

# Developing the Industry to Deliver Clients' & Societal Needs



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# Indian Construction Industry's Current Status

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- Many small size companies with a few companies with modern management and technical skills (28,000 companies + Individual Builders)
- Over employment and low productivity
- Age old construction methods
- Large time and cost overruns in public projects, in general
- Scarcity of project managers and construction managers
- Lack of trained workers

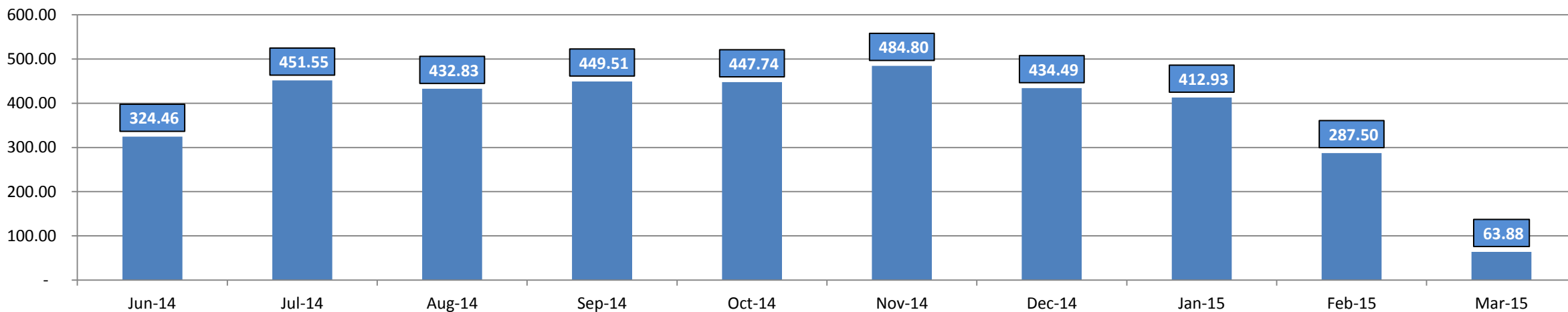
- Poor safety standards
- Quality only good by exception
- Lack of planning and monitoring
- Standards conservative - resulting in higher consumption of materials
- Lack of estimating standards
- Lack of good architectural and design practices

# Project Scheduling Issues

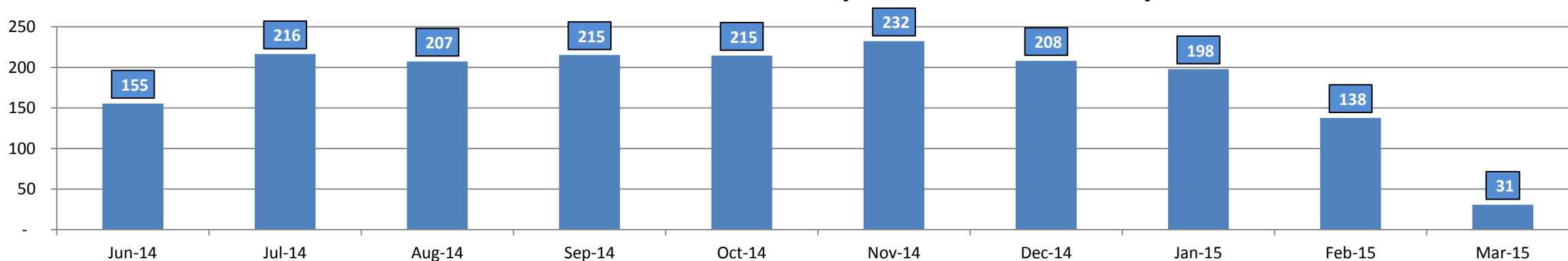
- Is the schedule realistic?
- Are milestones set in the contract achievable?
- Have ground realities like resources availability, labour availability weather conditions been taken into account
- Example case study – 11-storey buildings totaling 1 million sq. ft. to be completed in 18 months.

# Project Completion – Reinforcement Plan for the project

## Month wise Reinforcement Program in MT



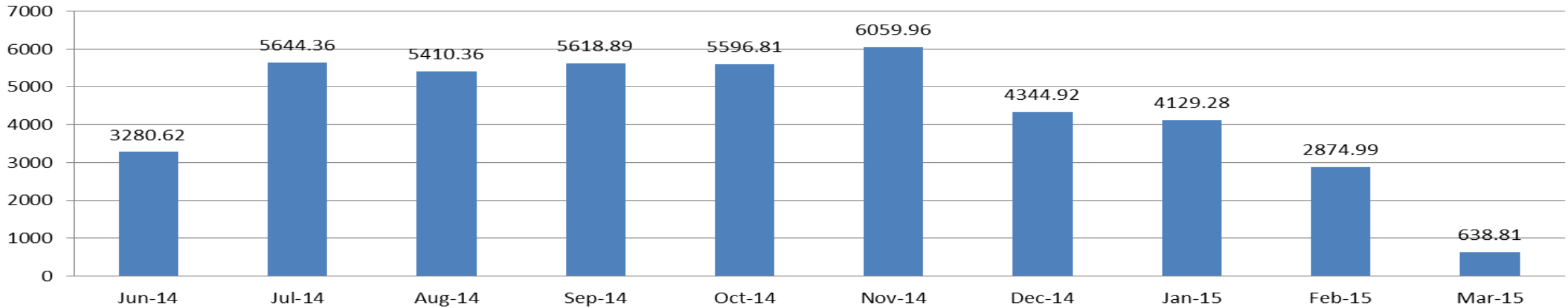
## Month wise – Bar Benders Requirement in Nos. / Day



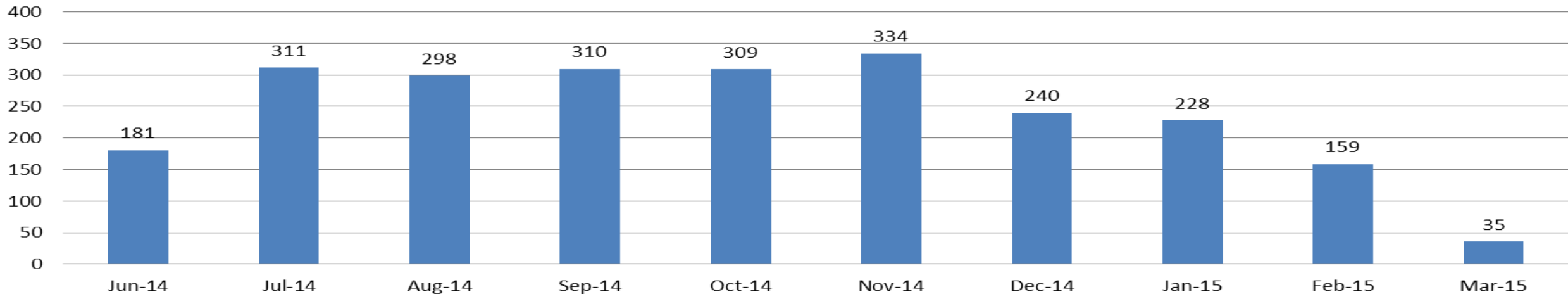
Productivity Considered – 65% qty. in Slabs & Walls – 85kg/MD – 12 Working Hours – 28 Working days per month  
Balance – 35% qty. in Columns – 140kg/MD – 12 Working Hours – 28 Working days per month

# Project Completion - Plan for the project

## Month wise Concreting Program in cum.



## Month wise - Carpenters requirement in Nos./Day



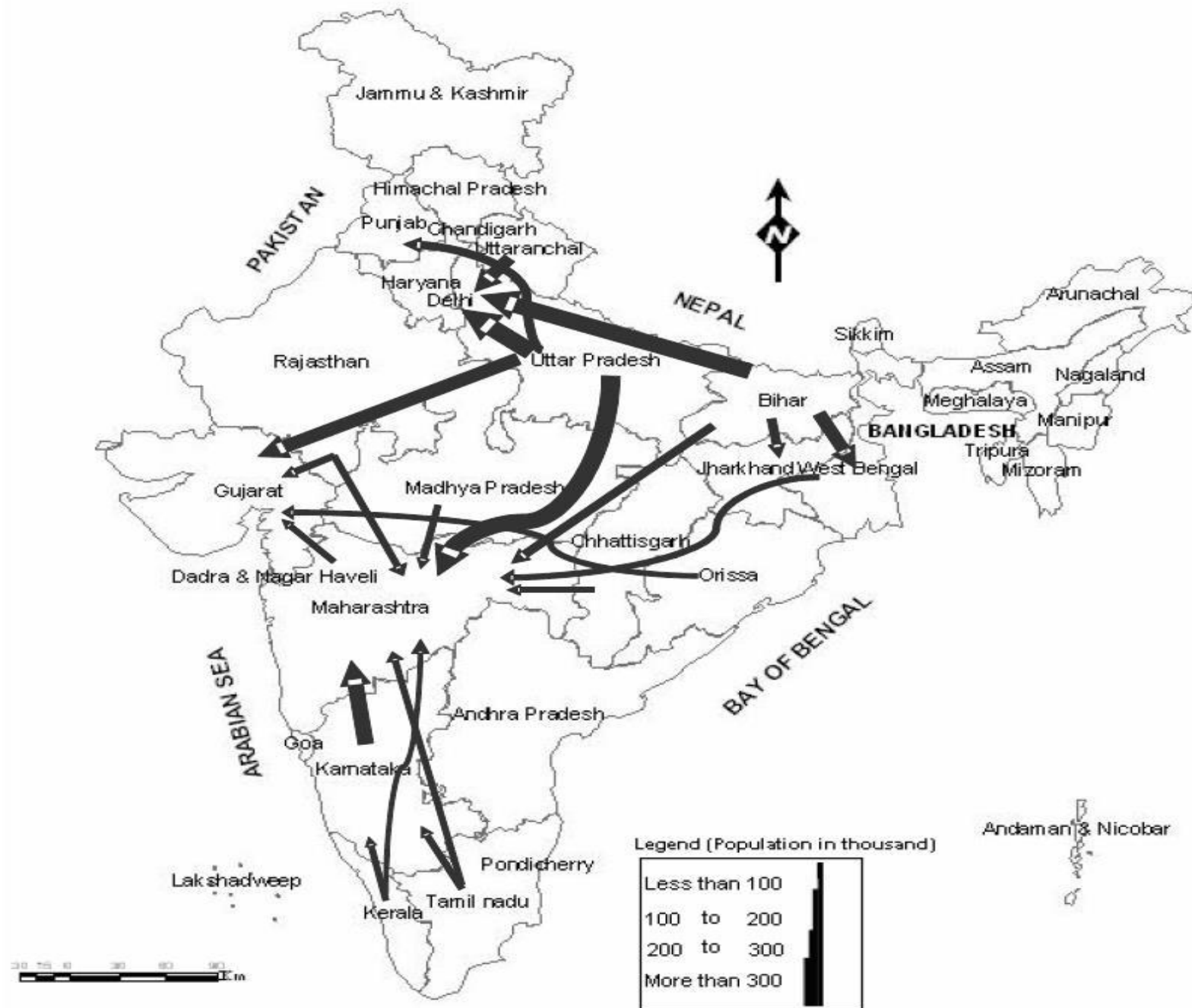
# **Construction Personnel Issues**

- The Indian construction industry comprising infrastructure and real estate sectors employs over 31 million workers
- Country’s second largest employer after agriculture
- Projected workforce is 47 million people in the next decade

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

Source: Government of India. (2010a). *Employment and Skill Development*, Planning Commission of India, Government of India.





90% of  
industry  
migrants

labor in the  
are internal

Source: R.B. Bhagat and S. Mohanty (2009), "Emerging Pattern of Urbanization and the Contribution of Migration in Urban Growth in India"

# Problems with migrant labors

- Lack of literacy
- Lack of formal training
- Leave jobs suddenly/ seasonally
- Unreliable source
- Highly unorganized
- Lack of basic skills for operating simple machines
- Pick up skills on jobs, from peers/ supervisors

# Poor Living Conditions



# Waste in Construction Industry

- Lean identifies seven forms of waste:

- **T**ransport
- **W**aiting
- **O**verproduction
- **D**efects
- **I**nventory
- **M**otion
- **E**xcess processing



# Details of Projects Studied

Parameter	Project A	Project B	Project C	Project D	Project E	Project F
Location	Palakkad	Palakkad	Palakkad	Chennai	Chennai	Chennai
Total construction cost (Rs. Million)	70	80	300	886.5	2100	2189.7
Planned duration (months)	24	24	24	17	24	20
% complete at time of data collection	50	70	60	77	70	20
Average number of workers per day	150	70	120	900	2000	680
Number of major equipments in site	2	1	3	10	15	15
Time overrun in months	2	1	4	4	3	5
Type of work	Villas	Apartments	Mall	IT Park	Hotel	IT Park





**Project A**



**Project D**



**Project B**



**Project E**



**Project C**



**Project F**

# Waste Summary

Cost (Rs.)	Project A	Project B	Project C	Project D	Project E	Project F
Material Scrap	675,798	580,745	1,320,174	7,869,718	26,100,834	23,634,084
Excess Inventory	259,534	208,347	336,801	2,402,966	13,110,783	15,477,740
Labour Inefficiency	8,504,250	5,316,750	7,672,950	38,383,875	122,104,800	36,414,000
Equipment Inefficiency	850,200	531,000	1,530,000	14,591,100	57,456,000	42,238,000
Total Cost of Waste	10,289,782	6,636,842	10,859,925	63,247,659	218,772,417	117,763,824
<b>Total Waste in % of Project Cost</b>	<b>14.70</b>	<b>8.30</b>	<b>10.86</b>	<b>7.13</b>	<b>10.42</b>	<b>5.38</b>

Does not include categories such as Cost of Quality – estimated to be atleast 12% in major US projects

# WASTE – WHO PAYS FOR IT?

- Developer?
- Contractor?
- Subcontractor?
- Labour Contractor?





# Way Forward

- Why is the construction industry worldwide a laggard in adopting new technologies and management methods?
- How can they be made to change?
- What can owners do about it?
- What have other countries done about it?