Sustainable Development Goal - 9

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Dear Friends,

This month we shall discuss the 9th Sustainable Development Goal: Infrastructure, industrialization and innovation. In this blog, we shall try to explain:

a. What it is and why is this relevant
b. What are its indicators and targets?
c. Where do we stand in India
d. What can we do to support the goal

As stated earlier, I have little to contribute on my own. I have attempted to provide a few references, so that if anyone is interested in probing deeper, you could do so.

What is SDG 9? [1]

The purpose of SDG 9 is to 'build resilient infrastructure, promote sustainable industrialization and foster innovation'. Infrastructure includes transportation (by road, rail, air, water and pipelines), healthcare, water supply and sanitation services, electricity and telecommunications, waste management and disposal etc. By resilient infrastructure, we mean that these systems are so designed that in the event of any disaster, whether man-made or natural, at least some basic levels of services can be quickly restored.

Sustainable industrialization refers to the manufacturing sector with an eye on employment generation, efficient use of natural resources and energy, while attempting to reduce greenhouse gas emissions as a mitigating measure for climate change. The Addis Ababa declaration of (July 2015) is relevant for this goal, and emphasizes 'knowledge-sharing, innovation and social inclusion'.

Innovation has many meanings, but for the purpose of this SDG, it is closely related to technological Research and Development (R&D) as we may conclude from the following two targets and their respective indicators for this goal:

> **Target 9.5** Enhance scientific research, upgrade the technological capabilities of industrial sectors in all countries, in particular developing countries, including, by 2030, encouraging innovation and substantially increasing the number of research and development workers per 1 million people and public and private research and development spending.

Indicators 9.5.1 Research and development expenditure as a proportion of GDP
9.5.2 Researchers (in full-time equivalent) per million inhabitants

Target 9.B Support domestic technology development, research and innovation in developing countries, including by ensuring a conducive policy environment for, inter alia, industrial diversification and value addition to commodities.
Indicator 9.b.1 Proportion of medium and high-tech industry value added in total value added

Why is this important?

A report [2] by UNIDO provides statistical evidence of the linkages between industrial development on one hand and human development on the other, including reduction of poverty and inequality, providing quality education and healthcare, and employment generation.

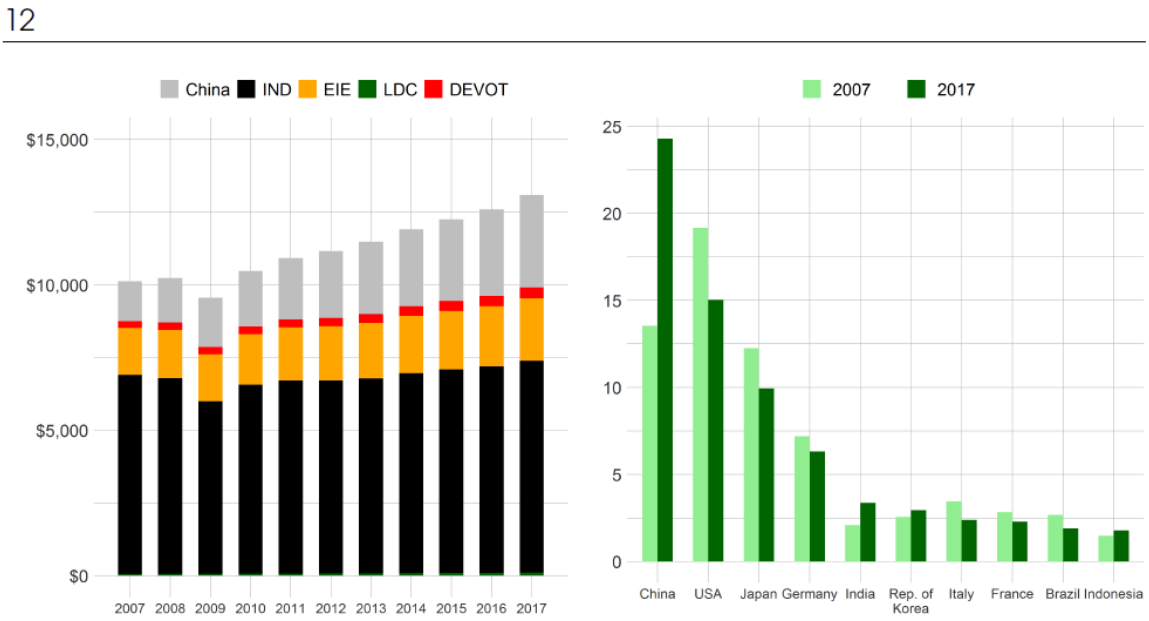


Figure 1: MVA and its distribution by country groups, billions of constant 2010 US dollars (left). Top 10 largest manufacturing producers in the world in 2017, share of countries' MVA in global MVA (right).

Legend: IND – Industrialized countries, **EIE –** Emerging Industrial Economies (India figures under this group), **LDC -** Least Developed Countries, **DEVOT -** Other Developing Countries – as detailed in Appendix 1 of the report.

Manufacturing Value Added (MVA) is a measure of the part of a nation's GDP derived from manufacturing activities. The two other primary contributors are agriculture and services. Fig. 1 above shows that between 2007 and 2017, China has replaced the US as the top share holder of global manufacturing, and India occupies the fifth position, after USA, Japan and Germany; overtaking Rep. of Korea, Italy, France and Brazil during this period.

The Human Development Index (HDI) has 3 elements: long and healthy life, acquisition of knowledge and avail of a 'decent standard of living'. Fig. 2 on the left shows that the HDI of nations across the globe rises as the MVA per capita rises. The graph on the right shows similar trends between a country's competitive industrial performance index and the HDI.

Hence it is evident that human development and industrial development go hand in hand, although industrial development has a demonstrated bias towards exacerbating inequalities, unless specific policy measures are adopted to address these adverse effects. The next SDG, SDG 10 is specifically devoted to reducing inequalities, and therefore, we defer further discussions on inequalities till then.

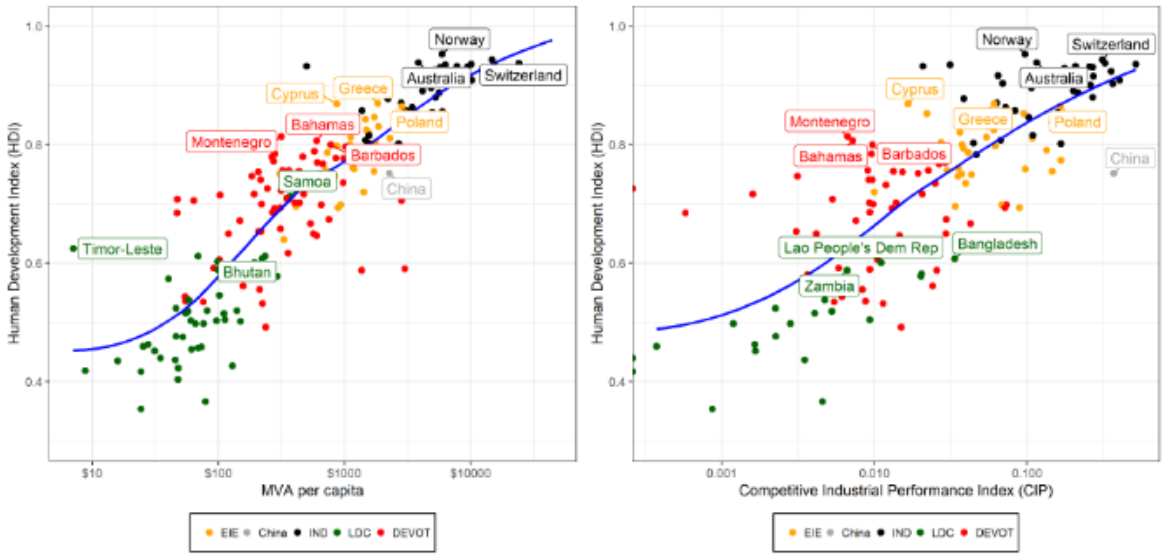


Figure 2: Comparison of the HDI with MVA per capita and the CIP index, all measured in 2017.

Source: UNDP HDI 2018 (UNDP, 2018), UNIDO CIP 2019 Database (UNIDO, 2019a) and UNIDO MVA 2019 Database (UNIDO, 2019d)

What are its indicators and targets? [3]

The indicators for SDG-9 are as under:

9.1 Develop quality, reliable, sustainable and resilient infrastructure, including regional and trans-border infrastructure, to support economic development and human well-being, with a focus on affordable and equitable access for all

9.2 Promote inclusive and sustainable industrialization and, by 2030, significantly raise industry's share of employment and gross domestic product, in line with national circumstances, and double its share in least developed countries

9.3 Increase the access of small-scale industrial and other enterprises, in particular in developing countries, to financial services, including affordable credit, and their integration into value chains and markets

9.4 By 2030, upgrade infrastructure and retrofit industries to make them sustainable, with increased resource-use efficiency and greater adoption of clean and environmentally sound technologies and industrial processes, with all countries taking action in accordance with their respective capabilities

9.5 Enhance scientific research, upgrade the technological capabilities of industrial sectors in all countries, in particular developing countries, including, by 2030, encouraging innovation and substantially increasing the number of research and development workers per 1 million people and public and private research and development spending

9.A Facilitate sustainable and resilient infrastructure development in developing countries through enhanced financial, technological and technical support to African countries, least developed countries, landlocked developing countries and small island developing States

9.B Support domestic technology development, research and innovation in developing countries, including by ensuring a conducive policy environment for, inter alia, industrial diversification and value addition to commodities

9.C Significantly increase access to information and communications technology and strive to provide universal and affordable access to the Internet in least developed countries by 2020

Where do we stand in India?

The following images [4] offer some national as well as global status on SDG-9 and trends:

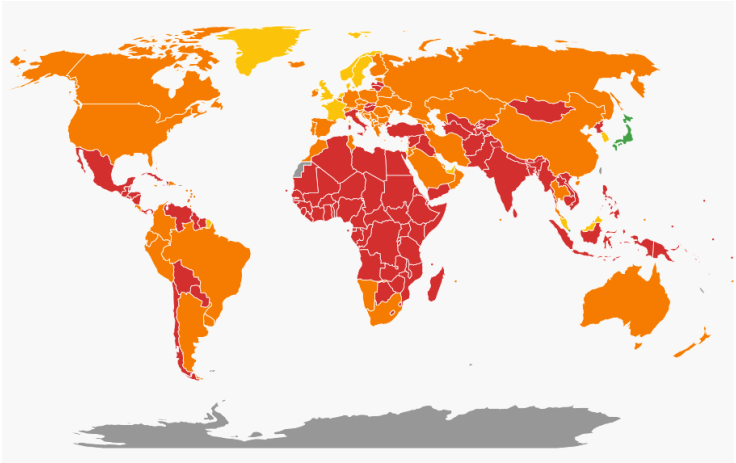


Fig 3. Status of SDG-9 in 2020

The above figure shows that the status in India comes under the category ‘major challenges remain’ while the trend (below) shows that India is ‘moderately improving’.

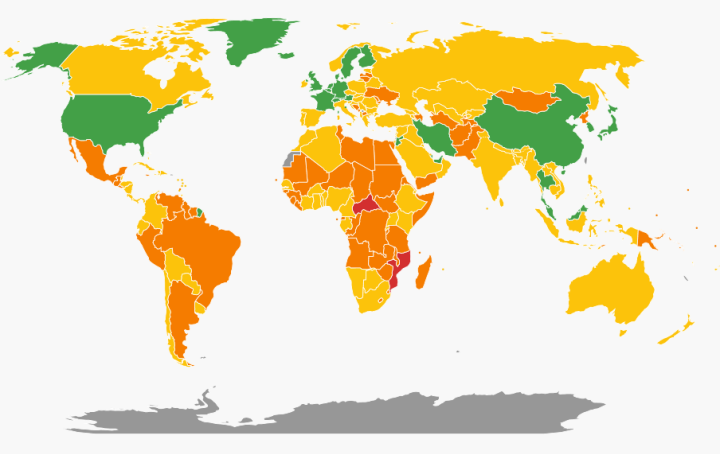


Fig 4. Trends SDG-9 in 2020

Specifically, India's standing in 2019 [5] is shown below:

SDG9 – Industry, Innovation and Infrastructure	Value	Rating	Trend
Population using the internet (%)	34.5	●	↗
Mobile broadband subscriptions (per 100 inhabitants)	25.8	●	↗
Logistics performance index: Quality of trade and transport-related infrastructure (1=low to 5=high)	2.9	●	↑
The Times Higher Education Universities Ranking, Average score of top 3 universities (0-100)	43.4	●	••
Number of scientific and technical journal articles (per 1,000 population)	0.1	●	→
Research and development expenditure (% GDP)	0.6	●	↓

The standing in 2020 [6] is as under:

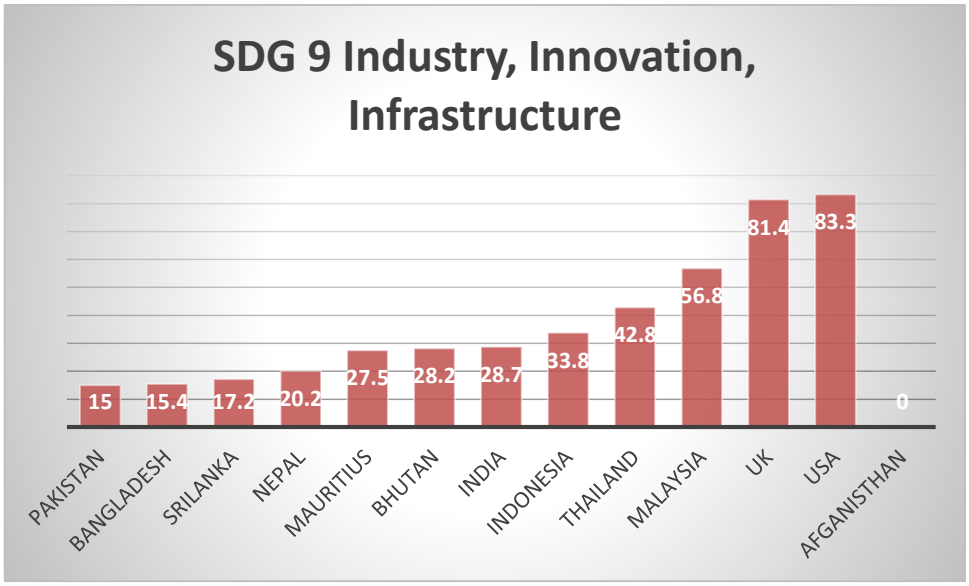
SDG9 – Industry, Innovation and Infrastructure	Value	Year	Rating	Trend
Population using the internet (%)	34.5	2017	●	↑
Mobile broadband subscriptions (per 100 population)	37.5	2018	●	↑
Logistics Performance Index: Quality of trade and transport-related infrastructure (worst 1–5 best)	2.9	2018	●	↗
The Times Higher Education Universities Ranking: Average score of top 3 universities (worst 0–100 best)	44.9	2020	●	●
Scientific and technical journal articles (per 1,000 population)	0.1	2018	●	→
Expenditure on research and development (% of GDP)	0.6	2015	●	●

Major challenges | Significant challenges | Challenges remain | SDG achieved | Information unavailable

Decreasing | Stagnating | Moderately improving | On track or maintaining SDG achievement

Internet use, broadband subscriptions and R&D expenditure continues to have major challenges.

In the following graph we offer a comparison of SAARC nations, 3 ASEAN countries and UK, and USA on the performance on SDG-9 in 2019.



All SAARC nations are far behind all the other countries. Within SAARC, India has the top position, and Pakistan occupies the lowest position. Overall, USA holds the first position within this comparison group. The key indicators are: proportion of the rural population who live within 2 km of an all-season road, passenger and freight volumes, manufacturing value added as a proportion of GDP and per capita, manufacturing employment as a proportion of total employment, proportion of small-scale industries in total industry value added, proportion of small-scale industries with a loan or line of credit and CO2 emission per unit of value added.

If we look at the indicators level, the comparison is shown below [5]:

This data should be cited as: Sachs, J., Schmidt-Traub, G., Kroll, C., Lafortune, G., Fuller, G. (2019): Sustainable Development Report 2019. New York:

Country	Normalized Score sdg9_intuse	Dashboard Color sdg9_intuse	Normalized Score sdg9_mobuse	Dashboard Color sdg9_mobuse	Normalized Score sdg9_lpi	Dashboard Color sdg9_lpi	Normalized Score sdg9_qs	Dashboard Color sdg9_qs	Normalized Score sdg9_articles	Dashboard Color sdg9_articles	Normalized Score sdg9_rdex	Dashboard Color sdg9_rdex
Afghanistan	9.46	red	14.85	red	0.30	red	0.00	orange	0.11	red	0.00	red
Bangladesh	16.18	red	29.73	red	24.53	orange	6.04	orange	0.71	red	N/A	N/A
Bhutan	46.94	red	87.20	green	4.51	red	0.00	orange	2.29	orange	N/A	N/A
India	32.98	red	24.71	red	46.05	yellow	47.64	green	3.79	orange	16.86	red
Mauritius	54.56	orange	58.38	yellow	41.67	yellow	0.00	orange	5.62	orange	4.80	red
Nepal	19.64	red	51.70	orange	16.42	orange	24.67	green	0.86	red	8.17	red
Pakistan	13.61	red	23.64	red	16.56	orange	27.33	green	2.16	red	6.65	red
Sri Lanka	32.63	red	21.33	red	28.71	orange	15.77	yellow	2.26	red	2.70	red
Indonesia	30.77	red	98.28	green	45.63	yellow	24.36	green	1.35	red	2.29	red
Malaysia	79.69	green	100.00	green	56.13	green	40.33	green	29.63	green	35.15	yellow
Thailand	51.83	orange	98.99	green	55.76	green	27.33	green	6.32	orange	16.74	red
United Kingdom	94.50	green	87.89	green	93.03	green	100.00	green	67.38	green	45.69	green
United States	74.68	yellow	100.00	green	93.55	green	100.00	green	57.70	green	74.17	green
China	53.27	orange	83.32	green	81.38	green	82.45	green	13.80	yellow	56.94	green
	Internet use		Mobile use		Logistics performance		Times HE Ranking		Articles pub./million		R&D Expenditure	

What can we do to support the goal?

The sustainable development website states:

> **"**Think about how industry impacts on your life and well-being and use social media to push for policymakers to prioritize the SDGs".

Industry, innovation and infrastructure require large capital and the civil society can perhaps raise its voice and draw the attention of the government towards deficit areas. We saw TV advertisements, prompting citizen to take photographs of damaged roads and to send it to The **Pradhan Mantri Gram Sadak Yojana** (PMGSY) for rectification.

But all of us can play a significant role in the field of waste management. First, we can develop a habit of segregating waste at home, and this has become a norm in most of the large housing complexes in cities. We can promote this idea in villages. Most villages do not have a system of waste collection and disposal. We can urge the village panchayats to take appropriate actions in this direction. All bio-degradable waste can be composted into organic manure. This can be promoted.

Modern lifestyle uses significant packaging materials, especially in these days of home delivery. Recycling of these packaging materials offer another means for value creation.

References:

1. https://www.un.org/sustainabledevelopment/infrastructure-industrialization/ Accessed on September 18 2020 09:32 IST
2. How industrial development matters to the well-being of the population final.pdf
3. https://unstats.un.org/sdgs/indicators/indicators-list/
4. SDG Index Dashboard https://dashboards.sdgindex.org/#/IND Accessed on May 28 2020 11:10 IST
5. Sachs, J., Schmidt-Traub, G., Kroll, C., Lafortune, G., Fuller, G. (2019): Sustainable Development Report 2019. New York: Bertelsmann Stiftung and Sustainable Development Solutions Network (SDSN).
6. Sachs, J., Schmidt-Traub, G., Kroll, C., Lafortune, G., Fuller, G., Woelm, F. 2020. The Sustainable Development Goals and COVID-19. Sustainable Development Report 2020. Cambridge: Cambridge University Press.