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HOW TO PACK FOR THE JOURNEY TO 2047

The transition to a Viksit Bharat will extend over the next two decades, and the list of reforms needed to achieve the objective is bound to be long. The Budget can send critical signals



Montek Singh Ahluwalia

With the new government in place, attention will naturally shift to how it proposes to deliver on the promise of achieving Viksit Bharat by 2047. The vision has gone down well as an aspirational objective. Since the transition will extend over two decades, the list of reforms needed is bound to be long, covering both the economy and also society. Today's *Mint* presents several articles that identify some of the areas where changes are needed. Each will involve a combination of policies and programmes, and the details can only evolve over time.

This article focuses specifically on the Budget and what signals it could send. First, I suggest some standard macroeconomic tests which the budget must pass. I then turn to some areas where a new approach is needed and which are more controversial.



BASIC MACROECONOMICS

Viksit Bharat, understood as reaching developed country status, requires 8%+ growth on average for the next 23 years! The economy did record an average of 8% growth in the last three years, but that was the recovery from the pandemic. The average over the last six years is only 4.9%. This can and should be improved, but most international agencies project that India will grow at 6.5% over the next few years.

The Budget is not the place to present long-term growth targets, but some indication of the growth on which it is based is needed. As Martin Wolf of *Financial Times* recently pointed out, even if we don't achieve 8%+ growth, but grow between 6.5% and 7%, we could still end up as one of the superpowers because other countries are expected to grow much more slowly.

The Budget would do well to state a

A major weakness in the growth story thus far is that private investment remains depressed. The lead role has to go to the private sector.

clear target of, say, 7% real growth on average for the next three years. Actual performance can then be measured against this target and policy corrections made as needed.

Fiscal deficit is the key target on the basis of which analysts judge macroeconomic stability, which in turn can affect investor perceptions. India's fiscal deficit (Centre plus states combined) has been much higher than in most other developing countries. This means the Centre and state governments together take up a large part of the available savings in the economy, crowding out private sector investors who might otherwise use the savings to finance investments.

Efforts were being made to reduce the deficit, but these were derailed by the pandemic. Since other countries had the same experience, we did not suffer reputational damage. In the first budget after the pandemic, the finance minister had announced that the Centre's fiscal deficit would be reduced to 4.5% of gross domestic product (GDP) by 2025-26. Recommitting to this target would send a good signal.

It will be easy to retain the 5.1% fiscal deficit mentioned in the interim budget thanks to the large Reserve Bank of India transfer. Reducing it to 4.5% next year is credible. The finance minister could go further and target 4% in 2026-27. It was the practice earlier to project the deficit for two years beyond the current year and this should be restored.

Fiscal targets are impressive only if they are credible. This depends on whether they are consistent with meeting the many expenditure demands that will arise within the revenue growth expected. Strong GDP growth will help generate higher revenues. This can be further boosted by tax reforms.

The most urgent tax reform needed relates to the goods and services tax (GST), and what needs to be done is also well known. Purists argue there should be a single rate. Others argue for no more than two rates, with an additional "sin tax" for certain items.

A basic problem in the present GST is that half the items in the average consumption basket are exempted from GST. This was done in the interest of progressivity, but the largest part of the consumption of these items is by the non-poor. An IMF Board review on the value-added tax experience in developing countries stated that if GST were extended to all these items, the effect on the poor could be completely offset by a direct benefit transfer of ₹2,000 per month to each poor individual, and it would cost only one-fifth of the revenue gain!

Technically, GST rates can be changed only by the GST Council, but the finance minister could use the Budget to indicate the specific changes she intends to propose to the council. This would be a basis for discussing in Parliament and starting the political outreach that will be needed to build public support. Some states may not agree, but a GST Council decision does not have to be unanimous; it needs only a weighted majority. Relying on the majority would be legitimized if there is broader discussion.

The credibility of the fiscal deficit target would be enhanced if the government reiterated the earlier commitment to privatize non-strategic public sector units (PSUs). This commitment seems to have evaporated. Air India is a distinguished exception, but much more could be done, garnering additional resources. The budget will be carefully watched to see what signals it gives on privatization remains on the agenda.

Infrastructure development is widely regarded as a success story, and one can assume that the budget will signal that this thrust will continue. However, much more could be done through public-private partnerships (PPP). For example, there is no reason why the proposed modernization of railway stations should not be opened to PPP.

AREAS OF WEAKNESS NEEDING CORRECTIVE STEPS

A major weakness in the growth story thus far is that private investment continues to be depressed, despite tax changes that were meant to stimulate it. Some will be tempted to conclude that perhaps we should turn to greater reliance on the public sector. The government would do well to clarify that while the public sector certainly has a continuing and important role to play, the lead role in achieving high growth and generating employment has to be played by the private sector.

In this context, a reduction in the fiscal deficit would help to revive private sector investment. The net financial savings of the household sector had fallen to about 5.2% of GDP in 2022-23 when the combined fiscal deficit was 8.8% of GDP. This clearly left nothing for the corporate sector. Reducing the deficit will effectively push the financial sector to increase the flow of finance available for the private sector, including those in the small and medium sector.



ILLUSTRATIONS BY TARUN KUMAR SAHU/MINT

EDITOR'S NOTE

Realizing the great Indian dream

Union budgets in India are often more than just a presentation of the Central government's annual accounts. They are a platform for the government of the day to make grand announcements and articulate their philosophy of managing the economy.

Now that a new government has taken charge, expect its first budget to lay out a blueprint of what it will take for India to become a developed nation by 2047, 100 years after Independence. The path to that goal over the next 23 years will not be easy. There will be a plethora of challenges and opportunities, some of which policymakers might not have started to think about. At *Mint*, we've been thinking deeply about the possibilities and the tasks that lie along the road to 2047.

This special issue, ahead of Union Budget 2024, aims to draw attention to the critical reforms that can help India in this journey. The five broad areas it will cover are: managing the demographic transition; tackling climate change and the energy transition; the next-generation financial sector reforms needed to aid growth and inclusion; reimagining the role of the state in this process; and how Indian industry can prepare for the future.

We have carefully curated a selection of essays from sector experts who are known not just for their depth of knowledge but also their innovative thinking and outspoken approach. Their voices cut across industry, academia, public services and civil society to provide an all-round view of what to expect on the way to realizing India's big dreams.

finally (e) undertake a major effort at skill development to produce a more skilled labour force in the short run.

Only the first of these problems, i.e. high customs duties, can be dealt with in the budget. The others require a more comprehensive approach, but the budget could signal how the government intends to address this issue.

This raises a potentially controversial issue in the march to Viksit Bharat. Should India become more open at a time when other developed countries are turning inwards? A good case can be made for doing so because we are at present much more closed than others. The government has rightly stated that it wants to integrate with global value chains. The current disenchantment with China, and the desire to have a China plus one strategy, provides an opportunity for India. But this will require lowering of tariffs and other trade barriers. Since space constraints make it difficult to elaborate this point, I propose to do so in a separate article in this paper.

Finally, a word on India's statistical system. It was at one stage a model for developing countries but is no longer so. As we move to become the third-largest economy in the world, wanting to attract more foreign direct investment to support our development effort, and also striving towards internationalizing the currency, we have to be ready for much greater scrutiny of our economic statistics. This is not a budget-related issue, but the budget speech provides an opportunity for announcing that the government intends to undertake a major modernization of the national statistical system and will consult the United Nations, the International Monetary Fund and the World Bank for inputs to ensure that the reform is in line with global standards of quality and transparency.

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graduates from our top institutions, and news of layoffs in many areas.

To generate more good quality employment, we need higher growth and more labour-using growth. East Asian countries succeeded by adopting a strategy based on a rapid expansion of exports of labour-intensive manufacturing. The government has targeted high export growth in the hope that this will stimulate both employment and domestic manu-

facturing, but we have not been successful. Both exports and manufacturing have stagnated in recent years. We cannot blame global trends since countries like Bangladesh and Vietnam are doing much better. The fault lies in our industrial and trade policies, and the sooner we realize this, the better.

Much of the action needed is in areas which are outside the budget. In my view, we need to (a) reduce our customs duties,

which are much higher than in other developing countries and have actually increased since 2017; (b) sign free-trade agreements with major economies that would give us access to their markets, and for this we may have to accept alignment of standards on many non-tariff issues; (c) introduce greater flexibility in labour laws that will make manufacturing more competitive; (d) manage the currency in a way that avoids an appreciation in the real exchange rate, and

MANAGING THE DEMOGRAPHIC TRANSITION

IT'S TIME FOR A
NEW FAMILY PLAN

India proved that development is the best contraceptive. Now, we need to focus on adapting to the demographic destiny through careful planning

We've made the right choices, the next step is fixing the pieces of the population puzzle



Sonalde Desai & Purushottam Kulkarni

There is often a gap between public posturing and private reality. This disconnect in the context of India's population growth—a crucial element of its future development journey—is particularly striking. At the World Population Conference in 1974, India took a strong stance against Western emphasis on population control, with Dr Karan Singh, then a Union minister, famously stating, "development is the best contraceptive." However, two years later, the same government initiated a coercive sterilization programme that contributed to the downfall of the Indira Gandhi government.

Since then, the population discourse has centered around a paternalistic approach to convincing "irrational" parents that their lives would be better with fewer children. Ironically, as socioeconomic development fuelled parental aspirations, and improvements in health curtailed child deaths, Indian parents quickly limited their families voluntarily. The first National Family Health Survey (NFHS) of 1992-93 reported the total fertility rate (TFR) as 3.4, a finding that was received with scepticism since prevailing wisdom expected it to be considerably higher. Since 1992-93, fertility has declined to the "hum do, humare do" mark (close to 2).

Given the success of the initial mission, why does population growth continue to occupy so much public attention? As India forges the next leg of its development path, with demography a key puzzle piece, three narratives deserve particular attention. The first relates to India becoming the most populous nation on Earth and population size being seen as an obstacle to development. With an estimated 1.4 billion people, India has overtaken China. Despite fertility declining to replacement level, India's population will continue to grow for some time due to large generations born in the past. It is expected to peak at around 1.7 billion in 2064 before declining.

Will this hamper economic growth? Should we encourage families to have a single child? China's experiment with the one-child policy is enough to dissuade us. A sharp reduction in children born today would lead to very small cohorts of workers in three decades and increase the dependency burden.

A second, almost diametrically opposite, narrative argues about the economic

growth that a large working-age population can generate and that demographic dividend will only last for a limited time. The demographic dividend is a term used to characterize temporary benefits of fertility decline where a larger working-age population supports a relatively small number of children and elderly, generating economic surplus.

However, this is a temporary phenomenon, and could become counterproductive as these workers age. This has created an urgency to ensure we make the best use of our demographic dividend by investing in the skills of our workforce.

While we must invest in a skilled workforce, it is surprising that the discussion of demographic dividend ignores a vast pool of workers: India's women. Women's employment in India is low, and those who are employed are often limited to family farms and petty businesses like sewing or handicraft; barely 11% of Indian women are wage workers.

Hence, instead of worrying about the

Resource-sharing formulas must recognize that the future Indian workforce will come from states that lag demographically

end of the demographic dividend, we should harvest the gender dividend by improving women's participation in wage work, particularly since the fertility decline has reduced childcare responsibilities.

The third narrative centres around population distribution across states. Kerala was the first to reduce infant mortality, triggering fertility decline. Tamil Nadu and Goa were not far behind. Today, 30 states have a TFR below 2. However, the TFR in some of the populous states in the Hindi-speaking heartland is still above 2, resulting in the redistribution of population share between the South and North.

Should a stronger population control policy be implemented to redress these imbalances? We argue that there is little need for it. Fertility has declined in all regions and for all groups. For example, the TFR in Uttar Pradesh, the state with the highest fertility in 1992-93, fell from 4.82 to 2.35 by 2019-21. Further fertility reduction can be achieved easily by expanding reproductive health services and education.

Inter-regional population distribution is linked to the distribution of political and economic resources. The allocation

of parliamentary seats was frozen using population data from the 1971 Census, resulting in disparities in the number of constituents represented by each member of Parliament across states. Southern states fear that if this were to be recalibrated to equalize representation, they would lose seats and political power to the North. Moreover, since the Centre-state resource-sharing formula depends on population size, they may also suffer financial losses. As they see it, using population size for these allocations rewards states that performed poorly in reducing fertility.

These are legitimate concerns that can only be addressed by carefully crafted consensus. Political representation challenges can be addressed by allocating a fixed number of seats to each state in Rajya Sabha to ensure their interests are represented. In contrast, Lok Sabha seat allocation may depend on population size. Resource-sharing formulas may want to recognize that the future of the Indian workforce will come from the demographically lagging states.

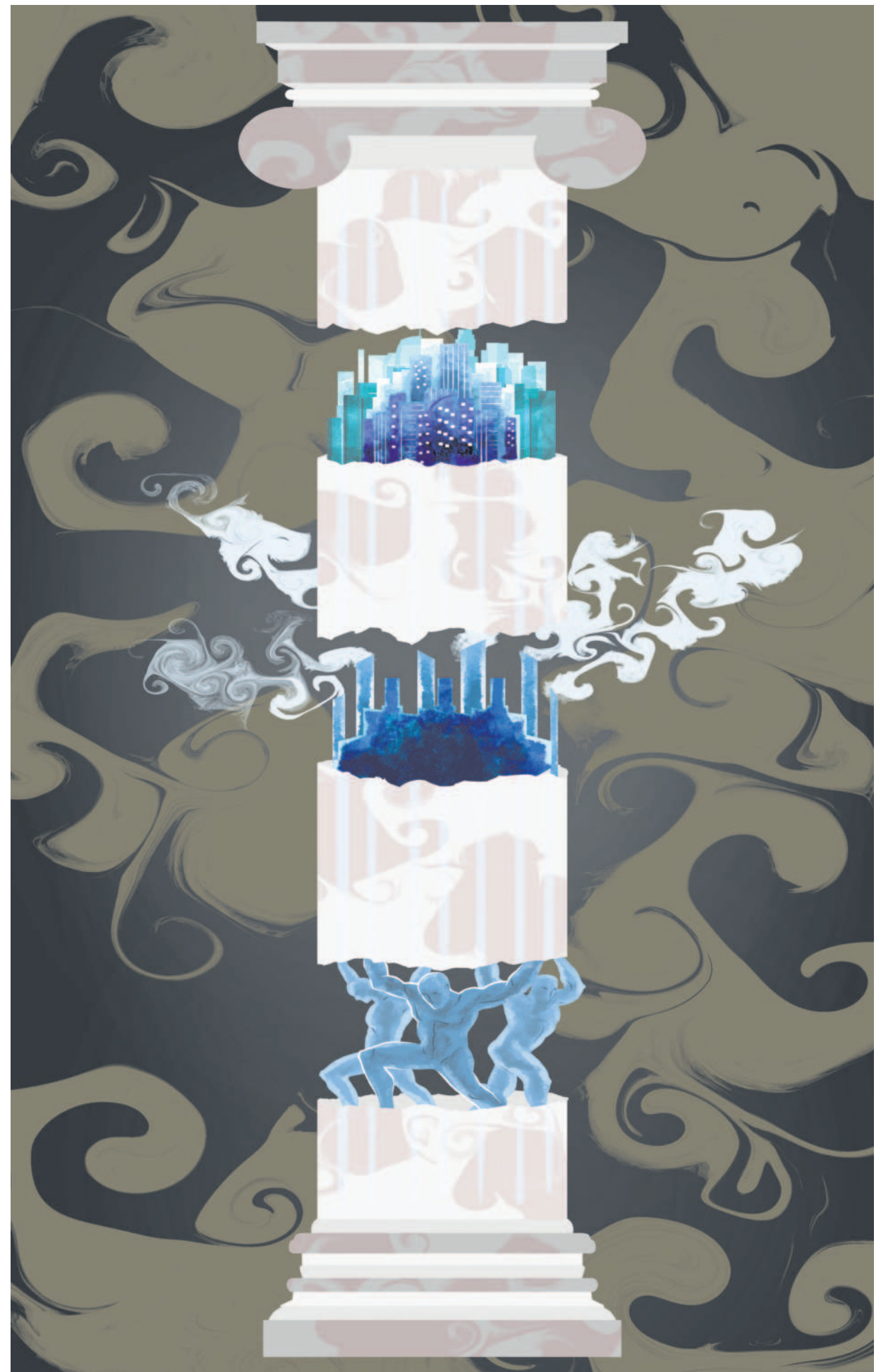
Our estimates suggest that in 2021 in Bihar, there were 165 persons of working ages (15-64 years) to support 100 persons of dependent age groups, while Tamil Nadu had 248 working-age persons to support the same dependent population. This will flip in 2051, with the ratio changing to 229 in Bihar and 188 in Tamil Nadu.

Consequently, even as the demographic dividend ends in southern states, it will continue to build in northern states, resulting in higher contribution to the economy. Should we not consider these future benefits and ensure that children in northern states are well-nourished and educated?

Over time, India's population will age. In 2021, about 6% of the population consists of individuals above 65, which will increase to about 15% by 2051 and reach a high of 30% by the end of the century. This rising burden of an ageing population will require careful restructuring of our financial safety nets and health services to ensure that their sunset years are happy and healthy.

India can take pride in achieving a demographic transformation through the cumulation of voluntary choices made by millions of parents in their family's best interests. We must now focus on adapting to our demographic destiny through careful planning and modulated narratives.

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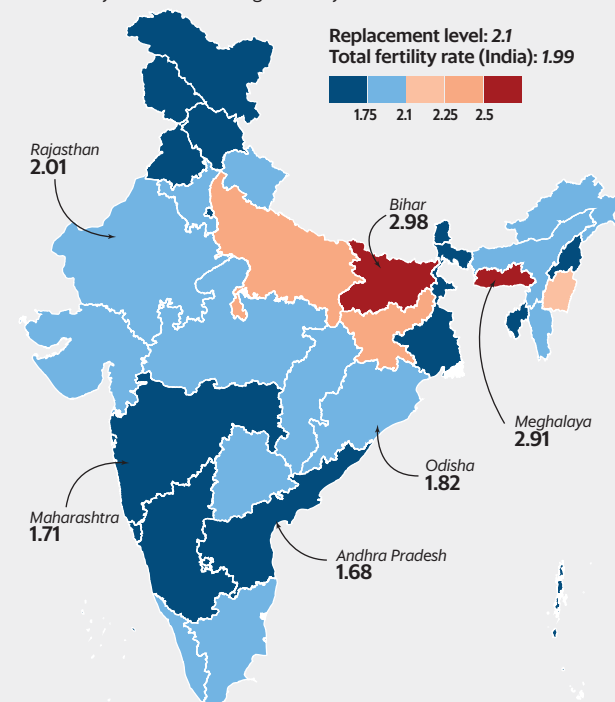
SARVESH KUMAR SHARMA/MINT

India's demographic dividend: A limited-period opportunity

India is racing against time as the share of its working-age population, though still on the rise, will peak by 2034. To gain advantage of this fast-fading opportunity, the country needs to build—and build fast—efficient institutions and large-scale infrastructure in education, health, and skill development. A large share of the population out of the workforce not only hampers output but also creates additional strain on resources. The charts below illustrate why India's much-talked-about demographic dividend matters—and the threats it faces. **Shuja Asrar** sets the context.

India's demography is changing: fertility rate has shrunk below 2.0 in most parts

Total fertility rate* of women aged 15-49 years

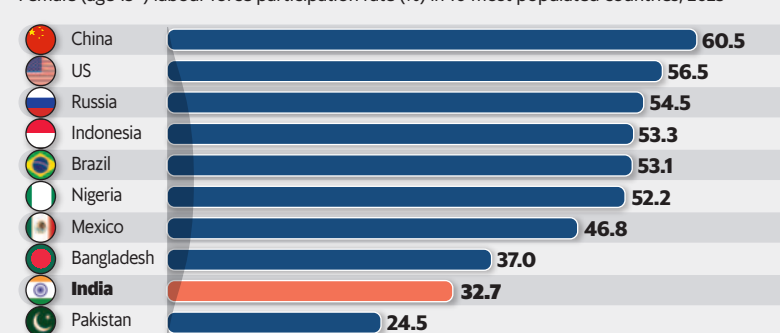


*The average number of children a woman would have by the end of her childbearing years (at current age-specific fertility rates). A fertility rate of 2.1 is the replacement level, i.e. population is likely to remain the same in the next generation.

Source: National Family Health Survey (2019-2021) Map data: © OSM

To really make it count, India will need more women in its workforce

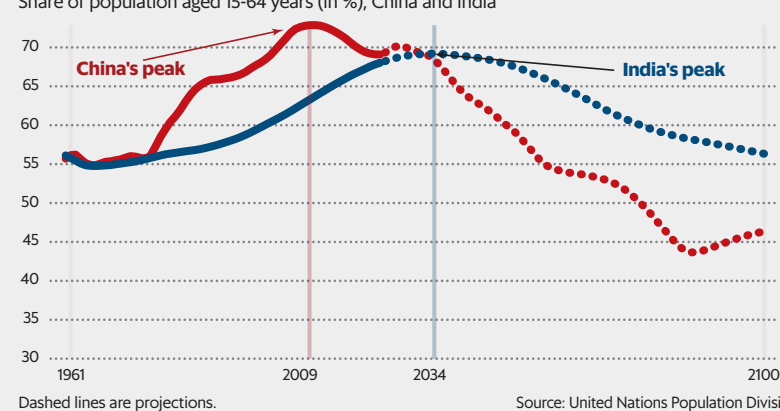
Female (age 15+) labour force participation rate (%) in 10 most populated countries, 2023



Modelled estimates used for better comparability across countries. Source: International Labour Organization

'Demographic dividend' is secure for now, but working-age share will peak by 2034

Share of population aged 15-64 years (in %), China and India



Can India give its youth the education they need to rule the workforce?

Share (in %) of enrolled students (age 14-18 years) who can...

BASIC READING & ARITHMETIC

...read at least a Class II level text 88.7

...read at least a sentence in English 74.8

...do at least a division 52.9

EVERYDAY CALCULATIONS

...add weights 54.8

...apply unitary method 48.4

...calculate time 45.4

FINANCIAL CALCULATIONS

...manage a budget 60.9

...apply a discount 36.8

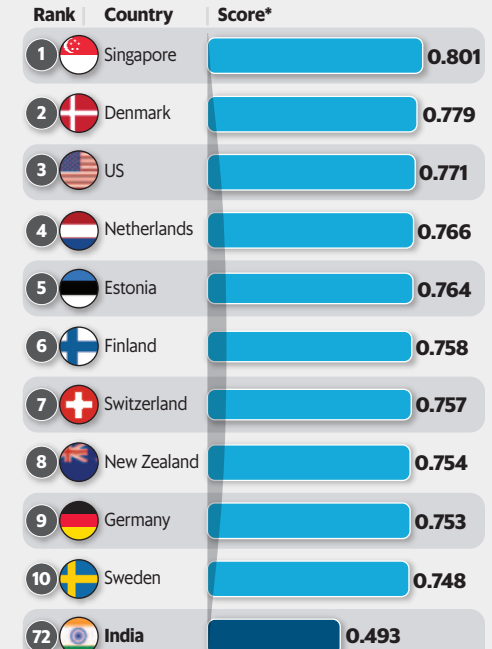
...calculate loan repayment dues 10.6

The survey covered 34,745 students in 1,664 villages across 26 states.

Source: Annual Status of Education Report 2023, Pratham Education Foundation

Ready for the AI age? India isn't too ready for the next shift, at least for now

Artificial Intelligence Preparedness Index (scale: 0-1)



*A higher score indicates more favourable environment for AI adoption. The index covered 174 countries based on several indicators across four dimensions: digital infrastructure, human capital, technological innovation, and legal framework.

Source: International Monetary Fund staff discussion notes (Cazzaniga et al, 2024)

MANAGING THE DEMOGRAPHIC TRANSITION

CAREER GUIDE: PUTTING THE BASICS IN PLACE

India should continue to promote the sustainable explosion of jobs and productive learning



Low-code: Five interventions we need to speed up formal and non-farm jobs

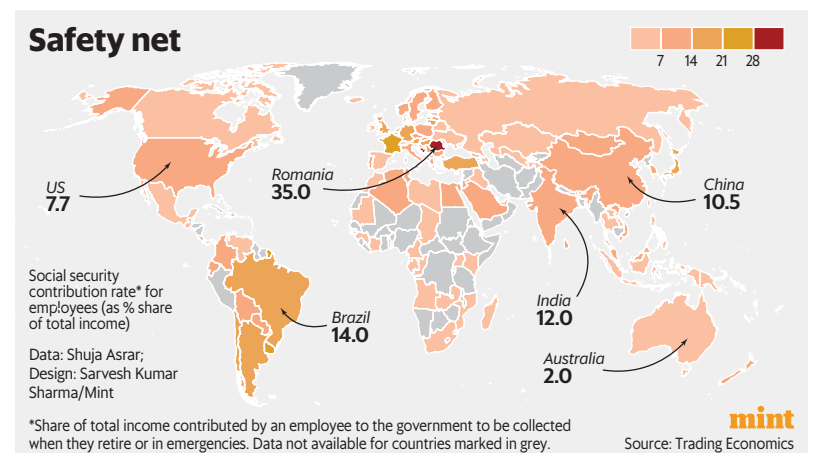


Manish Sabharwal

India's economic transformation of the last decade is impressive, earned and unfinished. As we await the next Union budget, we must resist incomplete explanations for recent election results by picking faulty paths like greatly expanding spending from last year's ₹45 trillion (if fiscal deficits could make countries rich, then no country would be poor), reversing the shift from revenue spending to capital expenditure (improving productivity requires allocating even more than last year's high of ₹10 trillion), or crowding out defence and police spending (about ₹8 trillion) with welfareism. The next budget should pray to the one god of formal non-farm jobs with five non-fiscal interventions that will raise the productivity of formal, non-farm employers.

The budget must ignore unhelpful, dated and self-serving notions—curiously peddled by offshore economists who chose exit over voice—that a large country like India must choose between manufacturing or services, exports or domestic consumption, and rising tax collections or improving ease of doing business. More importantly, most thoughtful economists now acknowledge their tribe has oversold monetary and fiscal policy as tools for sustainable mass prosperity. The damage is done; it's unclear that global public debt, deficit financing and central bank balance sheets will return to levels that make our generation good ancestors. India has avoided this economic narcissism and targeted our challenge of employed poverty by raising the population of productive non-farm jobs while ensuring a targeted welfare state and macroeconomic stability. The next budget should accelerate this mission by putting its weight behind five changes:

Jan Vishwas 2.0: The Jan Vishwas bill kicked off removing the excessive jail provisions in employer compliances last year by boldly recognizing that criminalization of civil offences hurts small employers, enables corruption and rewards informality (a sense of humour with the rule of law). It was a small start—only 113 employer jail provisions from over 25,000 were removed—and the budget must announce Jan Vishwas 2.0 with a new methodology. A committee of judges, lawyers, economists, and academics should articulate a "philosophy of punishment" and list the economic offences (harm to others, fraud, etc.) that should be criminal. Subsequently, central government ministries and departments must eliminate all jail provisions that do not meet this criterion. Jan Vishwas 2.0, eliminating thousands of corruption-enabling provisions, would accelerate investments, compliance, and productivity.



Raising net wages: Our mandatory payroll deductions (EPFO, EPS, ESI, EDLI, bonus, gratuity) are bafflingly regressive, with employers required to confiscate 35% for employees with up to ₹21,000 monthly salary and only 5% for new employees with monthly salaries above that. This massive wedge makes informal employers whose net wages equals gross wages attractive to low-wage employees. The budget must give employees (not employers) a choice by making employee contributions to the provident fund optional while raising employer contributions from 12% to 13%. We must stop mandating lower take-home salaries for formal employers whose better technology, training and human capital create the productivity that enables higher wages.

Social security portability and competition: Employment has shifted from being a lifetime contract to a taxicab

The budget announcing a single labour code will be a powerful signal of our policy intent to protect employees

relationship, yet our work social security programmes have not reviewed their design defect in linking payment and balances to employers rather than employees. This mistake explains the millions of dormant EPFO accounts with over ₹48,000 crore in unclaimed balances and the unexplainable ESI yearly premium surplus. This budget must allow employees (not employers) to pay their retirement savings to EPFO or NPS and their health insurance premiums to ESI, CGHS or buy IRDA-approved insurance. The monopolies of EPFO and ESI are rude, expensive and inefficient. Competition will improve employer coverage, employee enrolment and lifetime balance portability.

Compliance with digital public infrastructure (DPI): India's revolution in payments, identity and vaccination

certificates enabled by DPI has not been replicated in government plumbing. The budget must announce a digitization deadline for all central government and central regulator compliances that will replicate the open and stacked architecture of payments by creating a non-profit National Compliance Corporation that will use a Unique Enterprise Number (to be identified) to house the API/interface layer for all employer filings, compliance and workflows, and enable private sector innovation in straight-through processing for employers. Adding compliance to DPI will be a global first, save thousands of trees, and improve enforcement by enabling a single view of employers.

One labour code: It is impossible for employers to comply with all of India's labour laws without violating some of them. Given the delay in implementing previously drafted multiple labour codes, the budget must announce their consolidation into a single labour code for implementation before the next budget for all 97 industries notified under the central list. Some state governments may resist implementation immediately, but many are independently competing in reforms that recognize job preservation is not a form of job creation. The budget announcing a single labour code will be a powerful signal of our policy intent to protect employees while creating more formal employers. Informality is the slavery of the 21st century, and most Indian employer informality is a child of regulatory cholesterol in labour laws.

Rajasthan has a folk tale about a soldier who stops feeding his horse in peacetime only to find it lame when war comes. This soldier represents political ideas that peddle welfareism funded by fiscal deficits as substitutes for millions in productive private sector work. We humans get much more than income from work; it gives us confidence, self-esteem, identity, purpose, networks and ladders. The biggest gift the budget can give India is enabling the sustainable explosion of productive, private, formal, non-farm jobs.

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It's a strong foundation of primary education that will take India forward



Rukmini Banerji

As India embarks on its transformative journey towards Viksit Bharat by 2047, it is time for the government to urgently focus its energies on primary education—one of the key pillars that determines a nation's development. After two long years of pandemic-related school closures, we have finally gained enough ground after the losses of the covid years. The time is ripe now for us to look forward to a full and productive year of schooling and learning.

There are three key transition points in any primary school system. First is the entry into formal schooling in Std 1. Second is the movement of children from Std 2 to Std 3 (in the terminology of the new National Education Policy, or NEP, this would be the end of the "foundational stage"). Third is the transition from primary school to middle school (moving from Std 5 to Std 6). Looking closely at each of these transition points allows us to

assess how far we have come and set expectations for what can be achieved in the upcoming school year and in the future.

For a long time to come, 2020 will be remembered as the year that covid hit the world. But in India, we will hopefully also look back and remember that the new National Education Policy was launched in that year. NEP 2020 brought with it clear targets, tasks and timelines, especially as far as young children's education was concerned.

The new policy declared that the age range of 3 to 8 will be considered as the "foundational stage". Early children's education and the first two years of primary school must be seen as a continuum. NEP 2020 also lays out clear objectives—every student will attain foundational literacy and numeracy by Std 3. The document stresses that this is "an urgent national mission" and goes on to state that "the rest of this policy will become relevant for our students only if this most basic learning requirement (reading, writing, and arithmetic at the foundational level) is first achieved."

Translating policy into practice began energetically soon after the new policy was launched. For the early grades in formal school, the NIPUN Bharat (National Initiative for Proficiency in Reading with Understanding and Numeracy) mission was announced. Curriculum framework and instructional modules were developed, and the delivery of teacher-training programmes and distribution of materials got underway. Even as early as September-October of 2022, a majority of government primary school teachers had already been trained (as per the *Annual Status of Education Report of 2022*). The momentum for transforming instructional practices in early grades must be kept up as we move into the new school year.

Two key elements need to be firmly in place for helping children achieve the NIPUN goals by Std 3. First, teachers and classrooms need ongoing onsite academic support. Live demonstrations, discussions and problem-solving are needed by mentors from within the government school system to help teachers improve teaching-learning practices. Second, simple,

easy-to-generate and easy-to-understand data is needed at the classroom and school level to track children's progress in foundational skills through the year and across years.

NIPUN goals can be achieved, but, for that, instructional practices and cohort experiences must improve year on year. In 2024-25, we should begin to see the impact of the investments made in the past two years

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of the investments made in the past two years. As we welcome children into Std 3 in July, we must have a good understanding of how these children are different from the previous year's cohort, and a realistic but ambitious plan of how far we can take them by the end of the school year.

What about school readiness and entry into Std 1? The provision of early childhood education varies

substantially across and within states in India.

In some states, *anganwadi* coverage is high starting at age 3 and remains high till well after age 5. In others, private pre-schools dominate even in rural areas. In still others, government primary schools have included pre-primary grades. Based on available resources and emerging priorities, some state governments have begun to strengthen early childhood education (ECE) training within the *anganwadi* structure. Others are busy improving the in-school pre-primary structure and teaching-learning processes. Regardless of how the institutional delivery is done, efforts to systematically bring in the 3-6 age group into the continuum must continue.

It is worth noting that across the board, there has been a universal push to standardize age of entry into Std 1. Children coming into the formal system before age 6 can be a disadvantage. Children must be "ready"—cognitively, socially and emotionally to cope with what is required of them in the early grades of primary school.

The early childhood years have

also seen interesting innovations in the last two years. In particular, school systems in Himachal Pradesh, Punjab, Chhattisgarh, Madhya Pradesh, Maharashtra and Andhra Pradesh have been actively encouraging young parents, especially mothers, to participate in their children's learning journeys.

Holistic and "continuum" report cards in government schools are helping families understand that building strong foundations is not only about numeracy and literacy; children's development requires a breadth of skills that includes cognitive growth, socio-emotional resilience and a variety of physical and motor skills. Such innovations must be encouraged. Families and communities can bring in much needed support for ensuring that young children get a strong start.

Finally, a few words about the third transition—children moving from Std 5 into middle school in Std 6. It is worth remembering that the cohort of children who will attend Std 6 in July 2024 have only had three years of primary schooling and not five. These children were in Std 1 before the pandemic arrived. When schools reopened in

2022, they were of the age to be in Std 4.

While curricular expectations in Stds 5 and 6 are high, we must ensure that no child enters middle school without acquiring basic reading and comprehension skills and without with strong number knowledge and mastery of basic arithmetic operations. Tried and tested instructional approaches like "teaching at the right level" are available for helping children "catch up".

For the 2024-25 school year, the highest priority must be to continue the momentum on building strong foundations from the early years all the way to the end of primary school. NEP 2020 points out that building basic foundational literacy and numeracy for primary school children are essential and urgent national priorities. As citizens, it is up to all of us, to ensure that policy becomes practice and that each cohort of children going through the primary school system comes out stronger and certain to go further than previous cohorts.

Rukmini Banerji is chief executive officer at Pratham Education Foundation.

MANAGING THE DEMOGRAPHIC TRANSITION

A PLACE ON THE GLOBAL TECHNOLOGY MAP

India has the skills and population to leverage AI's benefits, and policies should be crafted to ensure that no section of society is left behind

A leadership position in the global AI supply chain will create more jobs



Amitabh Kant

Throughout history, technological advancements have repeatedly disrupted the labour market. The printing press, mechanized looms and the World Wide Web each brought about a transition that heralded turning points in human achievement. Now, as we stand on the brink of an artificial intelligence (AI) revolution, we face another profound shift in the workforce. The Indian economy is experiencing a once-in-a-generation opportunity with the ongoing AI revolution. AI is set to contribute a substantial \$967 billion to India's economy by 2035 and usher in a new era of innovation and growth.

Recognizing the significance of this transformative period, the government of India has allocated a substantial five-year budget of ₹10,372 crore to the India AI Mission. This initiative aims to spur AI innovation through dynamic public-private partnerships, with ₹2,000 crore specifically designated to support deep technology startups.

India's engagement in AI on a global scale is robust, with the second highest number of GitHub AI projects worldwide, comprising 19% of global AI endeavours. From 2015 to 2023, India led the world, expanding its AI talent pool, with an impressive 263% increase since 2016. In 2023, the hiring of AI talent in India surged by 16.8% year-over-year, indicating a strong emphasis on cultivating AI skills within the workforce.

According to Nasscom, 70% of Indian startups are integrating AI to propel their growth, highlighting its pivotal role in our startup ecosystem. The IBM Global AI Adoption Index 2023 reveals that 74% of Indian enterprises that have adopted AI are not merely using the technology, but are actively increasing their investments, underscoring the strategic importance of AI in enhancing operational efficiencies and pioneering new avenues for development.

Transition periods invariably bring their own set of adjustment challenges, and the current shift towards AI-driven economies is no exception. According to the *Future of Jobs* report by the World Economic Forum, we're on the brink of a major upheaval in the global job market, with nearly one-fourth of existing jobs facing potential turnover and about 44% of the workforce needing to adapt to altered skill demands. Similarly, the International Monetary Fund's recent analysis reveals that 40% of global employment is now vulnerable to AI innovations.

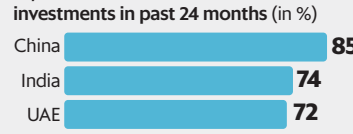
AI's remarkable ability to enhance operational efficiency, streamlining processes with unparalleled precision, is indeed transformative. However, this surge in productivity also prompts critical questions about inclusivity within the

Rising adoption

Share of large companies making active use of AI (in %)



Among companies already working with AI, share of those that have accelerated investments in past 24 months (in %)



The results are based on a survey involving 8,584 IT professionals from large companies in November 2023.

Data: Shuja Asrar; Design: Paras Jain/IBM

Source: IBM

workforce. How can we ensure that the benefits of technological advancements are equitably shared? Moreover, AI ushers in unprecedented creative possibilities with the advent of generative AI.

Yet, there's a risk that excitement about these capabilities could overlook the valued role of human diligence. It is essential to strike a balance where AI complements rather than replaces human expertise, fostering a collaboration that enhances both technology and human insight. As the prime minister put it eloquently in his remarks at the recent G7 Summit, "We have to collectively ensure that the benefits of technology reach all sections of society, to realize the potential of every person in the society, to help in removing social inequalities, and expand human powers instead of limiting them. This should not only be our desire, but our responsibility." Herein, a collaborative effort of policy-

AI is set to contribute a substantial \$967 billion to India's economy by 2035 and usher in a new era of innovation and growth

makers, businesses and the tech community becomes critical.

First and foremost, as we navigate the integration of AI into the workforce, India must aim to establish comprehensive end-to-end AI capabilities. India should not limit itself to merely being the application frontier of AI; it must ambitiously strive to establish foundational capabilities in both hardware and software, shaping the very core of AI technology. It is noteworthy that India generates 20% of the world's data yet hosts only 2% of the world's data centres, with our computing infrastructure comprising less than 2% of the global capacity.

This significant discrepancy poses a critical bottleneck that impedes our technological advancement. It is crucial to catalyse a robust strategy that pole vaults India into a leadership position

within the global AI supply chain. This approach will not only create more jobs and elevate opportunities for value addition but will also bolster our standing in the global technology landscape.

Second, it is crucial to integrate comprehensive AI curriculums within our education system. Our schools, colleges and research institutions must offer robust learning modalities that enable students and researchers to explore and experiment with the fundamentals of AI. This should encompass a wide range of subjects, from mathematics and statistics to machine learning, deep learning, natural language processing, computer vision, reinforcement learning and AI ethics. We must develop curricula that are industry-contextualized, technologically iterative and globally relevant, from K-12 to graduate levels, serving as beacons for educational excellence.

Establishing career tracks from the school level to cultivate AI specialists and implementing an AI-first strategy in our Atal Tinkering Labs within the next few years should be taken up in mission mode. It is vital to create a collaborative and competitive ecosystem among educational and research institutions to enhance AI interventions. Initiatives like the FutureSkills PRIME, a partnership between industry leaders and the government, that aim to reskill and upskill approximately 1.4 million employees over the next five years in emerging technology skills are essential and should be actively supported and expanded to address the evolving needs of the workforce amid rapid technological changes.

Finally, the continuous development of a robust and smartly targeting social welfare net to aid workforce transition should be prioritized. Furthermore, creating a national employment information monitoring platform that tracks real-time changes in employment across critical regions and key positions will prove invaluable. By providing up-to-date employment status, early warnings and predictive forecasts, we can navigate the ever-changing employment landscape more effectively. This comprehensive approach will ensure that the benefits of AI advancements are widespread and risks are actively mitigated, building a resilient and forward-looking economy.

Our steadfast commitment to building a developed India by 2047 is anchored in the principle that no section of society should be left behind in our national journey toward development. As we embrace this ambitious resolve, it is essential to recognize that we are amid an AI era brimming with limitless possibilities. It is vital that our policies set forth clear guiding principles—our North Star—and create robust navigation tools for every societal stakeholder. This strategic approach will illuminate the path toward our ambition, ensuring that every individual has the opportunity to both contribute and benefit.

Amitabh Kant is India's G20 Sherpa.



Simpler migration policies can solve the depopulation conundrum



Chinmay Tumble

The year 2024 marks an important demographic milestone in the world, as the absolute size of the working age (20-64) population of the relatively rich countries (the 38-country OECD, or Organisation for Economic Co-operation and Development, club) begins to shrink. In the next 25 years, projections are that it will fall by tens of millions, from its current level of around 800 million people. Correspondingly, the share of the aged (65-plus) in those countries is set to grow from 18% to 27% by 2050.

How do these factoids on external demographic transitions concern India's development journey over the next 25 years? First, while India's population will continue to grow, all discussions on population growth in India hereon will be centred on how

slowly that will happen. To be sure, annual population growth rates peaked in the 1980s itself and have been on a downward trend since. But hereon, it will pinch, since several regions will begin to experience a decline in population. Some wards in Kolkata are already facing it due to extremely low fertility coupled with high net out-migration.

Since 1921, virtually no district of India faced this 'depopulation' in any decennial census, but the number of such districts will begin to rise steadily by 2050. Depopulation pressures will slowly bring in closure of schools and maternity wards and the opening of old-age homes.

Second, as the *India Ageing Report 2023* published by the United Nations Population Fund and the International Institute for Population Sciences (IIPS) shows, the share of those aged 60-plus in the population is set to rise from around 10% today to a little over 20% in 2050, or close to 350 million in absolute terms. That is, there will be as many old people in India

in 2050 as there are people today in the US, with obvious implications on the sustainability of pension schemes that are hotly debated today.

Third, these broad contours of the coming demographic transition vary hugely within India. Consider two states at either end of the income spectrum: Kerala at the upper end and Bihar at the lower end. By 2050, the share of the aged in Kerala's population will be above 25% whereas in Bihar it would still be under 15%. Kerala's median age would be closer to 45 whereas Bihar's would be closer to 30. Currently, both states face high out-migration. By 2050, Kerala would almost certainly be a state with high net in-migration. With a high median age, its demographic pressure to emigrate would have slowed down (as the *Kerala Migration Survey 2023* already indicates) and the demand for a young (migrant) workforce would have opened substantially. Indeed, Kerala already hosts millions of migrants from

North India. In Bihar, on the other hand, expect substantial out-migration even in 2050.

Fourth, these demographic differences within India will reshape the internal migration dynamics heavily towards the ageing South from the relatively young northern hinterland. Until recently, natural

India would be younger than the rich world, creating opportunities to leverage gains from international migration

population growth (the extent to which births exceed deaths) outweighed migration dynamics as the major driver of population growth at the state level. As natural growth rates crash, migration will bear a larger weight in the future.

If the delimitation exercise after 2026 is indeed carried forward, the South will be penalized in the Lok

Sabha for better demographic performance (Lok Sabha seats are currently allotted as per the 1971 Census population figures, with a freeze on an update until the first Census after 2026). But by 2050, the picture could indeed change if substantial population transfers take place through migration. That is, delimitation exercises in the later part of the 21st century would reward those states which absorb more migrants, as it did in the US over the course of the 20th century. For instance, California increased its seat share in the House of Representatives from 11 out of 435 in 1910 to 53 out of 435 in 2010, essentially on account of migration. If the next delimitation in India is kicked down the road, as it has in the past, it could well be the case that in 2050, the reorganization of the Lok Sabha does not look very drastic as migration flows of 2025-2050 cancel out to some extent natural growth effects of the past 50 years.

Demographic pressures for interstate migration, however, run

against a hostile policy climate against migrants, with states passing or promising anti-constitutional nativist legislations, blaming migrants for their woes, and even raising the bogey of outsider status for migrants contesting elections. There is thus scope for an Inter-State Migration Council to be formed to protect and enforce the constitutional ideal of free interstate mobility, without which the efficiency gains of an integrated labour market would be lost.

Finally, precisely because India would be far younger than the relatively aged and demographically imploding rich world, there appears to be a huge opportunity in leveraging the gains from international migration. Bilateral mobility partnerships across the skill spectrum must be pushed forward despite the anti-immigrant rhetoric which simply won't withstand the demographic inversion that they are undergoing. Just as Kerala benefited from its connection with the Persian Gulf countries for 50 years

during its demographic transition, the other states of India that have a relatively young workforce can benefit by connecting with gaps in labour markets around the world. By 2050, South Korea, Japan and maybe even China, however unrealistic it may seem today, could well be new destinations apart from current destinations in the Persian Gulf, North America, Europe and Australia.

The next 25 years hold a lot of promise for India's developmental trajectory. A close understanding of India's demographic transition and labour market dynamics will be pivotal for policymakers in making the best use of the resources at hand. The newly elected political dispensation should start this journey with that most important exercise for this purpose, curiously delayed so far by three years: a national census.

Chinmay Tumble is a faculty member at the Indian Institute of Management, Ahmedabad, and the author of *India Moving: A History of Migration*.

MANAGING THE ENERGY TRANSITION

THE POLITICAL BENEFITS OF CLEAN ENERGY

Energy independence is within reach of a larger number of countries, and this could reduce one key source of geopolitical disputes



The real challenge to climate action and energy transition: global geopolitics



Shyam Saran

Climate action, especially over the last decade, has moved to the centerstage of global political engagement. The momentum has been galvanized recently by the consensus at the United Nations-led 28th Conference of the Parties (COP28) meeting in December 2023, where, for the first time since its inception in 1992, the need to “transition away from fossil fuels in energy systems” was acknowledged.

The transition challenges are, however, immense, especially from a geopolitical standpoint. But first, let us examine the relationship between fossil fuel commerce and global geopolitics.

Global geopolitics has been traditionally influenced by the uneven regional distribution of fossil fuel reserves and production centres and consequently lengthy chains linking producers to consumers. According to a recent study by the International Renewable Energy Agency (IRENA), 116 countries are net oil importers, 112 are net natural gas importers and 116 are net coal importers. The global fossil fuel markets are relatively centralized and concentrated and involve large scale movement over shipping lanes across the world. About 40% of all maritime cargo currently is accounted for by fossil fuels. Therefore, the safety and security of sea lanes on which such cargo moves, adds to the inherent global fuel supply security issue. The recent spate of attacks by Houthi militants resulting in disruption in the shipping lanes through the Gulf is an example of supply carriage risks. This raised oil prices and transportation costs.

Another aspect of fossil fuel commerce is the dominant currency in which it is traded, namely, the US dollar. This gives the US an enormous advantage and leverage over both producer and consuming nations. Sanctions on oil producing countries like Iran and Venezuela and lately Russia have disrupted and distorted the market, adding to the supply and price risk.

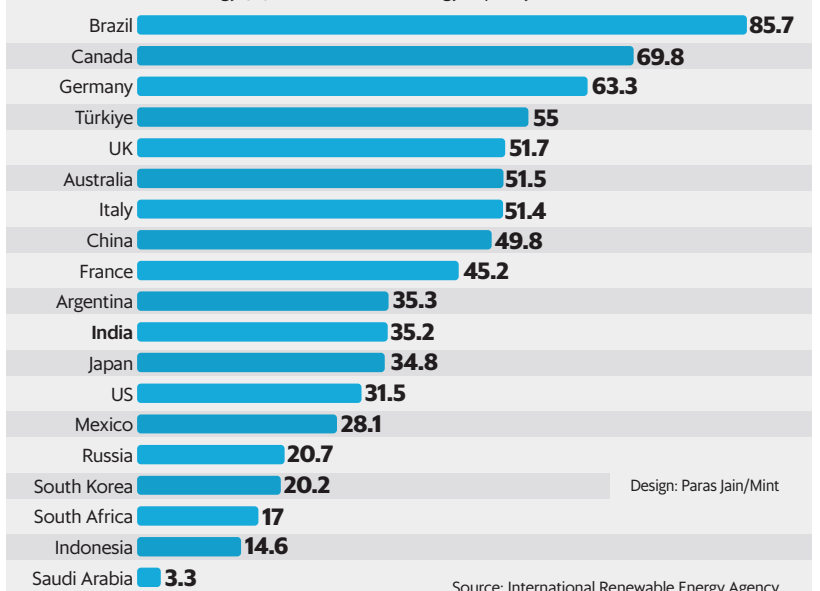
The rising share of renewable energy in the global energy mix diminishes no doubt minimizes the traditional geopolitical risks borne by energy import dependent nations like India since renewable sources of energy such as solar, wind, hydro, bio-mass or geo-thermal and cleaner sources of energy such as nuclear and hydrogen are harnessed largely within domestic and regional borders.

Energy security in a low carbon economy regime with increasing use of renewables will, nevertheless, be governed by an altered set of dependencies that will influence geopolitics and in turn, the energy supply and price risks.

For one, renewable power units like solar panels and batteries require extended supply chains for critical materials such as copper, nickel, lithium, cobalt and rare earths. Accessing these supplies involves commercial engagements with a new cluster of producer

Energy meter

Share of renewable energy (%) in total installed energy capacity in G20 countries, 2023



nations different from those blessed with oil and gas reserves.

For another, technological innovation and adoption is a key aspect of the energy transition narrative. Countries which possess advanced technologies and have significant R&D programmes will be at the forefront of transition initiatives.

On both scores, China has a significant advantage. The world's largest consumer of primary energy as well as the largest emitter of greenhouse gases is also a major producer and processor of rare metals and has cornered supplies elsewhere particularly in Africa.

On the technology side, it is the world's largest solar panel producer and manufacturer of wind turbines. It has ample supplies of the critical materials required

Transitions entail risks as both fossil fuel and renewable markets must function side-by-side until the shift is complete

for ramping up renewable energy production. It has also emerged as the most competitive source of renewable energy products.

Ideally, China could significantly contribute to the global transition away from fossil fuels to a renewable energy-based system. However, geopolitics is slowing this transition because of growing tensions between China and the US and increasingly, involving too, with Europe as well. India's own solar energy expansion plans could benefit from cheaper supplies of panels from China. A significant ramping up in the initial phase would result in an expanded scale which would then make local manufacture more competitive. However, the renewed tensions between India and China have adversely impacted the national solar mission.

For India, energy security and climate change are two sides of the same coin. Given the country's heavy, even over-

whelming dependence on fossil fuel imports, especially of oil, it makes sense to plan for a transition to an economy based progressively on renewable energy and cleaner sources of energy such as nuclear energy. While this transition is already under way, it needs to be accelerated.

Transitions also entail enhanced risks because until the energy transformation is complete, both fossil fuels and renewable markets must function side-by-side efficiently and relatively free of disruptions, since its otherwise blunts the efforts of nations to reduce their emissions.

In the recent past, we have witnessed a war-triggered disruption in Europe that set back the clock on the continent's ability to reduce its carbon emissions. The Ukraine War has delayed Europe's plans for decarbonizing its economy. Coal-based power has made a come-back in countries like Germany though this may be temporary.

Every country in the world possesses at least one if not more source of renewable energy - solar, wind, bio-mass or hydro. Therefore, relative energy independence is within reach of a larger number of countries, and this could potentially reduce one key source of geopolitical contestation.

In the transition to a progressively renewables-based economy, the risk of disruption of supplies of critical minerals and materials exists. However, such disruption will not lead to a sudden loss of energy availability since the materials are already embedded in renewable energy systems and hence will not immediately affect the power generation supplies. This is a major plus over fossil fuels.

On balance, one may expect a renewable energy dominated global economy to be less exposed to geopolitical contestation. Contestation may shift towards competition over rare earths and strategic minerals. However, its scale will be less than that experienced over fossil fuels.

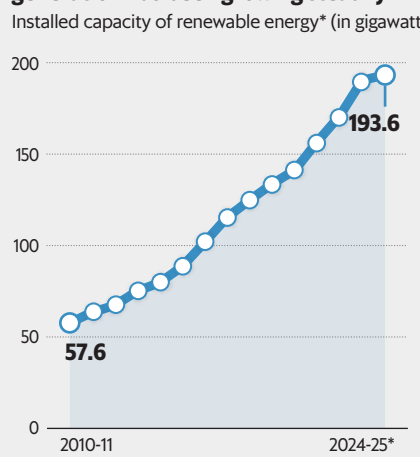
Shyam Saran is a former foreign secretary and served as the prime minister's special envoy on climate change (2007-10).

India's energy sector: Stuck between legacy issues and climate crisis

India's energy sector stands at a crossroads. It is in dire need of reforms to make it leaner and more efficient as state discoms run up heavy dues. Meanwhile, the sector also continues to depend on 'dirty fuels' such as coal and oil to power it forward. India needs to manage the competing push and pulls of the sector: One where an aspirational India's energy consumption will only rise going forward, even while being cognizant of our rising emissions and responsibilities towards tackling climate change. **Nandita Venkatesan** sets the context.

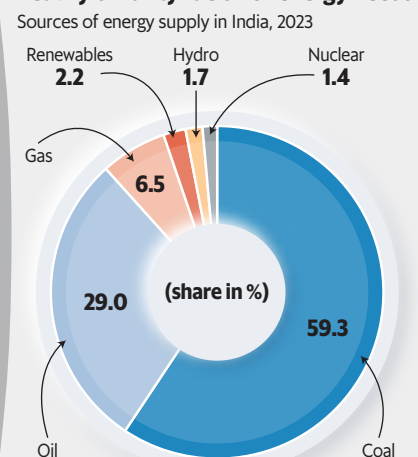
Net-zero goals: India's renewable energy generation has been growing steadily

Installed capacity of renewable energy* (in gigawatt)



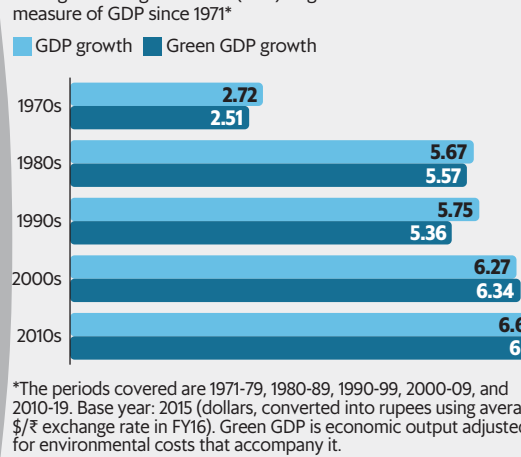
But the country continues to rely heavily on 'dirty fuels' for energy needs

Sources of energy supply in India, 2023



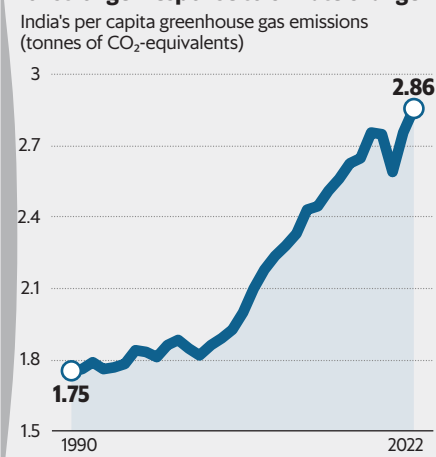
India must watch its 'green GDP' growth, too

Average annual growth rate (in %) in 'green GDP' and traditional measure of GDP since 1971*



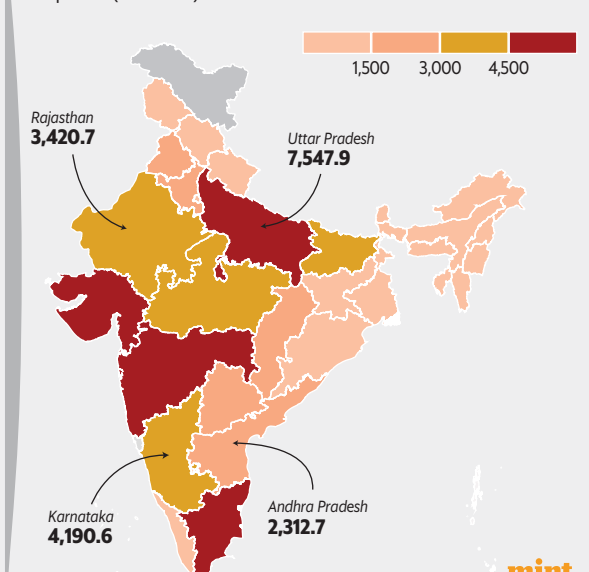
India's emissions are swiftly rising, calling for stronger response to climate change

India's per capita greenhouse gas emissions (tonnes of CO₂-equivalents)



Regulatory reforms are needed to make India's electricity system more efficient

State-wise overdues of power distribution companies to generation companies (in ₹ crore)



MANAGING THE ENERGY TRANSITION

THE ROADMAP FOR NET-ZERO EMISSIONS

Policymakers need to focus on proposals that can cut reliance on traditional sources of energy while meeting the country's growing power demand

Decentralized, green electricity networks will require a workforce with new skills



Kirit S. Parikh

Even as India aims to be a developed nation by 2047, it has set itself an ambitious target of net zero emissions by 2070, reflecting its commitment to undertake serious yet measured climate action. As we go forward, the twin goals need to shape our economic policies in a manner that transition must be fair and equitable to all stakeholders, with a 'leave-no-one-behind' approach. The policies also need to accelerate the pace at which fossil fuel is being substituted by non-greenhouse-gas-emitting sources.

The key challenge in these endeavours is to transform the electricity sector from being a key polluter to a net zero emitter. Currently, electricity generation accounts for 70% of coal use, while coal-based electricity constitutes 75% of total generation in the country.

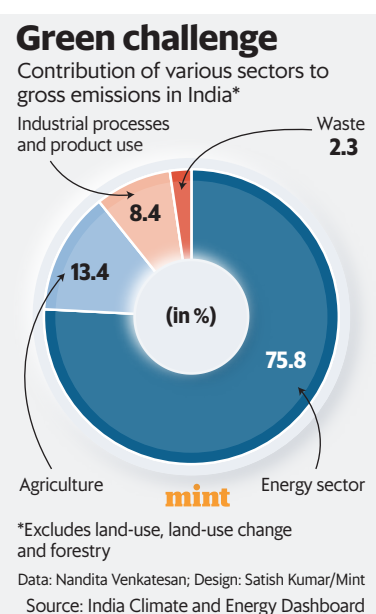
Replacing coal-based electricity and meeting the growing demand will require a considerable volume of renewable capacity, which, in turn, has implications.

Let us begin with the case of solar power generation. While the cost of photovoltaic cells has come down dramatically, electricity generation is limited to the period when the sun shines. In a year, this works out to around 18-20% utilization of the panels, compared to 80% for a coal-fired plant. Thus, at an asset creation level, a 1MW coal power plant is equivalent to 4MW solar panel capacity.

Hence, the initial investment required is greater, as much as four to five times that required for a coal-based plant. This brings forth a significant challenge—that of garnering long-term climate finance at a low interest rate. Industrialized countries must provide this, and Indian policymakers must aggressively engage in this direction.

A just way to mobilize funds from the Global North is to put a small annual parking fee of, say, \$1 per tonne of carbon dioxide parked in the global atmosphere by each country from 1990 onwards, the year when preparations for the Rio Earth Summit started and greater global awareness on the perils of climate change emerged. This approach recognizes the fact that the stock of greenhouse gases (GHGs) is causing warming in greater dimensions than annual emissions.

Another key challenge with augmenting solar capacity is that of land availability on the scale required to meet the demand. No doubt, rising cell efficiency will reduce land needs. For example, an efficiency of 30% compared to current levels of 20% will reduce land needs by 30%. Appropriate policy incentives for rooftop installations in domestic and industrial establishments, roadside areas and on water bodies, too, will help reduce



land needs.

Apart from high upfront investment, renewable generation sources also suffer from their inability to be available at all times of the day. No doubt, the intermittence in solar generation is lower than in the case of wind power, which is far more erratic and less predictable. However, that still leaves the challenge of providing reliable, continuous supplies to consumers.

The balancing options include battery energy storage systems (BESS), pumped hydro plants, particularly off-river plants, flexible operations of coal and nuclear plants and importing power from our neighbours, namely, Nepal and Bhutan, which have large hydro capacity. Battery storage is expensive, though lithium ion-based batteries are getting cheaper.

Energy labelling has been implemented successfully in India, helping consumers make informed choices while purchasing products.

This throws light on the emerging energy security horizon at a geopolitical level—imports of lithium will rise, while that of oil from the Middle East will decline. Given China is a dominant owner of lithium reserves across the globe, a large dependency on lithium may raise concerns about energy security and may not be acceptable to India.

Meanwhile, hydel resources have their challenges, too—the availability of electricity from hydro plants depending on the flow of the river.

Growing our nuclear power generation capacity will help meet the twin objectives of moving away from fossil fuels and meeting the rising electricity demand. However, our experience with nuclear plants has been that they are seldom com-

pleted within the allocated cost and time estimates.

Policy measures are required to introduce greater managerial efficiency for timely delivery of these projects.

The net zero power challenge can be approached from the other end of the pipe as well, namely, carbon capture and energy efficiency.

Carbon capture use storage (CCUS) is currently expensive and, besides, there are limited options for its use. The storage capacity of CO₂ is estimated to be quite small as well.

Energy efficiency, on the other hand, has been successfully implemented in the Indian context. Energy labelling has helped consumers make informed choices while purchasing products. For the business-to-business segment, industries have an opportunity to produce energy-efficient equipment that is globally competitive. However, by and large, these gains are incremental in nature, given the country's energy needs to grow economically to meet its human development goals and the large and growing aspirational class.

At an economy level, going beyond electricity, the net zero challenge will require oil and gas supplies to be substituted as well with non-polluting options. The popular emerging choices are electricity and green hydrogen.

Electric vehicles can significantly curtail the consumption of petroleum products. However, for heavy-duty trucks, shipping and airplanes, use of electricity is not practical as the range required will call for 'onboarding' of large battery capacity, which is not exactly feasible. Meanwhile, the shift of two-wheelers and three-wheelers and cars to electricity will increase the demand for electricity and put pressure on the electricity systems to deliver efficiently.

Green hydrogen requires green electricity, or electricity sourced from renewable sources by splitting water. Currently, the costs are very high. Yet, for some of the hard-to-abate CO₂ emissions sectors like steel, it currently seems to be almost the only alternative. In the medium term, it is likely to remain only as a niche option.

As a robust energy system evolves, especially involving decentralized electricity networks, operating them will require a workforce with new skills. This will require capacity building, both at the Centre and state levels. While policies have been formulated, they need to be followed up on to ensure efficient and fast-paced implementation. Further, the budget should remove distortions in the energy market, bring petroleum products under the goods and services tax, eliminate dual pricing of natural gas and usher in market-determined prices, and incentivize states to replace power subsidies with direct money transfers.

Kirit Parikh is chairman, *Integrated Research and Action for Development (IRADe)*.



Green revolution 2.0: Why India needs an integrated energy policy



Anil Kumar Jain

Over the last decade, the Indian energy sector has carefully navigated the throes of climate change concerns and the contentious issue of political economy imperatives while not losing sight of the need to cater to the energy demand required to become a developed country by 2047.

Going forward, this gradient is expected to get steeper, given the overall magnitude of the transition challenge. This is evident from the fact that we are substantially reliant on coal and oil that account for 53% and 20%, respectively, of commercial primary energy consumed by the country.

The multitude of objectives, hence, brings forth the need for an integrated planning approach at an unprecedented level. For example, the recent power shortages that have been partly precipitated by an imbalanced growth in renewables capacity over the last decade

reflect the need for better resource planning, both at the Centre and state-level. To improve supply adequacy, diversity metrics can be used while formulating policies. The country's energy basket requires a larger presence of renewable, gas, hydro and nuclear-based capacities. Currently, they stand at modest levels at 25% of the total generation. This approach can be applied to feedstock supplies as well. For example, naphtha and petcoke used in the petrochemical and iron and steel industry account for a significant 5% and 8.5% of the country's oil basket, respectively.

Hence, a key aspect of the climate imperative narrative in the country's approach to fuel/ feedstock switching, is of stepping down on coal and oil, and stepping up on low carbon fuels like natural gas, carbon free sources like hydel, solar and nuclear.

Let us now look at the approach to two key fuel sources—coal and gas.

Coal: The challenge in weaning away from coal for power generation (accounts for 75% generation,

50% carbon emission) lies in developing round-the-clock (RTC) alternate supplies at affordable prices. While solar tariffs are competitive, for the short to medium term, the complementing low-carbon capacities for RTC supplies are currently expensive (battery), or risk laden (hydel resources). The supply security in meeting the rising demand is equally important. For example, owing to water bodies going dry, Canada, which was dependent largely on its vast hydel resources, is now buying fossil fuel-fired electricity from across the border.

The challenge on the demand side is equally of a tall order: it is fraught with the political predicament of raising electricity tariffs to align with supply costs.

This calls for a larger policy framework involving electricity sector reforms to reduce appetite for coal. To improve fuel diversity in an 'organic' manner, the risk models used by lenders to appraise projects are currently biased towards coal projects, needs to be reviewed. For example, according to a study, in Europe, the loan loss-provisioning for low carbon sectors

is twice that for big emitters.

This approach will also facilitate faster adoption of newer technologies to reduce emissions in hard-to-abate sectors like cement and steel that use coal or the petrochemical sector which uses naphtha as a feedstock.

Natural gas: As a developing country on its journey to 'Viksit Bharat' by 2047, 'Just' transition is

The country's energy basket requires a larger presence of renewable, gas, hydro and nuclear-based capacities

an important aspect of government policy, one that enables reasonable pricing and availability of mass consumption products. Natural gas eminently fulfils this role. In the case of the transport sector, which contributes 12% of the country's carbon emissions, CNG and LNG offer a 'soft landing' since currently, Green Hydrogen is expensive, while EVs suffer from lack of ade-

quate charging infrastructure. In the agriculture sector, Nitrogen is the most consumed nutrient. No doubt, its production largely relies on the use of Natural Gas. However, a shift to a cleaner option, namely Green Ammonia, is expensive. In the case of cooking gas, piped natural gas is a cheaper option than the dominant supply of LPG (without subsidy) in the country.

These are some of the reasons why the government is committed to increasing the use of natural gas from the current primary energy levels of 7% to 15% by 2030. The challenges in this pursuit are significant and require policy interventions at various levels. In the case of City Gas Distribution (CGD), a key hurdle lies at the municipal level, where the cost of access to lay pipeline is exorbitant thanks to municipal levies. Secondly, to improve the viability of gas vis a vis coal in electricity, regulatory reforms are required to bring forth the real cost of electricity that consumers ought to pay. For example, the coal supplies to power do not reflect the cost of environmental rehabilitation and repurposing of 'End-of-

Life' mines and are sold at prices fixed in 2018.

Central to the Viksit Bharat narrative is the imperative to meet the energy demand that is expected to rise significantly, since India's per capita energy is currently at a third of the world average. With the rising need for climate action and the limitations posed by the fastest growing Renewables sources, that of supplies dependent on the sun shining and the wind blowing, nuclear power offers immense potential. This needs to be harnessed, from both 'base-load' supply security as well as competitiveness perspectives.

India's global engagement on carbon, especially at the United Nations-led COP conferences, has ensured that the principle of Common But Differentiated Responsibilities and Respective Capabilities (CBDR-RC) has prevailed. Thus, our low-emission strategies must provide for a differential approach to our energy mix through policy incentives in keeping with our social-economic obligations. As much as that, policies must evolve to recognise the various aspects of

technology and its ability to disrupt. For example, repurposing coal to produce petrochemicals or the declining cost of scrubbing carbon from the air.

In short, the challenges are evolving, and opportunities even more so. These need to be seized to implement the country's priorities through an integrated energy policy.

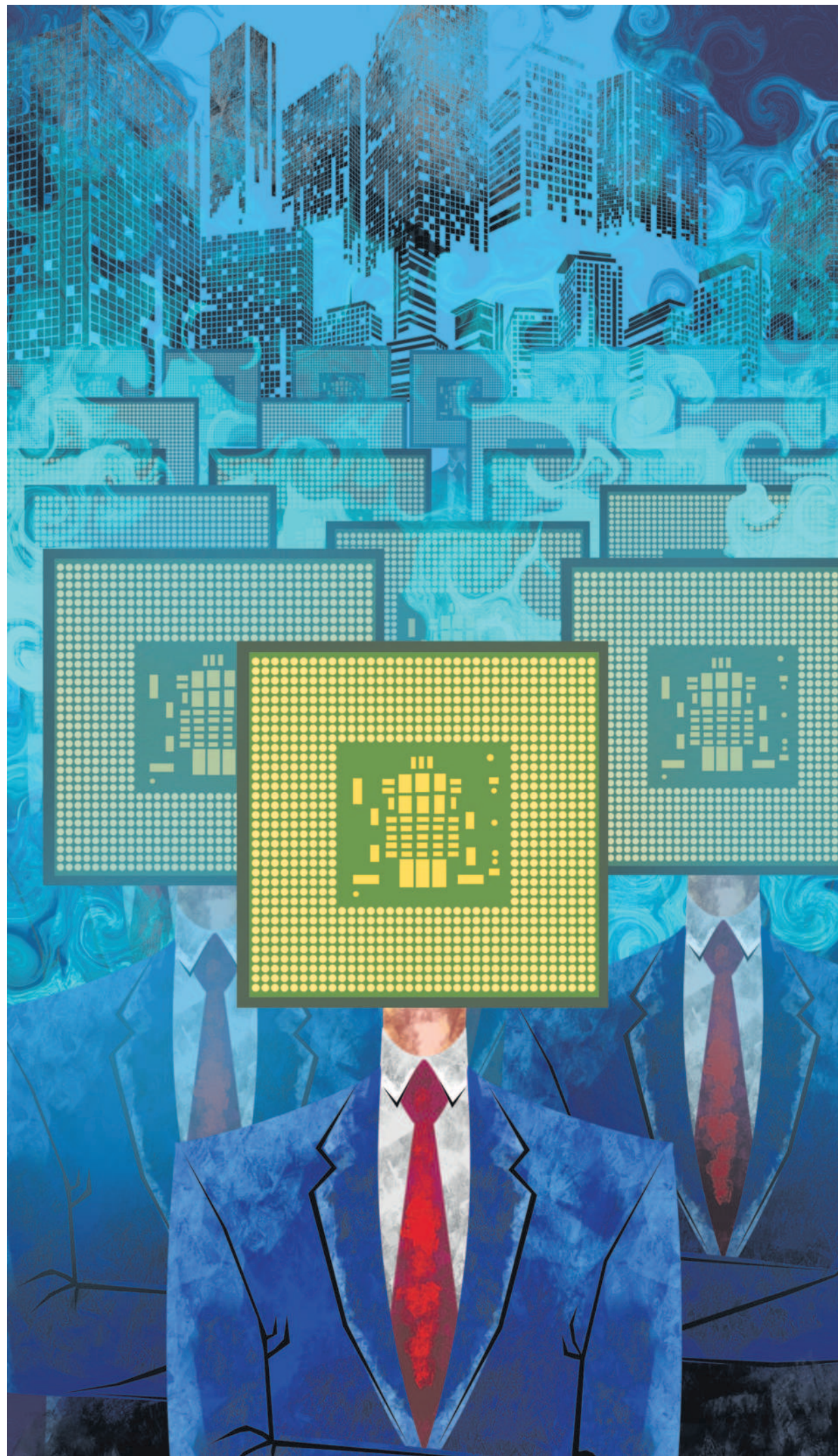
One approach to formulating such a policy, a dynamic one, would be through the outreach and synthesis efforts of an institution like NITI Aayog. This would address the gamut of climate issues such as calibration of fossil vis-a-vis clean fuels from a taxation standpoint, pricing of mass consumption products, the development of carbon markets, addressing 'Just' transition imperatives, etc. This will also efficiently facilitate medium-to-long term energy transition wherein stakeholders are able to smoothly play their part in a synergistic manner with measurable outcomes in every sector.

Anil Kumar Jain is chairman, *Petroleum and Natural Gas Regulatory Board*.

MANAGING THE ENERGY TRANSITION

LEADING THE CHARGE FOR CLIMATE ACTION

Structural reforms, including changes to the country's electricity regulatory framework, are necessary to meet climate action goals



3 steps to net-zero: Legislation, emissions trading schemes and capital mobilization



Jayant Sinha

Climate change has expressed itself in visibly powerful and quite traumatic ways, from floods to droughts. The economic upheaval that it portends is deeply concerning. Agricultural yields could drop or become more erratic leading to sustained food inflation. Monsoon-linked and coastal flooding could become more severe. In addition, our high-carbon exports could face high import tariffs. Thus, it is imperative for us to accelerate our green future.

Prime Minister Narendra Modi's government has prioritized 'green' growth. Not only has the government announced a 'Net Zero' by 2070 target, but several important policy initiatives have been taken to achieve this goal, especially through strong supply-related policy interventions. For example, renewable energy capacities, especially solar, are being set up at an extraordinary pace. The transmission grid is being augmented and re-engineered to move electricity from remote areas to large population centres. 'Smart' meters are being installed across the country at a feverish pace.

On the demand side, measures have been introduced to promote electrification of the transport sector. The market is responding well, with battery swapping networks and charging stations growing at a fast pace. Mass transportation systems are becoming cleaner with the growing population of e-buses, metro and passenger rapid transit networks, and e-rikshas. Green hydrogen and biofuels are also being encouraged in mission mode.

Going forward, in his third term, the prime minister can pursue a 'Green Frontier' economic development model for Viksit Bharat. This approach will strengthen India's global competitiveness by driving rapid decarbonization and digitization across the entire economy. This can help India leapfrog to the global production frontier and enable us to compete successfully with the world's leading economies such as the US and China. On the other hand, it will also significantly accelerate our net-zero policies, dramatically increase private sector investments and, consequently, generate millions of incremental green jobs.

To that end, there are three major structural reforms that could be undertaken to establish a Green Frontier decarbonization trajectory: (1) implement a legal framework to enforce net-zero targets; (2) roll out a comprehensive emissions trading scheme; and (3) establish and scale up a large Green Bank in Gift City. These three structural reforms complement each other and should be implemented in a synchronized manner.

National Net Zero legislation is one of the most important structural reforms for

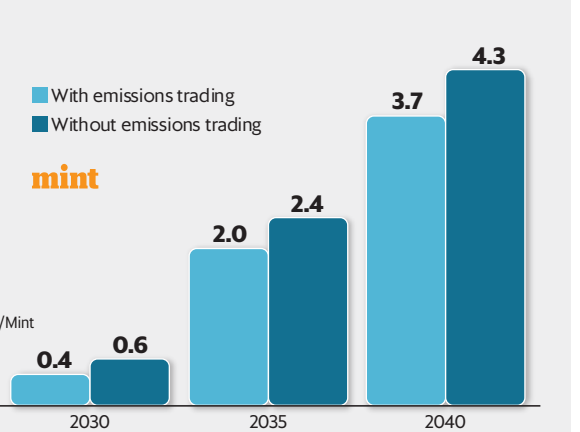
Cost factor

India's expected cost of mitigating climate change (\$ billion) in the presence or absence of emissions trading

Both scenarios assume an emissions cap on four sectors: electricity, iron and steel, cement, and fertilizers.

Data: Nandita Venkatesan; Design: Sarvesh Kumar Sharma/Mint

Source: Working paper by Malik, et. al. (2023), Council on Energy, Environment and Water



a Green Frontier development model. I had introduced India's first net-zero legislation in the Lok Sabha as a Private Member Bill in 2021. Such legislation is required urgently since it provides a consistent framework within which States, companies, financial institutions civil society, other stakeholders, and the public at large, can align their efforts. To be sure, this will require a complex reform process, similar in scope to GST implementation, since it spans the entire economy and all our states.

In my 2021 Bill, I proposed that we establish a National Climate Change Commission (NCCC) to provide independent, expert advice to the government on setting net-zero targets, adapting to the effects of climate change, and to monitor the government's progress towards these goals. The commission would propose annual emissions budgets for economic sectors and provide greater pre-

Over time, if we meet EU standards and have high-quality carbon accounting, we can boost our industrial competitiveness

dictability for those impacted by giving advance information on the emissions reductions required of them. The NCCC would also undertake risk assessments so enable appropriate early action. Finally, the commission would prepare a National Adaptation Plan to engage and inform the public of the government's policy responses to climate change and the indicators that would enable regular monitoring of the outcomes.

The second major structural reform would be to take forward the enabling legislation for carbon trading created in 2022, namely, the Carbon Credit Trading System. The government now needs to develop a comprehensive Emissions Trading System (ETS) for selected sectors such as steel, cement, and fertilizers. Companies that reduce emissions below their allowances can trade their credits, enabling us to discover a carbon price.

Over time, if we can align our ETS with the European Union's standards and enable high-quality carbon accounting, we can help strengthen our industrial competitiveness. A strong ETS will also aid us in creating a global carbon market and develop a global carbon price, which may well be above the Indian price. Such an ETS will also assist us in avoiding carbon border taxes of the kind to be introduced shortly by the EU.

Mobilizing climate capital through a hard-currency Green Bank is the third necessary structural reform. Various economic studies have shown that a trillion dollars of incremental foreign capital is required for climate investments by India over the next 10-20 years. A Green Bank based in Gift City is required to funnel this hard-currency capital from the Global North to Indian financial institutions.

To enable wider reach, the bank can be set up in collaboration with various Global North institutions such as multilateral development banks (MDBs), development finance institutions (DFIs), philanthropies, sovereign funds, as well as investment banks. Its ownership could be spread across major MDBs to assist Global North investors in dramatically ramping up climate finance in India. A key incentive for Global North institutions in pursuing this arrangement is that it would protect Global North investors that are funding decarbonization efforts for India's companies.

Leveraging its Global North links, the Bank needs to design various 'blended' finance instruments such as currency swaps to lower the cost of capital for climate investments. Various guarantee mechanisms can also be originated. Climate insurance products could be created with global reinsurers to insure against extreme weather events such as the recent destruction of the Teesta III dam in Sikkim.

The development trajectory for Viksit Bharat is being defined now. These three proposed structural reforms can help transform our economy just like GST and IBC have done. Let's make Viksit Bharat a Hariit Bharat.

Jayant Sinha is a former Union Minister and Lok Sabha MP.

A fine balance: From justice to cost, the many competing objectives of energy



Rahul Tongia

Electricity is a major enabler of economic and social development. India's per capita consumption is only a little over a third of the world average and hence, as we seek to become a developed country by 2047, managing our electricity needs is a key challenge, especially given the climate imperatives. Decarbonization efforts will require even more electricity as we shift transportation and industry away from fossil fuels. The issue becomes not just about quantity but also quality—what are the right fuels and regulatory frameworks under which a just and viable transition is undertaken?

Central to this predicament is the fundamental challenge of trade-offs that need to be made by policymakers. These necessitate balancing multiple and often competing objectives of energy, spanning energy security, low cost, environmental impacts, equity, consumer

choice, jobs, etc. No doubt, such trade-offs were ever-present, but now there are three specific additional challenges we must address as we grow our power system with environmental objectives in mind.

First, we will have to live with far greater uncertainty than before. Unlike where only demand varied over the day or by season, going forward, even a large share of supply will be variable in nature due to the rise of intermittent renewable energy (RE) like wind and solar. In this emerging environment, Least-cost resource planning, key to keeping energy costs down, becomes difficult with consumer owned and "invisible" (unmonitored) supply like rooftop solar, and the fact that technologies are also evolving rapidly, including batteries, electric vehicles, smart grids and smart appliances.

Even something as simple as capturing the growth in demand and its profile is fraught with enormous uncertainty and bears serious economic consequences. For example, at the consumption end, given a warming planet, cooling needs will

be one of the biggest drivers. How, then, will commercial AC use compare with that by household consumers? This matters since the latter rises towards the evening or overnight, which doesn't align with supplies from the fastest growing cheapest renewable, namely solar power.

Second, our regulatory frameworks will need to be upgraded. For instance, we mostly have 'cost-plus' regulation, and power markets are shallow, handling under 10% of electricity transactions. For the most part, distribution of power, the last leg in the chain, is still with state-owned distribution companies (discoms), which are in the grips of regulatory capture which makes it difficult to optimize efficiency. Many countries in the West already have market systems that handle higher RE and greater variability—and these often show negative prices during high RE periods, which means you get paid for consuming electricity or charging a battery!

Third, the present system of social welfare redistribution through both subsidies and cross-

subsidies, where commercial and industrial users overpay to offset underpaying residential and agricultural consumers, cannot sustain. By design, it raises costs for job-creating industry/commercial users, hurting their global competitiveness. More importantly, these higher-paying consumers are the ones who will disproportionately leave discom supply (and already are).

We mostly have 'cost-plus' regulation, with shallow power markets, handling under 10% of electricity transactions

both through rooftop solar and third-party suppliers, a process that will accelerate with cheaper storage technologies. This, in turn, raises the costs for other consumers.

Addressing these issues requires a renewed approach to incentive signalling (notably, prices) through a mix of incremental and big bang changes. The current development

model, dominated by top-down targets, is attractive and helpful up to a point, but does a poor job of tackling uncertainty, fairly allocating risk, and avoiding distortions or poor trade-offs. Instead of merely responding to targets, we need the right frameworks for our desired objectives, which could unleash more capital and innovation (and risk-sharing).

Fundamentally, we need to stop treating all electricity supplies as being 'equal'. It's not a basket of fruit (say, ₹5 per kilo, or ₹5/kWh), rather a basket of diverse fruits with varied costs, controllability, etc. Time-of-day pricing is a first step – for retail consumers this needs appropriate metering hardware (ultimately, smart meters) but even wholesale time-of-day pricing means we must move away from the dominant static power purchase agreements (PPAs) that treat all electricity the same. With dynamic pricing and more markets, we are likely to have enormous time-of-day spreads in prices, with dirt-cheap power during the day aligned with solar production.

Regulation needs to evolve and

move away from today's dominant approach of comparing new generation based on the levelized cost of energy (LCOE). LCOE ignores time of day issues and system level costs. For example, reducing thermal plants' output to prioritize RE, hurts their efficiency, or the prevailing practice of free transmission for RE power. "Free" here only means someone else is paying for it.

Ultimately, poor pricing leads to wasteful allocation of resources, and removes incentives to save energy. This is why farmers don't bother with efficient irrigation pumpsets, and even households are beginning to enjoy "free power", risking them becoming profligate. Most freebies are in the name of the poor but are poorly directed. For example, most farmers are landless labourers, so free or subsidized farm power only helps the well-to-do lot, and in the case of household supply, most beneficiaries are the middle class or even the rich (e.g., subsidy coverage is over 90% of homes in Delhi, and even higher in Karnataka).

The biggest change we need is one of mindset. Public views diverge

on whether electricity is a commodity – thus best handled by markets – or a public good. This is a false dichotomy. Electricity will always have aspects of both, and it should be treated like a well-regulated public utility. In this regard, our biggest gap is in the states' regulation of electricity, where consumer tariffs don't match costs.

The traditional narrative of the failure of publicly owned distribution companies (discoms) blames the "catch-all" measure of AT&C (aggregate technical and commercial) losses. While AT&C losses are high, research at CSEP has shown that the sizeable part of financial losses aren't the discoms' fault. Efficiency improvements are important, but we will also need higher tariffs to cover even prudent Discom costs. Keeping the transition as one major objective, this requires us to change the question from "are you paying more?" to "are you paying more than you should—for quality and clean supply?"

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REVAMPING INDIA'S FINANCIAL PLUMBING

WARDING OFF DANGERS
OF SUPERFAST GROWTH

The high growth rates India needs to be an advanced nation by 2047 will also require financial regulators to anticipate risks

New checks and balances needed to keep financial systems honest yet innovative



R. Gandhi

India's recent record of sustained high growth, sizeable economy, its self-sustaining agriculture, highly distributed production capability, leadership in services and technology and prudent fiscal management have emboldened it to aspire to be a developed nation by 2047, when the country will celebrate its centenary as an independent nation. Many economists and analysts have worked backwards to suggest what all are needed to be done to reach that status by that time. According to a study by the Reserve Bank of India in July 2023, the country will need to grow at a rate of 7.6% annually for the next 25 years to become a developed nation. To reach that level of sustained growth, India requires investment in physical capital and reforms across sectors covering education, infrastructure, healthcare and technology, the study said.

This essay will discuss specifically the role of the financial sector in furthering the cause of India becoming a developed nation by 2047. Sustaining high growth rates for a long period of time will require a stable, efficient and innovative financial system that meets the requirements of Indian households and businesses, and also the governments, without compromising macro-financial stability. Given the propensity of banks, non-banking financial companies (NBFCs) and fintechs to go overboard in their exuberance, we will deliberate on the guard rails for the banking system to chug on safely, securely and efficiently.

Given the development requirements of the country, capital accumulation needs to be at a faster rate with a focus on both domestic and external sources for capital formation. Demand for finance and capital will come from large-scale infrastructure projects, increased requirements in manufacturing capacity, expansion of the formal economy and increasing trade. Supply of finance and capital will have to be through mobilization of domestic savings, sustainable foreign capital, suitable types of financial institutions, instruments and products, channelling savings into investments, robust credit, and debt and equity markets.

India will need a large number of financial institutions to mobilize savings and channel them for investment. An increasing number of banks, NBFCs and the fintechs will have to emerge; these financial institutions will have to be of all sizes—small and equally large-sized banks will be needed to cater to the needs of financial inclusion and also to finance large projects. A variety of financial institutions will also be needed—for example, digital banks, wholesale/investment banks and even niche banks.

The suggested strategies will demand large and continuous capital infusion in banks and non-banks. The long-held policy preference for distributed holding vis-

Eagle eye

A look at some recent RBI moves

Nov 2023: RAISES risk weights for unsecured consumer credit such as personal loans and credit card dues

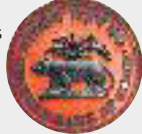
Dec 2023: TIGHTENS norms to prevent lenders from investing in AIFs as a way to evergreen loans (modified rule in March 2024)

Feb 2024: RESTRICTS Paytm Payments Bank from onboarding new customers

Apr 2024: ASKS Kotak Mahindra Bank to cease onboarding new customers online due to deficiencies in IT system

May 2024: ASKS NBFCs to strengthen governance practices

Compiled by Nandita Venkatesan, Design: Paras Jain/Mint Source: Mint research



Reserve Bank of India's prudential guidelines on project financing is an example of this approach).

Third, building up the war chest of capital and reserves of the financial entities will be the bulwark that the regulator would insist during the upswing. Typically, financial entities will be generating higher profits during this phase and it will be an ideal time for reserves to be enhanced with ease. The regulator should consider higher capital-to-risk assets ratio for the banks and non-banks in general.

Fifth, during the expected growth phase, India's banks and financial institutions will grow into big sizes, both as individual entities and as groups. Too big to fail will be a greater concern. Hence, the regulator should also be considering entity-specific variations for higher capital ratios like for financial conglomerates and systemically important banks and financial entities.

One of the important contributing factors for the expected high-growth phase of the economy in general and the financial sector in particular will be the emergence of fintech companies. The role of fintech companies in furthering financial reach and inclusion, and adding efficiency to the banking and financial system in the coming years is very crucial. While the earlier claims or expectations that fintech companies will eliminate banks have since been put paid to and the Reserve Bank's policy position that fintech companies cannot lend on their balance sheets have reduced direct financial risks, their proliferation and growth will entail customer protection issues and also possible indirect financial risks for banks and non-banks. Digital lending, buy-now-pay-later (BNPL) and pay-as-you-go kind of schemes have the inherent risks of going overboard and irrational exuberance on scale and speed at which these innovations grow. Misselling and overexposure are the common dangers. Further, enhanced risks relating to data protection and privacy issues, cybersecurity issues and operational risks will also have to be factored in. Besides, new concentration risks are also anticipated in Big Tech companies flexing their muscles in the fintech sphere.

While fintech companies are not regulated entities, one argument will be that they should be brought under direct regulation. However, that will be unwarranted and unmanageable. The current policy position of the Reserve Bank that fintech companies are best dealt with by indirect regulation through banks and non-banks will be suitable even for the high growth phase.

To conclude, as India is on its journey to become an advanced nation by 2047, the needed sustained high growth rate will in its wake manifest inherent risks for the financial system and entities. To manage these risks, the regulator has to be ever vigilant in anticipating risk events and placing precautionary and preventive regulatory measures so that the growth engines make a speedy journey along the regulatory guard rails safely.

R. Gandhi is a former deputy governor of the Reserve Bank of India.

à-vis concentrated holding in banks will have to be revisited. Similarly, the reluctance or hesitancy in letting business and industrial houses, private equity and venture capital funds, and foreign banks have large stakes in banks will also need reviewing, given the large capital needs of banks. Suitable innovative financial instruments, offering a share in economic prospects minus control for such large stakes, will have to be explored.

It is a standard approach of financial regulation that anything growing fast needs greater regulatory attention. Very often, irrational exuberance and pro-cyclical overconfidence have resulted in market participants underestimating and overlooking the risks that brew in the system. It has become the responsibility of the regulators to anticipate plausible damages and accidents, and hence build speed-breakers, bulwarks and guard rails, besides keeping a hawk's eye on the dynamics of the market developments. While discharging these responsibilities, the regulators also have to enable ample play for innovations.

The safety and soundness of the financial system and financial entities will continue to be the foundation for such guard rails. The playbook for such guard rails has been built under the aegis of the Bank for International Settlements' (BIS) Basel Committee on Banking Supervision. The Basel norms have been finetuned over years based on developments and experiences in the world financial system. Employing these as appropriate to the country and its phase of growth will be the key for India's next 25 years.

First, the regulator is on a special pedestal to see and anticipate risk build-up in a specific segment. Cautioning and red-flagging the market participants about this will be the starter in an upswing of the economy. (Last year, when the Reserve Bank cautioned banks and non-banks about the risk building up in the then high growing personal loan segment, the regulator was performing that role).

Second, countercyclical buffers and provisions for even standard assets will be another precautionary speed-breaker that the regulator will place. (The recent



Fresh credit decisioning ideas needed for final push towards financial inclusion



Indradeep Ghosh

For two decades, India has doubled down on the policy prescription of providing financial 'last-mile access' to its rural and poor citizens. Has the effort succeeded? It depends on who you ask. Financial institutions have expanded manifold their credit volumes to poor households in the last decade, and still the business remains so profitable that the sector continues to attract new entrants. However, in the non-credit domains, such as health insurance, investment products or retirement products, the inclusion record has been far less cheerful—indeed, it has barely even started.

There is a story to be told about why the discrepancy is so stark between credit and every other kind of financial product. And, even within credit, there is not always

agreement between stakeholders as to whether financial inclusion has truly succeeded or not. This latter disagreement is the subject of this piece, which also touches upon the other inclusion story—non-credit products.

Data from the 2021 All India Debt and Investment Survey (Aidis) suggests that, between 2013 and 2019, rural households in India increased their reliance on formal sources of credit by 10 percentage points. At the same time, informal sources continued, as of 2019, to constitute a full 34% of rural households' outstanding debt. There is a variety of hypotheses that these numbers might cause us to formulate.

I will focus on two of them. The first is perhaps access to formal credit remains a significant issue for India's rural poor. The second is perhaps formal and informal credit are not substitutes but complements. The interesting thing to note is that these two hypotheses are not necessarily competing ones,

but could both be true. If that were the case, what might policymakers and regulators take away from that possibility?

The 2021 Aidis data indicate that as of 2019, 35% of rural households in India had some quantum of debt outstanding—18% had debt from formal sources only, 10% had debt from informal sources only, and 7% had debt from both sources. This implies that 25% of Indian rural households were relying on formal sources of credit in 2019. Whether or not that number is high enough, it is the case that it hides a great deal of state-wise variation. In only 10 states, more than 25% of rural households relied on formal sources of credit, and the number breaches 40% only in the three states of Andhra Pradesh, Kerala and Telangana. In 15 states, less than 15% of rural households relied on formal sources of credit. Clearly, access to formal credit remains an issue that requires policymakers' attention. Yet, regular numbers on

the penetration of total formal credit at the district or state levels are hard, if not impossible, to come by in the public domain. Without such numbers, we cannot focus our attention more keenly towards helping formal credit become available to under-served parts of the country.

The financial lives of the poor are radically different from those of the middle- and high-income segments

At the same time, it is important to recognize that the financial lives of the poor are radically different from those of the middle- and high-income segments of the population. Relative to the latter segments, the poor have incomes that are both unstable and insufficient. One way to appreciate this point is

to look at monthly data rather than annual data. When one does this, one finds that a household may be judged as non-poor, or above the poverty line, on an annual reckoning, i.e., by taking the total annual income and comparing it to the poverty threshold defined in annual terms. But, the same household could appear as poor for more than six months of the year when the monthly income is compared to the poverty threshold now defined in monthly terms. That is, many poor households experience episodic poverty, moving in and out of poverty many times during the course of the year.

The obvious implication is that the poor suffer from cash flow deficits almost routinely, and therefore much of their borrowing is for consumption smoothing—they are not borrowing for conspicuous consumption that regulators and commentators usually worry about, but rather borrowing for consumption to sustain themselves at a minimal

required level. For that reason, such borrowing also most likely enables household enterprise activities because personal and business expenses are not easily distinguishable in the case of poor households. The canonical case here is that of a poor agricultural household with highly seasonal income patterns that is consumption-smoothing within the year to remain above the poverty line.

Regulatory mandates for formal institutions require them to disburse credit on the basis of income assessments. Yet, it is cash flow that is the proper input variable here. The far-reaching effects of this discrepancy cannot be overstated. On the one side, it means that even as formal credit becomes available, the poor do not stop relying on informal sources. On the other side, it means that credit disbursements are wrongly calibrated to the borrower's requirements, since the condition for borrowing (cash flow deficits at a high frequency) is not

aligned with the condition for lending (income sufficiency at a low frequency). As such, this kind of mismatch can quickly invite the threat of delinquency, inspiring once again a reliance on informal sources to repay formal debt. In other words, formal and informal debt become complements, not substitutes.

In conclusion, if it is true that many rural households in India still do not have access to formal credit and also true that formal credit does not and may not necessarily replace informal credit, then the policy problem is multi-layered. Last-mile access needs to be prioritized, but also new forms of credit decisioning need to be encouraged to protect the borrower from falling into a debt spiral. Therefore, last-mile access and customer protection should be simultaneous future policy priorities in the financial inclusion domain.

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REVAMPING INDIA'S FINANCIAL PLUMBING

AN UNEXPLORED PATH FOR PSBs, MARKETS

It is time for the government to reprivatize PSBs even as capital markets need to be primed to foster economic growth



Losses have been cut, and it's time to reprivatize India's public sector banks

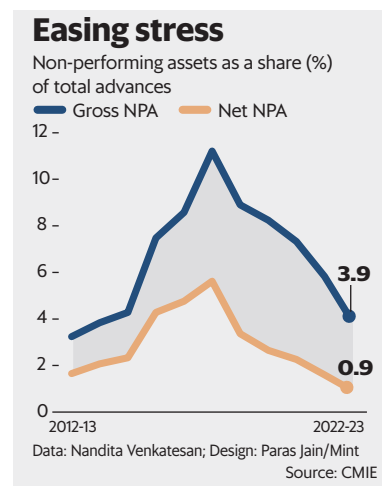


Viral Acharya

Reprivatizing public sector banks (PSBs) never seems to be on the table in India. I contend that it should be at this point of time. Until five years back, the price-to-book ratio of most PSBs was less than 1, in part due to not having fully recognized non-performing assets (NPAs) and not marking impending losses. It was considered inopportune then to discuss reprivatizing PSBs, akin to selling the family brassware for scrap value.

Things have changed. Losses are now more or less fully recognized. Significant capital injections have been made by the government. As per the bank balance sheets for the March quarter, seven PSBs—including the largest one—have less than 1% of loan advances in net NPAs, i.e., NPAs that are not provisioned for. None of the PSBs are anymore under the Reserve Bank of India (RBI)'s Prompt Corrective Action framework which imposes lending restrictions. With the Insolvency and Bankruptcy Code being actively used to resolve defaulted debt, corporates have deleveraged and fresh NPA slippages have come to a trickle. Management at PSBs has had the opportunity to rebuild balance sheet strength rather than simply focus on ever-greening of distressed borrowers or punt on treasury gains by investing in government bonds. Recognizing these positive developments, capital markets have rewarded the valuation of PSB stocks and their price-to-book ratio is now more than 1 on average. The government should take all the credit it deserves for this turnaround and start reprivatizing the PSBs without much ado. Let me provide five compelling reasons.

Firstly, PSBs were nationalized over 50 years back. The then government wanted its own 'foot soldiers', namely loan officers, providing credit in the nooks and crannies of India rather than to large corporates. The political objective was to attribute to the government's developmental progress; the stated objective was financial inclusion. Neither was achieved to satisfaction for over four decades. Eventually, and only over the last decade, Jan Dhan Yojna accounts, Aadhaar and the Unified Payments Interface (UPI) have delivered to near-completion the financial inclusion agenda. Given India's successful digital finance foray, the incremental gain on financial inclusion from retaining a controlling government stake in all PSBs is likely to be minuscule. Indeed, the government has figured out how to do welfare better, and to do more of it, by relying on modern technology and direct benefit transfers, eliminating the need for banking 'middlemen'. Under these circumstances, one, or at best two, PSBs with a nationwide presence should suffice to meet any future



financial inclusion goals and needs.

Secondly, and somewhat paradoxically, PSBs amassed NPAs decade after decade in each boom-and-bust cycle of leverage, precisely by lending to large corporates. This occurred often at the behest of past governments and against the purported objectives behind nationalizing them. Mercifully, it is now accepted by most within the government and various ministries that using PSBs to pump-prime the economy by blessing or requiring poorly underwritten credit is perilous. It exposes the country to the risk of anaemic credit growth for several years thereafter. For now, PSBs seem to have been exonerated from performing the dubious political function of connected or election-cycle lending. What exactly then is the political gain from retaining their complex ownership and management functions in the financial ministry? By shedding control, the government would send a credible signal to the world that it means business when it promotes the mantra of "minimum government, maximum governance."

Thirdly, even though PSBs have restored their balance sheet health, their price-to-book multiple is a whole point below that of Indian private banks, whose multiple exceeds 2 on average. Ordinarily, in a competitive industry, such large and near-permanent differences would be hard to reconcile unless entities with lower valuations are simply failing. Therein lies the catch. Private banks are in fact the biggest beneficiaries of the continuing existence of PSBs. That PSBs are subject to bureaucratic red tape in decision-making, face restrictions in offering attractive pay packages, and are slow to invest in technology to better service the customer base, are massive competitive advantages to private banks.

Unsurprisingly, private banks have been growing their deposit base faster than the PSBs year after year, without having to compete too hard on deposit rates. In turn, their intermediation margins remain at levels typical of an oligopoly, making them the darlings of stock market investors. At times, private banks can afford to not grow their credit book as much as there is demand,

instead retaining lower scale but higher margins as they do not need to scramble for deposits. The resulting low deposit rates are likely one reason why equity and housing investments seem so attractive to Indian savers. In response, many PSBs have evolved into passive equity fund managers, but there is no need for them to be government-owned to perform this function. Reprivatizing PSBs will thus be tantamount to levelling the playing field in India's banking sector. It will raise their own margins and valuation ratios, and bring to Earth those of private banks. Credit, private investment and high-quality employment growth will be the real winners.

Fourthly, even as the government has improved its tax collections, welfareism has grown popular in its modus operandi. It has expanded on infrastructure spending in parallel. The country's fiscal deficit therefore continues to remain high and is funded and rolled over in the bond markets. Reprivatizing PSBs below controlling stakes would not only unleash their repressed growth, it would also raise substantial divestment proceeds, stabilize government finances further and be seen as another step forward in upgrading the country's sovereign credit rating. Indeed, privatizing other parts of the financial sector, such as insurance and power-sector finance, should also be considered as steps in unison.

Finally, over the past more than 20 years, India has embraced change and modernized its corporate sector. Relinquishing state control of enterprises has been a key pillar of this transformation. However, the financial sector, and banking in particular, continues to retain a significant government footprint.

The financial sector must also now be modernized. If India is to realize its immense potential and demographic dividend, the financial sector should in fact lead the way and help accelerate the growth impulses of the real economy. Disrupting patchwork-style reform won't cut it anymore. For instance, playing musical chairs in the form of PSB mergers has kept everyone amused and guessing. Hopefully, some synergies have materialized. The music for that game has however stopped. It is time for more serious reforms. With attractive price-to-book ratios that were unthinkable five years back, the divestment ministry's Pavlovian inertia to taking any significant privatization decision appears evidently surmountable.

Changes in PSB ownership and style of management will undoubtedly entail some risks. But these risks can be managed. RBI has shown itself over the past decade to be swift in recognizing banking fragility and adept at addressing it. All things considered, I cannot think of a better moment for the government to start reprivatizing the PSBs.

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Capital markets are all set to play their role in India's development journey



Ajay Tyagi

The government has set an ambitious aspirational goal of India becoming a developed country by 2047. Then there are formidable international commitments to contribute towards achieving global public good—net zero GHG (greenhouse gas) emissions by 2070; and before that by 2030 reduce emissions intensity of its GDP to 45% from 2005 level, and achieve 50% cumulative electric power installed capacity from non-fossil fuel-based energy sources. Along this sustainable development journey, rapid technological changes pose additional challenges and opportunities.

The level of actual achievements vis-à-vis envisaged goals and commitments would critically depend on the right financing model to fund the required schemes and projects.

The Indian economy is bank-dominated. Going forward, the banks would need to continue to play their important role. That said,

bank financing of projects has its limitations. The build-up of banks' humongous non-performing assets (NPAs) on account of reckless funding of infrastructure projects during 2009-2013 made everyone realize that the banks are not best suited to fund long gestation projects on account of the potential asset-liability mismatch problem. Not only the infrastructure projects required to make India a developed country but also many of the green and transition projects fall in the long gestation period category, with back-ended returns. The capital markets, with their various instruments, provide a good financing option for such projects.

The good news is that the capital markets in India have come of age. Today, India can rightly boast of having one of the best-in-class securities market regulatory architecture. This has been well demonstrated in the last few years, wherein a series of major global events rolled the world financial markets. In this tumultuous period, the robustness of the Indian capital markets and their performance, as compared to the peers as well as developed econ-

omies of the West, have clearly stood out. The Indian markets, with market capitalization crossing \$5 trillion, are now ranked fourth in the world in terms of size, behind the US, China and Japan. The market cap to GDP ratio recently crossed 150%.

The marked increase in investment by domestic investors, especially retail investors, in the last few years has added to market resilience, making it less vulnerable to capital outflow shocks. The total number of demat accounts increased from 41 million in March 2020 to over 160 million at present, an increase of over 290% in a short period.

This must be sustained and encouraged with a view to facilitating people's participation in wealth creation.

As for the changes in technology, the Indian capital markets are well-placed to meet the challenges and harness the opportunities. The regulator, market infrastructure institutions and market participants are tech-savvy, and quick to learn and adapt. The ease with which they have assimilated the usage of artificial intelligence (AI) and machine learning (ML) in their functioning

and operations is remarkable.

It would thus be fair to deduce that the equities markets are well placed to serve India in its quest to become a developed country in the coming decades.

In addition to the equities, the framework for hybrid instruments such as infrastructure investment trusts (InvITs) and real estate investment trusts (REITs), though of recent

A developed bond market is a prerequisite to meet the debt requirements of green energy projects

origin, has rather come out well. Some regulatory improvements are on the anvil, and some more could follow later as the market matures. These instruments are of particular help in monetizing the brownfield infrastructure and real estate projects. The freed capital could then be used to finance new projects. These instruments are poised to play an important role in India's growth

story in the coming years.

The elephant in the room is the underdeveloped corporate bond market in India, requiring priority attention of the government.

India's aspirations to become a developed country need to be backed by a liquid, deep, and well-functioning debt market—something that the country does not have. An efficient Indian corporate bonds market with lower costs and faster issuances could provide a cost-effective source of long-term finance to Indian corporates. While some recent regulatory changes have improved the ease of doing business, helped increase transparency in the primary market, and enhanced liquidity in the secondary market, more reforms are needed. The most desirable one being the unification of the bond market, i.e., the unification of the regulatory regime for G-Secs, or government securities, and corporate bonds for both issuance and trading. This would significantly simplify the processes for investors, traders, and other stakeholders. G-Sec is like any other security and should be treated like one; having a separate regulatory regime

for it is counter-productive. The setting up of a credible credit enhancement mechanism and the development of markets for credit default swaps (CDS) and interest rate derivatives are other important tasks.

A developed bond market is also a prerequisite to meet the debt requirements of green and energy transition projects. These projects are likely to need a substantial proportion of foreign funding in the foreseeable future. At least two essential steps need to be taken to facilitate this. The government should come out with a comprehensive and unambiguous taxonomy on what is to be considered as 'green' investment, and the RBI should deepen the domestic currency hedging market to reduce hedging costs.

Much work needs to be done to revamp the urban infrastructure in the country. As per an estimate, about 800 million people are likely to live in urban areas by 2050. Most municipalities in India are resource-starved and face an uphill task in raising funds for their development projects. The market regulator had come out with the municipal bond regulations in 2015 and many modi-

fications have been brought therein, from time to time, in consultation with stakeholders. Unfortunately, this instrument is yet to gain popularity. Till now, only 14 issues of municipal bonds have been made, raising a rather small amount of about ₹2,400 crore. The municipalities need handholding and guidance, not only from the regulator but also from the central and state governments.

Lastly, there is a need for Indian corporates to improve their governance practices; though, admittedly, progress has been made over the period because of constant prodding by the government and the regulators. That said, Indian corporates need to do much soul searching and demonstrate responsible behaviour towards not only shareholders but also all stakeholders. Going forward, they ought to be also prepared to meet the increasing regulatory requirements of sustainability and climate-related disclosures.

Ajay Tyagi, formerly in the Indian Administrative Service, was chairman of the Securities and Exchange Board of India and is a distinguished fellow at the Observer Research Foundation.

REIMAGINING THE INDIAN STATE

TURNING CITIES INTO HUBS FOR GOOD LIVING

The government should strive to facilitate participatory governance while taking steps to improve the quality of life

Local government reforms can create a new vision for India's cities of the future



Srikanth Viswanathan

It is now proven beyond doubt that India needs a new imagination of how to govern her cities. The last decade finally saw the emergence of the city as a political agenda and a significant increase in investments in urban infrastructure and services. But the narrowly focused, mission- and scheme-led development of our cities across both the Union and state governments is not delivering the desired results.

We are faced with worsening quality of life and inequity on our streets and in our neighbourhoods despite larger budgetary outlays by governments and increasing prosperity of city dwellers. Urban India's challenge is primarily of systems and institutions, rather than of infrastructure and services. The latter is a consequence of well-designed and well-functioning systems and institutions. We need, therefore, to invest in robust "city-systems" to break out of the present status quo in our cities.

City-systems are a unique combination of three interlinked but distinct dimensions of democratic governance in cities. First, participatory governance institutions in neighbourhoods which foreground voice and agency of citizens through transparency and citizen participation. Examples include ward committees and area sabhas, or even slum dweller associations in Odisha or the older Kudumbashree groups in Kerala.

Participatory governance activates a virtuous cycle of engagement between citizens and governments leading to better prioritization, resource allocation and project execution. In a fast-growing, complex and resource-constrained setting such as urban India, transparency and citizen participation are not a democratic nicety but a governance imperative. They build the soft tissue of trust between citizens and governments. We have a working model in our panchayati raj institutions, which we must adapt and implement in our cities.

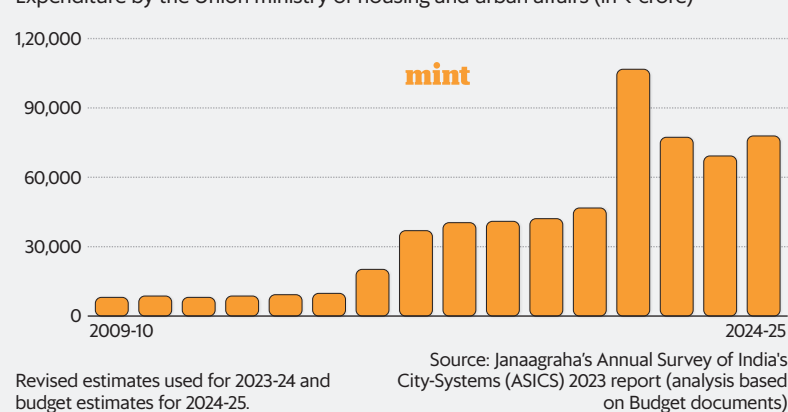
Second, mayors and councils who have meaningful authority over the city in terms of their tenure in office and powers, and authority over functions, funds and staffing are held to measurable and enforceable accountability for development outcomes.

Mayors and councillors are first-mile elected representatives and need to be empowered through both state municipal Acts and through systematic councillor leadership development programmes. City councils need to have better quality infrastructure as the nagara sabha, like the Lok Sabha at the Union and the vidhan sabha at the state level. India's approximately 90,000 elected councillors in cities, of whom about 46% are women, can be champions of change in our neighbourhoods, if only empowered.

Today, our mayors and councillors have

Building up

Expenditure by the Union ministry of housing and urban affairs (in ₹ crore)



Revised estimates used for 2023-24 and budget estimates for 2024-25.

Source: Janaagraha's Annual Survey of India's City-Systems (ASICS) 2023 report (analysis based on Budget documents)

SATISH KUMAR/MINT

no say over critical functions such as planning, public transport, traffic management, water supply and sewerage, environment, public health, gender equity and local economic development. Integrated, coordinated planning and development of our cities requires a single point of political accountability and a governance design to facilitate it. A bevy of bureaucrats across several civic agencies at the city and state levels can never deliver the outcomes we desire in our cities.

Third, municipalities and other institutions serving the city need to possess adequate administrative capacities across spatial planning, street and public space design, financial management, human resource management and digitization. Six specific measures on capacities include: (1) reforming master planning through high-impact neighbourhood

India's 90,000 councillors in cities, of whom about 46% are women, can be champions of change in our neighbourhoods

level planning, (2) mandating standards for design, execution and maintenance of streets and public spaces, and reforming procurement basis such standards, (3) formula-based transfers for cities basis their revenue capacity and funding needs, (4) catalysing municipal borrowings at scale on the back of a public registry of market-valued land in cities and a shelf of credible projects, (5) digital public finance management systems for radical transparency in public funds from their origin to outcomes, and (6) large-scale skilling in various domains of city management, and making the market for municipal shared services centres.

The primary responsibility to fix the above city-systems lies with state governments. The Union government, however, needs to assume thought leadership, facilitate peer learning, evolve common standards and frameworks where relevant, and

set aside significantly higher outlays as city-system reform incentives.

For the Union and state governments to get started on city-systems reforms, they would need to gain a new imagination of place-based governance and reimagine their own roles as ecosystem enablers rather than infrastructure providers.

The ministry of housing and urban affairs needs to be reimagined as primarily a place-based ministry rather than only a scheme-based ministry. We need its senior bureaucrats to be organized around places or regions rather than sectors. They need to adopt and be accountable for an integrated view across "economy, environment and equity" with infrastructure and services enabling outcomes across those three Es.

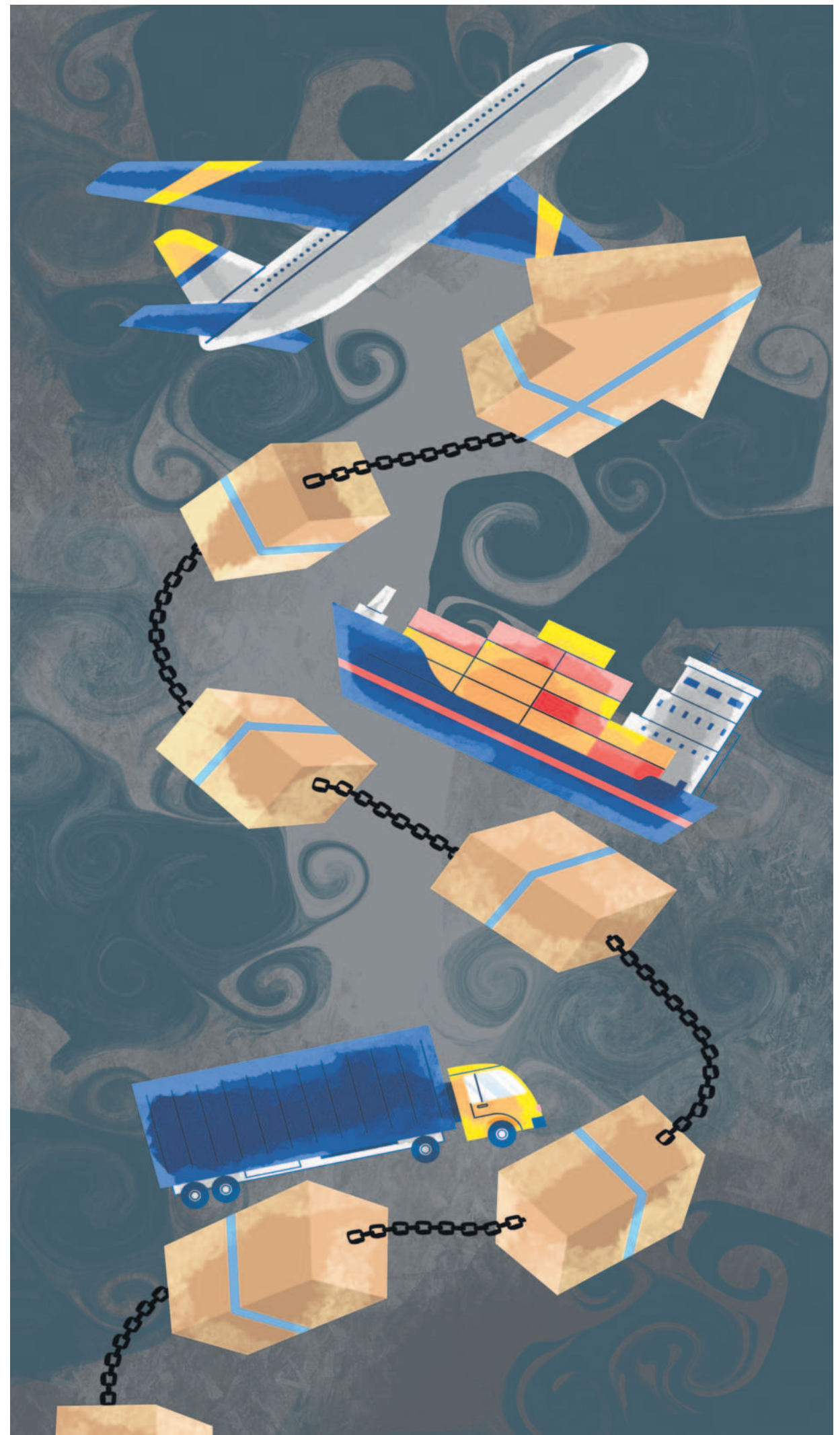
State urban departments, too, need to be organized based on divisions and districts within the state to create place-based specialization and integrated, coordinated governance across the three Es.

State governments should evaluate the district as a unit of governance for India's smaller cities. Districts already play an active role in panchayati raj institutions. The long tail of around 4,500 smaller cities with a population of less than 100,000 are burgeoning. Around 900 of them have been created by states since Census 2011 without any special incentives.

States do not have the fiscal or human resource capacities to deliver even basic infrastructure and services to them. The district as a unit of governance is well-settled and can effectively build shared capacities across spatially contiguous cities and villages (think common waste management facilities, common teams of engineers and tax collectors, "uberized" field services and common technology backbones) and address balanced development between rural and urban centres. They can also facilitate systematic rural to urban transitions.

The timing is perfect for the new government to strike a bold and imaginative note and embark on much needed city-systems reforms.

Srikanth Viswanathan is chief executive officer, Janaagraha Centre for Citizenship and Democracy.



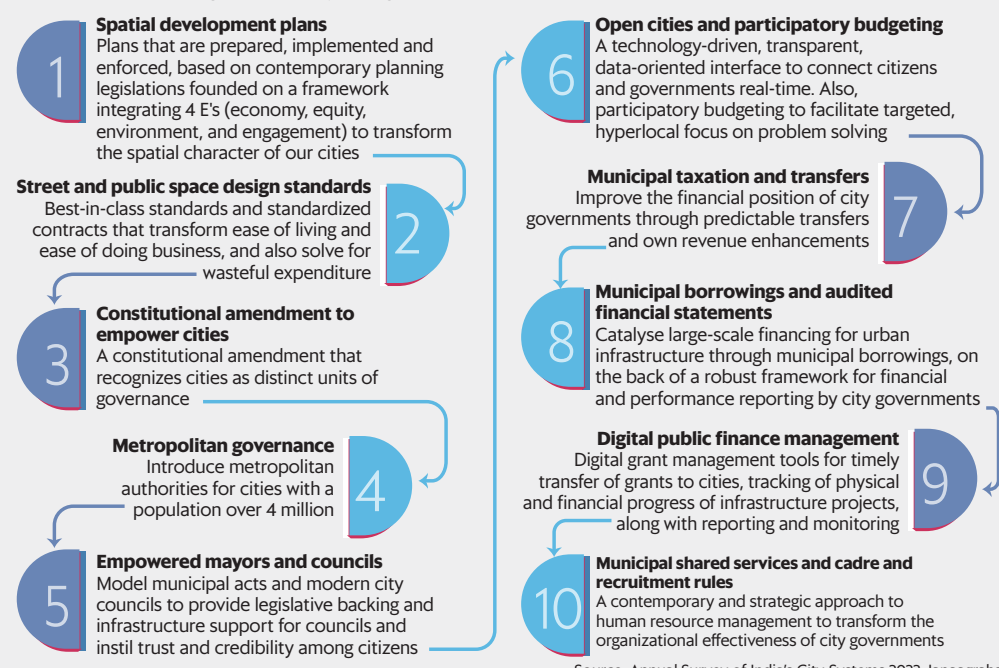
COMPILED BY SHUJA ASRAR; DESIGN BY PARAS JAIN/MINT

What will it take to transform governance in India's cities?

As the most populous country and the world's fifth-largest economy, the structure and quality of India's institutions need to be scrutinized more diligently than it has traditionally been. An efficient bureaucracy, a well-balanced federal structure, better-targeted welfare schemes, and greater autonomy for local government bodies could be key focus areas as India aims to become a developed nation by 2047.

What will it take to transform governance in India's cities?

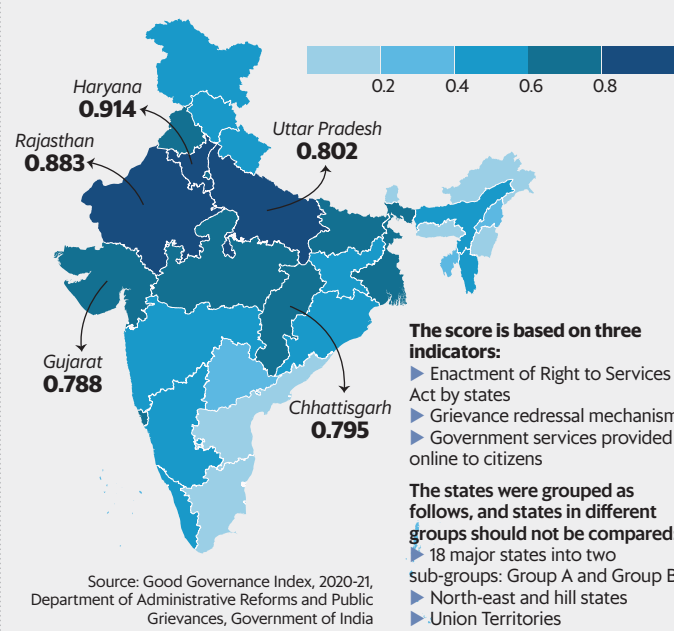
Ten 'instruments of change' proposed by Janaagraha's 2023 report to transform India's cities



Source: Annual Survey of India's City-Systems 2023, Janaagraha

Haryana, Rajasthan, Uttar Pradesh score high on citizen-centric governance index

Citizen-centric governance score in Centre's 'good governance index' (scale 0-1)



India's welfare challenge: What citizens think of growth versus economic equality

Urban India respondents (in %) when asked to pick between each pair of options

Option 1	Option 2	Option 3	
Sustainable development of rural India	73.6	26.4	Create many big cities like NYC and London
Free healthcare and education for poor	58.6	41.4	Increase income for the poor
More government jobs for the youth	57.5	42.5	Enable private sector to create more jobs
Narrowing rich-poor gap	52.5	47.5	High economic growth
Cash transfers for poor	47.3	52.7	Reducing income tax
Promoting public transport	46.3	53.7	Keeping fuel prices low
Bring caste quotas to private sector	33.6	66.4	Phase out caste quotas in public sector

Question: "What do you think should be the priority of the Indian government?" The survey covered 10,271 respondents in June-July 2022.

Source: YouGov-Mint-CPR Millennial Survey

REIMAGINING THE INDIAN STATE

REIMAGINING WELFARE WITHOUT SAFETY NETS

Building institutional capital and bringing in efficiency in administrative processes are the need of the hour



Holistic climate resilience strategies will be key to empowering people



Amit Kapoor

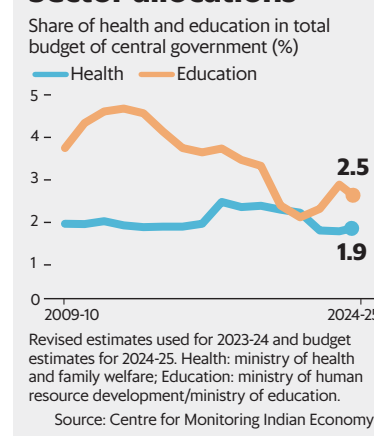
The term 'welfare' in economics has a long history, with different schools of thought defining the term in different ways. The modern usage of the term typically associates it with a system wherein the government bears a major responsibility for providing socioeconomic security to citizens. Over the years, the term has also attracted criticism, as critics have associated it with excessive or unnecessary government intervention. This has led to questions about the extent to which the state should be involved in the welfare system.

A limited definition of welfare has often associated it with provision of social safety nets, poverty alleviation programmes, social insurance and government intervention. While these are significant goals, the plethora of challenges we face today necessitates a new way of looking at what welfare constitutes—a change long overdue. Economist Nicholas Barr underscores the centrality of the welfare state and the need to redesign it to make it fit for purpose given the ever-evolving social and economic circumstances.

The question that needs to be raised is: Does the age-old concept of welfare in times that are drastically different and ever-changing really allow people to fare well? The idea of welfare needs to go beyond providing a mere buffer during tough times. The goal is not just to provide safety nets, but to create conditions that make citizens not require safety nets in the first place. The latter is the real task. The task of reimagining welfare is precisely to emphasize the latter. India is going through interesting times. Its people have demonstrated a desire for change. In this context of redefining welfare, how and what should the Indian state change? What then should state and local governments focus on?

Investing in human capital amplifies welfare efforts by making individuals able citizens, reducing dependency and enhancing overall societal well-being. The very foundation of welfare and overall being lies in the areas of education, skilling and health. According to World Bank estimates, each additional year of education leads to an increase of about 10% in annual earnings for an individual. The intrinsic value of education and its economic benefits are apparent advantages; however, a revamped Indian state must strategize to tackle learning crisis among students and equip learners with a skill set fit for today's world—one that comprises analytical, cognitive, mental and digital skills. Climate change and artificial intelligence (AI) are examples of future changes that we already recog-

Sector allocations



PARAS JAIN/MINT

nize. Many similar changes will reshape economies and societies, making job creation a dynamic process with newer segments transforming where we work and how we work.

Beyond skilling, health is another core component of a welfare system. India still lags behind on a range of health-related parameters. While the share of out-of-pocket expenditure in total health expenditure has reduced from around 62% in 2014 to 47% in 2019, it still shows that citizens bear a colossal burden of healthcare costs. A substantial increase in public investment in quality healthcare in India is central to a new Indian welfare system.

The pandemic was a jolt to our lives and livelihoods in more ways than one. It showed us the significance of building

Climate action needs a multi-pronged approach across sectors like health, transport, agriculture, energy and infrastructure

resilience to unpredictable external events. In a redesigned welfare system in India, formulating strategies to build resilience to the impact of climate change and adaptability to technological innovations and demographic shifts should be a focus area. The effects of climate are already being felt, and without necessary action, the effects will only be further aggravated.

According to the World Bank, over 80% of India's people reside in districts that are prone to climate-induced disasters. Estimates suggest that productivity decline due to heat stress may lead to job losses for around 34 million people in India. A renewed welfare system should accelerate progress towards climate-resilient development through a focus on mitigation. It is time to strategize and implement measures to assist those affected by and prone to climate-related

disasters. This will take a multi-pronged approach across multiple sectors including transport, agriculture, health, energy and infrastructure.

For efforts across the board to come to fruition and be reflected in the form of concrete outcomes and growth, revamping India's administration for a more agile state is of the essence. In order to see tangible outcomes of any welfare-oriented measures, bringing in efficiency in our administrative processes is akin to strengthening the country's backbone. As India steps into a new term, let's remind ourselves of an issue that has been a persistent source of concern and complain for a long time—lack of effective last-mile delivery of various welfare schemes.

On paper, the 73rd and 74th Constitution Amendment Acts mark a watershed, establishing local self-governance and fostering greater participation in governance. However, to what extent are local governance bodies and functionaries empowered? This issue bears relevance to India's oft-discussed implementation challenge. The third tier is the first and the closest layer of interaction between people and the government. Grassroots democracy thrives at the third tier of governance. To understand what hinders local bodies from functioning efficiently, the Comptroller and Auditor General of India is working alongside state governments to conduct audit exercises across local bodies to enhance governance, utilization of funds and service delivery.

Yet another aspect that warrants attention and discussion is the ramifications of competitive welfare strategies undertaken for the purpose of gaining favour for elections. An election-driven policy, in its pursuit of gaining voter appeal and favour, often tends to be short-term and unsustainable. Welfare issues are complex. They require long-term planning and holistic thinking. A poorly thought-out welfare policy may be unfeasible both implementation-wise and fiscally as well. It is important to think about the fiscal costs we may incur due to unsustainable and ill-conceived competitive welfare programmes. While they may seem beneficial for a certain voter base in the short-term, haphazard programmes tend to be detrimental in the long run. In addition to all our efforts to develop and grow across various sectors, reforming bureaucracy serves as the vital adhesive that binds our initiatives together, ensuring efficiency, transparency and sustainability in our progress. Efficient and streamlined bureaucratic processes form the bedrock for our future advancements.

Amit Kapoor is honorary chairman at the Institute for Competitiveness and a lecturer at Stanford University. Shivani Kowadkar, development policy lead at the Institute for Competitiveness, contributed to this article.

How to transform the government from 'the problem' to 'the problem solver'



Gulzar Natarajan

Every incoming government faces massive expectations. This time is arguably greater given the ambitious agenda of becoming a developed economy by 2047. The ability to deliver on these promises depends critically on the quality of the state's capabilities.

Why is state capability important? A capable state—in terms of its ability to plan and execute—has been critical in the history of national development. It is essential for designing and implementing policies and programmes, delivering public goods and services, collecting taxes and fees, preparing and managing contracts with the private sector, and regulating markets. Its performance manifests in the form of quality of public services, timely completion of infrastructure investments, improvements to the ease of doing business, the strength of regulatory systems, and so on.

These are the foundational

requirements for national development and economic growth. A capable state ensures that the political will and bureaucratic intent on these areas captured in the form of laws, rules, guidelines, policies, and programmes are implemented with fidelity and quality.

This insight on the critical role of the state is often lost amid public debates centering on clichéd big-bang reforms like the agriculture subsidies reforms, ease of doing business, factor market reforms, unleashing entrepreneurial energies, privatization, and so on.

In fact, all the so-called big bang reforms, even with enabling legislations, are about tens or hundreds of small steps whose effective design and execution depend on state capability. It's easy to overlook that the public and private sectors are two sides of the same coin. A strong economy cannot be built without a capable state.

Poor state capability is like the leaky bucket that drains resources and efforts with little to show for them. It is, therefore, only appropriate that the government's highest priority should be to create the institutional capabilities across all

government levels to realize its intentions and promises.

In India's federal structure, states and local governments are at the cutting edge of implementation, service delivery and generally getting stuff done.

The quality of common public services—school and college education to skill development, public health to primary and secondary healthcare, agricultural extension to industrial promotion, municipal services and social welfare—is critically dependent on the capabilities of sub-national governments and their entities.

There is a plethora of national programmes designed at the Centre but implemented by sub-national governments. In this context, in addition to setting national goals and providing financing, the central government's role would be to support sub-national governments in effective planning and execution.

This would involve enhancing the capabilities of sub-national governments by providing technical assistance in design and implementation, fostering peer engagement and constructive competition among executing units, and moni-

toring and evaluation.

This higher-level role clarity should be complemented with efforts to equip the Indian bureaucracy at all levels with the capabilities to get stuff done. This demands sustained efforts in at least six directions.

The foremost requirement for a strong state is capable personnel. This calls for good-quality training and other forms of capability devel-

Efforts to build state capability will not strain the budget, but it is a long-drawn, painstaking national endeavour

opment. Unfortunately, training today is one-off theoretical and superficial as to have become largely a perfunctory exercise. Instead, they should be prioritized as an administrative necessity, cover all cadres and levels, inculcate practical knowledge and skills, and be delivered continuously in a blended mode.

The scope of training should include work management skills

that improve the quality of supervision, monitoring and follow-up.

Second, each state government should be encouraged to prioritize building a proficient administrative training and technical assistance-providing institution.

Apart from offering training, it can be the in-house think tank to assist with process requirements like policy design, landscape scans and sector studies, data analytics, and evaluations and audits for the state and local governments. This institution should anchor partnerships with universities, research institutions and think tanks to create a knowledge ecosystem focused on practical policy research and development.

Third, the need for internal technical expertise should be met by institutionalizing fixed-tenure lateral entry as officers and hiring individual experts as consultants for specific tasks. This will also limit the widespread practice of outsourcing core activities, including their processes, to management consulting firms.

Fourth, there should be a conscious effort to create a culture of avoiding anecdotes and narrow

personal predilections and deliberating with evidence to inform policy design and execution. Such evidence should include analysis of administrative data, sample surveys and qualitative studies. The process and quality of deliberation are important. Even if the decision is ultimately political, it should be made after considering all available evidence.

Fifth, there's a need to introduce some form of performance accountability. State capability cannot be built without changing the incentives on performance (or non-performance). Those egregiously poor or corrupt should not only be not promoted but also should be forcibly retired.

Promotions should be linked to actual performance. These might be the hardest to pursue, especially given the challenges with reliable performance measurement.

Finally, there should be a campaign to infuse a higher sense of purpose and public service among public officials.

As economist Lant Pritchett said, accountability must come not from traditional top-down accounting but from bottom-up ownership of

the account centering on public service.

The public narrative that "government is the problem" should give way to "government is the problem solver", and public officials must internalize this narrative.

Fortunately, there are some ongoing efforts in all six directions. But they must be supplemented, deepened, become more focused and implemented with a strong collective commitment like with the Swachh Bharat Mission or Make in India campaigns.

Happily, efforts aimed at state capability improvements will not strain the budget. Instead, it requires a long-drawn and painstaking national endeavour. We also need to accept that its trajectory will be non-linear and non-uniform.

This investment in building institutional capital will generate the highest value for money in the long term among all investments made by the country. It should, therefore, become the topmost priority for the new government.

Gulzar Natarajan is a civil servant. The views expressed are personal.

REIMAGINING THE INDIAN STATE

TAPPING DATA TO DEFINE THE INDIA STORY

India's size and diversity mean it has to develop its own templates for data collection with proportionate increase in resources

Few parallels for our statistical system challenges



P.C. Mohanan

The vision to be 'Viksit Bharat' by 2047 can become reality only when we closely monitor progress towards our development targets and can prove at the end that we successfully met them. This rests on the institutional capacity to measure defined indicators and present them in an unbiased manner. Official statistics, considered an integral part of a country's development infrastructure, perform this role.

The United Nations has recognized that "official statistics provide an indispensable element in the information system of a democratic society, serving the government, the economy and the public with data about the economic, demographic, social and environmental situation." However, this element functions within the domain of the government, making its framework and architecture heavily reliant on the priorities and perceptions of the government of the day. Can India's statistical system surmount these challenges?

The foundation for official data collection was laid immediately after Independence when the country opted for a planned economic path. Before that, the decennial censuses, commercial trade statistics and other administrative reports were the primary source of data. The wholehearted support of the government and the data that the planning process needed ensured that India adopted several innovative statistical processes. In fact, few may remember that one of the first mainframe computers imported in the country in the mid-1960s was installed in the ministry of statistics!

The technical support from the Indian Statistical Institute saw the successful implementation of statistical sampling at a scale untested till then. This was widely recognized globally and formed the cornerstone of the national statistical edifice. It was complemented with censuses covering agriculture, livestock, manufacturing, enterprises, and more. Statutory and administrative reporting like the labour market information through employment exchanges also strengthened the database.

However, by the turn of the century, overreliance on conventional methods for data collection and processing, and the failure to produce timely data led to a steady decline of the statistical system. The need for timely data beyond the needs of the planning process was felt with non-governmental users, too.

Added to this was the global scrutiny of economic data after the East Asian crisis. The statistical system also failed to adapt to new challenges like the spread of the Internet and information technology (IT), and the growing complexity and size of the economy and society. In short, a failure to modernize.

One notable effort to identify and suggest corrective steps the government made was to appoint a National Statistical Commission under Dr R. Rangarajan. However, the recommendations of this commission could not address all the maladies, as the digitalization and data explosion changed the supply-and-demand environment in new ways not foreseen by the commission.

Today's official statistical system functions in an environment significantly different from the past, making many parts of the established processes obsolete.

Official data now has many stakeholders beyond the government, including business, academia, general public, media and international agencies. Even adhering to the sustainable development goals requires monitoring of datasets covering an array of topics.

This has enlarged the scope of official data and broadened the dimensions to include not just quantitative information of economic units, but also spatial and qualitative aspects.

Unfortunately, we now have a situation where Indian development data is under a cloud leading to growing discontent among users of Indian official statistics. Instead of a concerted effort to reorient the system, there is growing disregard and slow corrosion of key elements of the system like the population census, national sample surveys, revision of base years of economic indicators, etc.

Rather than generating independent objective data based on established procedures, there is greater reliance on data generated through portals in the form of 'dashboards' with completely opaque metadata. This has also meant a centralization of data gathering, disregarding the responsibility of state governments to track subjects under their remit, further degrading the statistical capacity of states. There are growing concerns about the privacy issues in the data assembled through such processes.

The recent labour ministry criticism of the *India Employment Report 2024* brought out by the International Labour Organization and the Institute for Human Development using data from official surveys is a case in point. Such instances can discourage independent analysis.

The scope of official data has broadened to include not just quantitative information of economic units, but also spatial and qualitative aspects

We have also witnessed government agencies widely publicizing global indices when they are favourable even if these have very weak data support.

On the flip side, results of the government's own surveys are criticized when they are in conflict with official claims. The government's sensitivity to data is a new dimension negating the advantages of having multiple sources of data that can actually help cross-validate official data.

The lack of interest in strengthening official data by central agencies within the federal framework impacts the states in more serious ways. For example, the gross state domestic product (GSDP) is a key metric used in the devolution of central funds to states. The current methodology has very little room for use of state-specific data in GSDP estimation.

These developments are in the backdrop of growing digitalization of business and social interactions and the growing interest in data by the media and researchers.

The high standards of data journalism and the incisive data analytics used by researchers are in sharp contrast to the official indifference to data. These independent agents have the capacity to work on underlying data and bring out insightful findings rather than reporting official conclusions.

Lack of auditing of statistical processes is

another area that impacts accountability. We have had national censuses and surveys that have cost huge resources but did not produce any results due to reasons casually ascribed as quality issues, without any professional justifications.

The path to becoming a developed nation by 2047 needs milestones in the form of socioeconomic indicators meeting global standards based on transparent and verifiable methodologies open to scrutiny and criticism. These steps are essential to restore public trust in data, both nationally and globally. This requires a series of new initiatives in statistical capacity building and institutional reforms. These include revisiting institutional structures for managing official data leading to more autonomy for the statistical system to restore the primacy of data. This can be along the lines of reforms in the UK statistics in recent times.

India's size and diversity mean it has to develop its own templates for data collection with proportionate increase in resources. The uneven capacity of states for data gathering and dissemination is an area of concern which, in the short run, needs the central agencies to be more proactive and produce national and sub-national data.

The integration of the many parts of the statistical system also calls for better metadata management techniques, without which data silos will have very little interconnectivity. Non-standardization of data elements has always been a problem for data users. Despite efforts in establishing e-governance standards in administrative data, at the ground level the statistical system is yet to derive its benefits. Same is the story of nearly two decades of efforts towards integration and access to spatial data where there are also issues of security involved.

The challenges faced by India's statistical system will have few parallels anywhere and even fewer models to emulate. The population size and the informality of economic activities will make measurement issues complex here unlike in developed countries. But transparent and autonomous institutions alone can defend the system.

The first set of reforms to enhance credibility is to build an independent institution in charge of national statistics with powers to break down the silos. Such an institution will help identify operations that have outlived their initial objectives like economic census, agricultural census, etc., and focus on production of key macroeconomic and social indicators.

Taking into account the new dimensions of data and the growing economy, human resources should be enhanced with more stress on the multidisciplinary nature of data and its handling. Experience also shows that initiatives like the open data portal of the National Informatics Centre, data and analytics platform of NITI Aayog, etc., have to be part of the statistical infrastructure and not just IT initiatives.

Though most statistical databases are freely given to researchers and are available in data centres of research institutions, data gathered by official agencies for various schemes are not in the public domain.

Making these available with safeguards for privacy and their objective analysis can also contribute to understanding the developmental milestones as we progress towards 2047.

P.C. Mohanan is a former acting chairman of the National Statistical Commission.



From PDS to police, the state has to find better ways to ally with its citizens



Niranjana Rajadhyaksha

The fictional village of Phulera is back on our screens. The third season of the streaming series *Panchayat* has once again brought to life

the rustic charm, the petty quarrels, the human drama in this little village in Uttar Pradesh. The tales from Phulera also tell us a lot about an issue India needs to grapple with in the coming decades—the ability of the state to work efficiently at the many points where it actually deals with citizens on a daily basis. This is the frontline of the state: the world of the ration office, the police constable, the public health centre, the sanitation inspector, the school teacher and the panchayat secretary.

The three seasons of the series provide tantalizing glimpses of how a rickety state struggles with issues such as welfare payments, sanitation programmes, installing solar

panels, rural roads and much else. Phulera is an archetypal village in the Gangetic belt, but building an effective state at the urban frontline is as important as doing so at the rural frontline.

Indians are inevitably moving in larger numbers to cities, making us a predominantly urban society in the years ahead. And it is not just a matter of how many people will live in cities. Large urban centres drive economic growth, by bringing together skills, capital and ideas through a dense network of interactions.

In his new book, *Accelerating India's Development: A State-Led Roadmap For Effective Governance*, Karthik Muralidharan of the University of California San Diego writes that service delivery in a federation such as ours should primarily be a local government function. "One of the most important governance reforms we need is to shift responsibility for service delivery from states to local bodies." He also points out that the urge to give local governments autonomy in service

delivery should be balanced by the risk of capture by local elites. More broadly, there are three core issues here.

First, most local governments are financially emaciated. They depend on transfers from the state government or the Union government for a big portion of their budgets. A pioneering study of municipal budgets by the Reserve Bank of India showed that city governments directly generate only ₹65 out of every ₹100 that goes into their budgets. The rest comes from financial transfers.

Some of this is understandable. The political reason is that most large countries assign more taxation powers to higher levels of governments, perhaps because the distance from local interest groups makes it easier to design effective tax policy. The economic reason is that a lot of income is generated from nationwide economic activity even though it may be booked at the place where an individual or company resides.

There is a compelling case for

strengthening the finances of cities. One option is for cities to collect more money through property taxes, user fees, parking charges and the like. However, these are all inelastic sources of revenue, which do not automatically grow in tandem with the underlying economy.

Cities need more elastic sources of revenues. One option is to assign a small proportion of the money

Building an effective state at the urban frontline is as important as doing so at the rural frontline

collected through the goods and services tax (GST) directly to cities, rather than route them through state governments, at least for the large cities to begin with. GST is a destination tax, so assignment should not be a major problem.

Second, the effectiveness of delivery of services by the frontline

of the Indian state also depends on clarity of purpose. The Indian Constitution was amended in 1993 to recognize the third tier as a formal part of the constitutional structure, in addition to the Union and state levels. There was also an attempt to carve out some specific tasks for local governments. For example, the 12th Schedule that was added to the Constitution after the 74th Amendment identifies 18 functions for city governments. These range from some that are very specific to cities (urban planning, land use, parks) to the more generic (planning for economic development, promotion of cultural activities, protection of weaker sections of society). Similarly, the 11th Schedule specifies the responsibilities of village panchayats in 29 matters.

A lot of the tasks that local governments are expected to perform are also linked to national requirements such as citizen safety, public health and school education.

The result is a spaghetti bowl of exclusive as well as derived tasks. Local governments end up having

limited autonomy to take independent decisions, even in the tasks that are constitutionally assigned to them. Nor do they have the freedom to hire adequate staff. Most of the people working at the frontline are employed by state governments. They also tend to report to seniors in that hierarchy rather than local elected officials. The incentives are thus misaligned in many cases.

Third, the staffing distribution of the Indian state across its three tiers—Union, state and local—is very different from other large countries such as the US and China. Devesh Kapur of Johns Hopkins University has shown how most government employees in those two countries are concentrated in either the central or local levels. State government employment is much less.

In India, it is the state governments that have the most staffing strength; the Union and local governments are relatively understaffed. "No matter how carefully designed development pro-

grammes are designed by national bureaucracies, ultimately their performance on the ground hinges on how effectively they are implemented by local bureaucracy at the frontline," writes Kapur, citing the work of Harvard University development economist Lant Pritchett.

A more balanced federal design across the three tiers of the Indian state would be a better reflection of the concerns of 21st century India, as it climbs up the development ladder.

A simple way to think about this is as follows: The Union government stays focused on policy frameworks as well as national public goods; state governments pour their energy into local public goods as well as competing for investments; and local governments raise their game at the many points where development programmes touch the lives of citizens every day. Phulera is a microcosm of that story.

Niranjana Rajadhyaksha is executive director at Artha India Research Advisors.

MAKING INDUSTRY FUTURE-READY

GLOBAL TECHNOLOGY, LOCAL ENGINEERING

The manufacturing sector must adopt an inclusive model that decouples growth from emissions



Digitization can enable sustainable manufacturing, greener automation



Sanjeev Sharma

To be a catalyst for India's ambition of becoming one of the top three global economies by 2050, the manufacturing sector must adopt a sustainable and inclusive model that decouples growth from emissions for a developing economy of this scale. This will lower our total cost of societal development. Over recent years, Indian manufacturing has successfully undergone a transformation, integrating global technology with local engineering. This evolution has created a foundation for a unique model that can drive significant economic growth. Here are the key areas pivotal to this model.

Sustainability in practice

India ranks fourth globally in renewable energy installed capacity, positioning it well to integrate sustainability into its manufacturing processes. There is substantial potential in manufacturing sectors like solar photovoltaic modules, battery storage, wind turbines, and various electrification and automation components essential for stabilizing and converting green power.

Beyond solar and wind, investments in green hydrogen, sustainable aviation fuel, carbon capture and battery storage are expected to reach approximately \$35 billion annually by 2030. By 2031-32, India aims to build 47GW of battery storage capacity, which is comparable to installing nearly 80 of the largest battery storage facilities globally.

The infrastructure push by the government is also increasing the demand for sustainable products and solutions such as green steel and cement, energy-efficient motors and drives, resource monitoring, and tracking precision equipment. By developing and staying the course on sector-level decarbonization pathways, it is possible to mitigate about 50% of the cumulative emissions from the new steel and cement production capacity that will be added between now and 2040. Technology standards, price support and public outlay on critical support infrastructure are some of the ways how this model can be achieved.

Energy efficiency and younger, evolving infrastructure

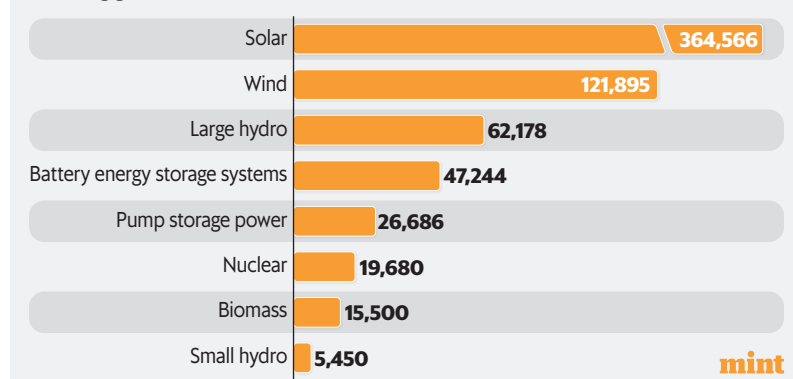
During COP28, 130 countries signed a pledge to double the annual rate of energy efficiency improvements by 2030. For India, this goal is attainable as much of the country's future infrastructure is still being developed with a digital layer.

An optimal route for this would be replacing International Efficiency 2 (IE2) with IE3 as the minimum efficiency standard for motors, leading to significant energy savings. Decarbonization, digitalization and electrification are creating new infrastructure in the social, digital and energy fields.

Future infrastructure development

Clean tech

Installed carbon-free capacity targets for 2031-32 as per the National Electricity Plan (in gigawatt)



Source: National Electricity Plan

SATISH KUMAR/MINT

will increasingly consider the hydrogen supply chain and the electric vehicle (EV) value chain, from mining to gigafactories, EV charging and recycling. These developments present a solid opportunity for India to adopt a sustainable manufacturing model that caters to evolving structures.

Scalability of digital and automation solutions

A key success of this sustainable manufacturing model would emanate from the scores of small and medium companies and even big companies adopting customized and scalable digital solutions to drive sustainability in tier-II, III and IV cities across the country. Digitalization is a key enabler of sustainability and makes automation safer and greener. Indian companies thriving on the entrepreneurial spirit in tier-II and III cities have realized the potential of not only automation but also digitalization to render

The success of sustainable manufacturing lies in small and medium companies adopting customized digital solutions

people, process and asset efficiency with resultant environmental sustainability.

At ABB in India, 37% of our customers are from tier-II and III cities. In some business areas, the contribution from these areas is even higher, reaching up to 40% of channel partner business with a five-year compound annual growth rate of 20%.

Across India, we have implemented diverse solutions. These include an edible oil company in Ganganagar, Rajasthan, which opted for automated drives and expellers; a spices company in Guntur, Andhra Pradesh, using an energy manager solution to monitor equipment; and energy terminals in Meerut, Uttar Pradesh, benefitting from digital solutions for monitoring low-voltage switchboards.

Having been involved in "digital" since the first use of microprocessors in auto-

mation offerings nearly 50 years ago, ABB has a long history of industrial automation and digital experience to further help industries improve production.

Enabling demography to continue as a dividend

India's population is projected to reach 1.6 billion by 2040, with a significantly younger demographic. This growth will make India a major contributor to the global workforce, with a quarter of the 1.3 billion net additions expected to come from India. To accommodate this growth, manufacturing must play a strategic role alongside the service sector.

This involves not only training people in digital skills, but also deploying digital tools for efficiency and scalability of upskilling and reskilling across sectors. A sustainable manufacturing model driven by digitalization can significantly contribute to this effort.

Digital tools can facilitate speed and scale of skilling programmes, enhancing productivity and making Indian shop floors safer and more attractive to future generations. It is also crucial to create an inclusive environment that encourages more women to pursue careers in this sector.

Collaboration for value chains and localization

Collaboration is essential for the success of any model, particularly in localizing supply chains. The unique Indian manufacturing model can carve out its niche by adopting sustainable and circular economy practices, such as reducing the use of bioplastics in packaging and optimizing water usage.

Collaboration is needed to address value chain concerns related to import dependencies on items like certain grades of steel, copper and printed circuit boards. Long-lead supply chains, especially in electronics and semiconductors, require dedicated focus to co-develop and optimize facilities required especially in areas like assembly, testing and packaging. Increasing free trade agreements with various countries will also support these efforts.

Sanjeev Sharma is country head and managing director, ABB India.

To forge a path to prosperity, domestic manufacturing must take a giant leap



Anish Shah

In a few days from now, finance minister Nirmala Sitharaman will present her seventh consecutive budget, a record in India's history. This is also the first Union budget in the third term of Prime Minister Narendra Modi's government. Undoubtedly, we expect directional continuity in policy announcements with a thrust on economic growth, social development and sustainability, in line with the vision for Viksit Bharat 2047. Here are the key priority areas this budget should focus on.

First is to scale up manufacturing. Domestic manufacturing must take a giant leap for India to be a global manufacturing hub. This is a necessity if we are to create scores of jobs and chart out a path for prosperity for our citizens.

A 360-degree planning of the

entire value chain—from design to manufacturing—must be done, especially in hi-tech areas such as defence, electronics and semi-conductors. Micro, small and medium enterprises (MSMEs) are an integral part of the ecosystem, and the industry must work with the government to enhance their presence and leverage their strengths.

Second is a simplified tax structure. The government has taken numerous actions to make the tax structure one of the best in the world. We expect continuity in tax policy, with further simplification of the tax regime as it will enhance ease of doing business and help improve investor confidence. For instance, we must work towards a simplified capital gains tax regime by having just two or three broad heads of asset type and by bringing uniformity in the applicable rates and holding period for instruments within the same asset class. Government should also lay down a road map for rationalization of

TDS, or tax deducted at source, rate structure as this will considerably ease the compliance burden on taxpayers and avoid litigation due to characterization disputes.

Third is greater thrust on research and development (R&D). Over the next three years, India must enhance its overall R&D spend to more than 1% of GDP (from 0.7% currently). The ₹1 trillion corpus announced in the interim Union budget for research and innovation in sunrise sectors needs to be operationalized. It must be ensured that TRL (technology readiness level) 2-4 research is taken up to innovations with TRL 8-9 implementation levels. Further, a collaborative approach for creating innovation clusters is required, co-locating private sector, academia, investors, start-ups and government funded R&D institutions for critical areas such as renewable energy, water, smart mobility, new materials, and life sciences. The government can

examine a shift in focus of publicly funded research in autonomous government laboratories to publicly funded research in higher education institutions as this will build a supply of advanced research talent needed by companies.

Fourth is focus on skills and

A 360-degree planning of the entire value chain, from design to manufacturing, is the need of the hour

quality jobs. A pertinent economic issue that needs to be addressed is the dichotomy of unemployment and skill gap. Only 3.3% of our labour force in the age group of 15-59 years has formal vocational training and even among the future workforce (age group 15-29 years), this ratio is less than 5%. This is

starkly low when compared with 52% in USA, 75% in Germany and 96% in South Korea. Greater spend towards vocational training and skilling is much needed. Collaborative PPP models of skilling must be explored to ensure that acquired skillsets match industry expectations.

Fifth is to get more women in the country's workforce. India could boost its annual growth by 1.5 percentage points if around 50% of women could join the work force (as against 35.9% in FY23). With right skilling, and supportive policies and schemes, we can place many more women in manufacturing roles. We must facilitate and incentivize market access for women entrepreneurs through public procurement and greater use of e-commerce. We must also increase access to finance and capital for women and young entrepreneurs. There should be a continued thrust on women empowerment in this budget as seen in the earlier

budgets. More lakhpati didis with right skilling will be a win-win for rural economy.

Sixth is to strengthen the farm-to-fork economy. We need multi-faceted policy interventions to unlock the potential of Indian agriculture and to strengthen the entire value chain from farm to fork. To boost agri productivity, the government should launch an agricultural yields mission for the bottom 100 districts on the lines of aspirational districts. A collaborative centre-state approach towards establishing potential agri-clusters may also be considered. Developing farm gate infrastructure including scientific storage, grading, processing, lab testing, packaging, price discovery mechanism, point of sale/purchase, and transport facilities will be critical to modernize agriculture and reduce post-harvest losses (from the current 40% to 20%). Further, India must work on developing climate-resilient seeds through R&D col-

laboration between private sector and government agri-research institutions.

Seventh is to continue focus on sustainability. India has set for itself the target of 'net zero' by 2070. We need an enabling policy framework that can target resources towards both green areas as well as transition areas. Another facet of promoting sustainability is circularity, which can by itself help us economize use of resources of all kinds. The government should come out with a national taxonomy for green finance which will set a standard framework and nudge banks and other financial institutions to set sustainability targets and align their business strategies accordingly. Likewise, there is a need to create pathways for green transition for all sectors, and development of a national framework for circular economy.

Anish Shah is president of the Federation of Indian Chambers of Commerce and Industry.

MAKING INDUSTRY FUTURE-READY

UNLEASHING THE SPIRIT OF INNOVATION

The next decade will determine whether India emerges as a true tech superpower or remains on the periphery

India's path to global leadership lies in mastering technologies of the future



Bhavish Aggarwal

In the last decade, India's gross domestic product (GDP) has nearly doubled to \$3.5 trillion, showcasing our resilience as one of the world's fastest-growing major economies. As we envision *Viksit Bharat* by 2047, increasing our economic growth from 8% to 12% could transform India into a \$50 trillion economy. The global landscape is witnessing rapid technological advancements, particularly in artificial intelligence (AI) and new energy. Our peers, notably China, are investing heavily in 'new productive forces', transforming traditional industries and fostering emerging sectors.

To drive India's growth and competitiveness, we must prioritize AI and new energy as foundational technologies that can revolutionize our entire economy.

In 1947, we won our political freedom. In 2047, we must achieve our technological freedom. We need to create our own playbook for technological advancement—one that addresses our unique challenges and leverages our strengths. It's about using tech not just for economic growth, but for societal transformation.

Building India's own AI stack: While India's economy has digitized significantly, our compute penetration remains low. Despite our huge success in information technology (IT) services, they represent just 1% of the \$30 trillion global technology industry. Our global competitors have rapidly accelerated investments in AI, pouring hundreds of billions into research, infrastructure and talent. India's approach to AI must leverage our core strengths across data, compute and algorithms.

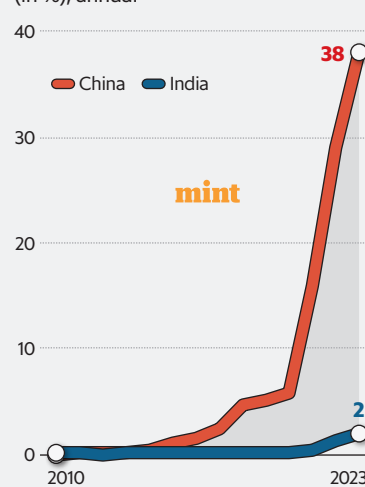
Data colonization: India generates 20% of the world's data, yet 80% is stored offshore, processed into AI and imported back in dollars. This 'data colonization' is reminiscent of the East India Company's practices, where India's raw materials were extracted and processed products sold back at a premium. Today, our digital raw material—data—is similarly exploited. We must reverse this trend by leveraging our digital public infrastructure (DPI) to create privacy-preserving datasets. We can build on our DPI success (UPI, UIDAI, ONDC) to create the world's largest open-source AI, grounded in Indian ethos.

Compute infrastructure: In terms of compute infrastructure, India currently has only 1GW of data centre capacity, while the global capacity is 50GW. By 2030, projections show the US at 70GW, China at 30GW and India at 5GW if we maintain our current trajectory. To achieve AI leadership, we need rapid AI adoption, data localization norms, incentives for global computing companies, and production-linked incentive (PLI) schemes for data centres. Deploying 50GW by 2030 will require \$200 billion in capital—an ambitious but achievable goal.

India is the world's largest hub for silicon development and design talent, yet we lack Indian-designed chips. We need industry-led chip design projects and government incentives through research-

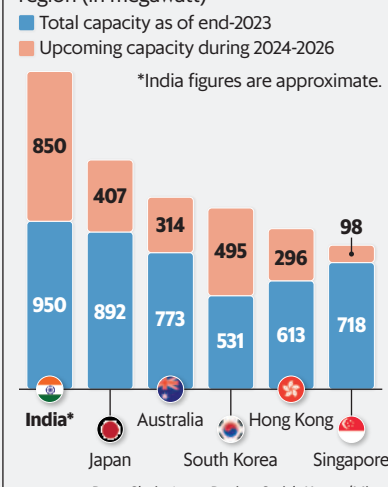
Electrifying trends

Share of EV sales in total sales (in %), annual



Source: International Energy Agency

Data centre capacity in Asia-Pacific region (in megawatt)



*India figures are approximate.
Data: Shuja Asrar, Design: Satish Kumar/Mint
Source: CBRE Research (Asia Pacific)

linked incentive schemes. Accelerating the deployment of cutting-edge process fabs of less than three nanometers in India is a geostrategic imperative.

R&D on algorithms: As AI research becomes increasingly closed and proprietary, India has a unique opportunity to become a global champion of open innovation in AI research and development (R&D). We can achieve this by attracting world-class talent and the best scientists to work in India, providing industrial-scale resources for research and offering government incentives for AI R&D. By creating a globally leading open innovation platform for AI, India can position itself at the forefront of AI advancement while ensuring that our values and perspectives shape the future of this transformative technology.

New energy supply chains: The new energy paradigm is shifting from mining

By building our own technologies and supply chains, we can make our economy more energy-efficient

and refining of fossil fuels to advanced material sciences, particularly for critical minerals like lithium. This transition is reshaping the global energy landscape, and India must position itself at the forefront of this revolution.

The new energy ecosystem rests on three pillars: renewable energy (RE) generation, battery storage and electric vehicles (EVs).

RE generation: India's RE capacity has grown from 72GW in 2014 to over 175GW in 2023, with solar capacity rising from 3.8GW to more than 88GW. However, we still lag behind global leaders. In 2023, China deployed 215GW of solar energy capacity compared to India's 8GW. We must intensify our focus on RE deployment to reach our target of 500GW by 2030.

Battery storage: For renewable energy to be truly effective, we must couple it with robust battery storage solutions.

Currently, our battery storage production capacity is only 2GWh, compared to China's 1,700GWh. To power our RE grid and achieve 100% EV adoption, we need to aim for 1,000GWh capacity. This significant increase in battery storage will not only support our RE goals but also drive down costs and improve energy accessibility across the country.

The EV sector: In the EV sector, India's current auto penetration is less than 200 vehicles per 1,000 people, with 2 million EVs sold annually compared to China's 30 million. By 2030, India should aim to become the world's largest EV market, potentially producing 50 million EVs. This shift will create a cleaner environment, lower transport costs for consumers and reduce the economy's overall logistics expenses.

Currently, 90% of the new energy ecosystem—from solar production to lithium cell production and midstream processing to EV manufacturing—is concentrated in China. By building our own technologies and supply chains, we can make our economy more energy-efficient and create tens of millions of future-ready jobs. This transition will secure our energy independence and position us as a key player in the global fight against climate change.

India's path to global leadership lies in mastering these technologies of the future. Our journey isn't about catching up; it's about leapfrogging our competitors to become pioneers in AI and new energy paradigms. This is our moment to transform India into the world's most technologically advanced economy, creating hundreds of millions of future-ready jobs. To realize this vision, we need a unified effort from all stakeholders in our society. Just as every Indian played a part in our struggle for independence, every citizen now has a role in building our technological future. We stand at a critical juncture. The next decade will determine whether India emerges as a true tech superpower or remains on the periphery. It's time for bold action and big dreams. The future is ours to create, and the time to act is now.

Bhavish Aggarwal is co-founder and chief executive officer of Ola Cabs, and the founder of Ola Electric.



India's deep pool of domestic surpluses can be directed towards startups



Renuka Ramnath

As India marches closer to the status of a \$4 trillion economy and the world's fourth largest, a crucial question emerges: how do we equip ourselves for the road ahead? For India to wear the crown of a developed nation, we require 10x growth targeting the \$40 trillion mark.

It is not just growth, but other goals that need to be addressed. I believe there are five pillars common to every developed nation: economic strength, evidenced by per capita income, and backed by a stable fiscal/monetary environment; superior quality of life for all citizens, coupled with universal access to education and healthcare; social stability, backed by

trustworthy legal systems; a fast pace of innovation and technological advancement; and strategic relevance to the global economy. Meeting these goals would also see us lifting millions out of poverty and building an India that withstands the test of time.

As we aspire to become a developed nation, the task on hand is to have broad-based growth which will be anchored on creating more than 100 million new jobs. According to projections by the Confederation of Indian Industry (CII), startups are expected to create 50 million jobs by 2030, which is certainly encouraging. In the last two decades, particularly, we have witnessed the emergence of innovative, tech-driven business models that have made a significant contribution to inclusive growth, having cultivated an ecosystem of new jobs and allowed for low-cost access to products and services.

Achieving developed nation status will require concerted effort and collaboration bringing together policymakers and business builders.

First, the government needs to bring accelerated policy development within 10-20 priority sectors that are directly linked to large-scale employment potential and can contribute to our target of more than 100 million new jobs. These sectors can be chosen based on a mix of factors including demand potential, supply-side factors including available skillsets, and keeping in mind sectors where human skills are indispensable. These could include diverse areas from labour-intensive manufacturing to core services such as healthcare and hospitality.

Second, policymakers and businesses will benefit from focusing on enabling more women to participate in this development jour-

ney. Currently, the female labour force participation rate stands at only 32.8%, as per the ministry of labour and employment's 2023 statistics, or less than half of males. There is an urgent need to bridge this gap. To achieve this, we must prioritize initiatives that increase

It is necessary to maximize entrepreneurs' access to capital, and fuel unfettered innovation

women's employment opportunities. One key gap that needs attention is developing a robust care economy, boosted by investments in caregiving infrastructure, fair compensation for caregivers, and comprehensive training that includes technical skills and essen-

tial qualities such as empathy.

While implementing effective policies and initiatives is essential, it is also necessary to maximize entrepreneurs' access to capital and fuel unfettered, disruptive innovation. India has a deep pool of domestic surpluses that can be directed towards startups.

In India, the Pension Fund Regulatory and Development Authority Act was enacted about a decade ago, allowing for a 5% allocation to alternative investment funds. Despite this regulatory framework, the actual involvement of these funds remains limited. In this context, there is an urgent need for the government to recognize that just enabling regulations is not enough.

Government-led allocators of capital can play a role in building strong guard rails around portfolio construction and prioritize fund managers who can deliver good

risk-adjusted returns while driving agile, disruptive innovation in India and helping meet our country's development goals.

Also, technology can play a significant role in strengthening our business environment and helping us leapfrog into development faster than the past experience of other economies. The transformative impact of innovations like Aadhaar, the Unified Payments Interface (UPI) and direct benefits transfers under the India Stack exemplifies this trend. By harnessing India's technology talent, the government can further deploy artificial intelligence to streamline its operations, enhance inter-departmental coordination, build governance and deliver efficient services to businesses.

While technology certainly will take the driver's seat in Mission Possible, we also need to be aware of its environmental impact, espe-

cially with sustainability becoming as important as economic progress. Climate change is staring humankind in the face, and particularly for economies like India, there are significant threats ahead like unpredictable weather, water scarcity and food security challenges.

To mitigate these risks, prioritizing business consciousness around sustainability will be key. I believe it is the tandem of policymakers, investors, and industry—that will shape the future of our nation. The foundation of this synergy, however, must be built on the pillar of mutual trust. If we play our cards right, a brighter, self-sufficient tomorrow awaits India.

Renuka Ramnath is founder, managing director and chief executive officer of Multiples Alternate Asset Management.