

# GREEN & AFFORDABLE CONSTRUCTION

## Case of Fly Ash Brick Sector in Bihar, India



### Fly ash brick technology is an eco-friendly technology

Bihar has a potential to produce 3 billion fly ash brick per year, which will

- ✓ Save **8.4 million tons** of top soil
- ✓ Utilize **4.5 million tons** of fly ash waste

- ✓ Save **2.02 million tons** of carbon
- ✓ Save **0.63 million tons** of coal



Agriculture is the backbone of Bihar's economy generating nearly **24.84% of states domestic product** and giving **employment to 77% of the states workforce**  
 Agricultural sector in **direct conflict** with the construction sector due to red brick industry

**2012**  
 DA initiated; Government of Bihar set-up an Inter Departmental Task Force on Clean Building Materials

**2018**  
 Government of Bihar introduced ban on traditional red clay bricks

### Key Government Initiatives

**2009**  
 MoEFCC mandated thermal plants to supply fly ash free of cost

**2017**  
 Government of Bihar notified 100% procurement of fly ash bricks in public sector projects

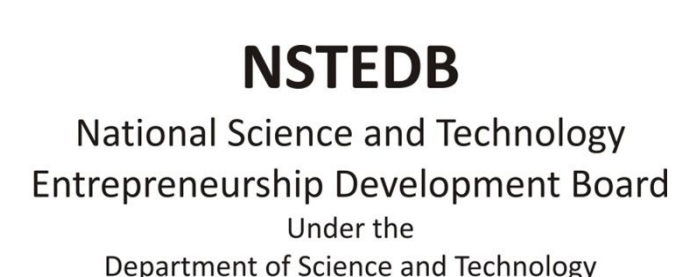
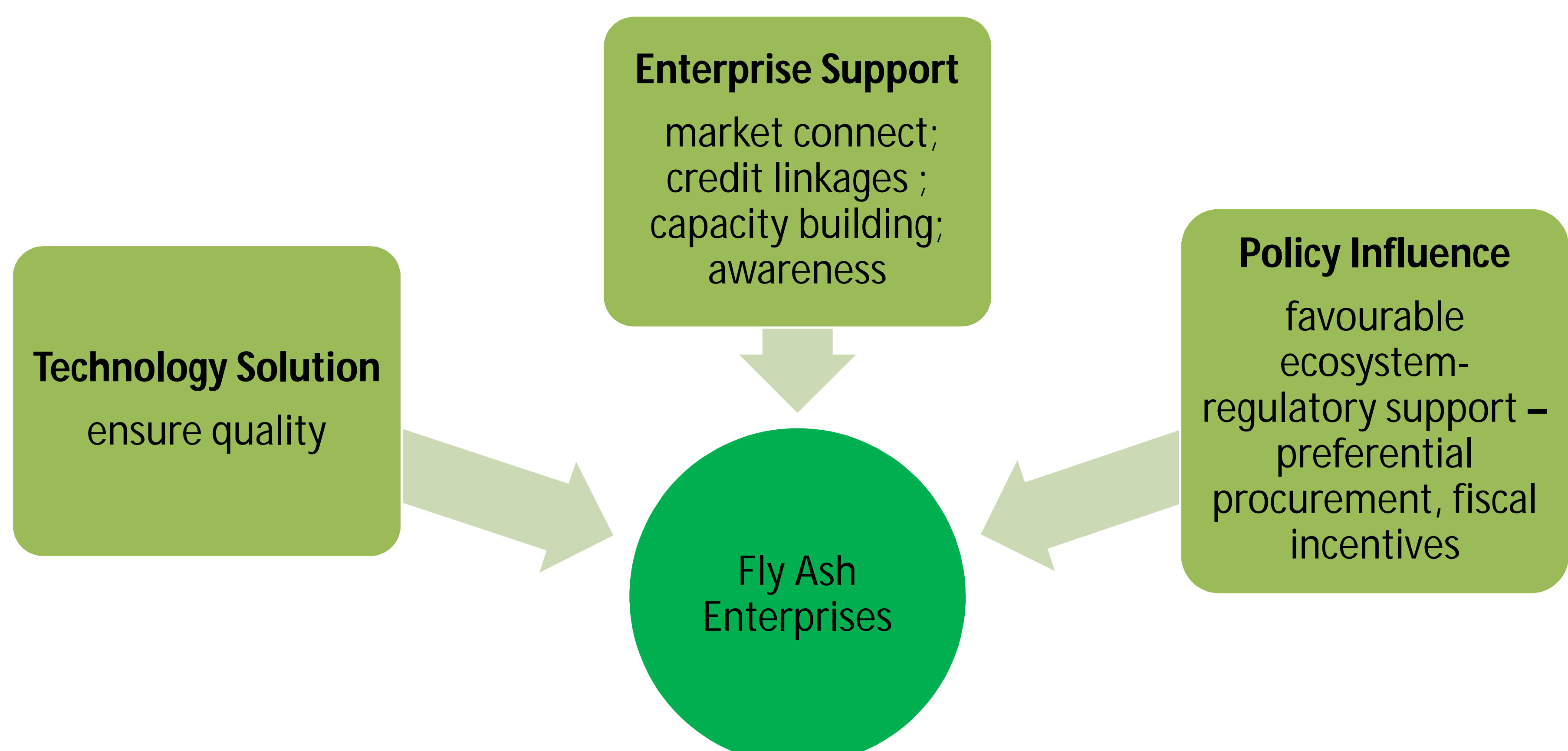
### Achievements

Improvement in the quality depicted in the consecutive round of testing after the technical training

Rising public discourse towards Fly Ash Bricks in Bihar

Department of Building Construction, Govt. of Bihar reinstated procurement of 100% FAB in public sector projects

### DA's Strategy

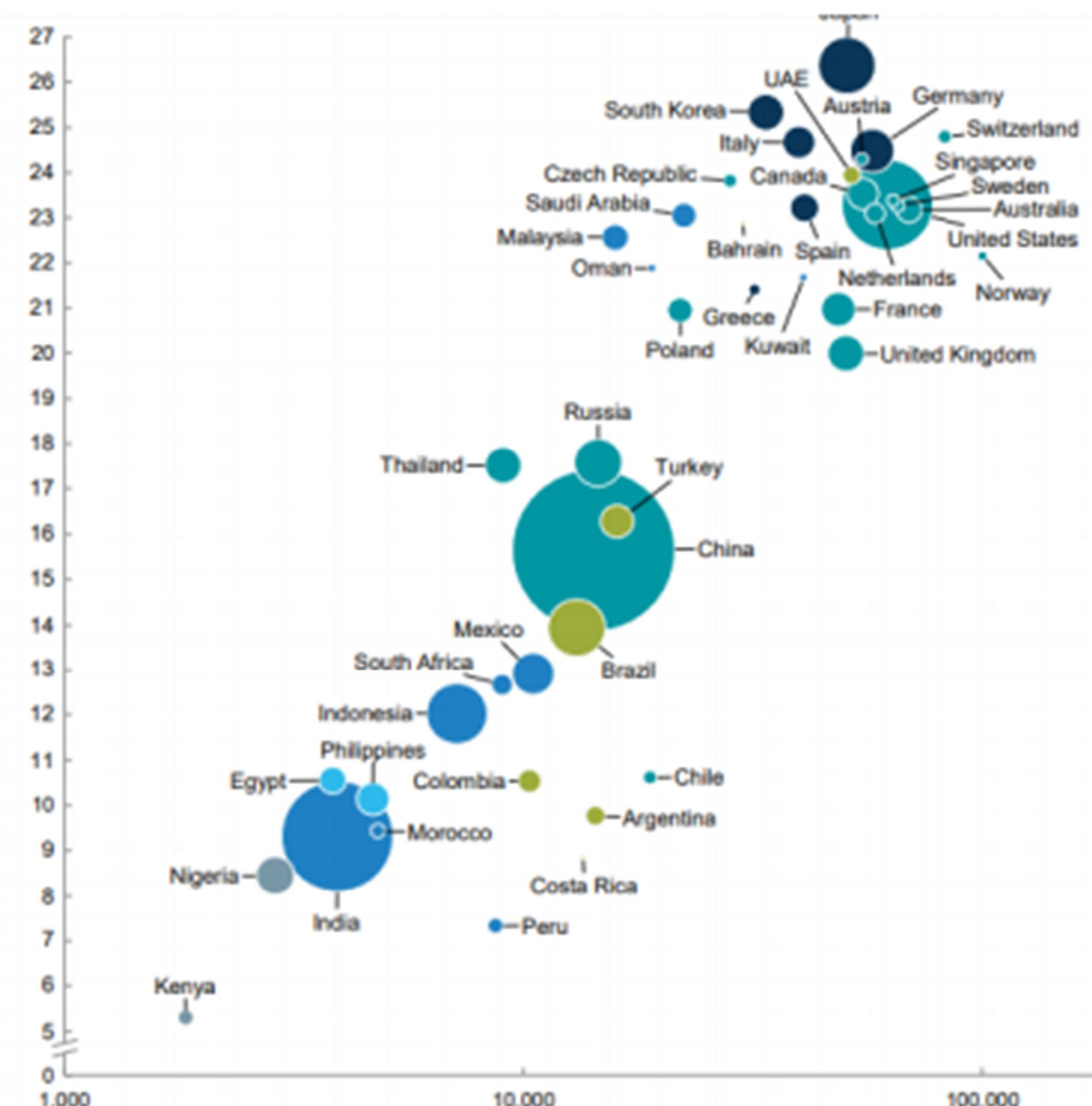
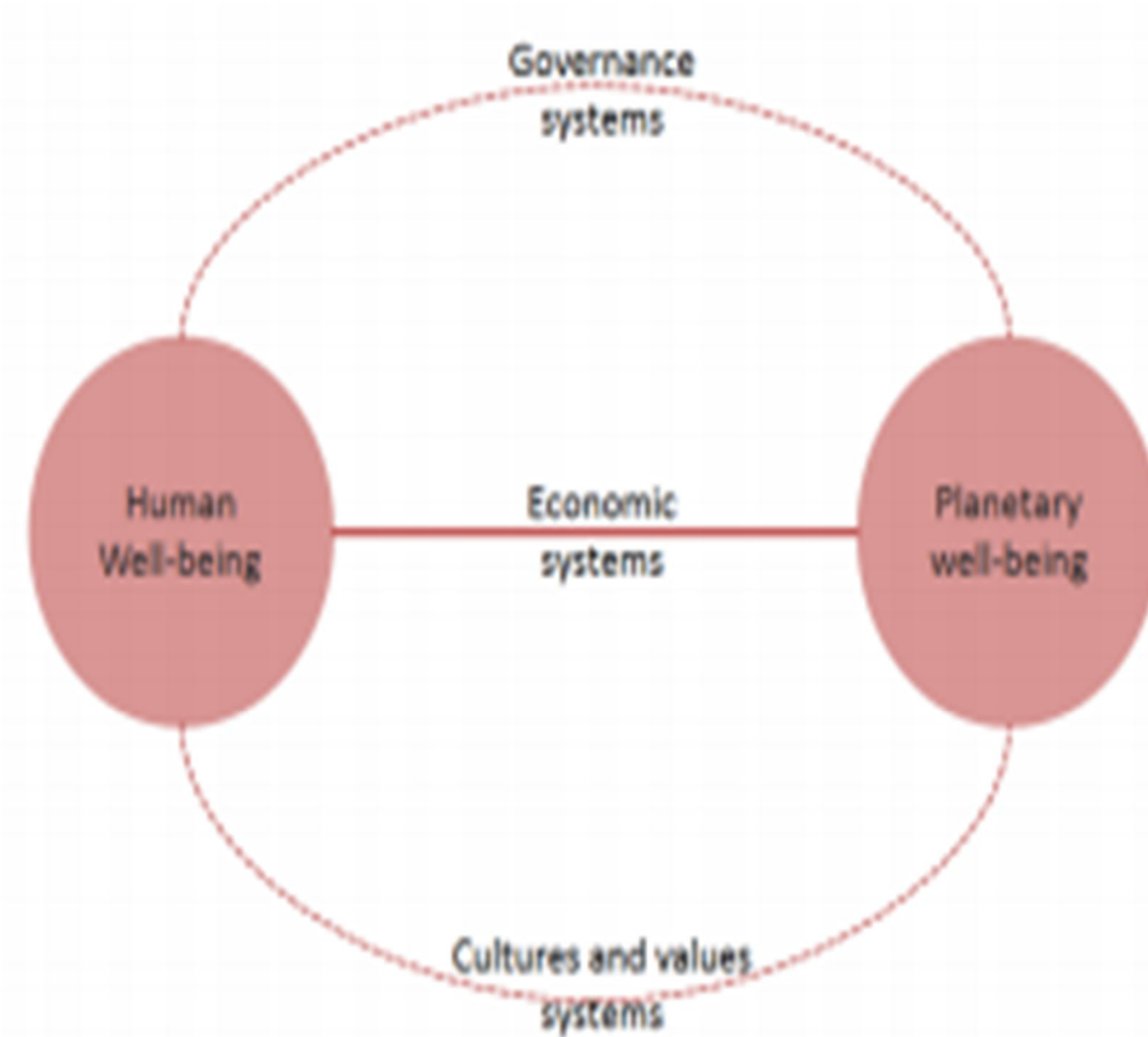




## Striving towards a greener economy

**A green economy is essentially one in which socio-economic systems are organised in ways that enable society to live well within planetary boundaries.**

- **Resource efficiency:** To extract maximum value from resources and minimise harmful emissions and waste.
- **Ecosystem resilience:** To guarantee that natural capital stocks are maintained for future generations. An economic model that transcends ecosystem boundaries will not be sustainable in the long term.
- **People's well-being:** To deliver acceptable living standards and social cohesion; an economy that cannot provide decent jobs and earnings will not be socially viable.



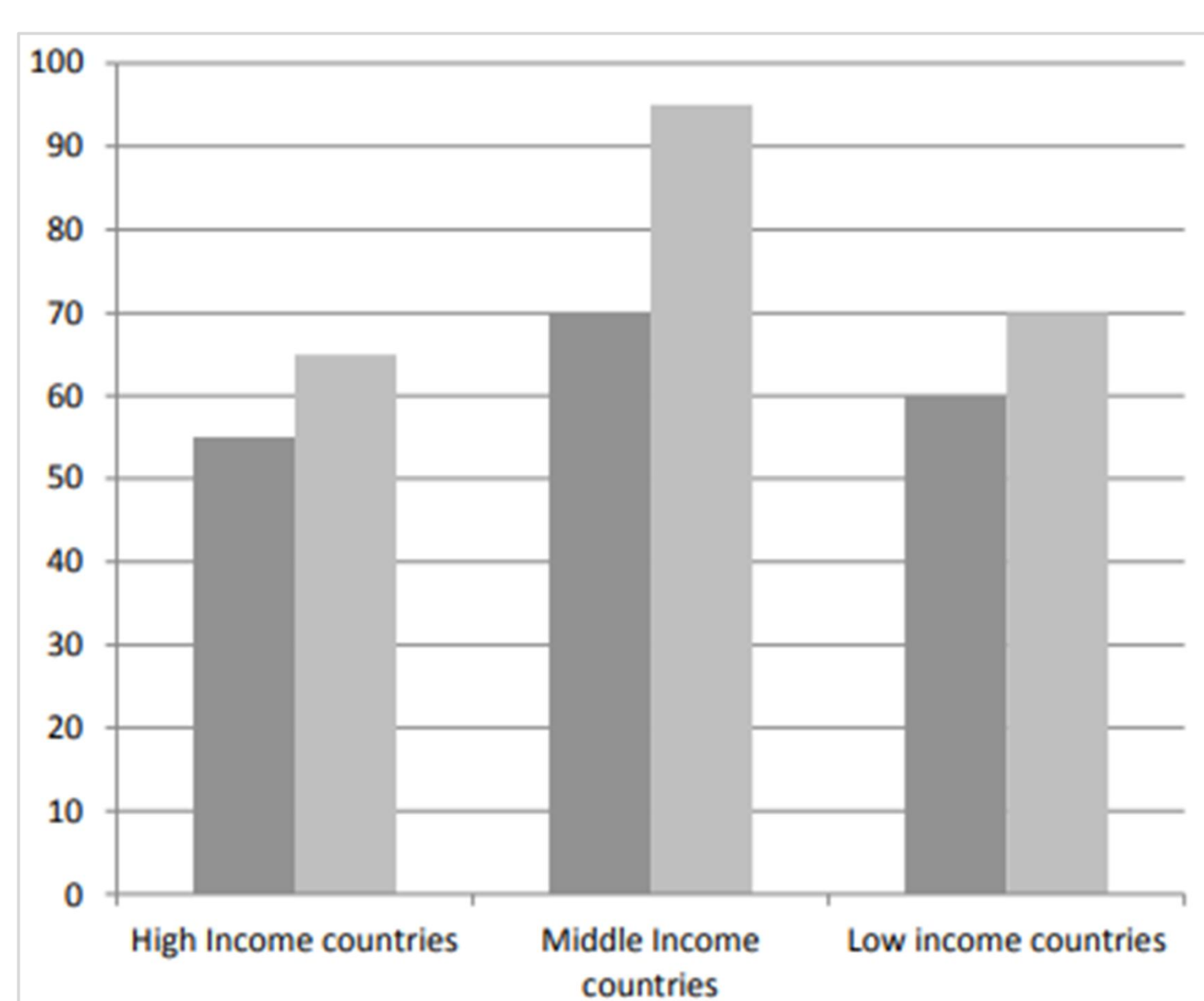
By 2030, 75 million to 375 million workers (3 to 14 percent of the global workforce) will need to switch occupational categories. (McKinsey, 2017)

Automation will change —60% of occupations have at least 30% of constituent work activities that could be automated.

Technological change was responsible for 85% of the 5.6 million manufacturing jobs lost in the US between 2000 and 2010. (Global Goals Technology Forum, 2017)

Percentage of current work activities displaced by automation, 2016–30, Source: McKinsey 2017

### Not All Economic Boon is Creating Jobs



**90 per cent** of all businesses globally, contributing

- **more than half** of all employment,
- **more than a third** of GDP

#### High Income Countries

- 65 per cent of total employment
- 55 per cent of GDP

#### Middle Income Countries

- 95 per cent of total employment
- 70 per cent of GDP

#### Low Income Countries

- 70 per cent of total employment
- 60 per cent of GDP

### Criteria for Green MSEs

#### NATURE OF INDUSTRY/SECTOR

Pollution index 60 & above	<ul style="list-style-type: none"> <li>• Automobile-manufacturing</li> <li>• Coal Plants</li> </ul>
Pollution index 41-59	<ul style="list-style-type: none"> <li>• Food Processing</li> <li>• Cotton weave</li> </ul>
Pollution index 21-40	<ul style="list-style-type: none"> <li>• Carpentry</li> <li>• Cement (without asbestos)</li> </ul>
Pollution index Up to 20	<ul style="list-style-type: none"> <li>• Bio-fertilisers</li> <li>• Solar Energy</li> </ul>

#### GREEN OPERATIONS OF MSEs

Resource efficiency	<ul style="list-style-type: none"> <li>• Raw material productivity</li> <li>• Waste reduction</li> </ul>
Reduce use of toxic materials	<ul style="list-style-type: none"> <li>• Efficiency of use</li> <li>• Replacing harmful substance</li> </ul>
Improve ecosystem services	<ul style="list-style-type: none"> <li>• Supporting ecosystems services</li> <li>• Cultural services</li> </ul>
Reduce CC impacts	<ul style="list-style-type: none"> <li>• Reduce carbon emissions</li> <li>• Increase adaptive capacity</li> </ul>

### Forging a Shared Vision and Global Action Agenda

15.1 By 2020, ensure the conservation, restoration and sustainable use of terrestrial, inland freshwater ecosystem and their services

14.2 By 2020, sustainably manage coastal ecosystem

14.4 Effectively regulate harvesting and end over-fishing, illegal & unregulated fishing

Ownerships and management of land by local communities and also looking at eco-tourism based livelihood options; Sustainable fish/oyster harvesting by local communities for sustainable enterprises

12.2 Sustainable management use of natural resources  
12.5 Substantially reduce waste generation through prevention, reduction, recycling and reuse

Recycling industry – PET Bottles, Plastic, Fly-ash, and Paper to address waste generation

11.1 Ensure access for all to safe and affordable housing  
11.6 Reduce the adverse per capita environmental impact of cities, including air quality and waste management

Use of eco-friendly local housing technologies for mass housing development Domestic waste management through household composting, etc



2.3 By 2030, double agriculture productivity and incomes of small scale food producers

2.4 By 2030, ensure sustainable food production systems

Small scale food producers organised to Collectively market their produce, ensure locally available inputs for sustainable agriculture

6.4 By 2030, substantially increase water use efficiency across all sectors and ensure sustainable withdrawals and supply of freshwater to address water scarcity

Decentralised Waste water treatment plants for reuse in agriculture, industrial purposes

7.1 Ensure universal access to affordable, reliable and modern energy services  
7.2 Increase the share of renewable energy in energy mix

Locally-appropriate business models for delivery of decentralized off-grid renewable energy technologies