India and the SDGs

ICT India Working Paper #22

John Biberman and Nirupam Bajpai

January 2020

Center for Sustainable Development
### EARTH INSTITUTE | COLUMBIA UNIVERSITY

Abstract

In 2015, the United Nations General Assembly passed UN Resolution 70/1, making achievement of the Sustainable Development Goals by 2030 official UN policy. Together, the 17 goals and 169 targets of the SDGs constitute a comprehensive agenda for sustainable development. The SDGs touch not just on environmental justice and intergenerational justice, but equitable economic growth and social stability, shaping development priorities around the needs of the disadvantaged, and designing just and robust institutions to strengthen coordination between sectors and build environments of accountability. India, for its part, has made great strides in meeting SDG targets related to climate change and sustainable consumption and production. More progress, however, must be made in reducing poverty and hunger, improving education, and promoting inclusive economic growth, and the country is seriously lagging when it comes to achieving gender equality and building inclusive and resilient infrastructure. Within India, the southern states of Kerala and Tamil Nadu have come closest to achieving the SDGs, particularly when it comes to social and economic goals. Various mountain and northeastern states have also performed well on SDG environmental targets. The northern states of the Gangetic Plain, collectively known as the Hindi belt, have overall made the least progress towards achieving the SDGs.

Defining Sustainable Development

The Sustainable Development Goals represent the latest iteration of a concept in flux which has undergone evolution over at least the past few centuries. When it was first conceived, the idea of sustainability was viewed strictly through the lens of restraining resource consumption and maintaining the ability of natural systems to support human societies. Early Malthusian thought, an 18th-century theory which stipulated that excessive use of natural resources brought on by overpopulation would inevitably lead to a crash correction of the population, drew heavily on this way of thinking by arguing that it was government's and society's duty to restrain the use of natural resources by preemptively advocating for population control.

By the time of the emergence of the environmental movement in the late 1960s, the dark predictions of Malthus had been proven wrong, or at least postponed. Advances in agricultural technology had allowed humanity's food production to more than keep pace with its growth, in no way more evident than through the innovations of the Green Revolution in India earlier that same decade. As our biosphere proved itself capable of supporting a larger population than had been envisioned, the sustainability debate shifted towards the terrain of promoting intergenerational continuity in quality of life. As newly independent postcolonial nations strove to elevate their living standards to match those in rich countries, developed countries struggled with an energy crisis and the prospect that their fossil fuel-based economic model could not be sustained into eternity. This shift was encapsulated in the findings of the 1987 UN World Commission on Environment and Development, otherwise known as the Brundtland Commission. In the report published by the Commission, Our Common Future, sustainable development was redefined as "that which meets the needs of the present without compromising the ability of future generations to meet their own needs." This "intergenerational" definition of sustainable development, which continued to lean primarily on limiting consumption of global resources and respecting the earth's carrying capacity, defined sustainability efforts for the next quarter century.

By the turn of the new millennium, global events had once again forced the definition of sustainability to expand. New social movements and demands from marginalized groups, particularly emerging from the global societal reorganizations which took place in the wake of the Cold War, have refocused attention on questions of who should benefit from development, how development should benefit excluded populations, and how failure to promote societal inclusion can undermine the sustainability of development efforts themselves. Sustainable development as a field has thus evolved into its present incarnation, which features a threefold emphasis on economic development, social development, and environmental protection. Only by keeping these three priorities in mind, the thinking goes, can societies ensure that resources are used to the benefit of the many, not the few, in a way that these societies can bear and that does not undermine the resilience and quality of life of future generations.
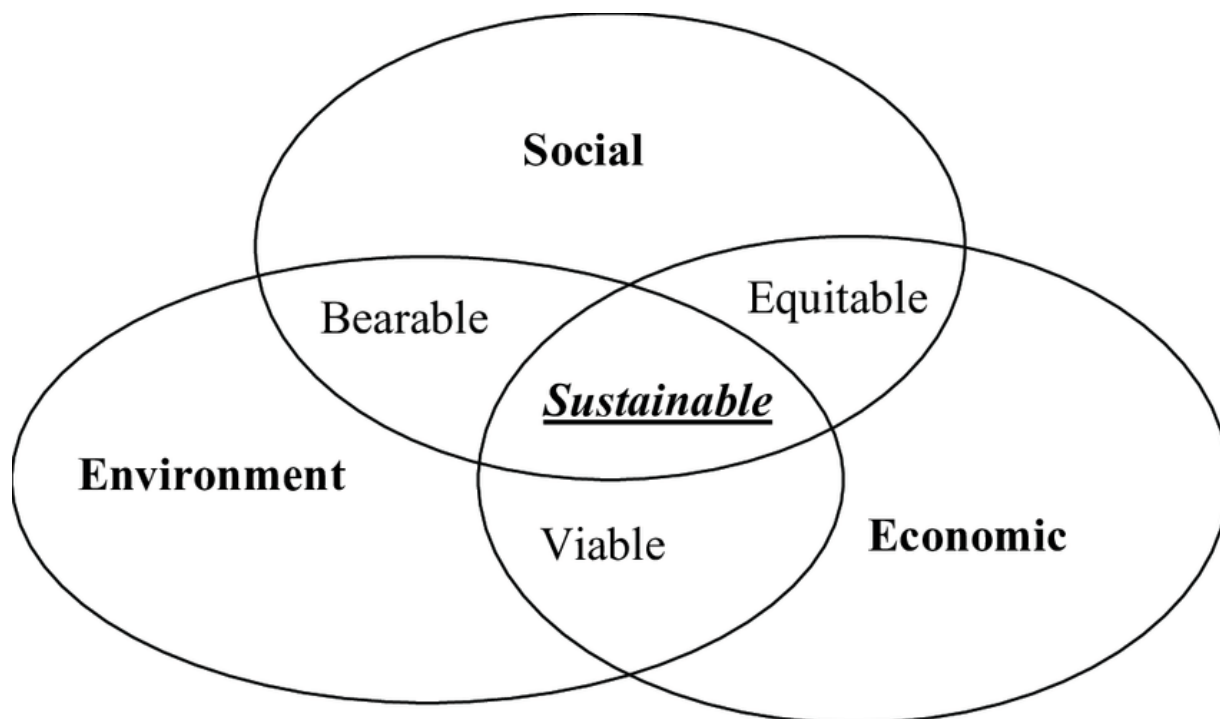
Modern Sustainable Development Framework.[1]

Sustainable Development Goals

The Sustainable Development Goals represent the most comprehensive, inclusive effort to date to formulate the steps which must be taken to fulfill this tripartite vision of how resources should be used to build prosperous, durable, inclusive, and low-impact societies. The SDGs were first proposed at the 2012 Rio+20 conference, during which UN member states passed a resolution on "the future we want" prioritizing poverty elimination, water and sanitation, green energy, and other themes which would eventually make it into the SDGs. These priorities were further formalized during the development of the Post-2015 Development Agenda, a dialogue led by the UN to determine the specific goals required for a global sustainable development framework and the targets which would most holistically incorporate the diverse development challenges of countries around the world. By the time the SDGs were unanimously ratified at the 2015 session of the UN General Assembly, they had grown into a template for countries and societies, regardless of their diversity and varied needs, to meet the challenge of building an inclusive, prosperous, and environmentally realistic future. The goals are detailed below:

1. **End poverty in all its forms everywhere:** This goal calls for an elimination of extreme poverty around the world, as defined both by national and international metrics. It also calls for an elimination of the extreme hardships created by extreme poverty, such as lack of healthcare, education, security, and social inclusion.
2. **End hunger, achieve food security and improved nutrition, and promote sustainable agriculture:** The second goal aims to eliminate all hunger and malnutrition around the world by 2030. This would be accomplished by increasing agricultural productivity through higher quality techniques and inputs, raising farmer incomes, promoting sustainable soil health, and reducing

[1] Grillo, Oscar. Biological Diversity and Sustainable Resources Use. January 2011.
https://www.intechopen.com/books/biological-diversity-and-sustainable-resources-use

commodity price volatility by lowering international trade barriers. Progress towards this goal can be measured through reduction of childhood stunting and wasting and increasing agricultural yields.

3. **Ensure healthy lives and promote well-being for all at all ages:** First and foremost, this goal prioritizes slashing childhood and maternal mortality through improved infrastructure for women's health. Cutting down the spread of communicable diseases, by improving sanitation infrastructure and expanding preventative care to the whole population, is also a priority. Finally, preventing deaths from noncommunicable diseases (NCDs) and other sources also receives attention through calls for treatment of substance abuse, reduction of traffic injuries, and cleaning air, water, and soil pollution.

4. **Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all:** Achieving inclusive, quality education for all involves not just achieving universal enrollment for all years of mandatory education, but ensuring that education prepares children with the skills and knowledge they will need to thrive as citizens and workers in their societies. This requires building effective learning environments where children of all age groups and, in particular, genders can achieve adequate literacy and numeracy. Furthermore, it requires developing effective curricula for teaching technical skills, and increasingly, for education in sustainable development itself.

5. **Achieve gender equality and empower all women and girls:** Full equality and inclusion for half the population is a necessary prerequisite to accomplishing many aspects of sustainable development, yet gender equality continues to lag in many countries. This goal exhorts countries to strive towards equity and female empowerment by eliminating child marriage, enforcing laws against discrimination, increasing female political representation, and shaping development priorities around the voices and needs of women.

6. **Ensure availability and sustainable management of water and sanitation for all:** Water access and sanitation are crucial prerequisites for several other pillars of sustainable development, such as health, economic prosperity, and gender equality. Improving water resources by reducing pollution and ending open defecation, tackling scarcity by improving water delivery and usage efficiency systems, and restoring aquatic ecosystems will substantially improve health, resiliency, and inclusion for communities in vulnerable environments.

7. **Ensure access to affordable, reliable, sustainable, and modern energy for all:** Increasing production and consumption of clean and renewable energy and improving global energy efficiency will lead to great progress in combatting climate change, improving health outcomes through better air quality, and allowing households with newfound access to electricity to participate more fully in economic and social life. Doing so will require expansion of distributive and distributed infrastructure, international technological cooperation, and new investments in improving energy efficiency.

8. **Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all:** Economic growth is one of the three core pillars of current definitions of sustainable development, and sustainable and inclusive growth is a particularly high priority in countries currently lacking the economic output to provide all citizens with a decent standard of living. This goal stipulates that countries should promote innovation, entrepreneurship, and small enterprises in order to spread the benefits of growth more evenly across the population. By 2030, countries should also reduce youth unemployment, eliminate forced labor, and expand inclusive financial institutions and business support services. Finally, countries should prioritize the growth and development of new and emerging industries which

dovetail with other goals of sustainable development, such as ecotourism and local cultural promotion.

9. **Build resilient infrastructure, promote inclusive and sustainable industrialization, and foster innovation:** Inclusive economic development requires investment in inclusive infrastructure which reaches communities that otherwise could not have participated in economic growth. It also necessitates efficient, sustainably designed infrastructure, and in particular the expansion and promotion of ICT infrastructure that can prepare rural and informal communities for inclusion in the new era of the digital economy. Targets for this goal include increasing the number of research and development workers in poorer countries, increasing technical and technological support to these countries for infrastructure development, and increasing the employment and GDP share of the industrial sector in developing countries.

10. **Reduce income inequality within and among countries:** This goal aims for more equal societies in which growth for the bottom 40% of the population exceeds the national average. Doing so will promote economic inclusion for the most disadvantaged groups, such as women, minorities, and the disabled. To support this goal, countries are encouraged to adopt legal measures promoting more equal outcomes, to improve management of migration and financial flows across borders, and to reduce transaction costs for remittances. Finally, international institutions are encouraged to increase representation for developing countries.

11. **Make cities and human settlements inclusive, safe, resilient, and sustainable:** Sustainable cities provide safe housing to all inhabitants, offer rapid and efficient means of transportation, maintain safe public spaces, and responsibly provide essential municipal services such as waste management. This goal seeks to transform urban environments into more sustainable spaces by accomplishing these goals, while also improving regional planning efforts, implementing disaster preparedness strategies, and reducing cities' negative environmental footprints.

12. **Ensure sustainable consumption and production patterns:** While economic growth necessarily entails increased production, production methods must also shift in order to ensure sustainable consumption of the planet's resources. This goal calls for more responsible usage of natural resources by reducing food waste, increasing recycling and reuse, eliminating fossil fuel subsidies, and implementing policy frameworks for sustainable natural resource management.

13. **Take urgent action to combat climate change and its impacts by regulating emissions and promoting developments in renewable energy:** The prospect of climate change threatens to undermine the progress many countries have made towards sustainable development, yet these same countries must follow a path of sustainable development in order to prevent and mitigate the worst potential impacts of global warming. In addition to pushing countries to fulfill their Paris Climate Accord commitments, this goal calls for climate change management to be mainstreamed into policy planning for vulnerable countries and for 100 billion USD to be mobilized globally by 2020 to aid the mitigation and Green Climate Fund-backed efforts of developing countries.

14. **Conserve and sustainably use the oceans, seas and marine resources for sustainable development:** The health of maritime ecosystems is one of the most overlooked, yet most critical cornerstones of inclusive human development. Goal 14 advocates for preservation of healthy aquatic environments by minimizing pollution and eutrophication, regulating overfishing, and halting the ocean acidification which is a byproduct of global warming and which threatens the collapse of maritime food chains.

15. **Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss:** Preservation of biological land resources, and especially biodiversity, reaches the heart of how sustainability has always been defined. By halting deforestation, formally protecting

vulnerable land ecosystems, stopping poaching and trafficking, and halting the spread of invasive species, sustainable societies can preserve endangered habitats, indigenous lifestyles and natural backstops to climate change for future generations.

16. **Promote peaceful and inclusive societies for sustainable development, provide access to justice for all and build effective, accountable and inclusive institutions at all levels:** Socially inclusive sustainable development can only be ensured through the construction of institutions which formalize and protect rights for vulnerable citizens. This goal pushes countries to eliminate organized crime including trafficking and forced labor, reduce all forms of violence, slash corruption and the promulgation of discriminatory laws, and increase the political participation of excluded and underrepresented groups. It also calls on countries to include all citizens in formal identity and registration systems, which will smooth the delivery of vital services as governments grow more reliant on digital systems.

17. **Strengthen the means of implementation and revitalize the global partnership for sustainable development:** The last of the SDGs calls for domestic and international partnerships between governments, nonprofits, think tanks, international institutions, and private organizations in order to promote the rapid and efficient achievement of all the preceding goals. Partnerships should be established to support trade, technology and financial cooperation, knowledge sharing and capacity building, and more thorough data monitoring and accountability efforts.

Indian Progress on the SDGs
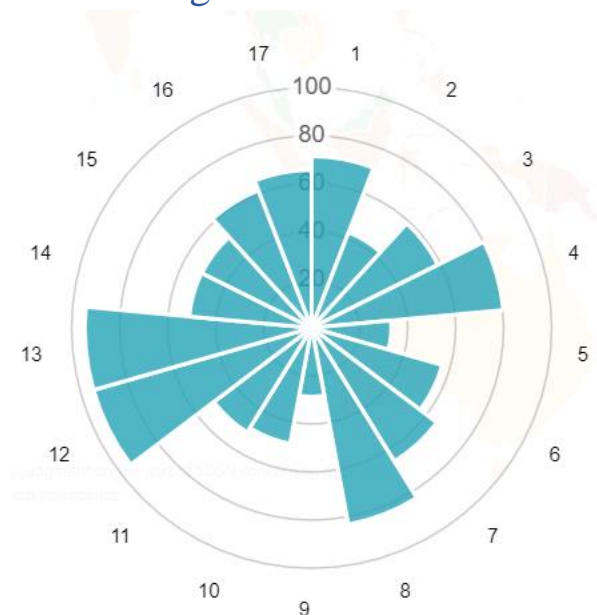
The Sustainable Development Solutions Network, through its annual SDG Index, currently compiles the most widely utilized report on internationally comparable achievement of SDG metrics. The report's assessment of India is illustrated above. According to the report, India is well on track to meet SDG commitments related to climate change and sustainable consumption and production. The country has achieved more middling results when it comes to reducing poverty, improving education, and promoting inclusive economic growth. Public health, clean water and energy, reducing inequality, designing sustainable cities, and building trustworthy and just institutions remain areas for improvement. India's biggest challenges, according to the

SDSN index, lie in the fields of reducing hunger and malnutrition, achieving gender equality, and creating resilient infrastructure as the foundation of a resilient, inclusive and innovative industrial sector.[2] Overall, SDSN ranks India's SDG attainment at 115th out of 162 surveyed countries, placing it somewhat below the East and South Asia regional average.
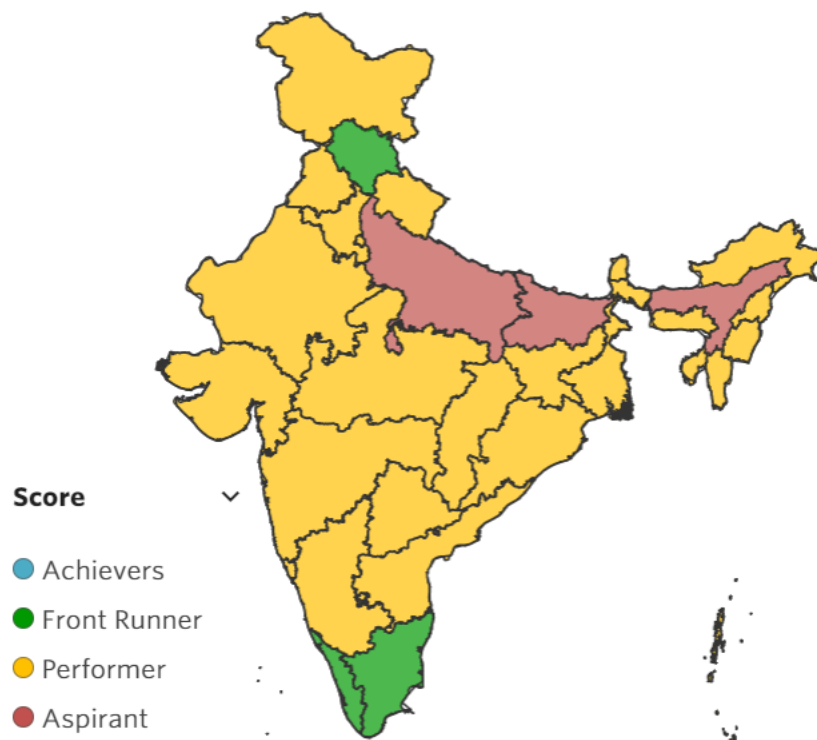
In 2018, NITI Aayog published a report on the achievement of the Sustainable Development Goals in India, entitled the SDG India Index. The report worked first to formalize how the SDGs could be measured according to existing public data concerning sustainable development in India, and second to compare SDG achievement across states and identify both success stories and investment priorities. In some respects, the NITI Aayog report presents a significantly more detailed overview of sustainable development in India than that produced by SDSN. By drawing on disaggregated national data and examining a wider range of targets than the SDSN index, NITI Aayog presents a significantly more granular analysis of sustainable development in India. On the other hand, some of the data in use is of questionable veracity or otherwise missing, making the methodology suspect. Goals 12, 13, 14, and 17, relating to sustainable consumption and production, climate change life below water, and partnerships for the goals, also remain unexamined either due to lack of data disaggregated by state or poorly defined targets within the SDGs themselves. Regardless, the SDG India Index offers a reasonably in-depth means of

---

[2] Details on the SDSN SDG Index metrics and methodology can be found at https://www.sdgindex.org/

examining which regions within India have achieved which facets of sustainable development most effectively and why.[3]

The SDG India Index reveals that overall, India's southern states of Kerala and Tamil Nadu as well as the mountainous northern state of Himachal Pradesh are largely on track to meet India's SDG commitments. The two south Indian states perform especially well on measures of governance and economic sustainability, such as poverty reduction, public health, quality education, and reduction of inequalities. Himachal, on the other hand, is a relatively better performer on environmental metrics such as clean water and habitat preservation.

In contrast, large states in North India's Hindi belt such as Uttar Pradesh and Bihar, in addition to the Northeastern states, have the most room for growth. Compared to the rest of India, these states have relatively high incidences of poverty and hunger, limited public health infrastructure, poor records on gender equality, high rates of habitat loss, and weak public institutions. They do, however, show promise in fields such as sustainable water usage and reliance on renewable energy, thanks to the abundant regional watershed.

Goal 1: No Poverty

SDG 1 aims to eliminate poverty in all its forms everywhere by 2030. This doesn't just mean raising incomes above official poverty lines, but doing so in a way sensitive to the diverse social and economic circumstances of women, children, and other vulnerable groups. That means implementing social safety nets, ensuring access to economic resources for disadvantaged groups, direct investment in excluded segments of the population, and developing strategies to mitigate losses from disasters.

India's official poverty line is defined as the minimum spending necessary for food, education, health, electricity, and transport. In 2011, the Suresh Tendulkar Committee based out of the National Statistics Office identified this line as 27.2 Rs/day in rural areas and 33.3 Rs/day in urban areas, while the Reserve Bank's Rangarajan panel defined it as 32 Rs/day in rural areas and 47 Rs/day in urban areas. Both these have been criticized as excessively low, politically motivated definitions to demonstrate progress moving people out of poverty, and both were less than half of the 1.25 USD/day international poverty line used by the World Bank at the time.[4]

Nonetheless, as India has attained the status of a low-middle income country, extreme poverty has become less and less common. As of 2019, 2.9% of the population spent below the World Bank's current extreme poverty line of 1.90 USD/day. 27.4% remained below the new poverty threshold of 3.20 USD/day, however. And 21.9% remain even below the national poverty line.

---

[3] The full SDG India Index report, including source data and a methodological note, can be found at https://sdgindiaindex.socialcops.com/. Details on the metrics used in the index and the justifications for including them are provided in Appendix 1.

[4] https://www.hindustantimes.com/business/demystifying-india-s-poverty-line-here-s-everything-you-need-to-know/story-43vy1sQ7LrCZuezTakDnkM.html

With an eye to reducing this crushing poverty, particularly in rural areas, the government has promoted numerous social protection schemes for the poor and vulnerable. In a country where only 28.7% of households have at least one member covered by health insurance, the government began piloting universal healthcare initiatives last year through the Ayushman Bharat scheme, which offers comprehensive primary healthcare as well as secondary and tertiary care to 100 million families. And while accessing social benefits has been a struggle in the past for such families, such as the 63.6% of the population eligible for Maternity Benefit which did not access those benefits, the Aadhaar national ID system is streamlining and simplifying access to and accountability for social services.
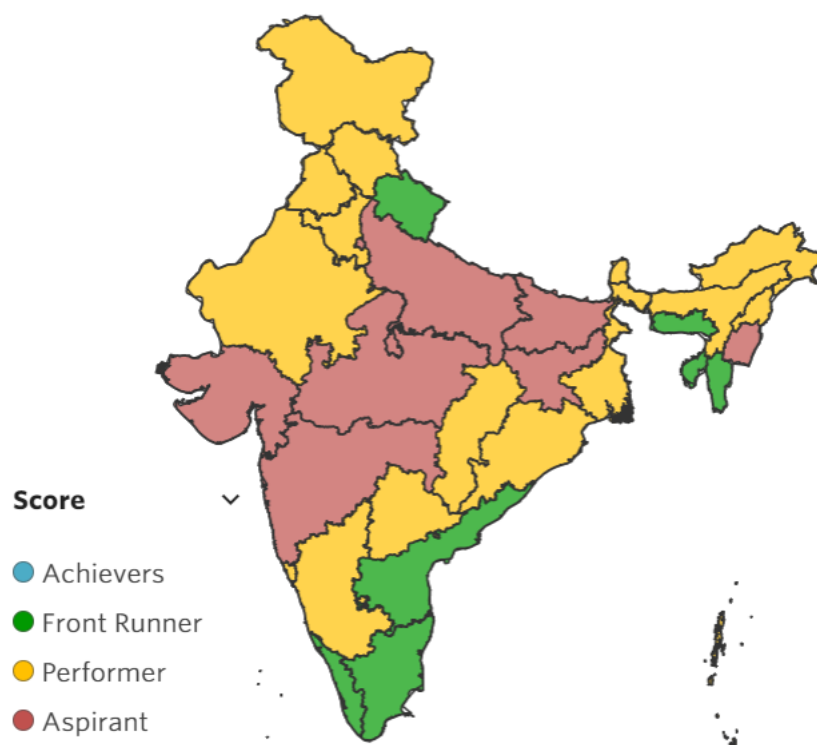
The southern states of Kerala, Tamil Nadu and Andhra Pradesh have seen the most success in poverty reduction, with isolated successes in the Northeast and in the Himalayan state of Uttarakhand. The aforementioned states, with the additions of Goa, Haryana, Himachal Pradesh, and Punjab, have already met or nearly met the GOI goal of halving the national poverty rate, thanks to high levels of existing development. Andhra Pradesh, Kerala, Tamil Nadu and Telangana are also among the Indian states with the highest rates of health coverage, critical for poverty avoidance.

On the other hand, various central and northern states stretching from Bihar in the east to Maharashtra in the west have faced difficulties in poverty reduction, partially due to lack of rural opportunity and partially due to urban factors. In Chhattisgarh, nearly 40% of the population lives below the national poverty line, a line which is already arguably set too low as previously discussed. Assam, Bihar, Jharkhand, Madhya Pradesh, Odisha, and Uttar Pradesh are right on its heels, all with poverty rates approaching or exceeding 30%. In certain other States and UTs with

large urban centers, homelessness has become a particularly intractable problem. Homelessness in Maharashtra, Chandigarh, and Madhya Pradesh, an estimated .2% of households are homeless. In Delhi, the rate exceeds half a percent.

Goal 2: Zero Hunger

SDG 2 concerns eliminating both hunger and malnutrition and the structural conditions which contribute to it. This involves meeting the World Health Organization's targets of a 40% reduction in stunting for children under-5 and a reduction of childhood wasting to less than 5%. Focusing on adequate nutrition for adolescent girls and pregnant and lactating women will help achieve this goal. Ameliorating the structural conditions which create hunger involves increasing agricultural productivity and small farmer incomes by expanding access to agricultural inputs, services and market opportunities. It also involves shoring up access to improved seeds, and making government and international investments in agricultural research, rural infrastructure, and crop genetic diversity. Finally, it requires building sustainable food production systems which increase productivity while improving soil health while maintaining resilience and adaptability to a changing climate.

Undernourishment is an endemic problem in India, where 14.8% of the population experiences some level of malnutrition. The problem is more prominent for children under 5, 38.4% of whom experience stunting and 21% of whom experience wasting. And early childhood malnutrition is complicated by a sky-high 50.3% rate of anemia in pregnant women. These burdens do not only fall on the most vulnerable groups, they also unravel the resiliency of these groups and diminish their ability to climb the socioeconomic ladder and escape the poverty traps which keep them in a state of malnutrition.

In a very dense country of over a billion people where little land remains to expand agriculture, one of the first prerequisites to improving nutrition outcomes is to simply increase the amount of food which farmers can produce. India has already experienced one wave of agricultural intensification, the Green Revolution in the 1950s and 1960s. Mostly implemented in the northern state of Punjab, the Green Revolution has contributed to raising India's overall cereal productivity to 2509 tons/hectare, with a high level of variance between states. Continued increases in productivity, with a focus on benefiting women and the indigenous, will drive the market outcomes that will allow families vulnerable to undernutrition to purchase higher quantities of higher quality food.

Increasing output in central and southern states which have not yet reaped the benefits of intensification can start with some of the same techniques applied during the Green Revolution, such as improved irrigation and fertilization. But attention will have to be paid to managing these agricultural systems in a sustainable fashion. India has achieved the worst possible score on the Sustainable Nitrogen Management Index, implying that inefficient application of fertilizer in intensified areas of farming contributes heavily to water pollution, eutrophication, and the destruction of marine fisheries which also play an important role in diversifying diets. Future reforms will need to focus on providing improved and genetically modified seeds to farmers,

eliminating market distortions and barriers to trade such as the onion export ban which went into effect in October, and increased agricultural research, development and extension. Fortunately, India's highly vegetarian dietary habits, measured as a 2.2/5 on the Human Trophic Level index, mean that the country's agriculture sector is capable of providing adequate nutrition to far more people without significant behavioral changes.

Score

- ● Achievers
- ● Front Runner
- ● Performer
- ● Aspirant
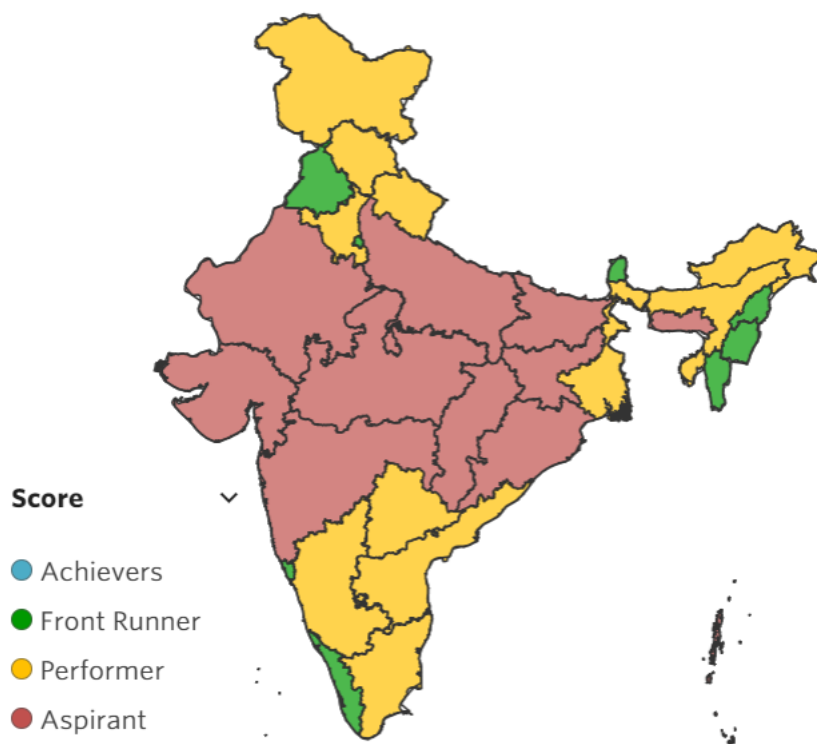
Punjab, Kerala, Goa, Sikkim, and the cluster of Northeastern states along the border with Myanmar have demonstrated the greatest achievement in resolving sustainability issues related to food production and hunger. Kerala, Punjab, Goa and Tripura have attained the lowest rates of malnutrition in the country as measured by stunting of children under the age of 5, and while stunting still hovers between 20 and 25% in these four states, their success is a departure from India's overall childhood stunting rate of 38%. These nutritional outcomes appear particularly promising in relation to the states of Bihar, Jharkhand, and Uttar Pradesh, each of which have stunting rates exceeding 45%.

Nutrition, however, remains an intractable problem for pregnant women across the country, over 50% of whom experience anemia. India aims to cut that rate roughly in half by 2030, and the states of Kerala, Manipur, Mizoram, Nagaland, and Sikkim have nearly achieved this (likely due to differences in dietary restrictions and preferences compared to the rest of the country), leading the way for the rest of India.

Intensive agricultural production is a prerequisite to producing enough food to avoid mass hunger in a densely crowded country of over a billion people. India has already averted mass famine once thanks to the Green Revolution of the 1960s, which increased yields through the application of fertilizers, scientific irrigation techniques, and improved seed and chemical inputs.

The legacy of the Green Revolution can still be witnessed today through the difference in agricultural yields between the region where it was introduced, Punjab, and the states where its techniques have not yet gained currency. Compared to India's national average grain output of roughly 2500 Kg/Ha, Punjab produces nearly 4300 Kg/Ha. Haryana, carved out from Punjab in 1966, produces a nearly comparable 3820 Kg/Ha. Recently, however, Tamil Nadu's adoption of similar improved agricultural techniques have elevated its production to nearly 3800 Kg/Ha as well. In Maharashtra, Odisha, Chhattisgarh, and Jharkhand, where outputs are 1070 Kg/Ha, 1485 Kg/Ha, 1495 Kg/Ha, and 1773 Kg/Ha, must progress must still be made before these states can reasonably contribute to India's food security.

Goal 3: Good Health and Well-Being

Ensuring good health and well-being, the third Sustainable Development Goal, first and foremost involves slashing maternal, neonatal and under-5 mortality rates. It involves eliminating epidemics of major communicable and neglected tropical diseases and dramatically reducing the incidence of noncommunicable diseases (NCDs). In addition, it includes prevention of substance abuse, road deaths and injuries, and deaths from air and water pollution and poor hygiene. In order to build a system which can accomplish all this, countries must achieve universal health coverage, including access to reproductive health services, affordable medicine and vaccines. This can be done by increasing health financing, recruitment and training, expanding ODA to the health sector, and implementing health risk reduction and management strategies.

India today has a mediocre life expectancy of 68.8 years, on par with many developed countries. One significant drag on life expectancy is high rates of maternal and child mortality. India has a neonatal mortality rate of 2.4% and an under-5 mortality rate of 3.94%, both just under double the national targets set in accordance with the SDGs. Furthermore, 174 mothers in India die per 100,000 live births, over double the SDG target of below 70, a statistic not helped by the fact that only 85.7% of births are attended by skilled health personnel. India experiences relatively high rates of death from Non-Communicable Diseases (NCDs) such as diabetes and respiratory disease, at 23.3 deaths per 100,000 annually, and traffic deaths, at 21.2 per 100,000 annually. India aims to halve both of these rates by 2030. Finally, certain communicable diseases have been beaten back but continue to persist, such as tuberculosis, which has an incidence rate today of .2% in the general population.

One way to increase life expectancy is to reduce the incidence of common risk factors. Such risk factors include air pollution, India's most visible health risk, which contributes to the death of .18% of the population annually. It also involves improves rates of childhood vaccination in a country where only 88% of infants receive at least two WHO-mandated vaccines and 62% of children 12-23 months are fully immunized. This can be accomplished in part by shoring up the public health system, which as of now only employs 221 physicians, nurses, and midwives per 100,000. Finally, life expectancy and quality of life can both be increased by tending to mental health in a country where the average reported subjective well-being is only 4/10, and in particular by preventing and treating substance abuse.
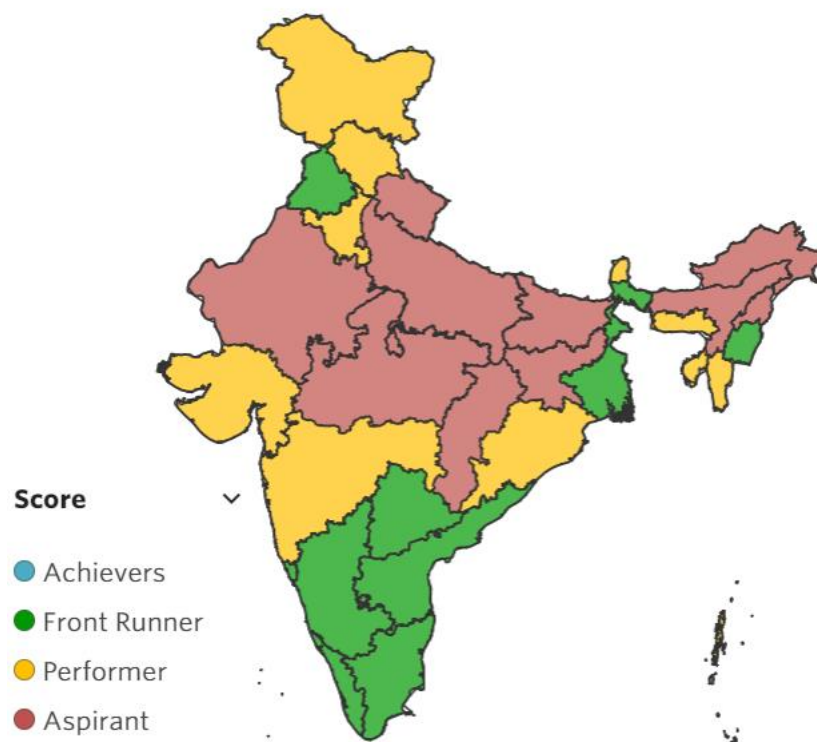
The five major southern States, Punjab, and West Bengal have built the most robust public health infrastructures as reflected through maternal and early childhood mortality, disease incidence rates, and health staff per capita. Kerala, Maharashtra and Tamil Nadu have each achieved the explicit SDG target of reducing maternal mortality to below 70/100,000, an achievement no other states can yet match although Andhra Pradesh and Maharashtra are within striking distance. Likewise, Kerala has already reduced under-five mortality to a mere 7/1000 live births, a rate which greatly improves upon the SDG standard of 25/1000 live births. Maharashtra, Manipur, Punjab, Tamil Nadu, Telangana, and West Bengal are all relatively close to achieving the SDG target. These same states have come within striking distance of eradicating infectious diseases such as Tuberculosis, whose incidence rate is now as low as 67/100,000 in Kerala and 100/100,000 in West Bengal. And they have the most thoroughly staffed medical systems – Kerala has 762 government physicians, nurses and midwives per 100,000 residents, Karnataka has 453, Tamil Nadu has 426, and Andhra Pradesh has 405. Rajasthan, despite relatively poor performance on other health metrics, also has a robustly staffed system at 426 personnel/100,000 population, signaling that it may see improved health outcomes in the near future as well. These dense networks of medical personnel have helped these states achieve some of India's highest vaccination rates, reaching 82.1% in Kerala for children aged 12-23 months, although Punjab has reached 89% vaccination for this same group.

In most other northern and northeastern States, the picture isn't quite as rosy. Assam has India's highest maternal mortality rate, at 237/100,000, followed by Uttar Pradesh and Uttarakhand at 201/100,000, Rajasthan at 199/100,000 and Madhya Pradesh at 173/100,000. Under-five mortality is similarly high in these States, at 78/1000 live births in Uttar Pradesh, 65/1000 in

Madhya Pradesh, and 57/1000 in Assam. Infectious diseases such as Tuberculosis remain prevalent in urban areas such as Chandigarh, which experiences 523 cases/100,000, and Delhi, which experiences 360. And medical staffing is least adequate in large northern and central States such as Bihar, with a mere 19.74 public medical personnel/100,000 population. Jharkhand, at 28.04/100,000, Jammu and Kashmir, at 29.8/100,000, and Uttar Pradesh, at 53.4/100,000, are similarly poorly staffed. Poor coverage in these states yields poor rates of vaccination, like 51.1% in Uttar Pradesh and a mere 35.7% in Nagaland.

Goal 4: Quality Education

Quality education is a cornerstone of sustainable development, boosting economic growth, social mobility and cohesion. Yet many countries continue to struggle to provide free, quality primary and secondary children to all girls and boys, a shortcoming SDG 4 seeks to rectify. Quality education involves equal access for all genders, ability levels and social groups to all levels of education, with concurrently high levels of universal achievement in literacy and numeracy. Beyond childhood, it also means ensuring youth and adults have the necessary skills and competences to compete in the labor market. Finally, a quality education makes students into better citizens, and in the age of sustainable development, it involves training students to promote sustainable development and lead sustainable lifestyles.

India has made strides in making education accessible to children, with a 92.3% net primary enrollment rate and an 85.9% lower secondary completion rate. However, Indian schools continue to lag in the quality of the education they deliver. In a recent survey, adequate learning outcomes in basic subjects such as language, mathematics and environmental studies were recorded for only 54.9% of class 5 students and 44.6% of class 8 students. Lagging quality can partially be explained by the conditions of classrooms, only 81.2% of whose teachers meet the minimum level of required training. Classroom crowding is also problematic, with only 70.4% of primary and secondary schools maintaining a pupil to teacher ratio below 30. The gap between education quantity and quality drives a high rate of departure from secondary schools, which experience a 17.1% average dropout rate across the country. Overall, despite substantial achievement in education provision, Indian education still needs to do more to meet the needs of its youth, 14% of whom aged 15-24 still remain illiterate despite sweeping national initiatives.
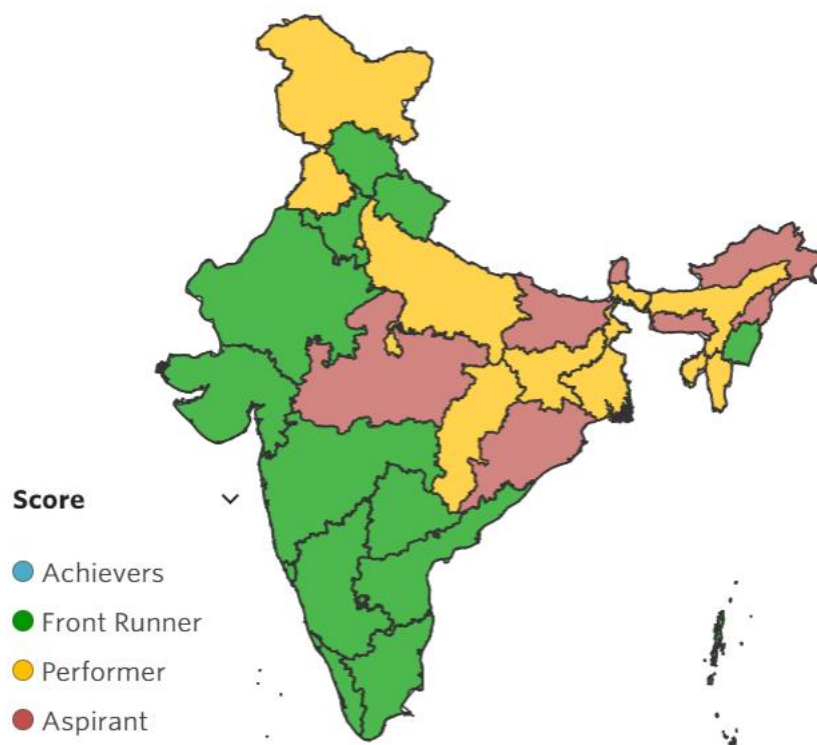
India aims to provide all elementary and secondary school students with a quality education, and so far, southern and western States have come closest to achieving this. Tamil Nadu leads major States with a net primary and secondary enrollment ratio of 93%, matching that of Delhi itself. Himachal Pradesh, Kerala, Goa, and curiously, Manipur and Tripura are similarly high-achieving when it comes to enrollment. On the flip side, other eastern and northern States are struggling to reach and maintain 2/3 enrollment. Sikkim brings up the rear at 45%, trailing Nagaland at 56%, Jammu and Kashmir at 57%, Meghalaya and Jharkhand at 68%, and Uttar Pradesh at 69%.

Education quantity does not necessarily mean education quality, and students in some of the states which have achieved the highest enrollment ratios are also some of those with the poorest demonstrated learning outcomes. A mere 48% of Delhi students in class 5 demonstrated adequate proficiency in basic subjects such as language, mathematics, and environmental studies. This rate drops to 39% for Delhi's class 8 students. Learning standards may be higher in Delhi, partially explaining the low scores, but wealthy states such as Punjab, at a respective 48% and 39%, Tamil Nadu, at 53% and 40%, and Telangana, at 56% and 42%, fare little better. In fact, their reported achievement according to the metric used by NITI Aayog is little better than poor states such as Uttar Pradesh, at 51% and 44%, and Chhattisgarh, at 52% and 45%. While this benchmark may be measured unevenly, the data resulting from it indicates that educational quality regardless of where one finds themselves is uneven at best. Only Chandigarh, Rajasthan, Karnataka, and Kerala have a correct response rate at or exceeding 2/3 for the primary school survey. No state besides Rajasthan performs better than 60% on the secondary school survey.

With lower perceived value to education comes higher dropout rates. India is working to reduce its average annual dropout rate to 10%, which various states have achieved such as Himachal

Pradesh, Punjab, and Tamil Nadu. Uttar Pradesh, Uttarakhand and Kerala are close to achieving this goal, although for the first two, this may be attributable to low enrollment rates entering secondary school rather than any particular talent for retaining students on the bubble. States experiencing high secondary dropout rates include Odisha at 30%, Assam at 27%, Bihar and Karnataka at 26%, and Gujarat at 25%. Some of these states have done well to enroll students in secondary school at all compared to some of their neighbors, but more must be done to reduce high rates of school-age children who are not receiving an education. As many as 6% of Odisha children ages 6-13 and 5% in Bihar, Uttarakhand, and Rajasthan are out of school, a rate which will stunt their generation's ability to participate in the society of the future if it is permitted to persist.

Finally, quality education can only be achieved at scale when teachers are qualified and classroom sizes are small. India seeks to reduce class size to 30 students across the country by 2030, which the northeastern States of Arunachal Pradesh, Manipur, Meghalaya, Manipur, Mizoram, Nagaland, Sikkim and Tripura are already close to achieving. Himachal Pradesh, Jammu and Kashmir, and Uttarakhand are also close, having shrunk 96.2%, 96.1%, and 88% of their classrooms below 30 students respectively. The states which have struggled the most to achieve this goal so far have been the denser, less mountainous states where large numbers of students are more easily aggregated into single schools. Only 21% of students in Bihar are in classrooms with fewer than 30 students. 50% of students in Jharkhand, 56% in Uttar Pradesh and 70.5% in Gujarat can say the same.

On the other hand, while classroom sizes in Northeast are small, relatively few of their teachers are adequately qualified. 30.5% of Meghalaya teachers have the required qualifications, compared to 33% in Nagaland, 43.3% in Manipur, and 40% in Assam. Some larger states have chronically underqualified teachers as well, such as West Bengal, where the rate is only 52.5%, and Bihar, at 54%. Southern and central states have generally led the pack when it comes to teacher qualification, with 98% in Kerala, Telangana and Tamil Nadu and 99% in Gujarat and Madhya Pradesh. Delhi leads the nation, with 100% of teachers boasting professional qualifications.

Goal 5: Gender Equality

Globally, women and girls are the largest disempowered segment of the population, and gender inequality has stubbornly persisted throughout history. Today, the impact of gender discrimination ranges from education to vulnerability to violence to economic opportunity in the workplace. To achieve societies that truly end all forms of discrimination against women and girls everywhere, legal frameworks must be put into place and enforced which guarantee equal access to economic resources, women's health, and the legal system itself, particularly in cases where trafficking and sexual exploitation are concerned. Countries must also shape their policies to value the contributions of women in unpaid domestic work, which can be aided by expanding women's participation in public life and the political system. Finally, countries can halt the propagation of gender inequality by putting a halt to harmful practices such as early and forced marriage and female genital mutilation.

Gender discrimination is deeply ingrained in Indian society and remains very stubbornly in place. Only 898 females are born for every 1000 males, a sex ratio that testifies either to mass selective abortion, mass infanticide, or mass failure to register girls. Once women are old enough to have a partner, domestic violence is likewise prevalent, with 33% of ever-partnered or married women having reported experiencing partner violence in the past 12 months. High rates of early marriage, particularly in rural areas, hamstring efforts to deliver education to girls and depress the labor participation rate. Women only attend 58.5% as many years of school as men on average, and women participate in the formal labor force at only 32% the rate of men, the informal and unpaid domestic labor which women are often tasked with going uncounted in official data.

But women are fighting for a more equal society, and they are succeeding. A burgeoning Me Too movement has called attention to abuse in the workplace and other issues of discrimination, urgent in a country where salaried women only receive 70% the pay of salaried men. Family planning has been on the rise as well, with 72% of married women using modern methods. And political representation of women is on the rise, although it still remains paltry with 11.8% of the national parliament and 8.7% of state legislative assemblies composed of women. As ICT usage by women becomes more broadly accepted, technology decouples the workplace from geographical location, and institutions improve representation and provide women with greater voices to speak out, India will continue evolving into a more gender-equitable society.

Score

- Achievers
- Front Runner
- Performer
- Aspirant
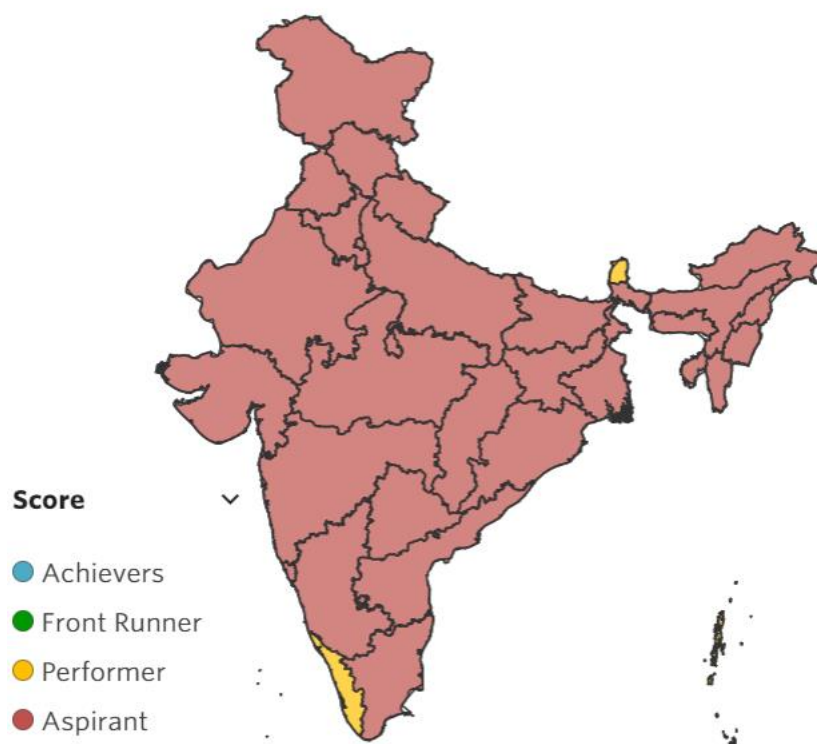
To this point, India has largely failed to meet its own national goals for achieving gender equality, and does not appear on track to do so by 2030 without major social changes. Discrimination starts at birth, when actions such as sex-selective abortion and infanticide

contribute to gaping disparities in the sex ratio. While states such as Kerala and Odisha have close to natural female birth rates per 1000 boys, at 959 and 948 respectively, India on average has a six-percentage point gap between the number of girls born and the number of boys. In Haryana, a mere 832 girls are born and registered for every 1000 boys, making for a ten-percentage point chasm in the sex ratio. Large states like Gujarat, Maharashtra, Punjab, Rajasthan, and Uttar Pradesh aren't much better, with 848, 876, 893, 857, and 882 girls born and registered per 1000 boys respectively.

This structural discrimination carries over into domestic life and the labor market. Salaried female employees, on average, only earn 70% the wages of their male counterparts, a rate which sinks as low as 55% in Madhya Pradesh and 56% in West Bengal. This is provided women work as regular employees, which in India, they largely do not. Nationally, the labor force participation rate for women is 32% that of men. Female labor force participation as a proportion of male participation sinks to a mere 15% in Uttar Pradesh, 16% in Jammu and Kashmir and Punjab, and 18% in Delhi and Bihar. The wage gap for regular employees remains intractable in almost all areas outside of urbanized UTs such as Delhi and Chandigarh, where earnings are approaching parity. However, southern and northeastern States are leading the way for female labor force participation, reaching as high as 62% in Telangana and 76% in Nagaland.

Domestic life for women is improving, but not rapidly enough. Roughly half of fertile women use modern family planning methods with their partners, a step forward from the past, but still a far cry from the world of universal access to sexual and reproductive health envisioned by the SDGs. Moreover, this progress seems to vanish when examining states such as Bihar, Manipur, Meghalaya, and Nagaland, where scarcely a quarter of fertile women have access to these services. Andhra Pradesh and Punjab have achieved the highest rates of adoption at 70% and 76%, but they too will need to make continued efforts to achieve the goal of universal family planning coverage. Spousal violence is a similarly stubborn problem, which one third of married women in India have experienced. Spousal abuse is a problem that transcends regions and one in which the worst offending states appear to defy categorization. Whereas 45% of women in Tamil Nadu and Bihar report having experienced spousal violence, only 16% of women in Kerala, 7% of women in Himachal Pradesh, and 23% of women in Gujarat report likewise.

Finally, political representation is often seen as a pathway through which women can achieve the soft and hard power necessary to make social change. As such, GOI has set a national target of equal political representation of men and women, in alignment with the SDG's target of full and effective participation of women in public life. Most states still have a long way to go to meet this goal. Madhya Pradesh has the state legislative assembly with the highest percentage of women, but at 13%, it has barely a quarter as many as would be necessary to achieve parity. Other states are worse, with no representation at all in the northeastern states of Manipur and Meghalaya and a paltry 2.7% representation rate in Karnataka, the country's worst performing state for female political representation in the legislature.
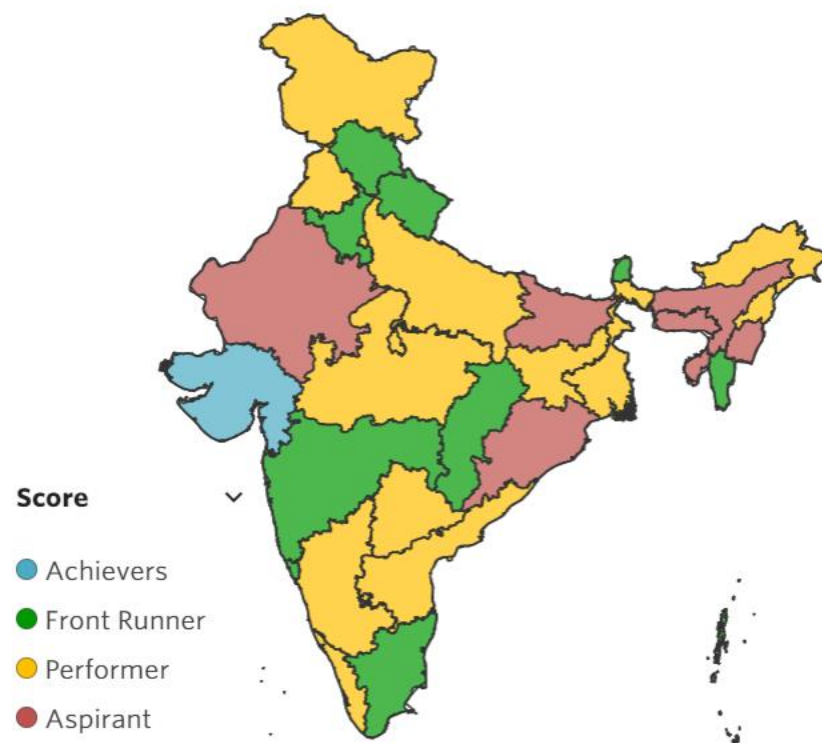
Goal 6: Clean Water and Sanitation

Clean water is essential for health, food, and the preservation of livelihoods, but it is at risk in areas where water is unsustainably consumed or inadequate sanitation facilities threaten its

cleanliness. The most important step individual households and communities can take to promote adequate sanitation is to provide adequate facilities to end open defecation and provide for the particular sanitation needs of women and girls. Agriculture and industry can improve water quality by ending dumping of hazardous chemicals and treating all wastewater. And excessive water withdrawal can be limited through integrated water resources management and advances in water usage efficiency.

India consumes 44.5% of the fresh water available within its borders, and withdraws 61.53% of annually replenished groundwater reserves, but these topline numbers mask an emerging water crisis in the country. Climate change has made seasonal rainfall more extreme and less predictable, creating alternate periods of flood and drought. In urban areas, flooding leads to serious sanitation and public health concerns, while in rural areas, little capacity exists to capture excess rainfall for periods of drought. When droughts do arrive, farmers are forced to rely on groundwater withdrawal for their crops, causing serious groundwater depletion in the drier areas of the country which will only accelerate as climate change progresses. Climate change must be mainstreamed into agriculture policy, urban policy, and water and sanitation policy by extension, but in a water-stressed country which is nevertheless the world's leading producer of one of the world's thirstiest crops, sugarcane, this level of intragovernmental coordination has not yet emerged.

While intersectional development challenges concerning water run the risk of thwarting India's sustainable development, initiatives confined within the space of water and sanitation have proceeded healthily. 87.6% of Indians now have access to basic drinking water services, including 71.8% in rural areas. Likewise, 82.7% of rural households now have individual toilets and sanitation facilities, and 31.9% of India's districts have been certified as Open Defecation Free. However, investment should go into all aspects of sanitation, not just the most visible. Urban sewage systems still only treat 37.58% of total sewage created, leaving more marginalized communities vulnerable to disease, and nationally, only 2.2% of wastewater is treated.

Score ⌄

- 🔵 Achievers
- 🟢 Front Runner
- 🟡 Performer
- 🔴 Aspirant

Clean water and sanitation have become signal causes of the national government through the *Swachh Bharat* (Clean India) mission, with visible results. NITI Aayog reports that several major states, including Rajasthan, Punjab, Maharashtra, Kerala and Gujarat, have enforced 100% compliance of installation of individual household toilets in rural areas. The problem of open defecation remains unsolved, with only 32% of districts nationally verified as open defecation free, but education and investment have generated a marked improvement just over the course of the past five years.

Improved sanitation has helped improve the safety of drinking water sources as well. In Gujarat, Haryana, and Madhya Pradesh, the proportion of the population with access to clean and safe water sources has been reported as at or close to 100%. In Assam, Bihar, Karnataka, Rajasthan and West Bengal, where access to safe drinking water hovers around 50% and relatively few districts have been certified as open defecation free, the same work must be scaled up.

Before worrying about access to clean drinking water, though, it's important to consider how difficult any water may be to access at all in the near future. Northern India, particularly the area impacted by the Green revolution, has withdrawn groundwater for decades now at a rate which watersheds cannot naturally replenish. Groundwater withdrawal rates against net annual availability stand at 126% in Delhi, 135% in Haryana, 140% in Rajasthan, and an eye-popping 149% in Punjab. Unless significant reforms are undertaken to irrigate agriculture more efficiently and treat and recycle urban sewage at a higher rate, North India will have to adjust to its oncoming water shortage the hard way.

Goal 7: Affordable and Clean Energy

Access to energy is necessary for growth, yet dirty energy undermines the economic, social and environmental sustainability which must ground economies in the 21st century. As a result, affordable, reliable and clean energy must be provided universally within any country wishing to achieve a sustainable economy. Large investments in renewable energy efficiency and cost-effectiveness can accomplish must of this, while improvements in energy efficiency can reduce the amount of clean energy required to power these societies. International cooperation can also encourage more efficient sharing of renewable technologies and output from renewable sources themselves.

India has made major investments in expanding the electrical grid to all corners of the country, and today, 84.5% of the population has access to electricity. Despite India's abundant renewable energy resources, however, the Indian energy system is still structured around fossil fuels and highly carbon intensive, producing 1.6 Mt of CO_2/TWh. Only 41% of the population has access to clean fuels within the home for activities such as heating and cooking, showing that the problem of decoupling energy production from carbon isn't limited to the power grid. Largely thanks to hydroelectric resources in the north of the country and advances in distributed solar, India has increased the renewable share of installed generating capacity to 17.5%. But greater progress must be made in adopting clean fuels, introducing more reliable and affordable renewable technologies, and increasing production efficiency.
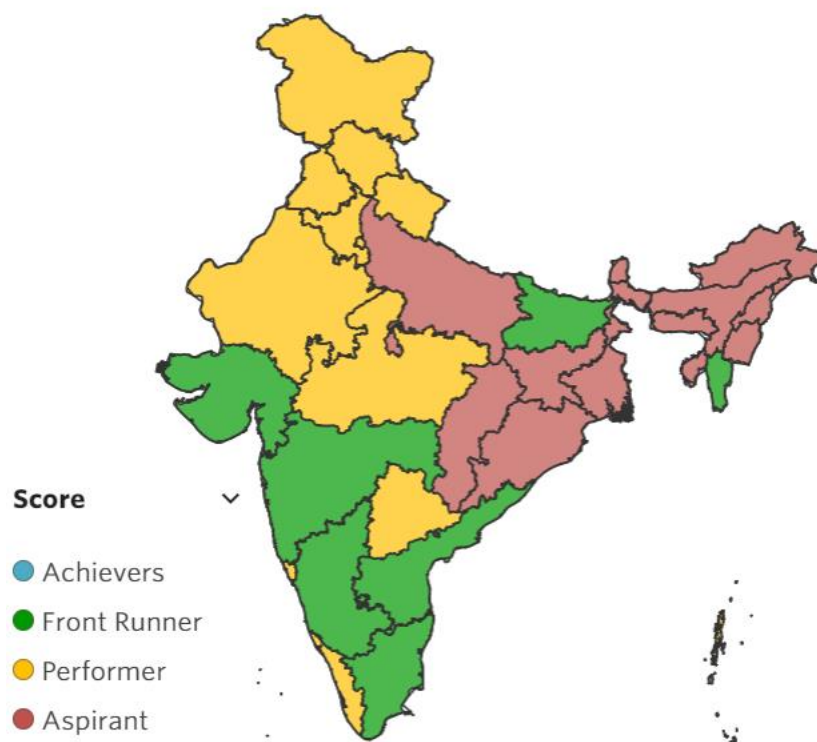
Since 2014, the government has renewed a major push to electrify all of India. Last year, the administration announced with much fanfare that it had reached its goal, which it defined as providing every statistical village in India with at least one power connection. That is still a far

cry from 100% electrification of all households, but it has paved a clear path to improvement. To date, all major States outside the northeast have a household electrification rate over 90%, with the exception of Uttar Pradesh, which stands at 79%. Unfortunately, India has not yet matched the same rate of progress when it comes to providing clean energy. States with high hydropower potential have seen high rates of renewable power generation from their natural resources. 41% of power in Karnataka, 49% in Tamil Nadu, and 58% in Bihar comes from renewable energy. But states that do not exploit hydropower resources to the same extent as their neighbors are still largely reliant on fossil fuels and coal in particular, as evidenced by the 1.4%, 2.5%, 2.9%, and 4.8% shares of renewable energy production in Jharkhand, Odisha, Chhattisgarh, and West Bengal in particular.

## Goal 8: Decent Work and Economic Growth

High rates of inclusive growth must continue to be posted in low- and middle-income countries in order to lift the world's poorest out of absolute material poverty, increasing their resiliency with respect to economic change, political change and climate change. Doing so involves not just boosting per-capita GDP growth, but orienting economic policy to ensure that growth benefits the poorest citizens. Such policies should encourage entrepreneurship and MSME development, encourage youth workforce participation through education and training initiatives, protect labor rights, and eliminate modern slavery and human trafficking. They should also make economies themselves more resilient to change by encouraging diversification, increasing resource use efficiency and reducing environmental degradation from economic growth, and promoting sustainable industries such as ecotourism.

India's GDP/capita growth rate has fallen in the past year to 5.53%, its slowest since 2014-2015. One of the barriers to higher growth has been a reluctance to continue pursuing the types of structural reforms which jumpstarted India's modern era of rapid growth, such as trade liberalization, privatization of inefficient state-owned enterprises, and simplification of the tax code. Moves such as the introduction of the GST and infrastructure improvements have been helpful, but they have not done enough to reverse the current slowdown.

In addition, figures concerning India's formal economy, in which unemployment stands at 6.35%, are of questionable relevance given that nearly 81% of India's population earns a livelihood in the informal sector. Informal work lacks the benefits of basic wage and social protections, makes labor organization unlikely and difficult, and often constitutes a form of mere subsistence for workers at the margins. Worse, it leaves women and children without the legal guarantees that could protect them from exploitation; today, .6% of children aged 5-17 work in a state of functional enslavement.

India maintains laws to protect the labor rights and working environments of formal workers, and recently, semiformal workers in the platform economy have developed means of organizing together for improved conditions. In general, technology holds the potential to boost economic productivity through reduced barriers to information, increased opportunities for diversification, and greater incentives for entrepreneurship at the MSME level. But infrastructure and institutional groundwork will need continue to be laid down to provide business and consumer

services to new participants in the emerging digital economy, especially in a country where 20% of the adult population still remains without access to a bank account or mobile money wallet.

Score

- ● Achievers
- ● Front Runner
- ● Performer
- ● Aspirant
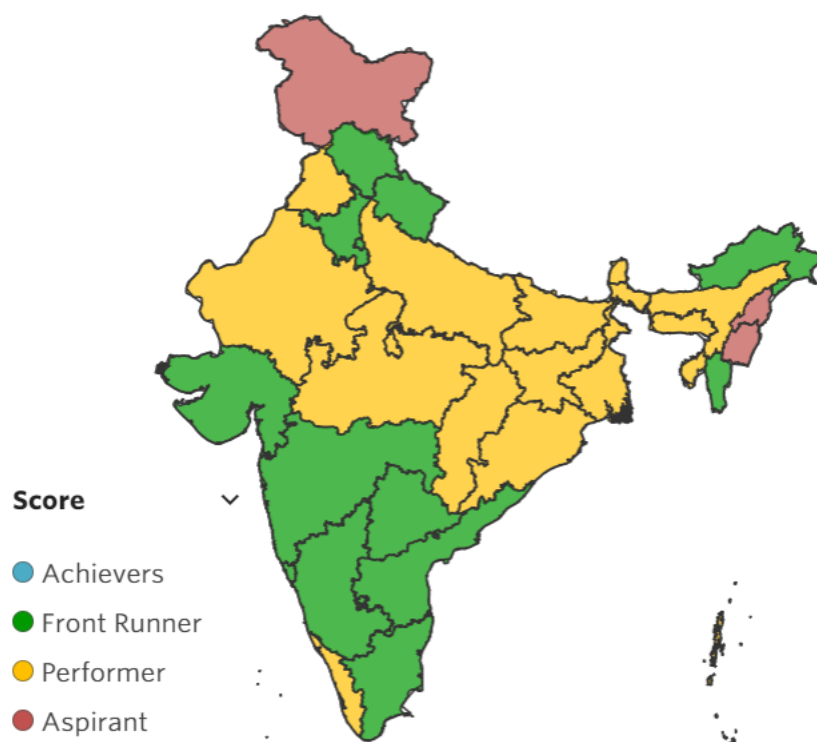
Since posting remarkable rates of economic growth in the years following liberalization, India has experienced above-average, if not overwhelming rates of growth, most recently a rate of 6.5% in 2018. Coastal states such as Gujarat (9.5%), and Andhra Pradesh (10.4%) have grown faster than the rest of the country, likely in a sign of convergence with wealthier states which reported slower growth rates such as Tamil Nadu (5%) and Maharashtra (6.9%). Other landlocked states like Chhattisgarh (3.9%), Jharkhand (4.2%) and Madhya Pradesh (4.4%) have largely been shut out of recent growth. Formal unemployment has followed a similar trajectory, albeit one complicated by the high rates of informal employment in the country. High rates of official unemployment are found both in India's wealthiest states, such as Punjab (12.1%) and Kerala (17.1%) and in some of its poorest, such as Uttar Pradesh (13.3%). The states with the lowest recorded unemployment rates also range wildly, from wealthy Gujarat (1.0%) and Karnataka (1.6%) to poorer Chhattisgarh (1.85%) and Mizoram (3.0%). These reported differences can likely be traced back to how each individual state reports the size of a labor force which is constantly shifting in and out of informal employment.

Financial inclusion, on the other hand, can be measured much more concretely. NITI Aayog states that virtually every household in India now has a bank account, which if true, constitutes an open invitation for India to push for deeper levels of financial inclusion. Financial infrastructure, as measured by the number of ATMs/100,000 population, is not yet up to the same mark. Highly urbanized States and UTs such as Chandigarh, Delhi, and Goa have met or

exceeded the national target of 51/100,000 people, but States such as Bihar, Uttar Pradesh, and
Manipur have yet to break 10/100,000.

Goal 9: Industry, Innovation and Infrastructure

Industrial development has been a crucial step in the economic development of all countries to
have made the transition to high-income so far. While India is somewhat of an anomaly for its
reliance on the services sector for development, a resilient, sustainable and inclusive industrial
sector and infrastructure network can still play an important role in creating quality work and
distributing economic gains to all. Inclusion in the industrial sector means inclusion of small
businesses in key enterprise services, such as access to credit, and inclusion and mobility within
global value chains and markets. On the infrastructure side, sustainability involves increased
resource use efficiency and increased technological sophistication through international and
intersectoral cooperation.

India's infrastructure remains middling, with room for improvement. Density in rural areas must
be improved, which is why the government introduced the *Pradhan Mantri Gram Sadak Yojana*
program to connect rural households to roads. To date. 47.38% of the targeted households have
been linked to transport infrastructure through the program. Industrial and import/export
infrastructure also hinders India's capacity for commerce; the country scored a mediocre 2.9/5 on
the World Bank's Logistics Performance Index, a metric measuring the efficiency of trade
infrastructure.

Yet services still dominate the Indian economy, and under India's envisioned development
pathway, in which the country develops into an export hub for technology development and
solutions, they should continue to do so. For India to transition into an exporter of high-tech
services, the country will need to significantly invest in the basic research capacity that will
develop an academic base for such efforts to succeed. Currently, given that only .1 journal
articles are published per thousand population and .6% of the GDP is spent on R&D, there is
room for these efforts to be improved. Investments should be made on the demand side as well
by improving access to ICT for the general population. As of now, only 83 mobile connections
and 25.8 mobile broadband subscriptions are active per hundred Indians, and internet use is
reported by the government at only 34.5%.
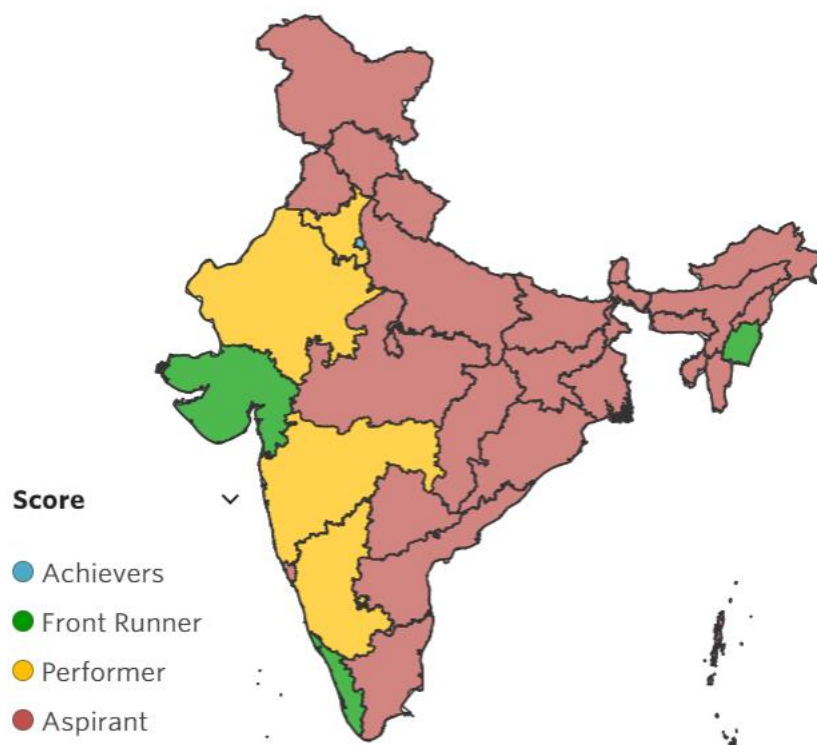
The Indian Government has made significant efforts to expand both physical and digital infrastructure in isolated rural areas. For example, under *Pradhan Mantri Gram Sadak Yojana*, whose third phase was approved in July 2019, the government committed to connect all targeted, isolated habitations to all-weather roads. The initiative, constituting an investment in 125,000 km of road construction, would aim to connect targeted areas not just to transportation linkages, but to agricultural markets, higher secondary schools, hospitals, and other institutions necessary to foster an environment of innovative, inclusive growth. Having achieved 100% completion in Gujarat, the project has reached significant levels of completion in other states as well, such as Rajasthan (81.9%), Bihar (50.18%), and Madhya Pradesh (55.4%).

In the category of digital and communications infrastructure, urbanized areas of the country already have remarkably high levels of teledensity. Delhi leads the country with 247 mobile subscriptions per 100 population, and Gujarat, Himachal Pradesh, Kerala, Punjab, and Tamil Nadu have each broken 100% teledensity as well. Assam (63.4%), Odisha (73.1%), Bihar (74.3%), Uttar Pradesh (74.6%), and Madhya Pradesh in particular (50.8%) still have some distance to catch up. The national rate of internet subscribers follows a similar pattern, with Delhi as the only region with more subscriptions than people. The same five states, Assam (25.2%), Odisha (24.1%), Bihar (17.0%), Uttar Pradesh (22.2%), and Madhya Pradesh (22.3%), are also lagging in terms of internet connectivity. To address this, the government has introduced an ambitious program, Bharat Net, to provide 100 mbps broadband connectivity to all Gram Panchayats in the country by 2023. The project has reached completion in Karnataka and Kerala, and is nearing completion in Rajasthan (88.6%) and Haryana (93.7%). The program has not been quite as on track when it comes to isolated or mountainous states like Sikkim (0%), Himachal

Pradesh (4.9%), or Arunachal Pradesh (0.8%). However, overall, the country appears well on track to meet its national goal of connecting 42.4% of rural Gram Panchayats to broadband by 2030.

Goal 10: Reduced Inequalities

Reducing inequalities cuts to the core of the need for socially inclusive economic growth at the heart of modern sustainable development. Inequality isn't just about economic growth for the rich and poor; it also involves social and political inclusion of all, regardless of age, sex, ethnicity, religion, or any other category. It also includes creating the conditions for intergenerational equality by introducing policies to ensure equality of opportunity and eliminate discrimination. Finally, at the international level, it involves giving greater voice to developing countries within international institutions and monitoring international financial flows to prevent capital flight.

When it comes to reducing economic inequalities, the SDGs primary call for the growth rate for the poorest 40% of the population to equal or exceed the national average per capita growth rate. According to NITI Aayog's self-reported inequality statistics, which examine rural and urban areas separately, India does appear to be spreading economic gains evenly between social classes. NITI Aayog applies a statistic called the Palma Ratio, which takes the GNI share of the wealthiest 10% of the population divided by that of the poorest 40%, and finds a ratio of 1.41 in urban areas and .92 in rural areas. This would indicate that while investments in reducing inequality should be made in urban areas, rural areas already maintain the government's targeted level of economic equality. This method, however, obscures India's most salient economic gap, the rural-urban divide. India's Gini coefficient, examining inequality across the whole society, is a very high 45.6, up from 35.7 in 2011 and definitively placing it among the more unequal countries of the world. While inequality within urban areas must be reduced, the bulk of resources directed towards reducing economic inequality in India should go to expanding opportunities in the rural areas whose economies prevent their inhabitants from gaining wealth and achieving mobility.

Economic inequality is not the only predominant form of exclusion in Indian society. While exclusion of women from the labor force has already been discussed in this document, India's prominent transgender population is also excluded from the labor force, participating at only 64% the rate of men and disproportionately in informal and dangerous roles. India's labor laws do provide a set of protections to workers, but only for employees within a narrowly defined subset of the formal workforce, meaning wage protection policies to a certain degree exacerbate inequality rather than reducing it. And when it comes to migration and refugee policies, the plight of the Rohingya demonstrates that for certain groups, policy barriers to integration and assimilation lead to lives which are lived on the margins. Article 16 of the Indian constitution prohibits discrimination on the grounds of race, religion, sex, caste, sex, or place of birth, but in practice, enforcement on behalf of the groups which would benefit most from such inclusion leaves much to be desired.

Score ⌄

- 🔵 Achievers
- 🟢 Front Runner
- 🟡 Performer
- 🔴 Aspirant
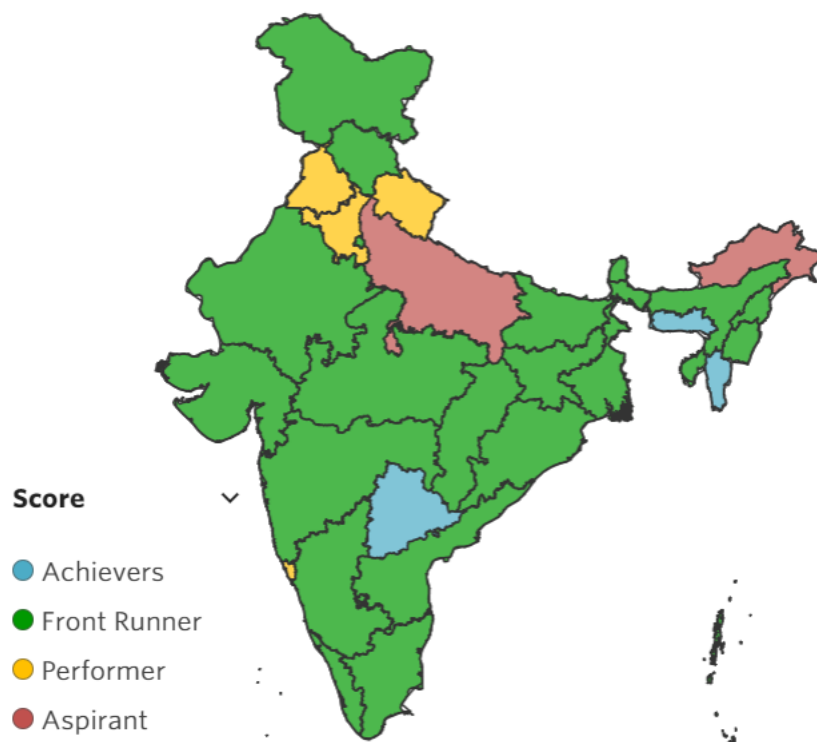
According to the Palma ratio, Goa, Gujarat, Himachal Pradesh and the small northeastern States have all achieved the targeted level of urban economic equality. West Bengal, Kerala, Haryana, and Karnataka are India's most unequal States when it comes to their urban populations, with Karnataka's wealthiest 10% consuming nearly twice as much as its bottom 40%. Rural India has achieved the targeted equality measure virtually across the board, although this speaks more to widespread poverty than any particular policy initiatives to promote more equal economic outcomes.

Goal 11: Sustainable Cities and Communities

By 2030, 40% of India, and 60% of the world population, will reside in urban environments. Ensuring that cities are sustainable, therefore, means making sure a large and rapidly growing segment of the population can benefit from living in a sustainable environment. Sustainable cities provide safe and affordable housing to all, rather than relegating the marginalized to slums and informal settlements. They also provide the infrastructure for social and economic mobility through affordable and efficient transport systems and participatory urban planning. And most importantly, they provide essential municipal services to all residents to ensure basic safety and quality of life, such as waste pickup, sewage management, and maintenance of public green spaces.

India's rapid economic growth, having been concentrated in cities, has caused rapid influxes of population to arrive in informal settlements from rural areas. While the government has made efforts to meet the quickly growing demand for urban housing, having fulfilled 3.32% of the total demand under the PMAY program, 5.4% of urban households continue to live in slums. Despite the speedy and often unplanned growth of Indian cities, however, basic municipal

services have managed to keep up to some degree. 74.4% of the population reports satisfaction with public transit options, and 73.6% of urban wards have door to door waste collection, both of which are largely managed through a large informal sector parallel to the formal economy.

Lack of coordination within city government, between city governments and state governments, and between state governments continues to threaten the health, wellness and sustainability of India's cities. Urban areas in India experience a mean annual PM 2.5 level of 90.9 μg/m3, well above the level considered acceptable by the World Health Organization. Piecemeal land management on the urban-rural periphery also contributes to high levels of urban sprawl, although cities such as Ahmedabad have led the way in developing new land management and urban planning schemes. And poorer areas of Indian cities still suffer from a chronic lack of open, safe public spaces, particularly green space.

Score   ∨

- 🔵 Achievers
- 🟢 Front Runner
- 🟡 Performer
- 🔴 Aspirant
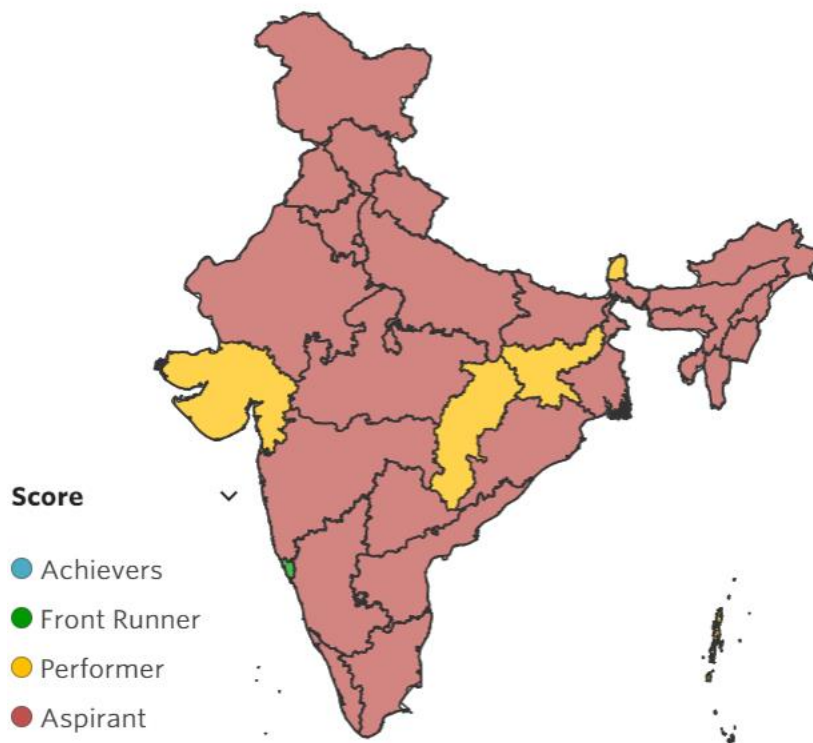
The first job of any city is to keep its inhabitants housed in safe, livable conditions. However, urban India has faced continuous issues with slums since before independence. In Andhra Pradesh, Delhi, Maharashtra, and Tamil Nadu, 12%, 10.6%, 10.5%, and 8% of urban households lived in slums, respectively. Not coincidentally, these are the states and UTs which house some of India's most dynamic urban centers, and therefore have the strongest pull factors for poor rural migrants wishing to benefit from the dynamism of an increasingly prosperous and globalized India. Although generally (but not always) poorer, states with fewer slums lack the pull factors which prompt them to develop in the first place. Such states include Assam (.6%), Bihar (1.2%), Kerala (.6%), and Meghalaya (1.9%).

To help feed the demand stemming from this wave of rural-urban migration that is driving the development of slums, the national government introduced the *Pradhan Mantri Awas Yojana* initiative in direct response to India's inadequate affordable urban housing stock. PWAY has made a dent in the problem, but it is a problem that scales up in the cities where affordable housing is most needed. To date, PWAY has met a high share of the assessed housing demand in Goa (35.7%), Jharkhand (16.4%), and Gujarat (9.7%), all states without high rates of slum prevalence. It has only met 4.3% of demand in Delhi, 2.7% of demand in Maharashtra, and 2.5% of demand in Andhra Pradesh, states with some of the country's most prominent slums. India has set a modest target for PWAY of meeting 3.3% of national urban housing stock demand by 2030 in order to address this crisis.

Part of making cities livable also involves providing municipal services to residents, such as water, power, and trash collection. Currently, 73.6% of urban wards nationally provide door to door waste collection, with an aim of elevating that rate to 100% by 2030 in compliance with SDG 11.6. Waste collection services are most widespread in Andhra Pradesh (95.8%), Madhya Pradesh (96.7%), Rajasthan (94.3%), and Delhi (86.4%). The poorest performing states include Assam (24%), Kerala (42.7%), Meghalaya (14%), and West Bengal (48.79%).

Goal 12: Responsible Consumption and Production

Sustainable development is made markedly difficult when people do not live sustainable lifestyles, yet human societies today waste food on a massive scale, pollute and overuse natural resources, and fail to recycle and reuse refuse and waste products. SDG 12 calls on countries to develop plans to sustainably manage and efficiently use all-natural resources by 2030. This includes environmental management of chemicals and e-waste, mainstreaming sustainability reporting into corporate practices, and eliminating market distortions which exacerbate harmful resource usage, in particular fossil fuel subsidies. It also involves promoting sustainable public procurement processes, as well as international support for developing countries to improve their technological capacity for sustainable production and consumption. By doing so, this goal seeks to slash the material consumption per capita of developed and developing societies alike.

India's per-capita resource consumption has remained low to this point, largely due to high population density and relatively low material wealth. Only 1.5 kg of e-waste is generated per capita annually, along with a relatively minimal 6.2 kg of sulfur dioxide (one of the major byproducts of coal burning) and 12.9 kg of excess nitrogen from fertilization and other industrial processes. With only 300 grams of nonrecyclable waste produced per capita on a daily basis, India's waste generation rate is very low relative to the wealthiest countries.

However, even these relatively low per capita rates of wasteful production and consumption habits leads to major downstream consequences with regards to sustainability, given India's high population and population density. Overall, India generates 26,000 tons of plastic pollution daily, making it the world's 15th largest plastic polluter.[5] This plastic pollution, concentrated in major deltas and river basins, complicates water and sanitation concerns for rural and urban residents alike while harming aquatic life and marine food security. Likewise, food wastage across the

---

[5] https://qz.com/india/1693117/indias-plastic-waste-crisis-is-too-big-even-for-modi/

agricultural value chain from harvest to consumption leads to 14 billion USD of food being lost annually in a country where 194 million still go hungry on a daily basis.[6] When India's urban population is projected to reach 814 million by 2050, and only 19.9% of urban India's waste is processed currently, this chronic lack of sustainable reuse patterns will limit long-term improvements in quality of life and environmental preservation absent a major effort for reform.

In some respects, improving responsible consumption and production patterns can only be addressed at the institutional level, where recycling regulations can be enforced, municipal waste collection can be more broadly applied, and partnerships between economic actors and secondary markets for used goods and resources can be organized. However, significant progress can still be made by integrating sustainable development into the national education curriculum and mainstreaming sustainability into public discussions. In this respect, India has acted as a leader. Education in sustainability and the environment was made a core requirement in primary, secondary and higher education through a Supreme Court order, and although many schools are still in the process of developing a successful sustainability curriculum, certain initiatives have already gained acclaim and renown, with track records demonstrating a capacity to smoothly scale up at the national level.[7]

Goal 13: Climate Action

Making progress on halting climate change is perhaps the most crucial challenge facing global society in the 21st century, and this goal revolves around the efforts countries must take in order to fulfill the international commitments they have made to do so. Namely, it requires countries to develop individual climate action plans as stipulated in the Paris Agreement, and additionally requires wealthier countries to fulfill their commitments to mobilize funds towards filling the climate mitigation needs of poorer countries to the tune of 100 billion USD from 2020 onwards. Recognizing that some level of climate impact is already unavoidable, it also pushes countries to adopt disaster risk reduction strategies at the local and national levels and to mainstream climate change adaptation measures into policymaking. Unless countries do so, rising seas, changing weather and other symptoms of the shifting climate will paralyze economies, force millions to leave their homes, and permanently reduce average global food yields in a time of growing population and societal stress.

On paper, India is meeting its SDG commitment to climate change, which largely concerns itself with holding countries accountable to their Paris climate goals, to the letter. The country emits an average of 1.7 tons of CO_2 per capita from energy production, low compared to China and the US although high relative to the world's least developed countries, and is on track to overachieve its Paris target by 2030 according to the Climate Action Tracker.[8] The producer of 6.9% of global carbon emissions, India has committed to reduce the emissions intensity of its GDP by 33-35% by 2030. As of 2018, investments in solar energy have exceeded those in coal, while in the transportation sector, the government has made a major push on increasing the use of CNG

---

[6] https://www.reuters.com/article/us-india-food-hunger/as-millions-go-hungry-india-eyes-ways-to-stop-wasting-14-billion-of-food-a-year-idUSKBN1ET07Y

[7] https://www.smithsonianmag.com/arts-culture/india-teaching-300-million-kids-sustainability-180956494/

[8] https://climateactiontracker.org/countries/india/

automobiles until electric vehicle technology advances enough to become affordable and within reach for the majority of the population.[9]

However, it remains an open question whether India's Paris climate commitment has been ambitious enough in the first place to prevent making significant contributions to climate catastrophes at home and in the world at large. 2360 out of every 100,000 Indians are already affected by climate disasters, one of the highest rates in the world. Climate change has contributed to more extreme monsoon cycles, resulting in unrelenting droughts in some areas such as those which harmed Indian farmers this past year and epic floods such as those which swept through Tamil Nadu and Kerala in recent years in others. Meanwhile, the retreat of glaciers in the Himalayas threatens the watersheds which North India relies on for basic sustenance. To this point, India's investment into climate change adaptation has been woefully inadequate despite the clear and present danger that it poses. The country's National Action Plan on Climate Change identifies six priority areas for adaptation, including decreased snow cover, erratic monsoons, declining agricultural production, rising sea levels, increased flooding frequency and intensity, and shifting forest cover. But the government has not made sufficient matching investments to meet these adaptation needs at this point.[10] India famously argued for a modest Paris target relative to other countries in order to allow a poor population to reap the benefits of development. But without stronger climate action, the low priority placed on reducing Indian carbon emissions will backfire on the vulnerable populations which such development was intended to help.

Recent events have not painted an encouraging picture, as the government has continued to paint a portrait consistent of much talk and little action. This is the year that India proclaimed its first "green budget"[11] and established a Coalition for Disaster Resilient Infrastructure (CDRI) including 33 climate-threatened countries, echoing UNEP's decision to name PM Narendra Modi a "Champion of the Earth."[12] Yet at the same time, state and local climate funds have consistently been diverted for other political priorities,[13] governments have failed to make the investments necessary to get new mass transit off the ground,[14] and investment in coal infrastructure has continued to increase. With the notable failure of the recent COP25 conference to reach any substantial agreement to reduce emissions beyond the Paris target, the countries on the front lines of climate change such as India must step up, now more than ever, to avert disaster.[15]

---

[9] https://www.livemint.com/auto-news/india-to-push-for-cng-lng-cars-till-electric-vehicles-become-affordable-1550603563554.html

[10] https://www.adaptation-undp.org/explore/india

[11] https://economictimes.indiatimes.com/news/economy/policy/budget-2019-pollution-control-in-focus-environment-ministry-gets-rs-2954-crore/articleshow/70095085.cms

[12] https://www.unenvironment.org/championsofearth/node/50

[13]

[14] https://urbantransportnews.com/opinion-why-indias-mass-transit-sector-needs-urgent-revival/

[15] https://www.economist.com/science-and-technology/2019/12/18/the-cop25-meeting-on-the-climate-yields-little

Goal 14: Life below Water

Human societies depend far more on the oceans than we realize, but our actions have put their health at risk. Goal 14 would reverse that trend by 2030 through a collection of interconnected policies to preserve biodiversity and ensure sustainable withdrawals from ocean fisheries. Under this goal, marine pollution would be significantly reduced through ecosystem-based management of EEZs and expansion of protected areas to at least 10% of coastal zones. Ocean acidification and eutrophication would also be monitored and limited by reducing agricultural runoff and stopping the rise of atmospheric CO_2 emissions. Finally, to prevent overfishing, misguided subsidies would be eliminated, countries would be encouraged to join international agreements on ocean conservation limiting and banning harmful fishing practices, and countries would individually limit legal and unregulated fishing alike to keep fish stock withdrawals within determinations of sustainable yields.

The health of India's oceans and waterways has experienced significant negative impact from the country's development. India's Exclusive Economic Zone has an Ocean Health Index of 58 out of 100 as measured across ten different metrics, putting it in 191st place out of 221 countries and dependencies ranked. Plastic pollution is particularly harmful to aquatic biomass, with nearly 40% of the 25,000 tons of plastic India generates per day going uncollected. In river basins, chronic agricultural and sewage runoff has created a pollution crisis which has turned major delta regions in the Bay of Bengal into "dead zones" where marine life cannot sustain itself.

Such ocean pollution is unsustainable in a country where much of the 13.36% of the population living in coastal districts relies on fishing for food and livelihoods. 12.4% of fish stocks are overexploited or have collapsed in the Indian EEZ, low relative to other coastal nations but leaving room to eliminate overfishing altogether. Meanwhile, 10.2% of fish are caught by damaging methods such as trawling, known for high rates of bycatch and ocean habitat damage. India has set aside a high proportion of protected coastal areas, with marine sites comprising 29% of total protected areas in the country. But the real risk to aquatic life and marine livelihoods in India lies not off and along the coast, but in the inland water basins from which most of India's ocean pollution originates.

Goal 15: Life on Land

Preserving terrestrial ecosystems is important not just for the obvious environmentalist reasons, but also for preserving climate resiliency, food security, and indigenous livelihoods. The crucial challenges linked to this goal include halting and reversing deforestation trends, combatting desertification and land degradation, and stopping biodiversity loss. Additional important related goals include ending the poaching and trafficking of vulnerable species, eradicating invasive species, and mainstreaming ecosystem and biodiversity protection into the policy process.

On paper, India has set aside a fair portion of its land for ecosystem and biodiversity protection. Terrestrial protected areas now cover 4.95% of India's land area. However, particularly in indigenous areas where community consultation has been insufficient and protected areas have infringed on traditional communities, protected areas have experienced conflict with the demands of human settlements. This has created a driver for poaching, wildlife trafficking, and in the extreme, violent interactions such as wild elephant attacks. India has experienced drastic biodiversity losses, now scoring a .7 on the Red List Index.

India has, however, made real progress in preserving and restoring natural areas in other respects. Annual permanent deforestation has leveled out to 0% this year, compared to earlier this century, when India had been experiencing steady and significant losses of forest area. In fact, the land area covered by forests has increased by .21% from 2015 to 21.5% this year. Desertification and land degradation remain a risk in arid, grazing-heavy regions of India, such as the areas of Rajasthan bordering the Thar desert and the Deccan Plateau. Improvements in irrigation systems, changes in agricultural practices and concrete global action on climate change will all need to take place in order to ensure that this threat is neutralized.

Score ∨

● Achievers
● Front Runner
● Performer
● Aspirant
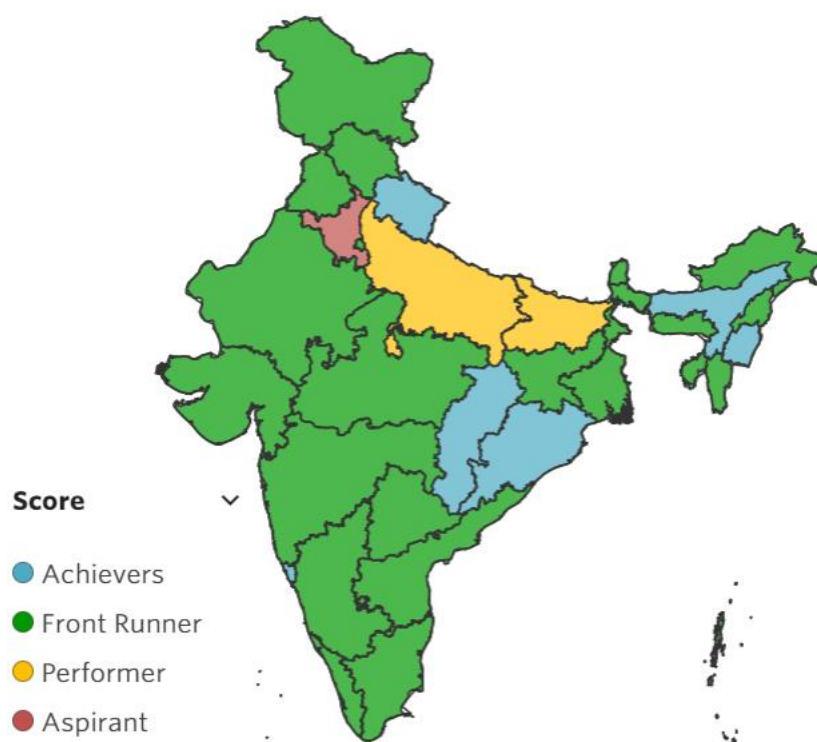
With rapid population growth and the spread of agriculture over nearly the entire subcontinent, India's development trajectory has turned forests and wild animal habitats into collateral damage. Forest cover is now extremely low in India's most populous states, many of which were once far lusher and greener. This is most noticeable in the northern states of the Hindi belt. Forests currently cover only 3.59% of Haryana, 3.65% of Punjab, and 6.09% of Uttar Pradesh. With forest loss comes habitat loss. Over the past decade, the extent of water bodies has shrunk by 15.4% in Bihar, 23.8% in Haryana, and 16.6% in Uttar Pradesh. Where forests remain healthy, they often grow in states which are too mountainous and sparsely populated to support the growth of agriculture in undisturbed habitats. Examples of such states which have maintained adequate forest cover include the northeastern states, Chhattisgarh (41.1%), and Kerala (52.3%). Habitat preservation efforts appear to be holding the line in these states, with forest water body coverage expanding 9.1% in Chhattisgarh, 23.5% in Kerala, and a remarkable 61.6% in relatively heavily forested Tamil Nadu. In addition, despite its middling forest coverage of 17.3%, Andhra Pradesh is notable for having increased its forest cover by 1.3% in the past decade, the most of any Indian state.

Unfortunately, with the advent of hunting poaching in protected forested areas, habitat preservation has not done enough for some endangered species. Wild elephant populations, for example, fell by as much as 50.6% in Kerala, 31.2% in Tamil Nadu, and 20.3% in Uttar Pradesh over the past five years. However, more stringent protections in more eco-conscious states have preserved biodiversity; over the same

period, elephant populations have grown in Andhra Pradesh (58.5%), Uttarakhand (36.6%), and Nagaland (110.4%).

Goal 16: Peace, Justice and Strong Institutions

Building sustainable societies is impossible when violence threatens social progress, lack of justice eliminates accountability, and institutions fail to guarantee basic rights of security, due process, and transparency. Violence occurs in conflict situations, in the home, and to children in exploitative situations, all of which must be addressed to build safer societies. Inclusive societies which prioritize justice must stop organized crime and create the conditions for adequate legal representation for all. And the strong institutions sustainable societies rest on must provide for the elimination of corruption and bribery, participation and inclusion of all social groups in the political system, and inclusion of all citizens through legal identification systems. Finally, states must preserve the independence and freedom of the fourth estate, the free press, by ensuring public access to information.

Perceptions of peace and safety in Indian society have improved, but much progress remains to be made. 73.1% of the population feels safe walking at night, an increase from 2015, but one which continues to be insufficient. Crimes against children continue taking place at a rate of 24/100,000 annually and are especially prevalent in urban areas and transit hubs, while the child labor rate remains stubbornly stuck at 11.8%, driven by agriculture in rural economies and the informal urban economy.

India's justice system likewise must make further efforts to meet the needs of citizens. .7% of the total population in prison has not been charged with a crime in part due to shortages in the court system. 12.8 courts operate per million people in India, compared with the government's target rate of 33.8 by 2030. With insufficient and uneven enforcement of the rule of law comes pressure to bypass and work around the system, and India has maintained a reputation for corruption and bribery despite major government efforts to stamp it out. India's score on the most recent Corruption Perceptions Index was 4.1 out of 10, and 34 corruption crimes are reported annually per 100,000 people. This reported rate is likely to be a massive underestimation due to normalization of certain actions by public officials and fear of repercussions and retaliation. And in a country where mass protests have erupted in recent weeks regarding a series of divisive laws involving national origin and religious identity, far too many Indians question on a daily basis whether their own institutions are meant to include them at all.

India has historically had a highly decentralized government in which the central government has had insufficient capacity to manage certain tasks, dating back to the governmental structure and institutions inherited from British colonialism. But India has made strides, particularly since 2015, in making government more efficient and accountable to its citizens. One of the greatest advances in improving the provision of government services has been the Aadhaar system, a biometric identification database which offers a centralized means for citizens to register themselves with public institutions and make their needs known. 89.5% of the population is now covered under Aadhaar, although only 71.9% of the population of children under 5 has a birth certificate, indicating other forms of government registration still need to be made more universal. With that being said, one of the key ingredients for an accountable and responsive government is free access to information and a free press. These have both been under stress under the current government, in which press freedoms have been restricted and the accuracy of public data has come under question. India scores only a 43.2 on the Freedom of the Press Index, a score which has been falling.
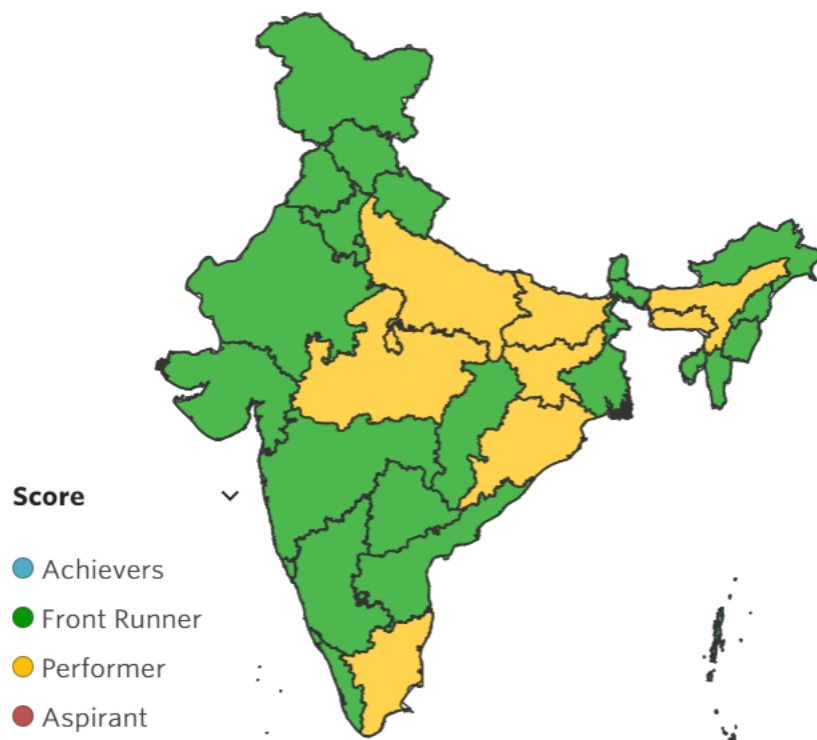
India has a low violent crime rate compared to the rest of the world, with 2.4 murders/100,000 population and 24 reported crimes against children/100,000 population. But there is room to improve, and the country intends to cut the rates of both by half in line with SDG 16's goal to significantly reduce all forms of violence. Jharkhand, where the murder rate is nearly twice the national average, should become a focal point for violent crime reduction efforts, as should Haryana and Chhattisgarh. Delhi, perhaps due to its status as an international transport hub, has also become a hotspot for crimes against children compared to the rest of the country; efforts to protect children from harm should start in the national capital.

India also aims to expand its court system so that national coverage matches its three leading states, and to further improve the efficacy of the legal system by cutting corruption in half. The northeastern states currently have the fewest courts per capita, but West Bengal, Madhya Pradesh and Telangana are also in need of a more robust court system. The states where corruption is most frequently reported per capita are, in order, Tamil Nadu (2493/10,000,000), Odisha (2490/10,000,000), and Gujarat (1677/10,000,000). Corruption reports in these states, however, are several orders of magnitude above reports in other states, indicating that they may simply be more effective at prompting citizens to call corruption crimes in. Paradoxically, the states with the lowest reported rates of corruption could be the ones where citizens have the least faith in public institutions, or where institutions are least accepting of such complaints. In West Bengal, for instance, reported corruption crimes are a laughable .75/10,000,000 people.

Finally, for all citizens to participate equally in their public institutions, they must be properly registered with the government. India has maintained a longstanding goal to register all births, a goal which has been achieved in many states but lags in others. Only 64.8% of births in Bihar and 67.4% of births in Uttar Pradesh are registered, the lowest rates in the country. With the advent of the Aadhaar biometric ID system, however, citizens have new avenues to register with the government and become eligible for public services. To date, Aadhaar adoption has reached 90%, with states in the northeast such as Meghalaya (21.4%) and Nagaland (56.5%) mainly responsible for the remaining gap.

Goal 17: Partnerships for the Goals

The first 16 goals present a highly ambitious framework for building a world all societies can benefit from and prosper within into the indefinite future. But without a plan for implementing these plans, they have little hope of actually being achieved. The final goal involves the partnerships between governments, private organizations, nonprofits and civil society that will be necessary for the Sustainable Development Goals to fulfill their own promise. Namely, Goal 17 sets benchmarks for countries to mobilize their own domestic resources to the fullest extent towards sustainable development through enhanced taxation and reduced debt service, while inviting resources from abroad through new remittance policies, expansion of ODA and FDI, and investment promotion regimes. On the technological front, it leverages North-South cooperation to preferentially share the knowledge and material required for poorer countries to gain a sustainable footing, particularly by enhancing the use of ICTs across national and international economies. And it involves shifting the role less developed countries play in international trade by dismantling discriminatory trade practices and expanding market access, creating the conditions for them to move up the value chain and create more opportunities for decent work and sustainable industrialization. Finally, it calls on national governments to coordinate the mobilization of these resources through enhanced data analysis and management, new macroeconomic policy frameworks, and increased investment into public-private and civil society partnerships aligned with the strategies outlined within these frameworks.

Appendix 1: NITI Aayog SDG Index

Goal	Indicator	National Target Value	Justification
SDG 1: End Poverty in All its Forms, Everywhere	Percentage of population living below national poverty line	10.95%	Reduction by half of proportion of population living in poverty as per Target 1.2
	Percentage of households with any usual member covered by any health scheme or health insurance	100%	Implementation of universal health coverage as per Target 1.3
	Persons provided employment as a percentage of persons who demanded employment under MGNREGA (National Rural Employment Guarantee Act)	100%	The MGNREGA mandates 100 days of wage employment to every rural adult volunteering for unskilled manual work.
	Proportion of eligible population receiving Maternity Benefit as a form of social protection	100%	Universal social protection benefits as per Targets 1.3 and 1.A
	Number of homeless households per 100,000 households	0	Provision of universal access to basic services according to Target 1.4
SDG 2: End Hunger, Achieve Food Security and Improved Nutrition and Promote Sustainable Agriculture	Ratio of rural households covered under public distribution system to rural households where monthly income of highest earning member is less than Rs. 5000	1.29	Average of three leading States/UTs
	Percentage of children under 5 who are stunted	21.03%	Average of three leading States/UTs; according to Target 2.2, states should reduce stunting under 5 by 40% by 2025.
	Percentage of pregnant women ages 15-49 who are anemic	23.57%	Average of three leading States/UTs; WHO seeks 50% reduction of anemia in pregnant women by 2025
	Annual rice, wheat and coarse cereal yield (Kg/Ha)	5,018.44	Doubling of current national productivity of 2509 Kg/Ha as per Target 2.4.
SDG 3: Ensure Healthy Lives	Maternal Mortality Ratio per 100,000 live births	70	Target 3.1

and Promote Well-being for All at All Ages	Under-five mortality rate per 1000 live births	11	Average of three leading States/UTs; Target 3.2 sets less ambitious goal of 25/1000 live births
	Percentage of children aged 12-23 months fully immunized (BCG, Measles, three doses of Pentavalent vaccine)	100%	Ending preventable deaths of children under-5, as per Target 3.2
	Annual reported TB cases per 100,000 population	0	Target 3.3; national goal is to eliminate TB by 2025
	Number of governmental physicians, nurses and midwives per 100,000 population	550	Average of three leading States/UTs; Target 3.C aims to "substantially increase" recruitment, development, training and retention of health staff
SDG 4: Ensure Inclusive and Equitable Quality Education and Promote Lifelong Learning Opportunities for All	Adjusted net enrollment ratio at elementary (class 1-8) and secondary (class 9-10 school	100	Target 4.1, ensuring all girls and boys have access to free, equitable and quality primary and secondary education
	Percentage of correct outcomes on learning outcomes in Language, Mathematics and Environmental Studies for Class 5 students	67.89%	Average of three leading States/UTs; Target 4.6 calls for improved literacy and functional numeracy; Target 4.7 calls for mainstreaming of education in Sustainable Development
	Percentage of correct outcomes on learning outcomes in Mathematics, Science and Social Science for Class 8 students	57.17%	Average of three leading States/UTs; Target 4.6 calls for improved literacy and functional numeracy; Target 4.7 calls for mainstreaming of education in Sustainable Development
	Percentage of children ages 6-13 who are out of school	.28%	Average of three leading States/UTs; Target 4.4 calls for gender, rural/urban, wealth and disability parity in access to education
	Average annual dropout rate at secondary level	10%	GOI target
	Percentage of school teachers professionally qualified	100%	National target corresponding to SDG Target 4.C
	Percentage of elementary and secondary schools with PTR less than or equal to 30	100%	National target
SDG 5: Achieve Gender Equality and Empower All Women and Girls	Sex Ratio at Birth (female per 1000 male)	954	Natural sex ratio at birth, according to Census Commissioner
	Average female:male ratio of wages/salaries received per day by regular employees ages 15-59 in rural and urban areas	1	Eliminating the gender wage gap to meet Target 5.1 (end all forms of discrimination against women)
	Percentage of ever-married women ages 15-49 who	0%	Target 5.2 (eliminate all forms of violence against all women)

	have ever experienced spousal violence		
	Percentage of seats won by women in the general elections to state legislative assembly	50%	Target 5.5 (full and effective participation of women in public life)
	Ratio of female labor force participation rate : male labor force participation rate	1	Target 5.5 (full and effective participation of women in economic life)
	Percentage of women ages 15-49 using modern methods of family planning	100%	Target 5.6 (universal access to sexual and reproductive health)
SDG 6: Ensure Availability and Sustainable Management of Water and Sanitation for All	Percentage of rural population with safe and adequate drinking water	100%	Target 6.1
	Percentage of rural households with individual household toilets	100%	Target 6.2; Goal of GOI Swachh Bharat Initiative
	Percentage of districts verified to be open defecation free	100%	Target 6.2; Goal of GOI Swachh Bharat Initiative
	Installed sewage treatment capacity as percentage of sewage generated in urban areas	68.79%	Target 6.3; halving the proportion of untreated sewage from present mark of 62.42%
	Percentage annual groundwater withdrawal against net annual availability	70%	Target 6.4, in alignment with national recommendation from Central Groundwater Board
SDG 7: Ensure Access to Affordable, Reliable, Sustainable and Modern Energy for All	Percentage of households electrified	100%	Target 7.1
	Percentage of households using clean cooking fuel	100%	Target 7.1
	Renewable share of installed generating capacity	40%	Target 7.2, in accordance with commitments under Paris Climate Agreement
SDG 8: Promote Sustained, Inclusive, and Sustainable Economic Growth, Full and Productive Employment and Decent Work for All	Annual real GDP per capita growth rate	10	National target; Target 8.1 aims for 7% growth in LDCs
	Average unemployment rate per 1000 persons for males and females	14.83	Average of three leading States/UTs; Target 8.5
	Percentage of households with a bank account	100%	National target in line with Target 8.10
	Number of ATMs per 100,000 population	50.95	Average of three leading States/UTs
SDG 9: Build Resilient Infrastructure,	Percentage of unconnected habitations connected to all-weather roads	100%	National target of Pradhan Mantri Gram Sadak Yojana, in alignment with Target 9.1

Promote, Inclusive and Sustainable Industrialization and Foster Innovation	Number of mobile connections per 100 persons in rural and urban areas	100	National target of Digital India program, in alignment with Target 9.C
	Number of internet subscribers per 100 population	100	National target of Digital India program, in alignment with Target 9.C
	Percentage of Gram Panchayats covered under Bharat Net	100%	National target of GOI broadband initiative in alignment with Target 9.C
SDG 10: Reduce Inequality Within and Among Countries	Palma Ratio based on household expenditure in urban India	1	National target in line with Target 10.1
	Palma Ratio based on household expenditure in rural India	1	National target in line with Target 10.1
	Ratio of Transgender labor force participation rate to male labor force participation rate	1	Social, economic, and political inclusion of all regardless of sex, in line with Target 10.2
	Percentage of Scheduled Cast Sub Plan (SCSP) fund utilized	100%	National target in line with goal of Target 10.4 to implement social protection policies
	Percentage of Tribal Sub Plan (TSP) fund utilized	100%	National target in line with goal of Target 10.4 to implement social protection policies
SDG 11: Make Cities and Human Settlements Inclusive, Safe, Resilient and Sustainable	Houses completed under Pradhan Mantri Awas Yojana as a percentage of net demand assessment for houses	100%	National target in response to Target 11.1 seeking to provide adequate, safe, and affordable housing to all
	Percentage of urban households living in slums	0%	Target 11.1
	Percentage of wards with 100% door to door waste collection	100%	National target under Swachh Bharat Mission, aligned with Target 11.6
	Percentage of waste processed	100%	National target under Swachh Bharat Mission
SDG 15: Protect, Restore and Promote Sustainable Use of Terrestrial Ecosystems, Sustainably Manage Forests, Combat Desertification, and Halt and Reverse Land Degradation and Halt	Percentage of total land area under forest	33%	National target in line with Target 15.1
	Decadal change in extent of water bodies within forests, 2005-2015	0%	Indicator for rate of loss of natural habitats in line with Target 15.1
	Change in forest area, 2015-2017	0%	Halt to deforestation, in line with Target 15.2
	Percentage change in estimated population of wild elephants over 5-year period	0%	National indicator corresponding to Target 15.7, ending poaching and trafficking of protected species

Biodiversity Loss			
SDG 16: Promote Peaceful and Inclusive Societies for Sustainable Development, Provide Access to Justice for All and Build Effective, Accountable and Inclusive Institutions at All Levels	Reported murders per 100,000 population	1.2	Half of current reported murder rate as per Target 16.1
	Reported cognizable crimes against children per 100,000 population	0	End of abuse, exploitation, trafficking of and violence against children as per Target 16.2
	Estimated number of courts per one million population	33.76	Average of three leading States/UTs in line with Target 16.3 goal of ensuring equal access to justice for all
	Estimated reported corruption crimes per ten million population	17	Significantly reducing corruption and bribery to half of current level, following Target 16.5
	Percentage of births registered	100%	Target 16.9
	Percentage of population covered under Aadhaar	100%	Legal identity for all, under Target 16.9

References

Choudhury, Gaurav. "Demystifying India's poverty line: Here's everything you need to know." Hindustan Times. May 6, 2015. https://www.hindustantimes.com/business/demystifying-india-s-poverty-line-here-s-everything-you-need-to-know/story-43vy1sQ7LrCZuezTakDnkM.html

Grillo, Oscar. Biological Diversity and Sustainable Resources Use. November 14, 2011. https://www.intechopen.com/books/biological-diversity-and-sustainable-resources-use

NITI Aayog. "Sustainable Development Goals India Index 2018." https://sdgindiaindex.socialcops.com/

Sustainable Development Solutions Network. "Sustainable Development Report 2019: Transformations to Achieve the Sustainable Development Goals." June 2019. https://s3.amazonaws.com/sustainabledevelopment.report/2019/2019_sustainable_development_report.pdf

Chancel, Lucas, Alex Hough, and Tancrède Voituriez. "Reducing Inequalities within Countries: Assessing the Potential of the Sustainable Development Goals." *Global Policy* 9, no. 1 (October 2017): 5–16. https://doi.org/10.1111/1758-5899.12511

Das, Mousumi, Ajay Sharma, and Suresh Chandra Babu. "Pathways from Agriculture-to-Nutrition in India: Implications for Sustainable Development Goals." *Food Security* 10, no. 6 (2018): 1561–76. https://doi.org/10.1007/s12571-018-0858-4

Dhaliwal, Livpreet Kaur. "Health in Sustainable Development Goals: Issues before India." *Research Journal of Humanities and Social Sciences* 10, no. 2 (2019): 298. https://doi.org/10.5958/2321-5828.2019.00053.6

Fuller, and Dwivedi. "Assessing Changes in Inequality for Millennium Development Goals among Countries: Lessons for the Sustainable Development Goals." *Social Sciences* 8, no. 7 (March 2019): 207. https://doi.org/10.3390/socsci8070207

Jayaprakash, Parvathi, and R. Radhakrishna Pillai. "Role of Indian ICT Organisations in Realising Sustainable Development Goals Through Corporate Social Engagement." *Advances in Theory and Practice of Emerging Markets Digital India*, 2018, 49–65. https://doi.org/10.1007/978-3-319-78378-9_3

Karttunen, Marianna, and Michael O. Moore. "India–Solar Cells: Trade Rules, Climate Policy, and Sustainable Development Goals." *World Trade Review* 17, no. 2 (2018): 215–37. https://doi.org/10.1017/s1474745617000647

Kumar, Anil, Om Prakash, and Akarshi Dube. "A Review on Progress of Concentrated Solar Power in India." *Renewable and Sustainable Energy Reviews* 79 (2017): 304–7. https://doi.org/10.1016/j.rser.2017.05.086

Malhotra, Charru, Rashmi Anand, and Shauryavir Singh. "Applying Big Data Analytics in Governance to Achieve Sustainable Development Goals (SDGs) in India." *Studies in Big Data Data Science Landscape*, 2018, 273–91. https://doi.org/10.1007/978-981-10-7515-5_19

CSD Working Paper Series: Towards a New Indian Model of Information and Communications Technology-Led Growth and Development

"Measuring Progress in Achieving the Sustainable Development Goals." *Governing through Goals*, 2017. https://doi.org/10.7551/mitpress/10894.003.0010

Mehta, Simi, Vikash Kumar, and Arjun Kumar. "Measurement of Sustainable Development in India and Bangladesh." *Lessons in Sustainable Development from Bangladesh and India*, 2018, 79–101. https://doi.org/10.1007/978-3-319-95483-7_4

Panda, Basant Kumar, and Sanjay K. Mohanty. "Progress And Prospects Of Health-Related Sustainable Development Goals In India." *Journal of Biosocial Science* 51, no. 3 (2018): 335–52. https://doi.org/10.1017/s0021932018000202

Poddar, Anushree, Sapna A. Narula, and Ambika Zutshi. "A Study of Corporate Social Responsibility Practices of the Top Bombay Stock Exchange 500 Companies in India and Their Alignment with the Sustainable Development Goal s." *Corporate Social Responsibility and Environmental Management*, 2019. https://doi.org/10.1002/csr.1741

Praharaj, Sarbeswar, Jung Hoon Han, and Scott Hawken. "Urban Innovation through Policy Integration: Critical Perspectives from 100 Smart Cities Mission in India." *City, Culture and Society* 12 (2018): 35–43. https://doi.org/10.1016/j.ccs.2017.06.004

Reddy, A Amarender A. "Development and Welfare Schemes Towards SDGS: Case Study of Emped Village, Telangana, India." *SSRN Electronic Journal*, 2018. https://doi.org/10.2139/ssrn.3101247

Ritchie, Hannah, David Reay, and Peter Higgins. "Sustainable Food Security in India—Domestic Production and Macronutrient Availability." *Plos One* 13, no. 3 (2018). https://doi.org/10.1371/journal.pone.0193766

S., Selvi. "Women Empowerment in India-Current Scenario." *Gender Parity and Women Empowerment– Challenges and Way Forward*, August 2018, 13–17. https://doi.org/10.9756/bp2018.1012/03.

Srivastava, Alok. "Standardizing Evaluation Process: Necessary for Achieving SDGs – A Case Study of India." *Evaluation and Program Planning* 69 (2018): 118–24. https://doi.org/10.1016/j.evalprogplan.2018.05.001

Taylor, Sara Rose, and Rianne Mahon. "Gender Equality from the MDGs to the SDGs." *Achieving the Sustainable Development Goals*, November 2019, 54–70. https://doi.org/10.4324/9780429029622-4

Thampi, Anjana. "Where Does India Stand on the Sustainable Development Goals?" *Social Development and the Sustainable Development Goals in South Asia*, February 2019, 49–73. https://doi.org/10.4324/9781351035262-4