II and Tier-III cities, increasing consumerism in retail sector, growing hospitality infrastructure and tourism will drive the demand for this sector.

Infrastructure

Infrastructure segments constitutes more than 40 percent of the construction sector and expected to be valued at over INR 4774 billion by 2017 and INR 8674 billion by 2023. With over 1000 PPP projects in the country at an estimated project cost of about US \$97 billion in the pipeline, infrastructure sector in India is poised for tremendous growth momentum in the years ahead.

Urban Housing Shortage at current population levels is estimated to be more than 29 million

Residential Space

The segment witnessing significant growth with supply pipeline of more than 3.5 billion sq.ft lined up for completion by 2013. According to estimates of the taskforce on Rental housing, the urban population in India is expected to shoot up from 377 million in 2011 to 590 million by 2030. Even at current population levels, urban housing shortage is estimated to be more than 29 million. 76 percent total housing shortage arises from Uttar Pradesh, Maharashtra, West Bengal, Andhra Pradesh, Tamil Nadu, Bihar, Rajasthan, Madhya Pradesh, Karnataka and Gujarat.

Decline in supply of new housing units maintained the demand–supply gap allowing developers to raise prices. Slow GDP growth, high interest rates, a weak job market and high property prices have forced buyers to postpone their decision to buy residential property, hitting investor driven housing demand.

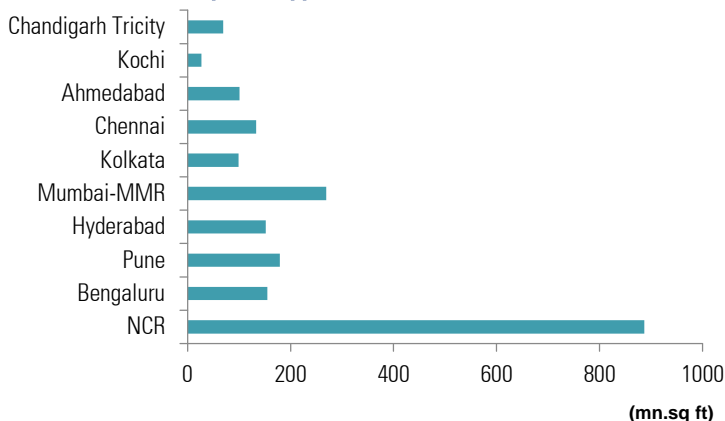
Urban Housing Shortage in India (in million) and Its Distribution across Economic Categories



Source: Report of the Technical Urban Group (TG-12) on Urban Housing Shortage 2012-17, 2012

The demand for affordable housing in the country is largely insulated against the slowdown. Government programmes like Indira Aawaas Yojna, Rajeev Gandhi Aawaas Yojna, Two Million Housing Programme, will boost the demand for residential real estate investments in the forthcoming years. This indicates that the labour requirement for construction of residential spaces is also insulated irrespective of the market conditions largely and is expected to increase.

Planned Residential Space Supply (2013-2015) in India



According to a CRISIL research, nearly 67 percent of the planned new property construction is expected to be completed by 2015 with major demand centres being Mumbai and Delhi NCR regions.

The top ten major cities in India in the coming years namely Mumbai, Kolkata, Chennai, Hyderabad, Pune, Ahmadabad, Chandigarh and Kochi will be the priority centres for real estate development in India going forward.

Source: CRISIL Research

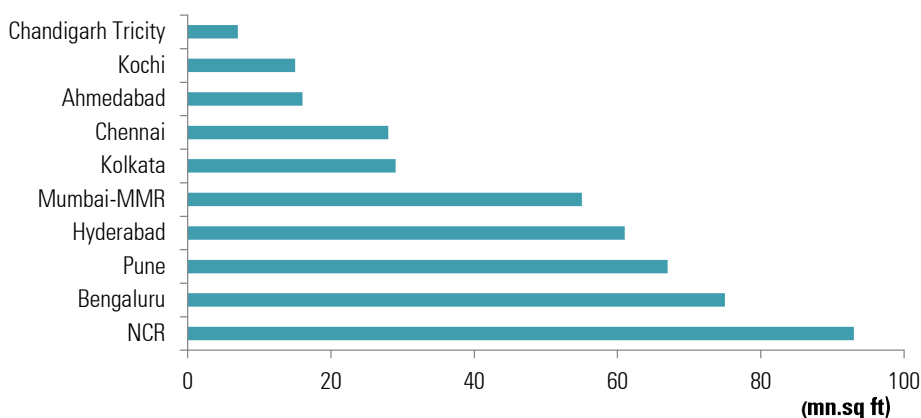
Rapid growth in IT/ITeS service sectors and SEZs are driving investments in the real estate commercial and industrial sector

Commercial Space

Rapid growth in the IT/ITeS service sectors is driving the demand for commercial office spaces in the country. Large untapped customer base, low cost manpower is attracting a large number of Multinationals to set up operation in different regions in India. Occupiers are also looking to shift to cost-effective locations in the suburbs, while leading IT/ITeS occupiers continue to expand.

Though the commercial segment traditionally concentrated towards CBD (Central Business District) areas in large cities, the need for huge office space by the IT/ITeS companies has led to the evolution of secondary business district (SBD) model leading to multiple developments in city outskirts and suburban regions like Gurgaon, Electronic City, Bandra and Malad etc. Instead of having several small office at multiple locations, occupiers are focusing on relocating and consolidating. More than 445 million sq. ft of real estate development is planned in the office space across 10 major cities with NCR and Bengaluru regions itself accounting for more than 53 percent. This will drive the demand for labour.

Planned Commercial Office Space Supply (2013-2015) in India

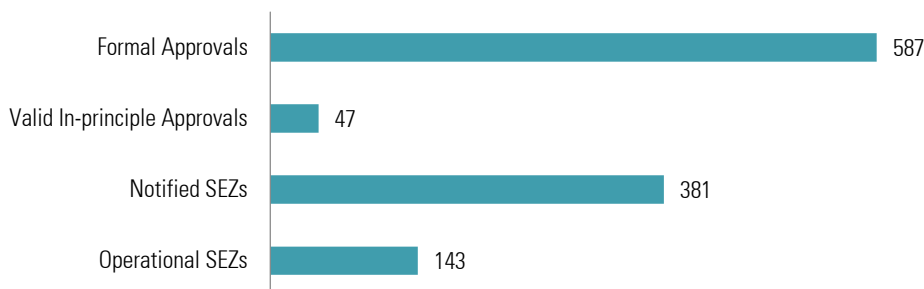


Source: CRISIL Research

Special Economic Zones (SEZs)

Growth in investments in Indian Industry will be driven by strong capacity additions from SEZs. This means, this segment is expected to grow in the coming years. 100% FDI is permitted in real estate projects within SEZs. Thus, SEZs are emerging as an extension of real estate business. The government has brought down the minimum land requirement from 1000 hectares to 500 hectares for multi-product SEZ and for sector specific SEZs to 50 hectares. As of March 2013, 577 SEZs have been formally approved by the Government of India.

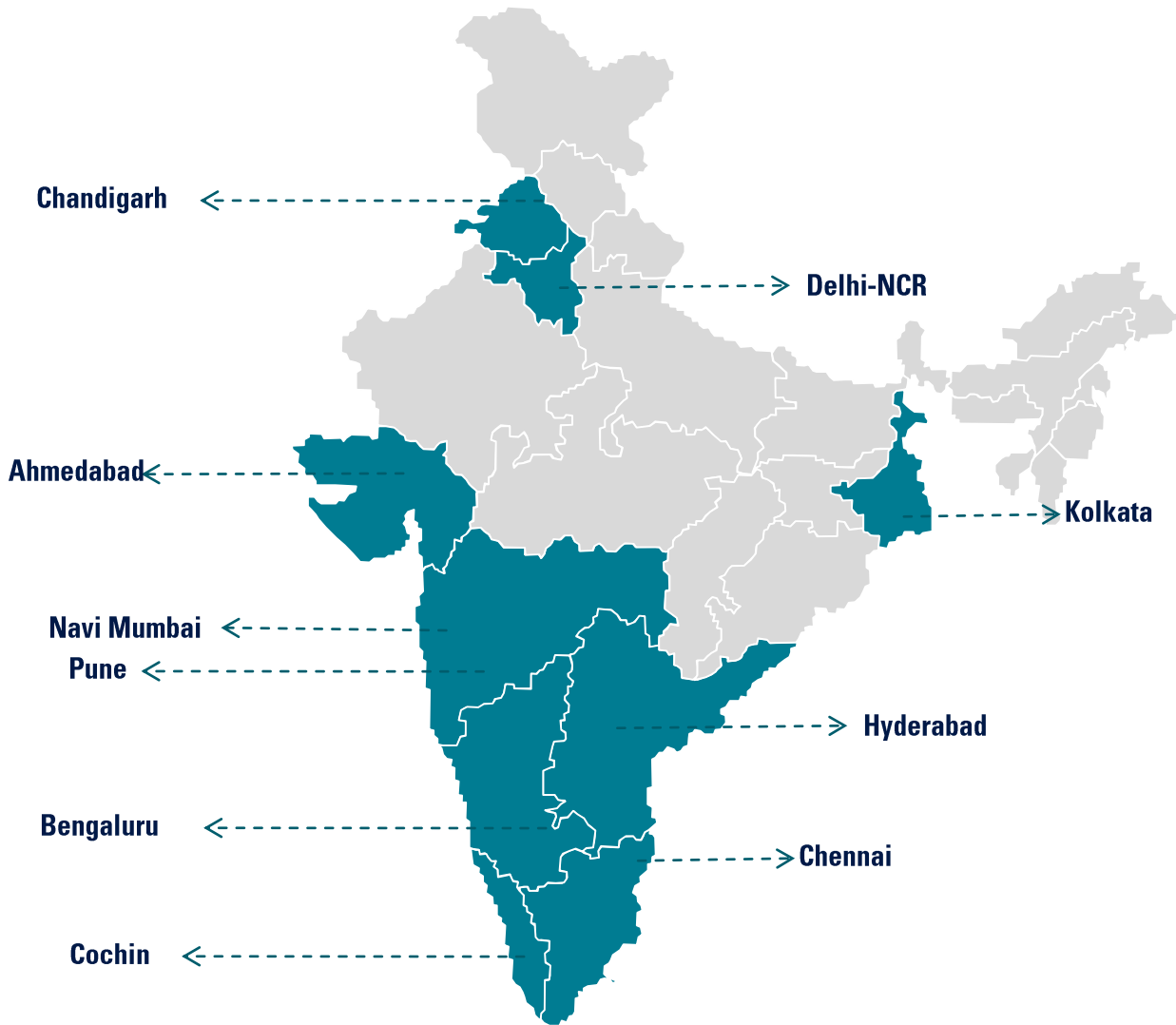
Status-wise Number of SEZs in India (as of October 2011)



Source: SEZs Role in Indian Manufacturing, IBEF

Sub-sectoral overview – Real estate

Investment in real estate is mostly concentrated around Tier 1 cities with major demand centres being Mumbai, Delhi and NCR regions



Source: CRISIL Research

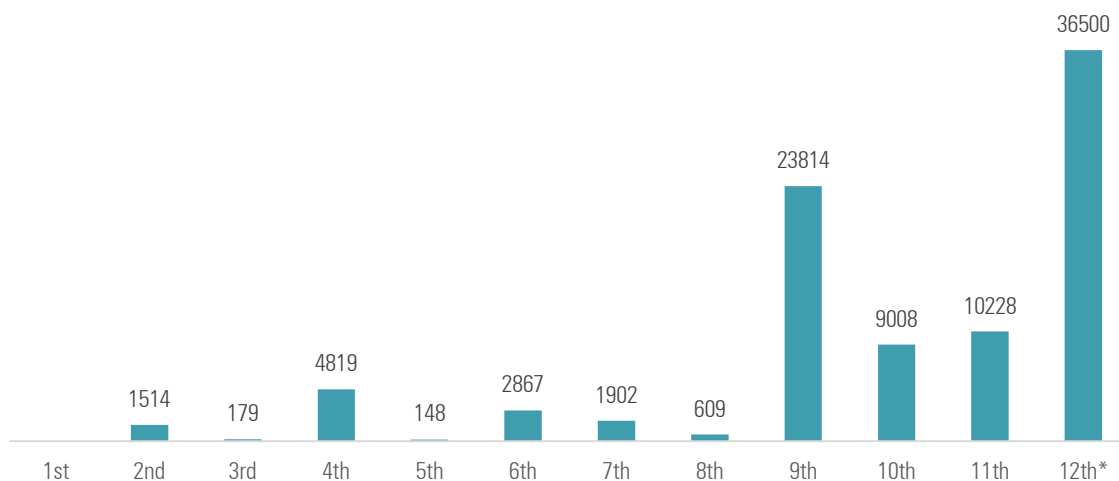
- Key factors such as strategic location, upcoming infrastructure projects and proximity to office spaces play a vital role in rapid real estate development in selected regions in the country
- Major demand centres are Mumbai, Delhi and NCR regions
- Satellite towns around these 10 centres would also see significant growth
- Share of investment in industrial and infrastructure development, across states, is skewed due to mining and energy projects

Government plans substantial investments to develop India's transport infrastructure which is expected to give a boost to the sector

Roads

India has the second largest road network in the world for a length of 4.7 million kilometres. The Government of India aims to develop 66117 kilometres of roads under various schemes such as National Highway Development Project (NHDP), Special Accelerated Road Development Programme in North East (SARDP-NE) and Left Wing Extremism (LWE.). The budget outlay for road transport and highways increased at a robust CAGR of 19.4 per cent between FY09 and FY14. This points toward the potential demand for road construction labour in India.

Length of National Highway added in the various Five-Year Plans (kilometers)



Source: NHAI, MoRTH, IBEF August 2013

Railways

Indian railways is the fourth largest rail network in the world. It interlinks the most interior parts of the country. It has a total route network of about 64,600 kilometres (of which 29.98 per cent is double/multi-track) spread across 7,146 stations. Demand for urban mass transport coupled along with increased FDI flows are the key drivers of demand and thereby skilled labour.

Airports

India is ranked as the 9th largest civil aviation market globally with more than 50 airports and 1188 aircrafts in operation. The aviation market in India is poised to become the 3rd largest in the world by 2020. As on 2012 the airports in India handled more than 162 million passengers recording a 14 percent growth compared to the previous fiscal year. The aviation market is booming with growth opportunities due to evolution of low cost air fares and rising incomes of the middle class population in India. Freight traffic has also registered an unprecedented growth registering a CAGR of over 8.3 percent during the period 2006-12. Over 2.26 million tonnes of freight traffic is handled by Indian airports during 2012 of which more than 65 percent are international freight.

Sub-sectoral overview – Infrastructure

With emphasis on economic growth and urbanization, construction activity in ports and urban infrastructure is expected to increase significantly

Ports

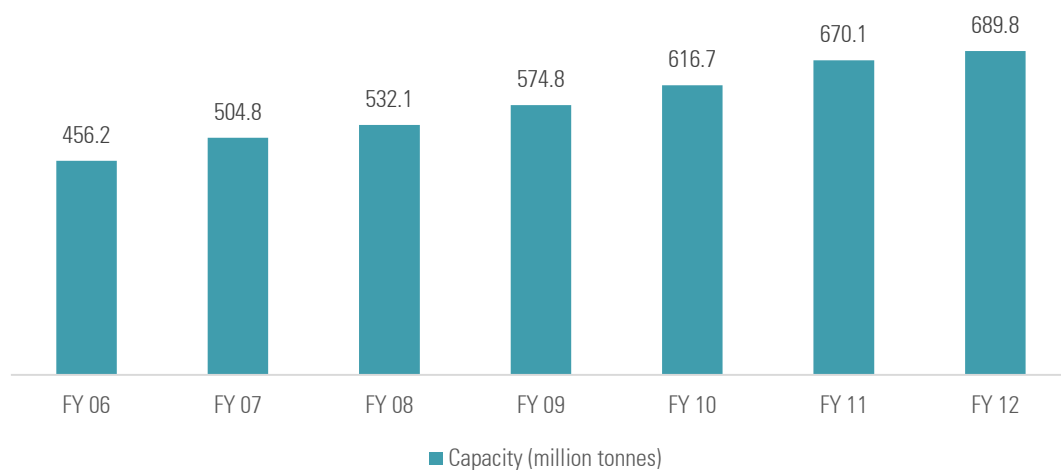
India has more than 13 major ports- 6 on the eastern coast and 7 on the western coast and 200 minor ports as on 2012. During FY13, 29 projects are scheduled to be executed adding capacity of 208 MTPA at the cost of USD 8.8 billion. Port based SEZs are being set up in places like Mundra, Krishnapatnam, Rewas and few others to provide strategic advantage to industries within these zones.

Under National Maritime Development Programme (NMDP), a total of 251 projects comprising of construction of new berths to rail/road connectivity with an investment outlay of USD 11.8 billion have been identified. In 2013, government has set a target for creation of 250 million tonnes of capacity spread across 42 projects at an estimated cost of USD 2.8 billion.

Under the National Maritime Agenda 2010-2020, port infrastructure is to be developed to implement full mechanisation of cargo and two major ports and two hub ports will be developed.

The proposed outlay for port sector in 12th Five year plan, excluding private investment is USD 4.7 billion. Thus, Ports are going to expand and upgrade in capacity and infrastructure which will lead to increased demand of labour.

Capacity at major ports (MMT)



Source: Ministry of Shipping

Urban Infrastructure

According to industry estimates, the urban population is expected to reach 40 percent of the total population soon and it will contribute to 70 percent of the country's GDP. Such rapid progress of urbanisation will demand extensive urban infrastructure facilities like congestion free transportation network, high speed metros, efficient sanitation and waste management.

Source: IBEF August 2013, Secondary Research, KPMG analysis

India's growing demand for power will experience a significant boost with rise in industrialization. The need for capacity addition in power is driving forecasts for the construction sector.

Power

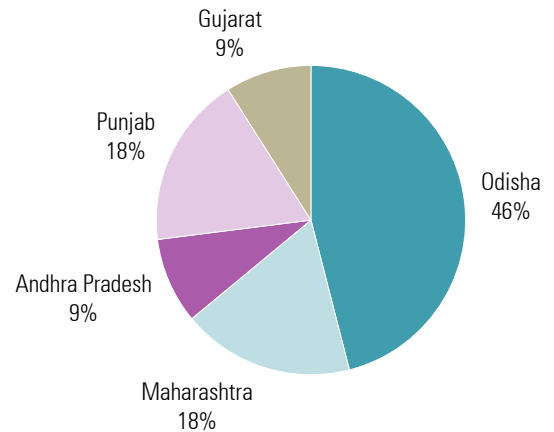
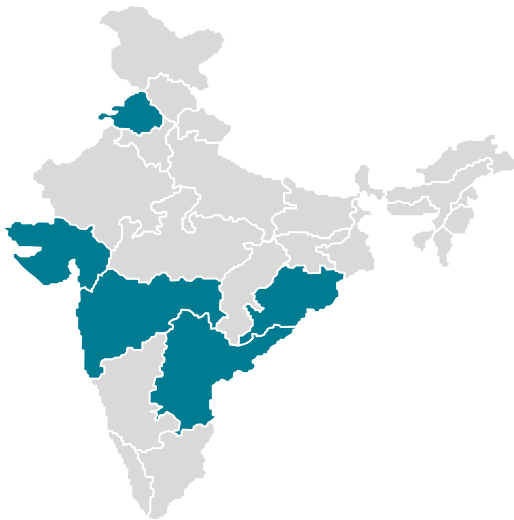
India is the fifth largest producer and consumer of electricity in the world. With growing industrialisation fuelling economic growth over the coming years, power demand will experience a strong boost. In the 12th Five year plan, the government targets a capacity addition of 89 GW and around 100 GW under the 13th Five year plan. Investments of around USD 223.9 billion are planned for the power sector during 12th Plan. Existing inefficiencies in the power sector namely significant demand-supply gap, high AT&C losses, peak demand deficit require immediate attention to meet the requirements of the future without shortfall. In order to address the existing shortfalls in the system and to efficiently meet the projected energy needs of the future, the 12th plan has envisaged investments in highly advanced modern supercritical technology. A total investment of more than Rs 13,72,580 crores is envisaged under the 12th Plan to the power sector in various key areas. Renewable energy is also set to grow with capacity additions of 30 GW planned over the next five years.

Total Proposed Investment for 12th Plan Rs 13,72,580 crore				
Expenditure Area	Centre	State	Private	Total
Thermal	48,650	55,734	1,73,117	2,28,851
Hydro	35,183	8,042	6,952	50,177
Nuclear	26,200	0	0	26,200
Biomass	0	0	0	0
Small Hydro Projects	0	0	0	0
Solar	0	0	0	0
Wind	0	0	0	0
Captive Projects	0	0	65,000	65,000
Modernisation of Plants	19,847	12,040	0	31,887
Transmission	1,00,000	55,000	25,000	1,80,000
Distribution	48,191	2,38,082	19,963	3,06,236
Energy Efficiency	7,482	0	0	7,482
Human resources	4,108	0	0	4,108
R&D	4,168	0	0	4,168

Sub-sectoral overview – Infrastructure

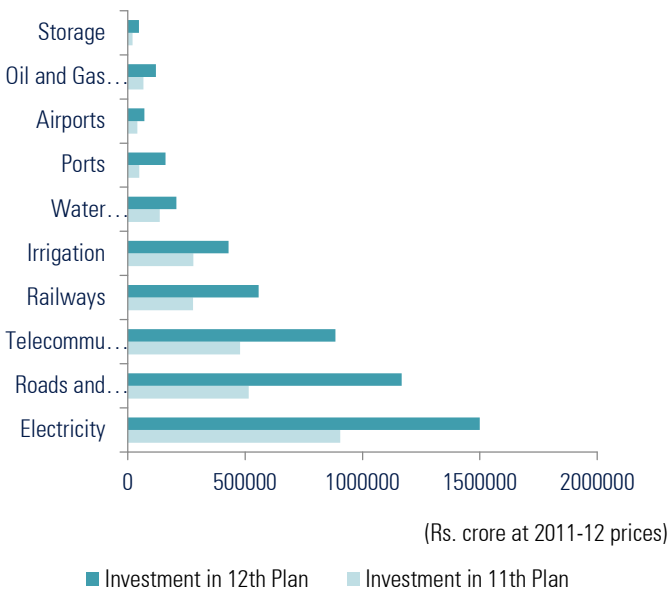
Investments in infrastructure across nation is driven majorly by the policies adopted in the State governments

Major Infrastructure Investment Regions and their Share in Total Investments in 2012-13

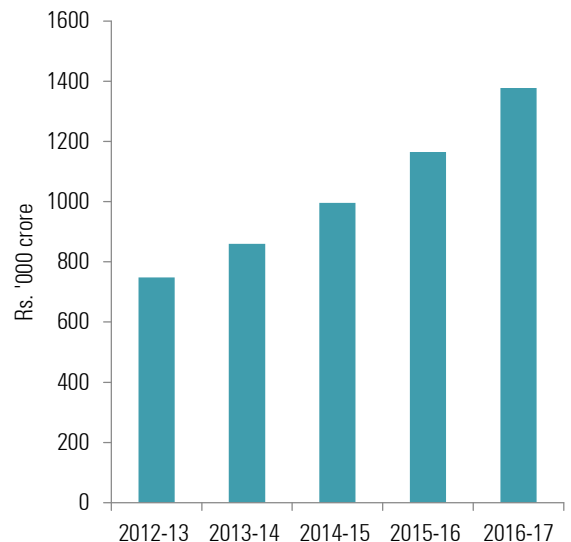


Source: Reserve Bank of India

Sector-wise Projected Investment in the 12th Plan



Projected Investment in Infrastructure in 12th Plan



Source: Interim report of the High Level Committee (Planning Commission) - Aug 2012

- States are coming up with a number of policies/schemes to promote infrastructural investment
- According to the statistics released by the RBI, Odisha has emerged as the hottest infrastructure investment destination during 2012-13
- Other attractive investment regions included Maharashtra, Punjab, Karnataka, Andhra Pradesh and Gujarat

Government is making policy changes to support rapid actions in terms of clearances and funding models

Completed Projects

- As on 2012, 68 PPP projects of national highways with an investment of Rs. 25,614 crore and 30 PPP projects in the port sector with an investment of Rs. 9,448 crore have been completed
- Airports at Cochin, Bangalore and Hyderabad worth Rs. 5,883 crore have been completed through PPP mode

Under Implementation

- 160 projects worth Rs. 1,55,252 crore in the road sector
- Projects worth Rs. 19,226 crore in the ports sector Rs. 25,237 crore worth airport Up gradation in Delhi and Mumbai
- Projects worth Rs. 3,441 crore in the railways sector

Projects in Pipeline

- 68 National Highways projects worth Rs. 68,536 crore to be awarded
- 19 port projects worth Rs. 8,577 crore to be awarded
- 14 airport projects worth Rs. 24,585 crore to be awarded
- 12 railway projects worth Rs. 58,100 crore to be awarded

Central Policies to support rapid infrastructure growth

- In 2013, Supreme Court allowed linear project such as expansion of roads and expressways to start work once they received their environmental clearances, reversing a previous mandate to start work after receiving both environmental and forest clearance
- In 2013, Ministry of Road Transport decided that road projects that are not viable under a PPP model can be awarded under an EPC format
- The road projects in India's north eastern region are funded under the Special Accelerated Road Development Program and proposed to be completed by 2016
- In 2012, Government approved a policy to allow land licensing to the concessionaires for major ports under PPP model. This policy is expected to speed up the process of expanding port infrastructure in the country.

Geographical clusters

Major Sources for Resources - Labour

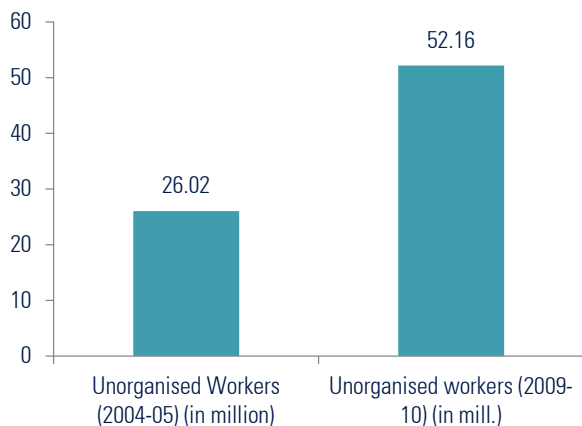


Total Casual Workers in Construction Sector

Organised Industry Segment	No. of Employees	No. of Firms
Small	Less than 200	25,000-30,000
Medium	200-500	Greater than 500
Large	Greater than 500	250
Unorganised (standalone Contractors)		120,000

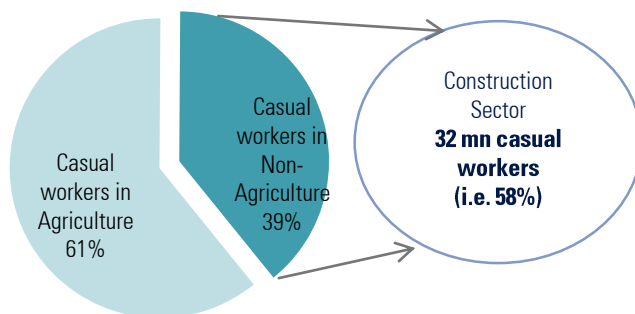
Source: KPMG in India analysis

Increase in no. of Unorganized Workers in Construction Sector (in million)



Source: Data for use of Deputy Chairman, Planning Commission 2013

Total Casual Workers in Construction Sector



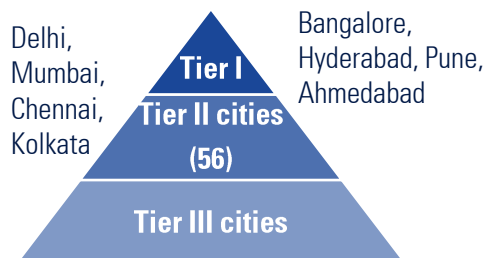
Source: NSS 64th Round

- The construction sector is one of the largest seasonal employment providers in India next only to agriculture.
- The sector is also highly unorganised and is the principle industry employing short duration out-migrant
- Of the total estimated 15.2 million short duration out-migrants, more than 36.2 percent are employed in the construction industry alone.
- According to 64th NSSO round, there were 58.6 million casual workers in non-agriculture sector of which construction industry alone employed around 58 percent of the casual workers in non-agriculture (i.e. 32 million).

Employment across Worker Classes

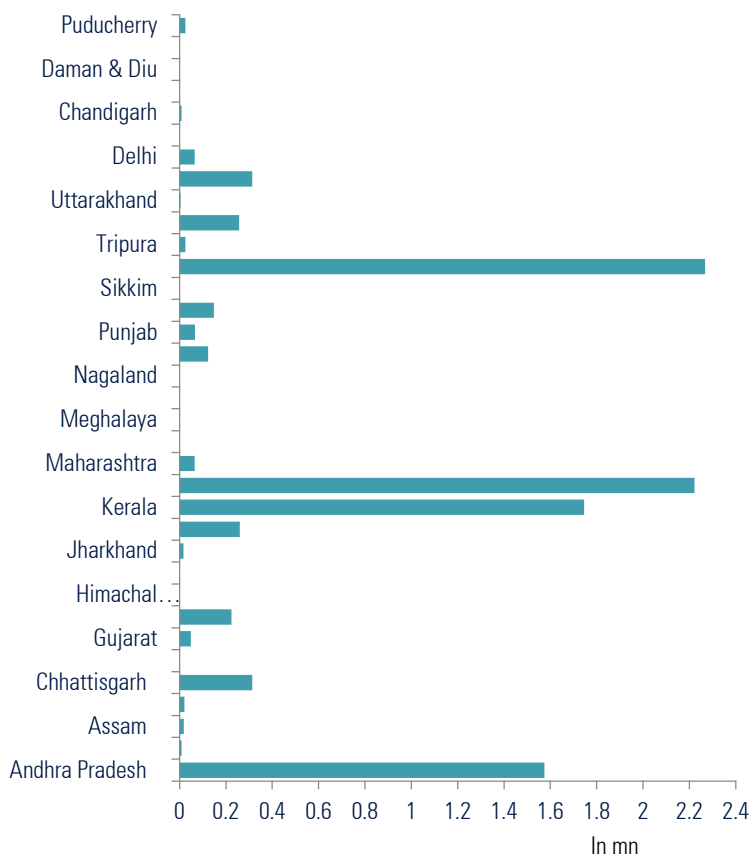
Occupation	Nos. (000's) 2005	% of work force	Nos. (000's) 2011	% of work force	% growth
Engineers	822	2.65%	1050	2.56%	28%
Technicians/Foremen etc.	573	1.85%	1120	2.74%	95%
Clerical	738	2.38%	930	2.26%	26%
Skilled Force	3,267	10.57%	3730	9.10%	14%
Unskilled	25,600	82.45%	34200	83.30%	34%

Major Sources for Resources - Engineers



Source: 12th Five year plan document, Chapter on Construction

State-wise No of Registered Construction Workers



- Only a meagre 9.8 million construction workers of the total 32 million workers are registered in the country.
- Tripura, Manipur and Lakshadweep are the states/UT that employ the highest number of registered workers in construction sector
- Interestingly, significant number of female workforce form a part of unorganised construction.
- In terms of employment, technicians/foremen have had the maximum growth of 95% between 2005 and 2011 followed by unskilled workforce (34%).

Source: Rajya Sabha Unstarred Question NO. 4603, 2013

**Incremental human
resource requirement
(2013-17, 2017-22) and
skill gaps**

Incremental human resource requirement (2013-17, 2017-22) and skill gaps
Current workforce of 45 million (2013) is expected to increase to ~76 million by 2022

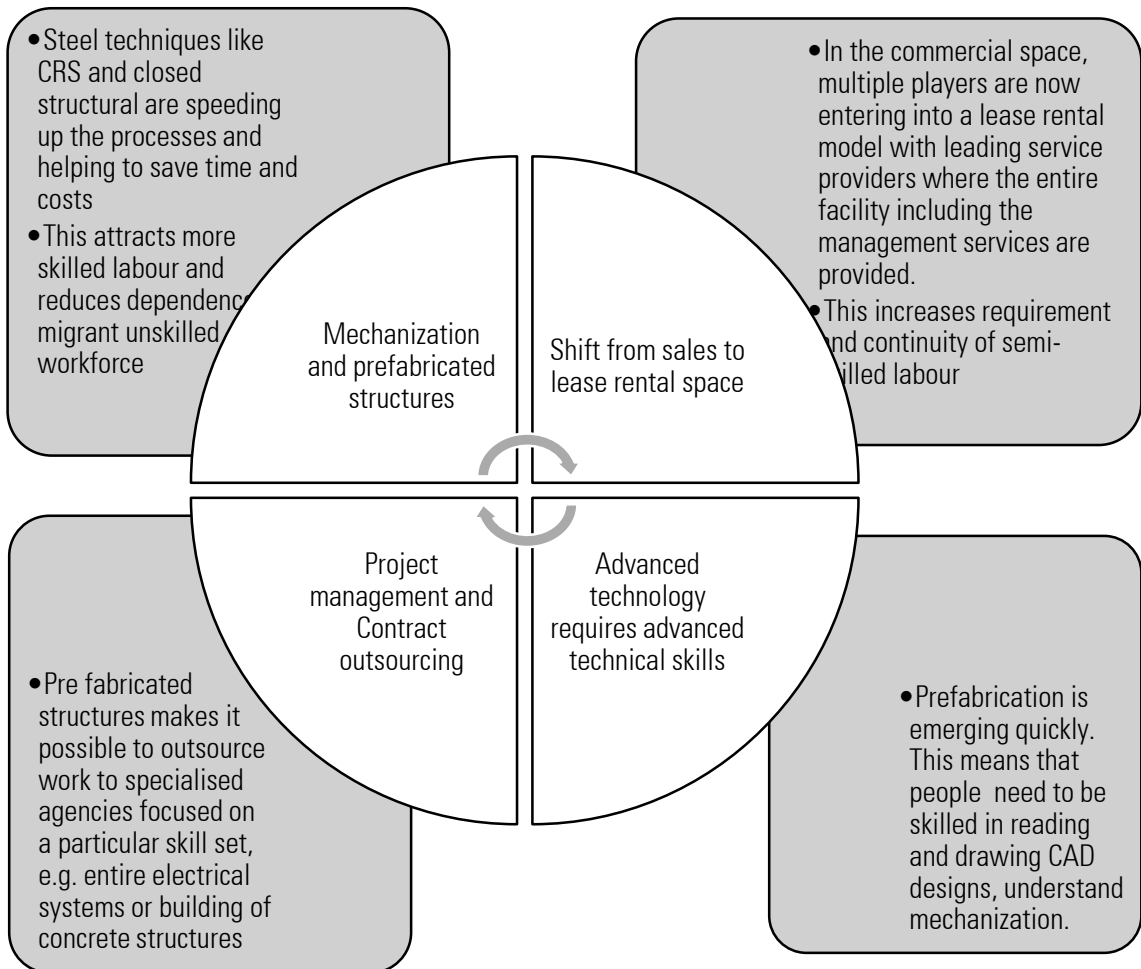
Segment	Employment Base in million				
	2013	2017	2022	2013-17	2017-22
Building , Construction & Real Estate	40.14	51.95	66.62	11.81	14.67
Construction of Buildings	35.52	45.97	58.96	10.45	12.99
Demolition and site preparation	0.34	0.45	0.57	0.11	0.12
Electrical plumbing and other construction installation activities	1.00	1.29	1.66	0.29	0.37
Building completion and finishing	3.27	4.24	5.44	0.97	1.2
Infrastructure	5.28	7.45	9.93	2.17	2.48
Construction of roads and railways	4.28	6.04	8.05	1.76	2.01
Construction of utility projects	0.79	1.12	1.49	0.33	0.37
Construction of other civil engineering projects	0.18	0.26	0.35	0.08	0.09
Other specialized construction activities	0.02	0.03	0.04	0.01	0.01
Overall Sector	45.42	59.40	76.55	13.98	17.15

Source: Primary Interactions, NSSO 68th Round of EU Survey, KPMG Analysis

The sector currently employs over 45 million employees and is slated to employ more than 76 million employees by 2022. This implies additional creation of ~31 million jobs in the 9 year period

Incremental human resource requirement (2013-17, 2017-22) and skill gaps

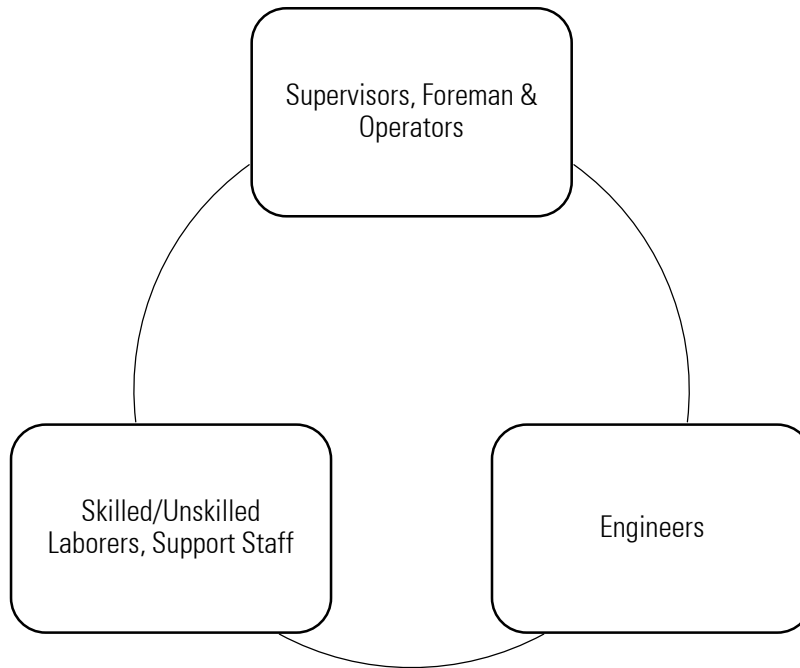
The skills sets needed to cope with the changing environment are different and workforce needs to be trained/re-skilled on them if they are to stay competitive



Incremental human resource requirement (2013-17, 2017-22) and skill gaps

Functional Distribution and Key Job Roles in Construction Sector

Key Functions



In Construction works, two areas of trades are of utmost importance: a) Mechanical trades: Those which require more understanding of machines and mechanical engineering & b) Civil Trades: Those which are more closely associated with understanding structures and civil engineering related aspects.

Main job roles –

- Manual Labor– Provide physical effort to accomplish a variety of unskilled tasks
- Skilled Laborers – Carpenters, Plumbers, Welders and Fitters, Bar Benders and Scaffolders
- Supervisor- Analyze a problem and complete the job through interaction with laborers.
- Foremen requires skills in understanding the drawings and design related aspects.
- Operators mainly consist of machine operators, e.g. Motor Grade or Crane operator
- Engineers - Surveys land before project starts, plans & advises the contractors
- Project Managers & Architects – Specialized skills help them to shoulder responsibilities for completing construction projects on time & within the budget

Incremental human resource requirement (2013-17, 2017-22) and skill gaps

Critical Profiles and their characteristics

Based on the interactions and meetings with the leading Engineering & Construction players in the country, we have come up with a set of critical profiles which currently faces enormous skill shortage. Some of these profiles are highly skilled and require only skilled professionals, and there are some for which the skill training need not be intensive, but the number of people to be trained is large.

Some of those critical profiles include:

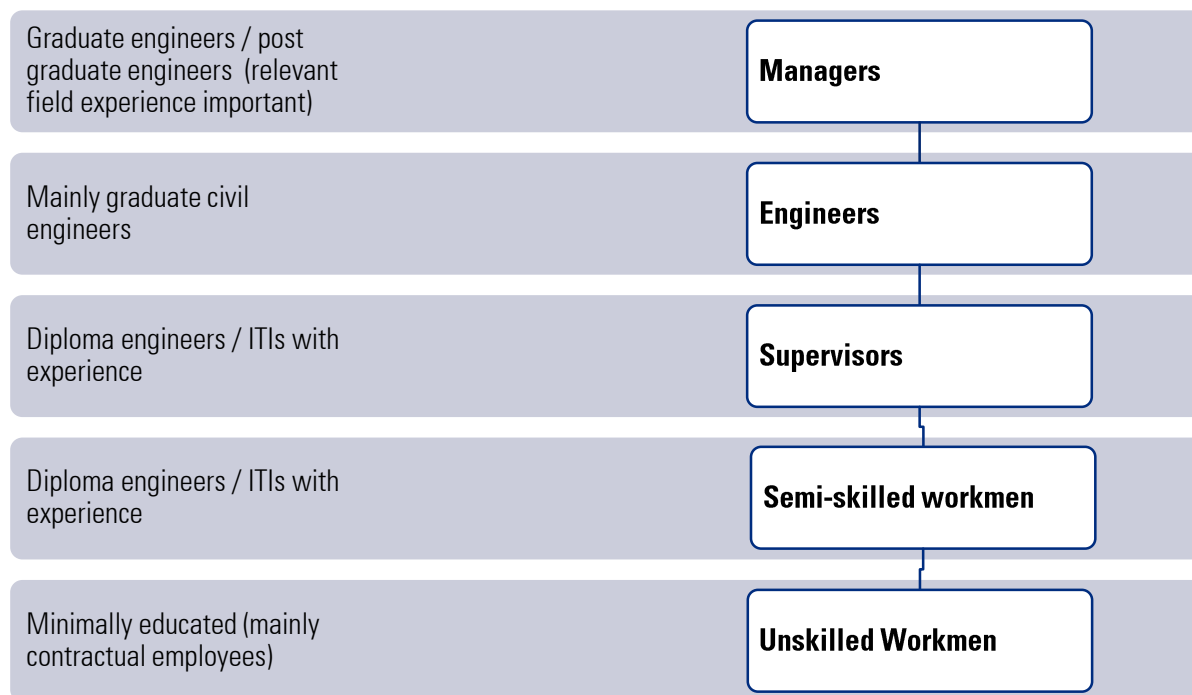
Profiles	Skills Requirement
Mechanical Trades: Welders and Fitters	The profiles of welders and fitters under the mechanical trades are critical to the success of any construction project. The welders profile especially is considered to be a very skilled profile with a strong emphasis on recruiting trained/experienced welders. Both the profiles are under acute shortage of skilled people given the huge requirement.
Civil Trades: Bar-benders, Scaffolders and Carpenters	The civil trade profiles like Bar-benders, scaffolders and carpenters are essentially required in huge numbers and the problem in this scenario is that of quantity. Profiles like Bar-benders do not require as much skill as a Welder, but the shortage in terms of quantity is being felt.
General across all trades and sectors: Supervisors and Foremen	The roles/profiles of Supervisors and Foremen are of utmost importance to any construction company for ensuring successful delivery of a project. A supervisor role requires skill in understanding the problem and getting the job done on time through interaction with laborers. A supervisor is generally a person holding a Diploma qualification. Foremen require skill in understanding the drawings and design related aspects. Both the Foremen and Supervisors are in acute shortage in the current scenario.
Operators	Operators could be any type of machine operator, for e.g. Motor Grade operator, Crane operator et.al. The requirement of operators has been rising of late given the advancements in technology and the higher degree of mechanization the construction projects are undergoing. There is an acute quantity problem and over the period of time, these skills would be required in far more number.
Specialized profiles (for specific sectors):	These kinds of profiles are niche in the sense they are mainly required for a certain sector /segment or for some specific activity within the sector. Nonetheless, these profiles require great skill and are very critical to the sectors/segments in which they are deployed. For e.g. Riggers, Drillers (Oil & Gas); People involved in Stringing and Tower Building (Power Sector); Pre-Fab Steel Workers (Steel Industry) et.al.

Incremental human resource requirement (2013-17, 2017-22) and skill gaps

Functional Distribution of Key Job Roles and broad profile of employees

Function	Key Job Roles
Operations	Project Mangers, Engineers/Supervisors, Foremen, Accounts/billing, Planning, Surveying, Quality/lab, Safety, Support functions
Project Management	Procurement, Designing, Scheduling, Overall Planning
Others	HR, Administration, Finance, Communications, IT

Profile of people employed in the Building, Construction and Real Estate Sector



Incremental human resource requirement (2013-17, 2017-22) and skill gaps

There is a significant gap in the level of skills desired and actual skill set

Changing skill set requirements			
Job Role	Educational Qualifications	Skills Required	Skill Gap
Project Managers	Graduate engineers / post graduate engineers (relevant field experience important)	<ul style="list-style-type: none"> ▪ Project Management Skills ▪ Good understanding of nuances of multi industry complexities ▪ Aptitude, attitude, intellect to react in uncertain times ▪ Communication and people skills ▪ Problem solving skills ▪ Planning and risk management ▪ Technical skills and experience ▪ Vision and focus on the end results ▪ Leadership & Motivation Skills 	<ul style="list-style-type: none"> ▪ Lack of leadership, managerial, supervisory and project management skills ▪ Some experienced people suffer from linear thought process ▪ Greater need to inculcate a positive attitude ▪ Grooming second rung leaders on a continual basis
Site/Project Engineers	Mainly graduate civil /mechanical/electrical/architectural engineers	<ul style="list-style-type: none"> ▪ Analytical, communication skills ▪ Project management skills like, planning, scheduling, engineering, designing, procurement & contracting, execution ▪ Understanding of Project Risks and legal issues ▪ Overall Project Knowledge ▪ Management of Workers, Communication, Coordination and Team Management skills ▪ Technical Skills (Domain Knowledge) ▪ Safety Management Skills, Preventive Maintenance Skills ▪ 	<ul style="list-style-type: none"> ▪ Lack of desired technical knowledge ▪ Lack basic understanding of engineering ▪ Huge mismatch in knowledge imparted and industry needs ▪ Lack of specialization in areas such as planning, execution, quality, CAD and process control ▪ Lack of industry knowledge as also the broader economic trends ▪ Poor employable skills of graduates ▪ Communication and writing skills

Incremental human resource requirement (2013-17, 2017-22) and skill gaps

There is a significant gap in the level of skills desired and actual skill set

Changing skill set requirements			
Job Role	Educational Qualifications	Skills Required	Skill Gap
Supervisors	Diploma engineers / ITIs with experience	<ul style="list-style-type: none"> ▪ Technical Skills (Domain Knowledge) ▪ Ability to show and teach the labors how to do things in the right way ▪ Planning Skills - Ability to Anticipate & Forecast Material, tools, manpower & Machinery needs ▪ Ability to read the drawings ▪ Make the materials schedule ▪ Labour Management Skills ▪ Productivity Driven & Goal Setting ▪ Maintain a safe work environment 	<ul style="list-style-type: none"> ▪ Communicating with and managing workers to ensure maximum productivity is a skill not easily available in supervisors making skilled supervisors much sought after ▪ Formal training in technical skills lacking and not up to the level desired by the industry
Bar-Bender, Mason, Plumber, Painter, Welder, Equipment Operator	Class X/XII pass or below/school dropouts	<ul style="list-style-type: none"> ▪ Basic knowledge of construction engineering ▪ Trade Skill – e.g. Bar Bending, Formwork carpentry, plastering, painting, plumbing, etc. ▪ Coordination Skills with unskilled workmen ▪ Ability to work at heights ▪ Ability to comply with safety and quality measures ▪ Knowledge of machine operations and basic machine troubleshooting ▪ Ability to operate key equipment such as cranes, especially tower crane operations, and also mechanisms for loading and unloading of cranes ▪ Loading and unloading 	<ul style="list-style-type: none"> ▪ Sub-optimal equipment utilization due to lack of knowledge on machine operation ▪ Understanding of quality control process ▪ Ability to manage productivity ▪ Equipment maintenance ▪ Financial management and safety procedures

Source: KPMG in India analysis

Incremental human resource requirement (2013-17, 2017-22) and skill gaps

Workforce characteristics and related challenges

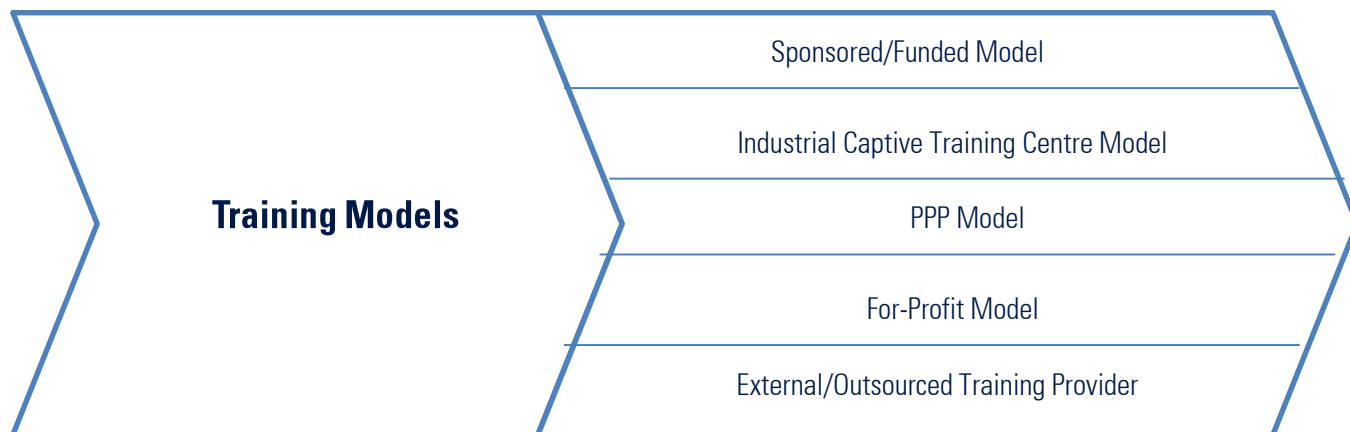
Area	Qualitative insights
Issues in attracting/ retaining talent	<ul style="list-style-type: none"> ▪ Untrained people mostly at the entry level ▪ No or little aspiration among the youth to get trained in this sector . In terms of being a preferred sector it faces stiff competition from retail and security sector since they do not require as much hard labour
Skills premium – correlation to increasing wages	The skill premium seems to be absent, mostly there is no recognition for trained manpower since the unskilled manpower is available aplenty and costs less
Manpower quality supplied by EPC contractors	<p>Lack of skilled manpower supplied by the contractors hired for the EPC projects by the Construction Companies resulting in low quality output.</p> <p>Lack of regulatory framework or Industry requirements to impose certain percentage of trained and certified manpower to be supplied by contractors</p>
Migrant nature of labor	<ul style="list-style-type: none"> ▪ One of the biggest issue in this sector is the unskilled labour force often come from agriculture sector. The farmers come into construction in non seasonal times or when the crops are bad, or when the family is in financial crises. These people get skilled but when the scenario changes in the agriculture sector they go back and comes back to construction after 1-2 years, these people have to be skilled again and again. Institute needs to re-skill the same set of people who come from agriculture sector ▪ Most of the labour force are migrants. They are usually from states such as WB, Orissa, UP, Bihar and Assam and they migrate mostly to southern states such as Kerala and Karnataka where they get relatively higher wages than their home states
Capital Intensive training	<p>Construction specific training requires exposure to high-end construction equipments for practical training needs.</p> <p>High Capital Investment required for construction specific training needs (Land & machinery/construction equipment purchase)</p>

Training Infrastructure

Construction Related Trades Offered by ITI s / ITCs and their Capacity

Trades	No. of Units		No. Of ITI's		Unit Size
	Govt	Pvt.	Govt	Pvt.	
Architectural Assistant	21	139	18	84	16
Carpenter	443	119	379	91	16
Draughtsman Mechanical	455	535	288	342	16
Draughtsman Civil	760	1709	509	891	
Electrician	3029	24764	1702	9898	16
Foundryman	174	7	118	6	16
Fitter	3438	18274	1730	8619	16
Interior Decoration and Designing	44	56	32	36	16
Mason(Building Constructor)	109	94	93	56	16
Machinist	1124	135	441	84	12
Mechanic Machine Tool Maintenance	105	9	70	6	16
Plumber	332	581	283	369	16
Operator Advanced Machine Tool	4	1	4	1	
Painter(General)	202	74	168	69	16
Sanitary Hardware Fitter	9	21	8	14	16
Sheet Metal Worker	304	55	235	50	11
Wireman	1600	888	1021	595	16
Welder	899	1237	653	833	
Welder(Gas & Electric)	1088	701	666	438	12

There are different types of training models currently prevailing in the country viz. a) Sponsored/Funded (Corporate adopted) Model, b) Industrial Captive Training Centres, c) PPP model for training, d) For-Profit Model and e) External/ Out-sourced Training Provider Model. They differ in terms of their sizes, operating structure, industry associations, revenue model etc.



Shortage of talent in the construction sector is a long term problem and will continue to push up project costs and risks. The education and training capacity offered through various schemes currently are clearly inadequate to meet the demand of the large percentage of unskilled workers in the Indian labour market. The education system is often not delivering the required number of specialists across project management, engineering, surveying, contract management and the skilled/semi-skilled labor.

The NSSO findings also reconfirmed that over 97% of individuals between 15 and 65 have no exposure to any training. So the imminent need is to expand the reach of training providers, set up models and institutes with the capability to scale.

Different employment levels and the current training/skill scenario

Workers	Near absence of formal training and skill certification systems and institutions & over reliance on conventional sourcing of manpower.
Engineers	A perceptible reduction of share of new trainees in Construction Engineering Streams (Civil, Electrical, & Mechanical Engineering) with a lack of interest of Institutions to raise intake levels
Contractors	Lack of adequate number of skilled contractors for the existing number of projects Organizations especially PSU's have recommended setting up a few contractors' training institutions.

Construction Skills Training Institute (CSTI)

- Founded by L&T in 1995, CSTI promotes construction vocational training in India in a professional manner
- CSTI has been set up in an area of 5 acres land in Chennai and Panvel near Mumbai with permanent infrastructure and training facilities.
- CSTI branches have been established in Mumbai, Delhi, Kolkata, Ahmedabad, Bangalore and Hyderabad.
- CSTI has entered into an MOU with Henry Boot Training Limited and the Construction Industry Training Board of UK for the development of modular training.
- At present, basic training is imparted in seven trades - Formwork Carpentry, Masonry (brick work), Bar Bending and Steel Fixing, Plumbing & Sanitary, General Assistant, Construction Electrician, Welding, Pre-stressing and Transmission Line and Tower Erection.

Construction Industry Development Council (CIDC)

- Set up jointly by the Planning Commission, Government of India and the Indian construction industry.
- In order to improve the work performance of construction industry CIDC had initiated a country wide Human Resource Development initiative focused on developing a formidable work force to fructify various Infrastructure Development Projects in the Nation and also abroad.
- Over the last 13 years CIDC has made substantial achievements in the area of HRD especially for construction workers, Artisans and Supervisory cadre personnel. The programme is now spread over 19 states and supported extensively by various State Governments.
- The support from the State Government has come by way of provision of physical infrastructure, 29 ITIs, nomination of learners under various central and state schemes such as NREGS, Chhattisgarh Raj Mistry Yojana, Vocational Training for candidates belonging to SC/ST categories and training of Jail inmates.
- Over 250,000 personnel trained, tested and certified by CIDC for their skills. Almost 100% have found value added appropriate employment with leading industry organizations.
- Provides training for a list of 47 trades
- Courses are certified by CIDC/Ministry of Labour
- The course cycle is 3 months per batch

National Academy of Construction

- Set up in 1998 by the Government of Andhra Pradesh and is registered as a Society and incorporated as Public Charitable institution.
- Has emerged as a distinctive institution and one of its kind for providing training and development of all types of construction resources, technologies and methodologies for fast track completion of projects.
- Presently has 138 centres through out Andhra Pradesh and 21 trades today with target of training 1,00,000 technicians per annum.
- NAC has created six regional centres in Guntur, Kadapa, Vishakapatnam, Karimnagar, Rajahmundry and Hyderabad.
- NAC has presently 713 Employees on its rolls in different centres of Andhra Pradesh

National Institute of Construction Management and Research (NICMAR)

- Set up in September 1983 as an autonomous, non-government, non-profit academic body
- Objective - Promotion of education, training, research, professionalism and skill formation at all levels of the construction and other allied industries
- Provides post graduate education in construction, projects, real estate, infrastructure and allied areas in the country. Its educational programmes primarily involve imparting / acquiring particular knowledge and skills specifically needed for professionals in construction and allied industries such as real estate, projects and infrastructure
- Active in research and industrial problem solving in these areas.
- Faculty has developed case development activity, in which they have so far studied 121 cases related to road, highways, buildings and aviation from the Indian context.
- Recognized as “Scientific and Industrial Research Organization (SIRO)” by Dept of Scientific and Industrial Research, Ministry of Science and Technology
- Boasts a near 100% placement record including overseas placements. On an average, around 20-25% of the students secure overseas placements.
- For the year ending 2013-14, the Institute placed 594 out of its 597 students with 97 companies in total coming to the institute for placements

Recommendations for stakeholders

Recommendations for stakeholders

- High Capital Investment for construction specific training needs (Land & machinery/construction equipment purchase) required
- Construction specific training requires exposure to high-end construction equipments for practical training needs.
- Reluctance on the part of organizations to invest on training of lower order skill workers(particularly contract employees) due to lack of funding support and unpredictability of the trainees staying with the firm after training
- Workers cannot afford the fees charged by independent training providers given their socio-economic backgrounds

- Lack of certification /skill up gradation and assessment mechanisms
- Non-existence of a national level accreditation body for recognizing the quality and delivery of training providers

Recommendation 1: Govt. and industry body to incentivise and promote collaborative training

- Government should give incentives to private players for letting the training providers use their assets for training.
- Industry Body should ensure that there is a market for collaboration and use of scarce capital resources. For e.g. there could be a network of employers who commit to train a certain percentage of their workforce and tie-up with training providers for the same making it commercially viable for the training providers.
- Government could support private companies to open up training schools / increase their training expenditure by giving concessions or subsidies.

Recommendation 2: Financial assistance to be offered to trainees

- Corporate sponsored apprenticeship-where the organization bears the training expenses.
- Workers should be given subsidized training
- Providing scholarships/grants to a certain percentage of trainees
- Workers could be provided an interest free loan to afford their training expenses.

Recommendation 3: National level certification and accreditation body should be set-up

- Government should develop a nationally recognized framework for qualification and also work with industry to ensure that the qualification framework is recognized.
- A system of 'Graded Certification' depending upon levels of proficiency achieved with a seamless integration with the Higher Education programs should be enforced.
- Standards and certification should be introduced for the training institutes that train unskilled labor
- There should be an assessment method for the skilling programs and the assessment panel should ideally be from the industry
- An independent body which would validate the training providers programmes, grade them basis their infrastructure/delivery model should be created.

Recommendations for stakeholders

- Lack of skilled manpower supplied by the contractors hired for the EPC projects by the Construction Companies resulting in low quality output.
- Lack of regulatory framework or Industry requirements to impose certain percentage of trained and certified manpower to be supplied by contractors.

- Linkages between the industry and the training providers is very weak and does not contribute to the Construction Industry's cause
- Focus on higher order skill training like Project Management skills is not intense and such training examples are very scarce.
- Tie ups with developers and contractors to give labors on-site training

Recommendation 4: Govt. should enforce conditions on manpower quality and certification while selecting EPC contractors.

- Pre-qualification process in selection of contractors with a focus on the quality of manpower supplied should be strictly enforced and should form a part of contractual agreements
- Govt. should enforce Labor inspection framework to audit major EPC projects by government/private players for upholding minimum labor standards/quality
- A way of enforcing quality could be that a part of the contract fee should be given to the contractors only when it has trained a minimum percentage of workers/deploys a minimum percentage of skilled workers

Recommendation 5: Industry should foster and nurture strong linkages with Training providers

- Industry players and training bodies should initiate steps to develop strong linkages which would serve their collective interest and provide mutual support. This linkage could help the industry in overcoming skill shortage and improving productivity and would help the institutes in various ways like content development, low fixed expenditure etc.
- Training modules should be designed keeping in mind latest technologies.

Recommendation 6: There should be focus on imparting higher order skills training as well

- Institutions/Training providers should also impart generic skills such as project management and should also develop and promote executive and management development programmes to solve the problem of higher-order skill shortage

Recommendations for stakeholders

- Industry is facing difficulty in creating large pool of students aspiring to join in the workforce and lacks appeal.
- Many training institutes are running below capacity/are underutilized with seats going vacant
- People do not possess much knowledge about the construction training programs
- Difficulty in mobilizing people to undergo training and join workforce
- Reluctance of people to travel to remote far flung locations for work which is the case in many construction projects.
- Difficulty faced by training providers to scale their operations and spread their centres across the country. Delivery infrastructure of the training providers is not robust

- Institutes face a acute shortage of qualified faculty to train the workers
- Qualification norms to be eligible for a staff role coupled with low salary levels are hampering faculty strengths.

Recommendation 7: Govt. and industry should make efforts to transform perception about construction and motivate youth to join the sector

- Strong and proactive need to portray the industry in a manner such that students/youth feel proud of working in such a space and do not show any hesitancy in joining
- Intensive marketing and media activities should be implemented by both Government and Industry players to improve the image and create awareness about the industry and training programs.
- Industry Players need to invest in learning and also actively project the career progression path as people stay on longer if they see sufficient learning and career progression

Recommendation 8: Training providers to adopt innovative delivery models

- Training providers should have innovative delivery models to reduce the relocation dissonance for the labor that needs training and employment
- Tiered delivery model with sourcing centres close to the supply centres feeding into the regional hubs could be adopted
- Institutes will need to be close to demand in a B2B model and closer to supply in a B2C model

Recommendation 9: Incubation of education cell to address the challenge of qualified faculty for training

- Industry Body could undertake measures to incubate an education cell with members support so that industry people can be trained to teach part time by the institutes.
- Institutes should follow Train the trainer Model and leverage technology enabled delivery
- Establishment of a training institute to develop trainers with adequate expertise in a specialized trade



सत्यमेव जयते

GOVERNMENT OF INDIA
MINISTRY OF SKILL DEVELOPMENT
& ENTREPRENEURSHIP



N · S · D · C
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