

Ci3 India ROUNDTABLE -October 19, 2016

Action Item 5 - 'Human Capital (including Labour, Technical & Managerial, and Skills Development) and Productivity'

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Introduction



- First objective of Ci3 *India* - **19** current and imminent critical issues were identified, verified & validated – two regional Roundtables
- Identified issues were then converted into Action Items & Action Teams
- **Action Team 5**, i.e. “Human Capital (including Labour, Technical & Managerial, and Skills Development) and Productivity” was formulated to study the following **six issues**
 - Low productivity
 - Acute shortage of skilled workmen
 - Lack of proper facilities for workers
 - Need for up-skilling construction professionals
 - Inadequate quality
 - Lack of productivity benchmarks and standards

Methodology



- An initial literature survey - to understand Indian conditions & international practices
- An exploratory survey was also conducted in 15 construction projects across the country to better understand the management of construction workers - present scenario
- Joint brainstorming through Conference-calls to propose the various Action Agendas
- **Proposed Demo-Site study and research projects**

Exploratory survey - Findings

low productivity, time-cost over-run paradigm:



Low Productivity &
Time-Cost Overrun

Constant
attrition

Skill
Shortage

Construction work is seen as a
'part-time', unskilled profession

Skill is at the root of productivity

Exploratory survey - Findings

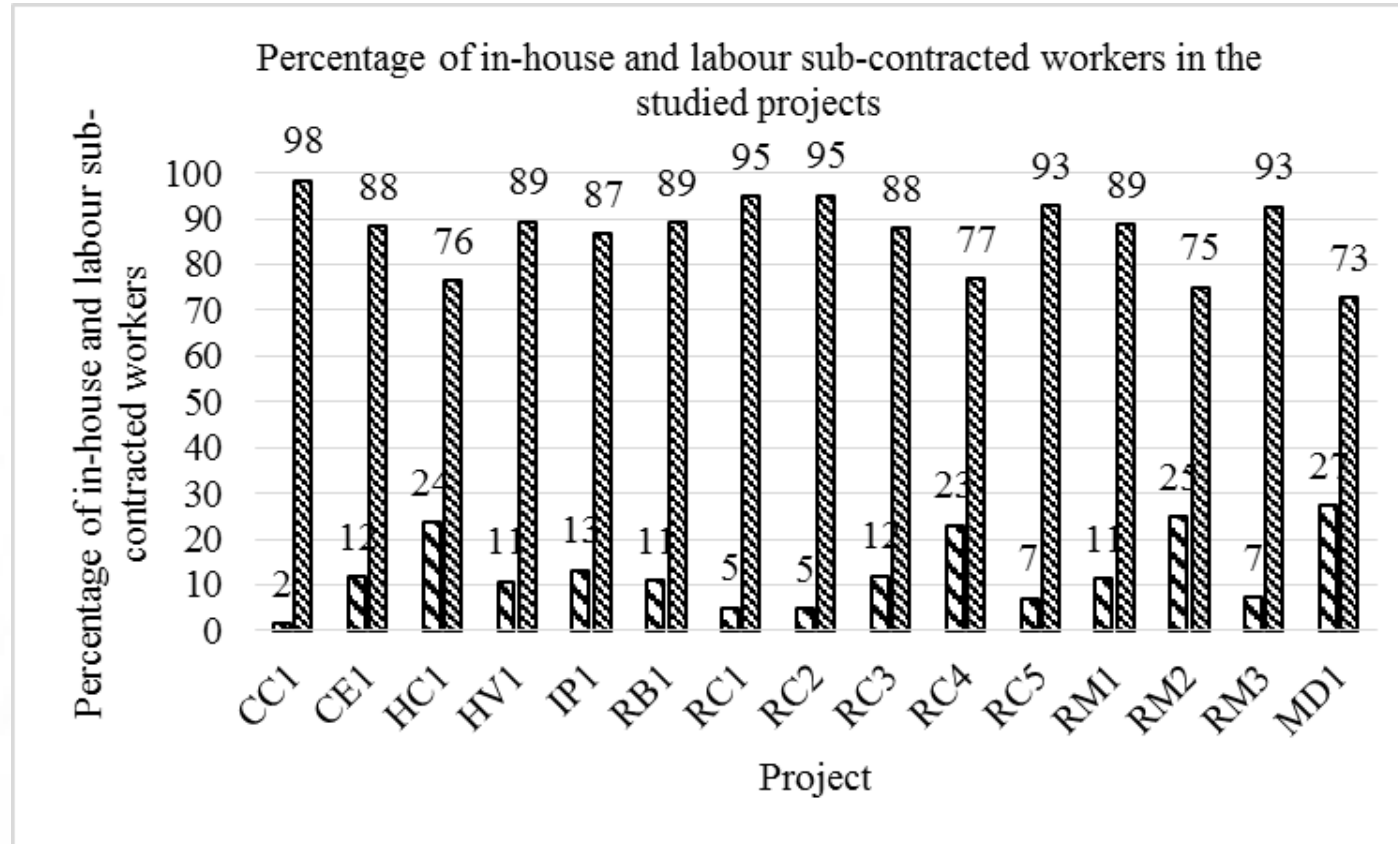
low productivity, time-cost over-run paradigm:



- Among the numerous factors that influence the outcome of a construction project, productivity is one of the major factors.
- Since many of the construction activities are labor-intensive, construction productivity is influenced by effective and efficient use of labor resources.
- Poor labour productivity has been identified as a major factor causing delay in Indian construction projects (Doloi et al. 2012)
- A report of the National Commission on Labour, Govt. of India also reported that the industry functions at low productivity because of lack of skills, poor workmanship, low levels of mechanization and technology adoption.

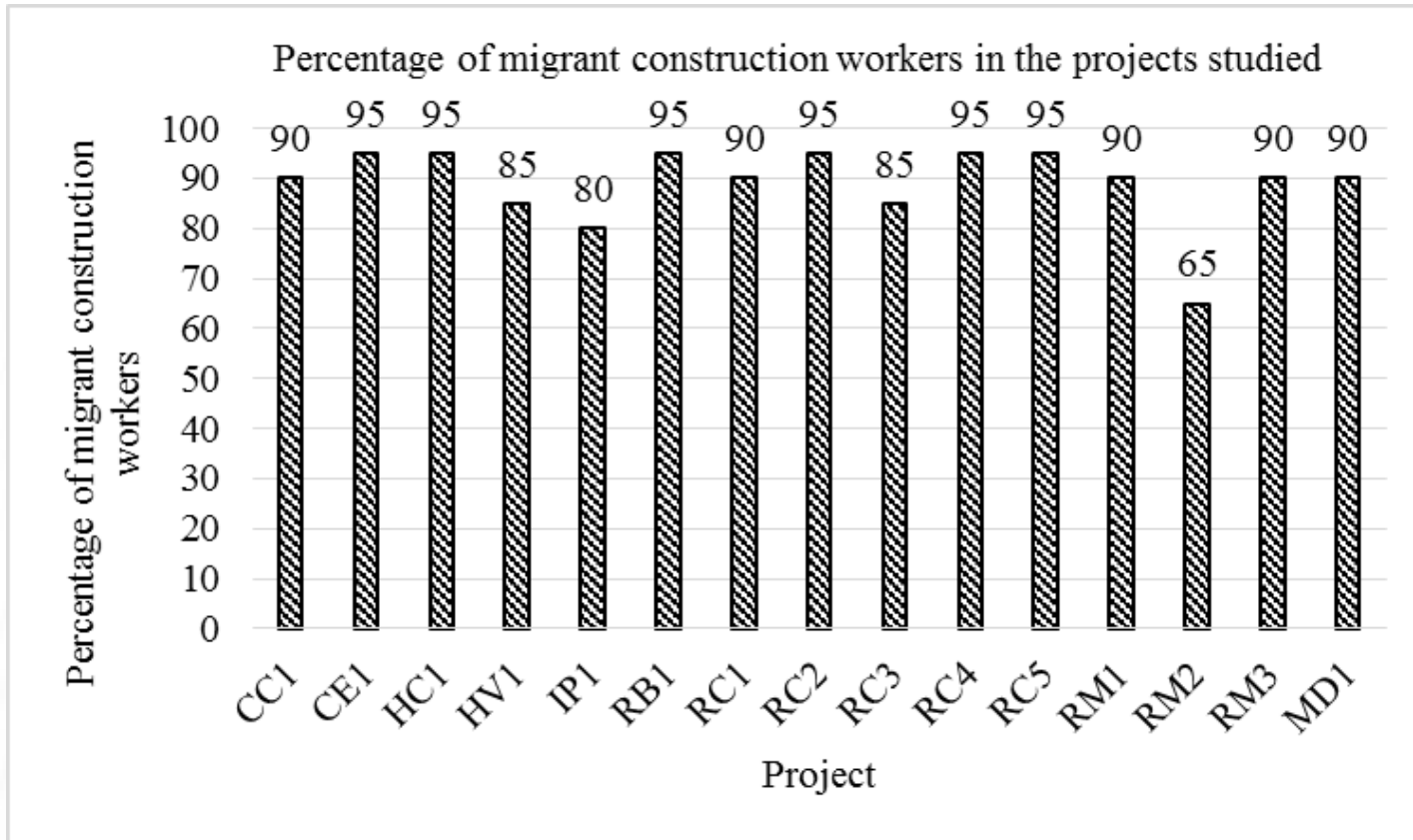
S. No	Project code	Project type	Project location	Project duration (in months)	Project cost (in million INR)	No. of in-house workers at site on date of survey	No. of sub-contract workers at site on date of survey
1	CC1	Commercial	Chennai	24	1680	20	1180
2	CE1	Commercial	Erode, Tamil Nadu	24	1400	20	150
3	HC1	Hospital	Chennai	18	200	20	65
4	HV1	Hospital	Vadnagar, Gujarat	18	1030	30	250
5	IP1	Institutional	Pondicherry	24	1000	35	230
6	RB1	Residential	Bangalore	26	1040	80	650
7	RC1	Residential	Chennai	30	2500	50	950
8	RC2	Residential	Chennai	21	747.5	57	1100
9	RC3	Residential	Chennai	20	580	45	330
10	RC4	Residential	Chennai	24	600	45	150
11	RC5	Residential	Chennai	36	1250	50	650
12	RM1	Residential	Mumbai	48	6000	102	800
13	RM2	Residential	Mumbai	27	7000	500	1500
14	RM3	Residential	Mumbai	27	600	20	250
15	MD1	Metro	Delhi	27	4100	600	1600

Percentage of labour sub-contractor and in-house workers in the studied projects



The percentage of labour sub-contract and in-house workers engaged is about 87% and 13% respectively

Percentage of migrant construction workers in the projects studied



65% to 95% of the total construction workforce is migrant construction workers - an average of 89% of migrant workforce

Most of the migrant workers were from Bihar, Odisha, West Bengal, Jharkhand, Uttar Pradesh, Andhra Pradesh & Telangana, Assam.

➤ From the projects studied, it was observed that the age of construction workforce range from 18 to 60 years

➤ Fig. shows age distribution of 1200 workers from five projects studied

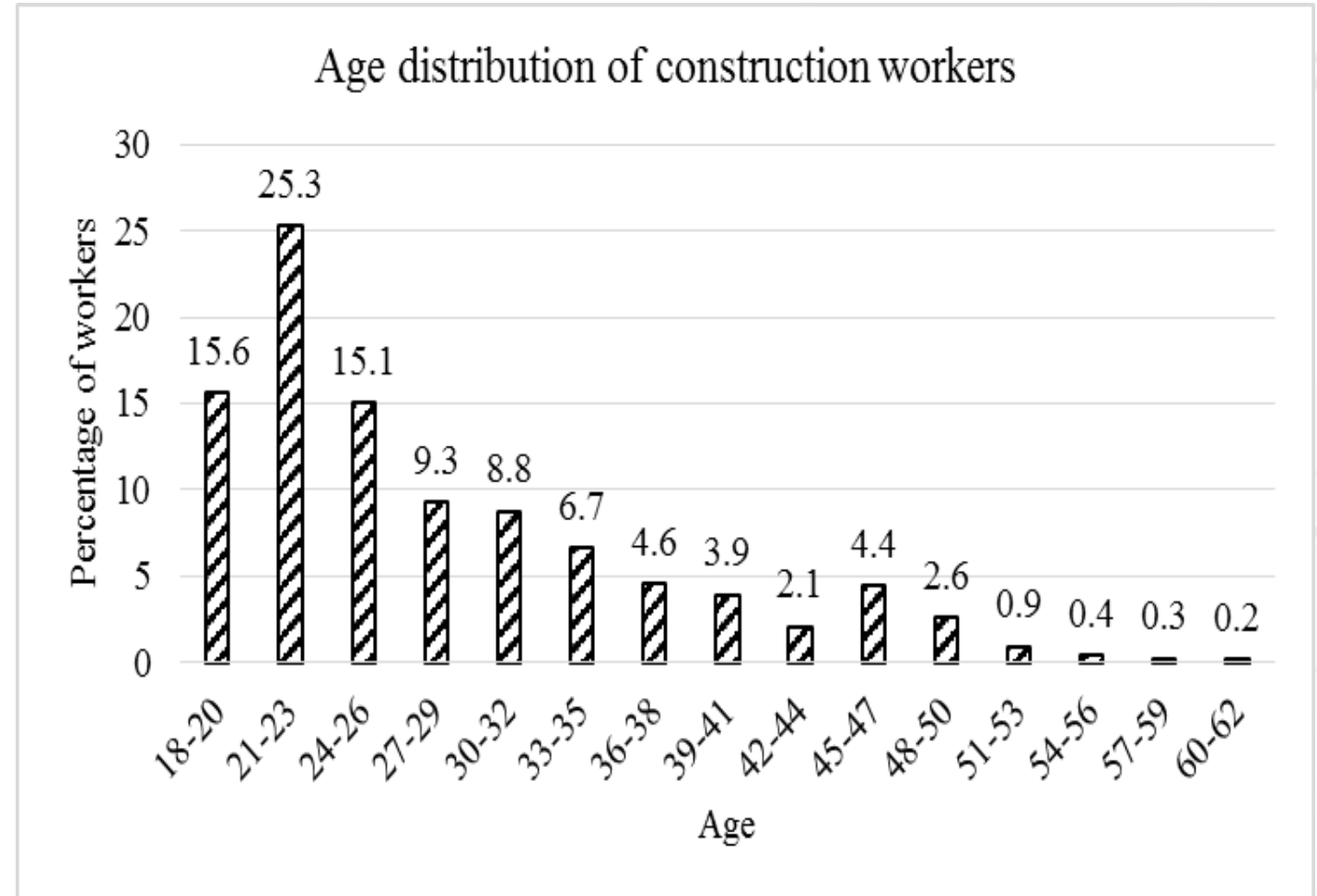
➤ **Average age of construction worker is 28 years**

➤ Also, it was found that about

➤ 16% of the workers are under 20 years,

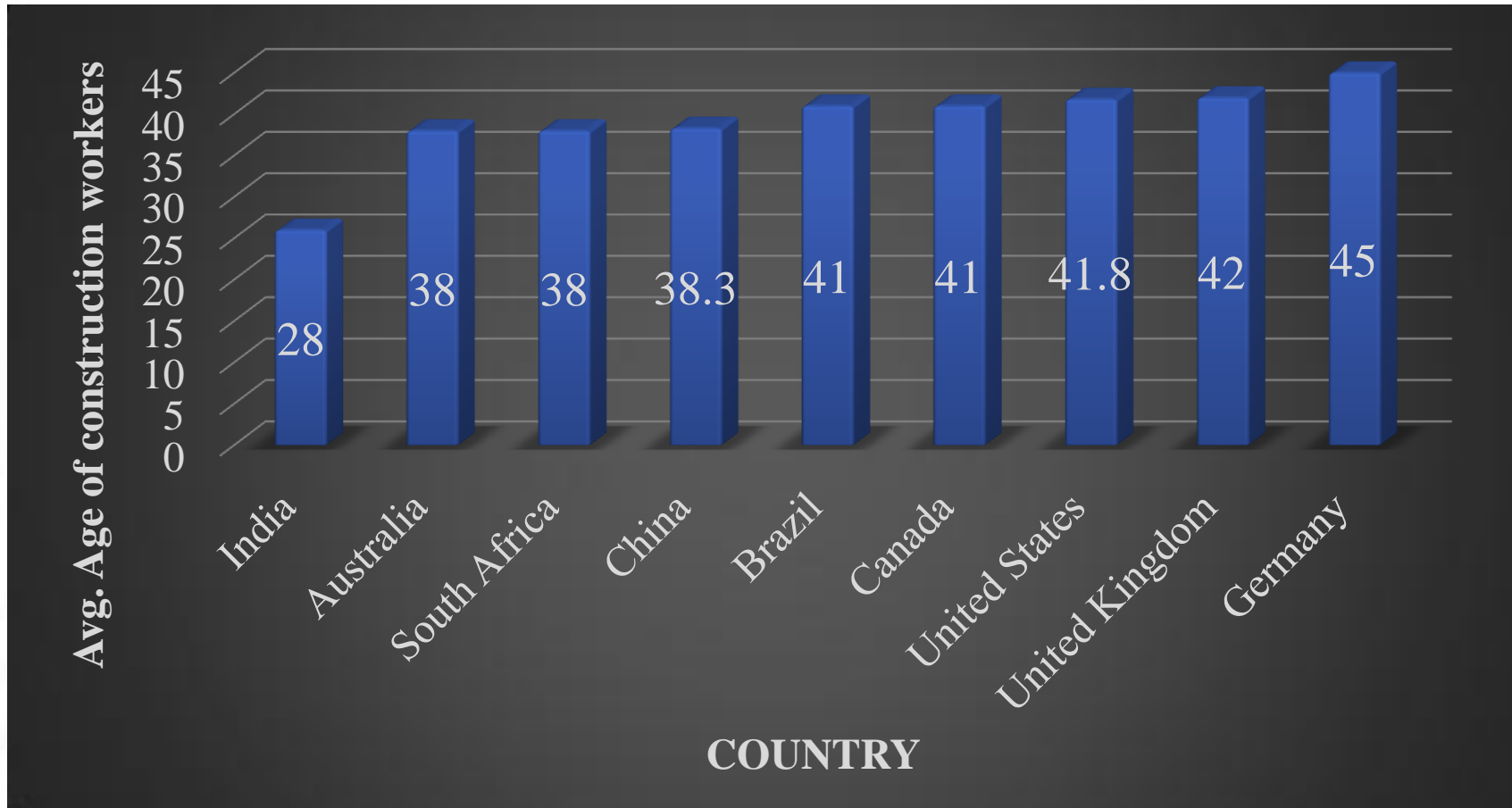
➤ 51% are under 25 years,

➤ 69% are under 30 years, and **81% are under 35 years of age**

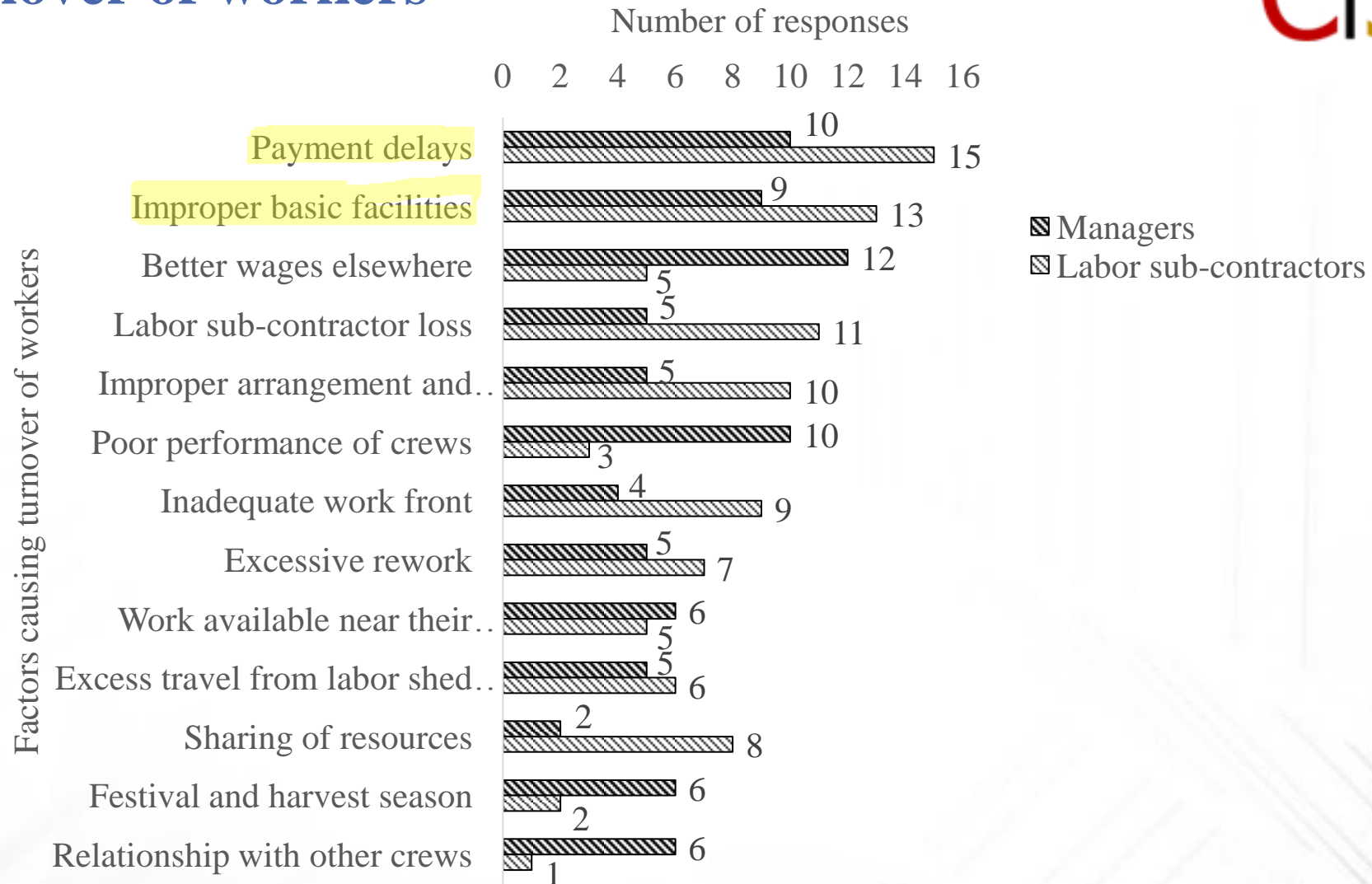


Age distribution of workers (1200 workers) – from five of the surveyed projects

A comparison of average age of construction workers in different countries



Factors causing turnover of workers

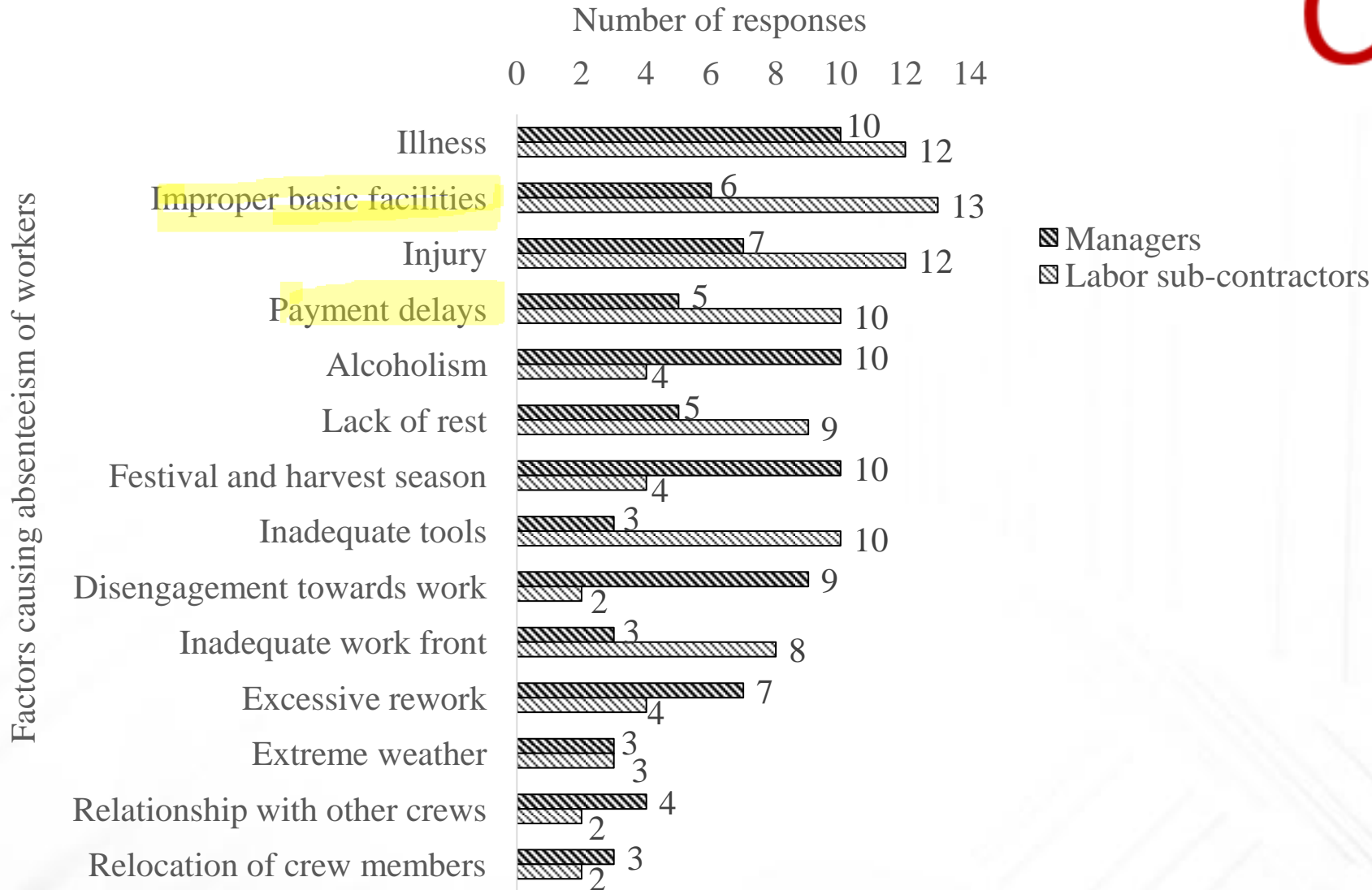


Discussions & Action Agendas



- *Business case for Quasi-Formalization of workforce*
 - *Mandatory digital bank account wage- payments for monitoring actual wages to last-mile-sub-contracted workers* - this will also ensure timely disbursement of wages thus fulfilling labor laws' mandate for Principal employer.
 - *Provision of 'Site-id' with access control-based attendance to digitally log attendance to be used for time-sheeting of wage/OT calculations* - this will enable in actual head count and fair Wage/Overtime calculations without 'inflated' headcount claims from sub-contractors.

Factors causing absenteeism of workers





Labor camp



Sunday market near Labor camp



Drinking water facilities



Toilet facilities



Bathing facilities

Discussions & Action Agendas



- *Making construction sector ‘aspirational’ for workers*
 - *Uniforms like ‘over-alls’ for all site-workers (to be issued along with helmets, shoes) to ensure a ‘factory-like’ environment at construction site*
 - *Weather-resistant accommodation (using pre-fab materials like Bison boards), along with on-site canteen, Entertainment, bus-travel facility (to be provided if need be on deductible basis) like in the Middle East.*

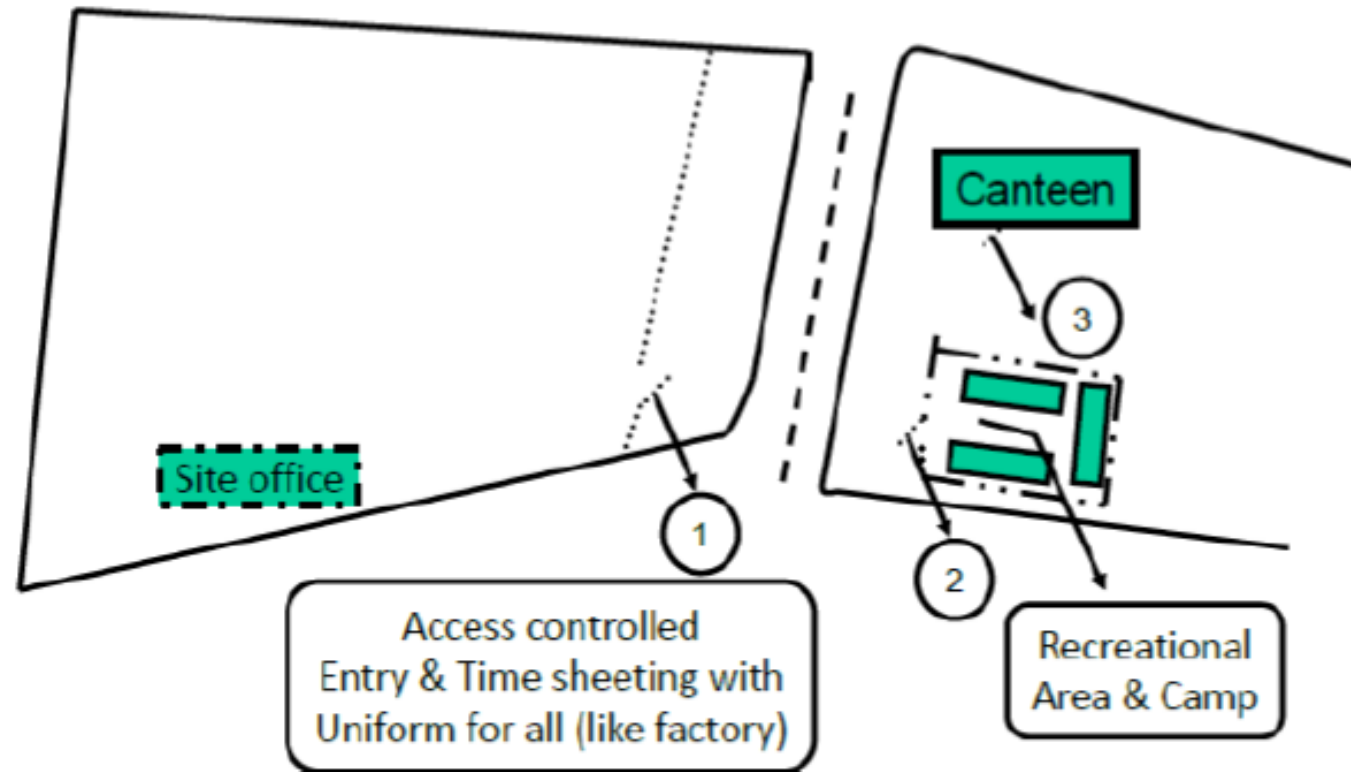
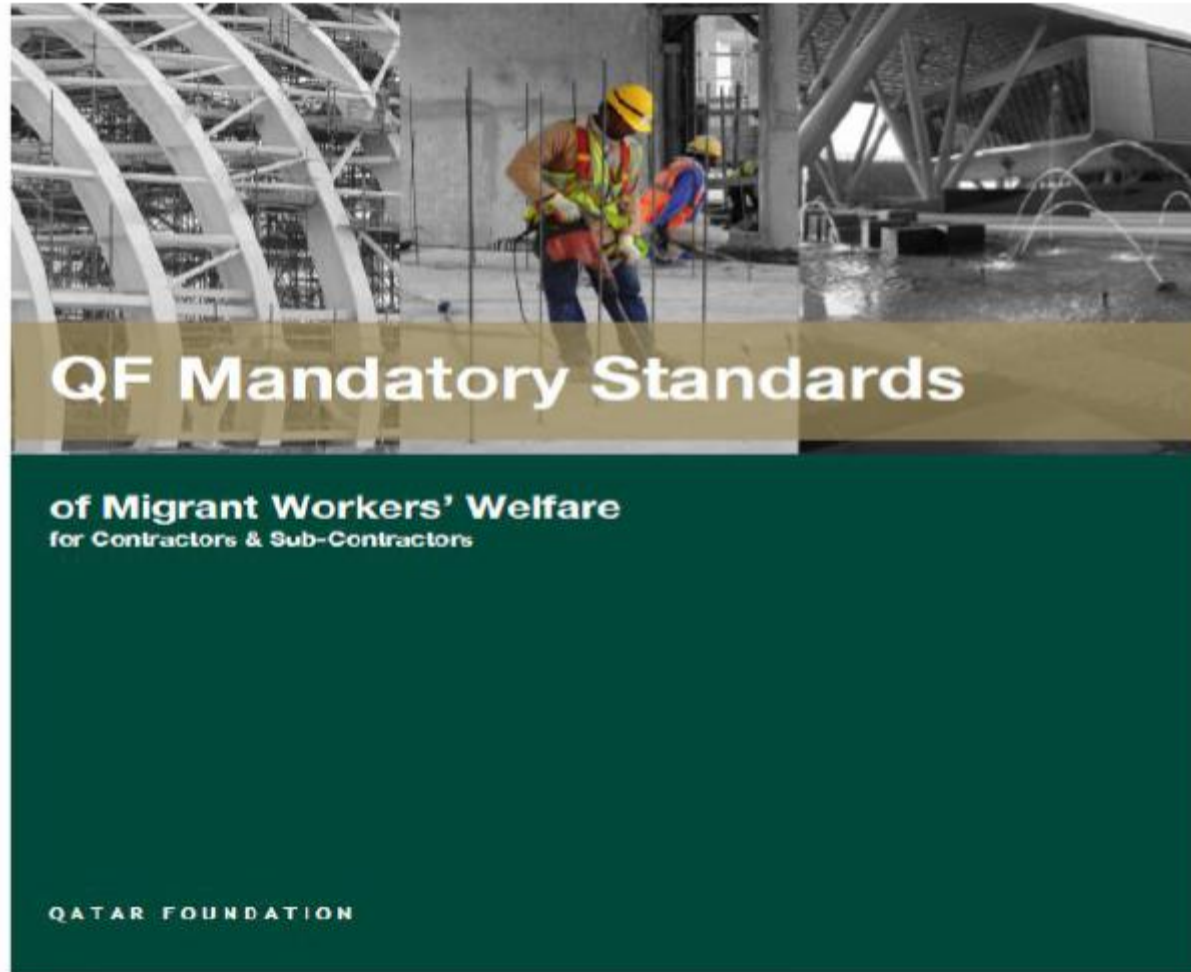


Fig. 4. Facilities for workers at site



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4. PURPOSE	6		
5. SCOPE	6		
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13. ACCOMMODATION - PLANNING STANDARDS

- 13.1 Purpose of Accommodation Planning Standards
- 13.2 Community Planning Principles
- 13.3 Planning Standards
- 13.4 Infrastructure Standards

14. ACCOMMODATION – Building Design Standards

- 14.1 Community Planning Principles
- 14.2 Living Units
- 14.3 Communal Recreation Facilities
- 14.4 Communal Service Facilities
- 14.5 Fire Precautions

15. FOOD SAFETY

16. TRANSPORTATION

- 16.1 General
- 16.2 Vehicle Specification
- 16.3 Driver Competence

17. CONSTRUCTION SITE STANDARDS

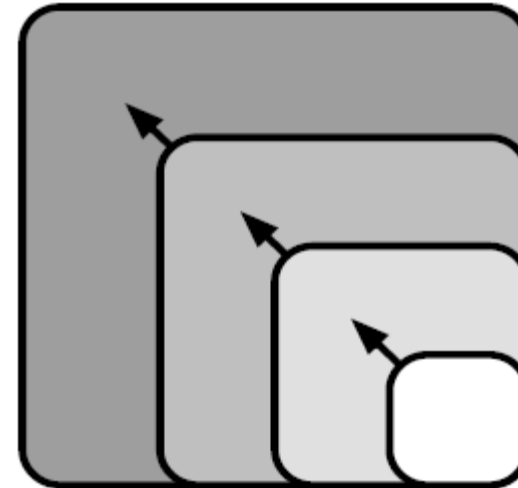
- 17.1 Health & Safety
- 17.2 Site Welfare

18. FACILITIES MANAGEMENT PROGRAMME

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12.15 Skills Training

The Employer shall provide Workers with training on the necessary skills required to carry out their tasks and shall provide or allow others to provide Workers with training such as English or Arabic language, financial management, and other kinds of skills.



COMMUNITY max. 5000 persons

NEIGHBOURHOOD max. 750 persons

CLUSTER max. 100 persons

LIVING UNIT max. 12 persons

Exploratory survey - Findings



between infrastructure and real estate, Indian construction industry has been relatively stable. Hence there is need for skilled, retained work force

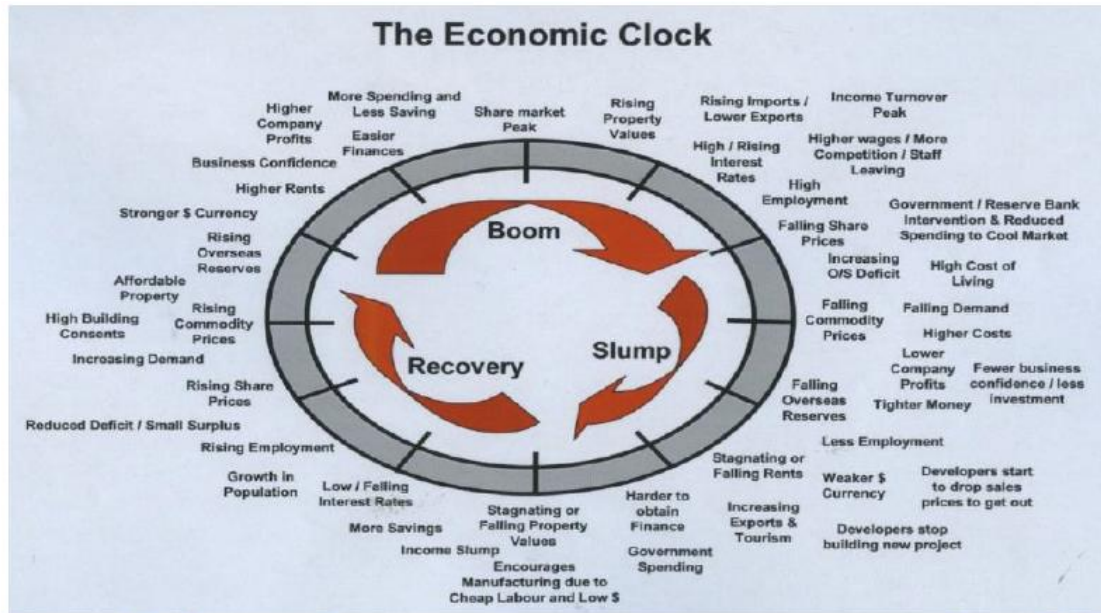


Figure 17 The Economic Clock

Source: RCP

Fig. 5. The Economic clock

Construction Sector Growth Forecast till 2017 (Rs. Billion)

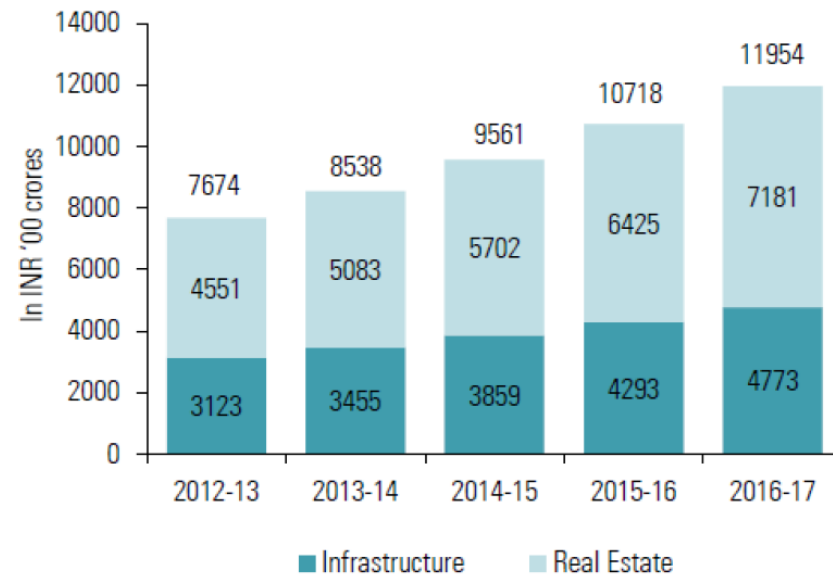


Fig. 6. Construction sector growth forecast

Exploratory survey - Findings



Skilled labour - 7 fold increase in next 5 years

Present condition :

Category	Percentage of Employment	Total Employment
Unskilled workers	83%	25.6 million
Skilled workers	10%	3.3 million
Engineers	3%	0.8 million
Technicians and foremen	2%	0.6 million
Clerical	2%	0.7 million

Table-2

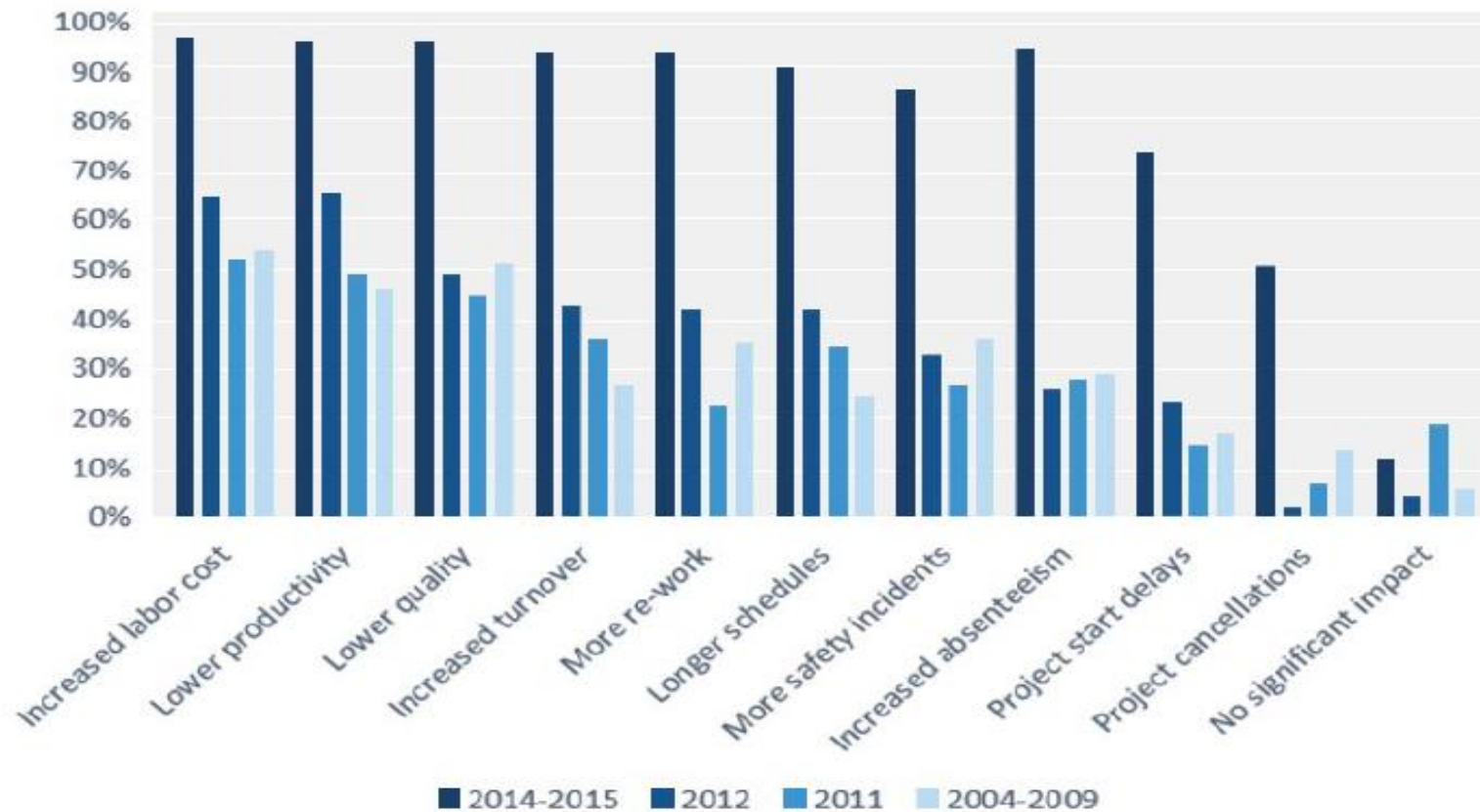
The following table shows the requirement of Human Resource for Construction (2022) as per approach plan 2012 by National skill development council.

Type of Manpower	Required man years
1.Engineer	3.72 million man years
2.Technician	4.32 million man years
3. Support staff	3.65 million man years
4.Skilled worker	23.35 million man years
5.Unskilled/ semi-skilled worker	56.96 million man years
TOTAL MANPOWER	92 million man years

Impact of skilled labour shortages on projects – in the US Construction market



Q: What was the impact of the skilled labor shortages/challenges on your project(s)?

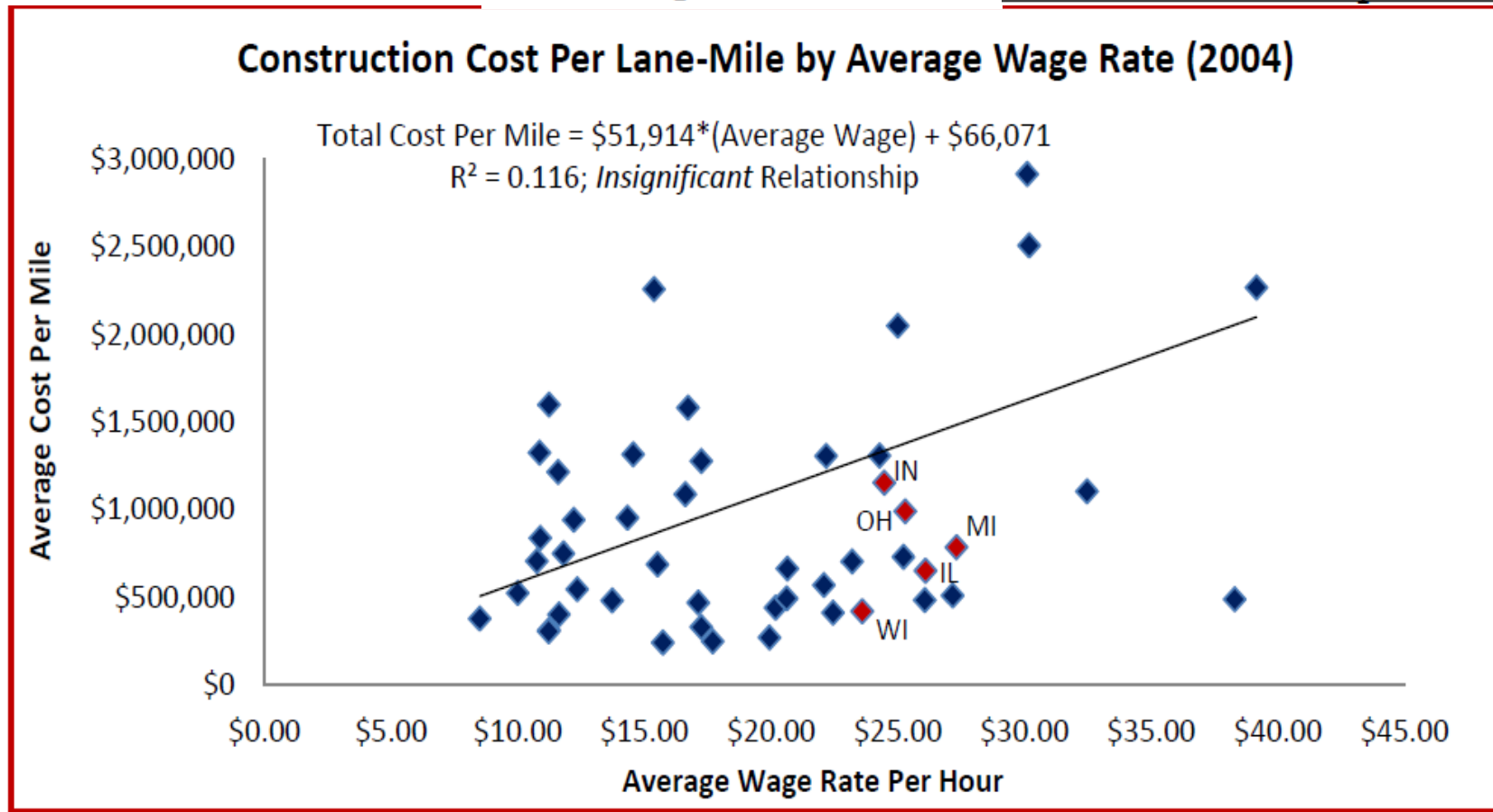


Discussions & Action Agendas



- *Formally trained and certified workforce to be mandated, measure at least for semi-skilled and skilled jobs to understand impact on productivity over time. Up-skilling of professionals on advanced technologies is also proposed.*
- *Monitoring of productivity-wages-paid based on skill levels to ensure premium over minimum wages is paid to semi-skilled/skilled workers for ensuring their retention and also **understand RoI on Skill Development in terms of productivity for the same.***
- *Formal training to ensure entry of 'semi-skilled' assistants instead of unskilled helpers.*
- *'Finishing school' for professionals with up-skilling on latest technologies.*

“Higher average hourly wages are not associated with higher construction costs.
Higher wage workers can build with no impact on total cost because of their superior skills

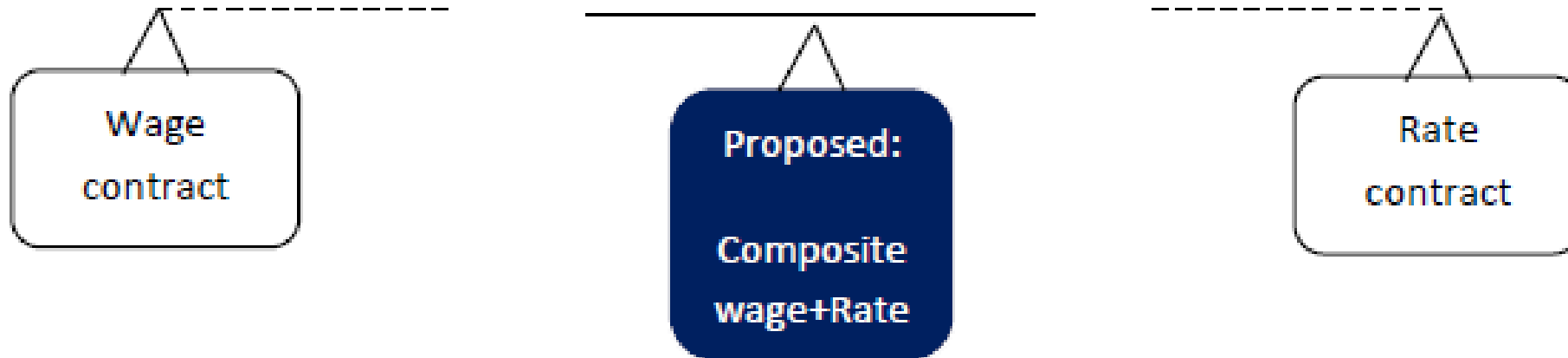


Source(s): Poupore (2004), "The Impact of Wages on Highway Construction Costs: Updated Analysis," The Construction Labor Research Council.

Discussions & Action Agendas



- *Productivity-linked wages as against government-set minimum wages*



Discussions & Action Agendas



- Research study needs to be done for:
 - Determining a productivity-linked-payment system with both fixed and variable components for both rate and wage contract.
 - RoI of Skill Development from a scientific manner in terms of wage-productivity-investment-RoI calculations.

Summary of Proposed Action points:



➤ **Demo-site (Partners: Awaited)**

- *Mandatory digital bank account wage- payments*
- *Provision of 'Site-id' with access control-based attendance*
- *Skill testing of all workers and Formal training to ensure entry of 'semi-skilled' assistants instead of unskilled helpers.*
- *Monitoring of productivity-wages-paid based on skill levels to ensure premium*
- *'Finishing school' for professionals with up-skilling on latest technologies.*
- *Uniforms like 'over-alls' for all site-workers*
- *Weather-resistant accommodation along with on-site canteen, bus-travel facility like in Middle East.*

➤ **Research studies**

- *Research study for productivity-linked-payment system for sub-contractors merging aspects of rate and wage-contracts for optimization at the whole project level*

(Sponsor-cum-site partners: Awaited)

- *RoI on Skill Development from a scientific manner in terms of wage-productivity-investment-RoI calculations. (Sponsor: PanIIT Foundation, Partners awaited)*

Structure & Expected Contents of Action Team 5 White Paper- due 10 Dec. 2016

- *Based on Working Paper +*
 - *We want to get feedback...*
 - *Solicit partners for the demo-site & research studies?*

Structure & Expected Contents of Action Team 5 White Paper- due 10 Dec. 2016

- *Suggestions solicited TODAY + any more before 25 Oct. 2016 please*
- *Then we will formulate a Specific Activities List with a Time-line*



Thank you all...