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The article discusses vision impairment, focusing on inherited retinal diseases (IRDs).

Retinal diseases: RNA therapeutics show promise but is India ready?

There is currently no large cohort study in India, i.e. involving at least 500 patients, to describe the mutation spectrum of IRDs; such extensive studies are vital for researchers to identify the most common genetic defects that can subsequently be targeted using precision medicine

Sandeep Sarma Asodu

Vision is crucial to navigate the world, connect with others, and perform everyday tasks. It helps us perceive colours, shapes, and movement, which are essential to learn, work, and keep safe.

According to the World Health Organisation, more than 2.2 billion people worldwide experience some form of vision impairment. The causes range from cataracts and diabetic retinopathy to glaucoma, age-related macular degeneration, and inherited retinal diseases (IRDs).

IRDs are genetic conditions that lead to progressive vision loss, often resulting in blindness. These diseases stem from mutations in more than 300 genes responsible for the function of the retina, the light-sensitive tissue at the back of the eye.

While some individuals may lose their sight shortly after birth, others experience gradual deterioration over time. In many cases, early intervention could slow down or even prevent the progression of blindness.

An estimated 5.5 million people suffer from IRDs around the world, with a prevalence rate of one in 3,450. However, the situation is more critical in India. Studies have revealed significantly higher prevalence, with one in 372 individuals in rural South India, one in 930 in urban South India, and one in 750 in rural Central India affected by these conditions.

A treatment breakthrough

In 2017, the U.S. Food and Drug Administration (FDA) made a historic move by approving the first gene therapy for blindness caused by mutations in the *RPE65* gene.

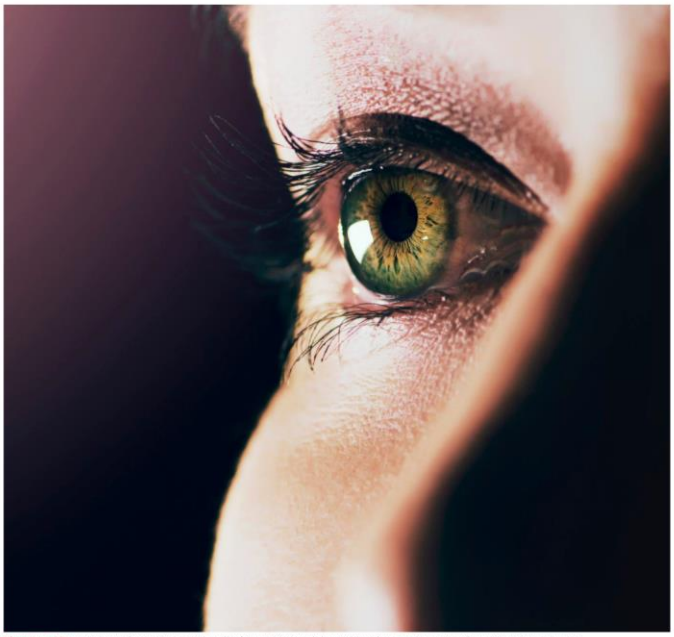
This approval sparked hope for patients with other genetic causes of blindness. Currently, more than 50 clinical trials are exploring gene therapy as an option to treat various inherited eye disorders.

In India, however, awareness among clinicians about the availability and potential of *RPE65* gene therapy remains limited. While gene therapy has proven revolutionary, it is not yet a universal solution for all genetic eye diseases. This is where RNA-based therapies are poised to make a significant impact.

RNA-based precision therapeutics are emerging as a game-changer for genetic disorders, including IRDs. Unlike DNA or genome-editing therapies, RNA-based therapies offer a safer alternative as they make temporary changes that don't carry over to future generations, reducing the risk of unintended long-term effects.

Recent advancements have introduced RNA-based therapies like antisense oligonucleotides (ASOs), which have already been used successfully to treat diseases such as spinal muscular atrophy and Duchenne muscular dystrophy. Medical researchers are now exploring ASO therapy for retinal conditions like Stargardt disease, Leber congenital amaurosis, and retinitis pigmentosa.

Beyond ASOs, researchers are also developing more advanced RNA-based options to address IRDs. One promising approach involves RNA-editing with ADAR enzymes, which can correct specific genetic mutations at the RNA level. This method has the potential to restore protein production in retinal cells without altering the underlying DNA, offering a new way to treat retinal degenerative diseases caused by single-point mutations.



Visual trouble: An estimated 5.5 million people suffer from IRDs around the world, with a prevalence rate of one in 3,450. GETTY IMAGES

Another innovative strategy is the use of suppressor tRNAs to bypass stop-codon mutations, which can prematurely halt protein synthesis in retinal cells. By enabling the production of full-length proteins, this approach could help restore proper retinal function in IRD patients, where stop-codon mutations disrupt vital protein production.

Another potential small molecule RNA-based therapy is PTC124, also known as ataluren, which is already being used to treat patients with cystic fibrosis and Duchenne muscular dystrophy. Recently, clinical trials have begun to investigate its use in treating a rare developmental eye disease called aniridia.

Taken together, these options offer a more targeted, personalised treatment approach that could halt the progression of IRDs and improve patient outcomes with greater precision.

India and precision therapeutics

Precision medicine is an approach that tailors treatments to an individual's genetic makeup, lifestyle, and other factors, offering a more targeted alternative to the one-size-fits-all approach of traditional options.

For rare diseases like IRDs, understanding the genetic mutations prevalent in a population is essential for researchers to develop effective RNA-based therapies. Although researchers have linked more than 300 genes to IRDs, research in India has yet to fully map the genetic mutations responsible for these conditions in the local population.

IRDs are genetic conditions that lead to progressive vision loss, often resulting in blindness. These diseases stem from mutations in more than 300 genes responsible for the function of the retina, the light-sensitive tissue present at the back of the eye

In fact, there is currently no large cohort study in India (i.e. involving at least 500 patients) to describe the mutation spectrum of IRDs. Such extensive studies are vital for researchers to identify the most common genetic defects that can subsequently be targeted using precision medicine.

For example, the *ABCA4* gene is commonly mutated in IRD patients worldwide and is a popular therapeutic target. However, we lack a clear understanding of whether it is just as prevalent in Indian populations and/or whether some other mutation is expressed more often in certain ethnic groups.

India's large size and diverse population add another layer to this challenge.

Genetic mutations can vary significantly across different communities, making it difficult to identify common mutations. Accurately mapping these mutations necessitates extensive, resource-intensive research across various subgroups.

Additionally, there are several barriers, including a lack of awareness of the genetic basis of IRDs among the people at large and healthcare providers alike, limited availability of genetic counselling services, insufficient research funding, and restricted access to diagnostic infrastructure in rural areas.

Thus, to fully unlock the potential of RNA-based therapeutics, India must prioritise genetic research with a particular emphasis on understanding the mutation profiles of people with IRDs, in collaboration with local research institutions and healthcare providers.

A notable example of such a collaboration is a June 2024 study by researchers from the CSIR-Institute of Genomics and Integrative Biology, New Delhi, and the L.V. Prasad Eye Institute, Hyderabad. The teams' findings led to the development of a precision therapy for a specific form of IRD.

Expanding partnerships between global and local pharmaceutical companies, as well as research institutes, will also make these treatments more accessible to Indian patients. Raising awareness among clinicians and researchers about advances in RNA therapies will likewise be crucial to ensure they are implemented effectively.

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- It also highlights RNA-based therapies as a promising treatment, emphasizing India's need for genetic research and precision medicine.

Gene Therapy Breakthroughs

- In 2017, the U.S. FDA approved the first gene therapy for blindness caused by RPE65 gene mutations.
- Over 50 clinical trials are exploring gene therapies for IRDs, but awareness in India remains low.

Inherited Retinal Diseases (IRDs) and Their Impact

- IRDs are genetic disorders that cause gradual vision loss, often leading to blindness.
- These diseases result from mutations in over 300 genes responsible for retinal function.Some people lose sight at birth, while others experience slow deterioration over time.
- Early intervention can slow or prevent blindness.
- About 5.5 million people worldwide have IRDs, with a prevalence of 1 in 3,450 globally.India has a higher prevalence:1 in 372 in rural South India1 in 930 in urban South India1 in 750 in rural Central India

RNA-Based Therapies: A Safer Alternative

- RNA-based therapies, like antisense oligonucleotides (ASOs), offer temporary, precise treatments without altering DNA.
- ASOs have successfully treated diseases like spinal muscular atrophy and are now being tested for retinal conditions.
- Advanced RNA-editing techniques, such as ADAR enzymes and suppressor tRNAs, can correct genetic mutations and restore retinal function.

Precision Medicine in India

- Precision medicine tailors treatments to genetic makeup, lifestyle, and other factors.
- India lacks large-scale studies to map IRD mutations, essential for developing targeted therapies.
- Genetic mutations vary across India's diverse population, requiring extensive research.

Barriers and Solutions

- Challenges include low awareness, limited genetic counselling, insufficient funding, and poor diagnostic access in rural areas.
- Collaboration between research institutions, like CSIR-IGIB and L.V. Prasad Eye Institute, has led to precision therapy development.

- Partnerships between global and local pharmaceutical companies can improve treatment accessibility.

Conclusion

- RNA-based therapies offer hope for treating IRDs in India.
- Prioritizing genetic research, raising awareness, and fostering collaborations are crucial to making these treatments accessible and effective for patients.

UPSC Mains Practice Question

Ques: Examine the potential of RNA-based therapies in treating diseases. Discuss the challenges and strategies for advancing precision medicine in India. **(250 Words /15 marks)**

Scientists discovered a fossilized neck bone of a young Cryodrakon boreas in Canada.

- The fossil reveals evidence of a possible crocodilian ambush attack during the Cretaceous Period.

Species in News: Cryodrakon Boreas

- About 76 million years ago, a young Cryodrakon boreas, one of the largest flying creatures in history, was likely ambushed by a crocodilian while drinking water.
- Cryodrakon boreas was a species of pterosaur, a flying reptile that lived during the Cretaceous Period, about 76 million years ago.
- It was discovered in Dinosaur Provincial Park, Alberta, Canada.
- The name Cryodrakon boreas means "Cold Dragon of the North" in Greek.
- It was one of the largest flying creatures in history, with adult wingspans reaching 10 metres and standing as tall as a giraffe.
- Juveniles had a smaller wingspan of about 2 metres.
- It had a long neck, a large toothless beak, and a short tail.
- Scientists believe it was carnivorous, but its exact feeding strategy is debated.

Scientists and students during fieldwork at Bonebed 10 in Dinosaur Provincial Park in Alberta, Canada. FILE PHOTO

A Cretaceous drama of croc against flying reptile

Reuters

About 76 million years ago, a juvenile of one of the largest flying creatures in the earth's history, called Cryodrakon boreas, walked along a riverbank on a lush coastal plain and lowered its toothless beak to take a drink, unaware of danger lurking at the water's edge. Suddenly, a large croc surged out of the water in an ambush and sank its teeth into the Cryodrakon's neck.

That was life, and death, in the Cretaceous Period in the Canadian province of Alberta. Scientists have unearthed in the badlands of Alberta's Dinosaur Provincial Park the fossilised neck bone of a young Cryodrakon, a type of flying reptile called a pterosaur, that may have died in just such a scenario.

The fossil, examined under a microscope and with micro-CT scans, has a conical puncture 4 mm wide that appears to be the bite mark of a crocodilian that either preyed on the Cryodrakon while alive or scavenged its body after death.

Adults of this pterosaur had wingspans of about 10 metres and stood as tall as a giraffe. The juvenile's wingspan was about 2 metres. The elongated neck bone, about two-thirds complete, is 8 mm long. The bone is thin. Much of its outer wall is less than a credit card in thickness.

"Most crocodilians feed at the surface of the water and are ambush predators, and many pterosaur species are thought to be tied to the water as well. Given this,

Scientists have unearthed in the badlands of Alberta's Dinosaur Provincial Park the fossilised neck bone of a young Cryodrakon, that may have died in an ambush by a croc

if it was predation, it likely happened as an ambush at the water surface," said paleontologist Caleb Brown of the Royal Tyrrell Museum of Palaeontology in Alberta, lead author of the study published this week in the Journal of Paleontology. "There are several reasons why a pterosaur would be at the water surface, including drinking and hunting for food itself," Brown added.

Modern crocs are both active predators and scavengers. "There is no sign of healing, so the wound either happened at the time of death during an attack or after the animal was already dead," said ecologist and study co-author Brian Pickles of the University of Reading in England.

Cryodrakon rivaled Quetzalcoatlus, which also inhabited North America at the time, as the largest of the pterosaurs, which were cousins of the dinosaurs. Both had heads with large toothless beaks, long necks, and short tails.

"They were carnivorous, but researchers have disagreed as to their feeding strategy, with suggestions from carrion-feeding scavengers to aquatic probers to heron-like terrestrial stalkers," Brown said. The researchers noted that the puncture mark does not match the shape of the teeth of dinosaur predators in this region at the time, such as the Tyrannosaurus relatives Gorgosaurus and Daspletosaurus. Instead, it matched the shape of a croc's tooth.

Crocodilians living in this ecosystem included Leidyosuchus, around 3.5 metres long, and the smaller Albertochampsa. The semiaquatic superficially croc-like Champsosaurus also was present.

Page 10 : GS 3 – Indian Economy

India's economic slowdown is marked by weak private consumption and investment despite rising capital expenditure.

How can the Budget arrest growth decline?

How did the period from 2004 to 2011 have a consistent high growth rate accompanied by a reduction in absolute poverty? Does the nature of fiscal expenditure also matter when it comes to private consumption? How would an increase in revenue expenditure, particularly in the social sector, help?

EXPLAINER

Dipa Sinha
Rohit Azad

The Indian economy is going through a rough patch as was evident from the recently released provisional estimates of its Gross Domestic Product (GDP). The underlying growth rate is lower than what was expected and estimated by the government earlier. What is surprising is that, as noted in the last Economic Survey, this slowdown is despite the rising capital expenditure in various budgets under this regime. To understand the current predicament of the government, it may help to take a longue duree of the Indian economy. In particular, we focus on private consumption since that is the ultimate driver of the domestic market.

We divide the post reform period into three parts – 1991-2004, 2004-2011, and 2011-2023. The period from 2004 to 2011 stands out as the one with sustained high growth rate accompanied by a reduction in absolute poverty. This period also saw some revival in state interventions in welfare through rights-based legislations as well as new national schemes.

In contrast, the most recent period starting from around 2012, but especially since 2019, has seen a slowdown in growth rates with the current concerns in the Indian economy being related to sluggish private consumption as well as private investment. This period also saw some major shocks to the economy including demonetisation, the introduction of the Goods and Services Tax (GST), and the lockdowns during the COVID-19 pandemic. Chart 1 shows the rate of growth of GDP and private consumption over these three periods; and we get inverted U-shaped growth curves in both.

What explains the high growth then and the slowdown now?

Something unique happened during the high growth phase of 2004-2011. While income and wealth inequality were rising for over a decade, this is the only phase in the post-reform period when the share of consumption (out of the total private consumption demand) of the richest 20%, after having risen since 1990, fell significantly. This means that the consumption of the bottom 80% was rising at a faster pace than the richest 20%. But how was this possible when the growth of income was the opposite?

We believe that state policy played a key role in this unique composition of consumption demand. It is not just the amount of fiscal expenditure that matters but its nature as well. Those at the lower end of the income spectrum have a higher propensity to consume as compared to the richest. If state spending tilts in favour of the working class, the income and employment multiplier effects of such spending would be much larger.

To understand this point, let us consider a hypothetical scenario where the government has a choice of spending ₹100 on (A) capital expenditure in commissioning a large scale dam/nuclear project or (B) providing it as National Rural Employment Guarantee Act (NREGA) wages or pension to the elderly. Let us, for simplicity, assume all wages are consumed and all profits saved.

Under choice A, only a part of the ₹100 is received as wages, which increases workers' consumption demand by that amount. This increase in demand, say on food and clothes, generates income for those employed in producing these commodities and this process, what economists call as multiplier effect, goes on. In contrast, under choice B, the entire ₹100 is received as wages which leads to a larger base on which the income and employment multiplier works.

Additionally, in choice A, there is a likelihood of a greater leakage of demand to the rest of the world in the form of higher imports such a capital expenditure may entail. Heavy machinery required for a dam or a nuclear reactor may have to be imported whereas the import component in choice B will likely be lower. So, the domestic component of choice A's multiplier might be even lower than what we have described above.

If the state spends as income transfers (whether in cash or kind) a certain amount per worker at the lower end of the income spectrum, this would add to the demand for mass consumption goods. A mere change in the composition of government expenditure in favour of such transfers, therefore, adds an exogenous component to demand. Moreover, the state played an additional role during this period by introducing NREGA and fixing its wages higher than the prevailing market wages. This generated additional jobs as well as set a floor for rural wages. This rise in rural wages pushed up wages for casual unskilled workers. Investment in agriculture and in rural areas in general also increased during this period contributing to rural incomes.

Chart 2 shows a sharp rise in the share of social services expenditure as well as development expenditures out of the total expenditure of the Union government, which exactly overlaps with the boom of 2004-2011. Developmental expenditure includes expenditure on economic as well as social services and therefore also includes the spending on agriculture and rural development, whereas social sector expenditure only includes the direct social sector spending such as education, health and welfare programmes.

Not surprisingly, this change in the nature of fiscal spending had a significant impact on consumption, across different categories of commodities, for the bottom 80% of the population (see Chart 3). It is this rise in consumption of the bottom 80% (and this trend continues all the way down to the lowest income group as well) in comparison to the top 20% that explains the fall in the latter's share in total consumption.

What has the government done so far to arrest the current slowdown?

While the government has acknowledged the slowdown and the lack of private investment (for example, in the last Economic Survey), its response has been to focus on capital expenditure of the kind mentioned in choice A as discussed above (see Chart 4). This was done even as the share of fiscal expenditure (as a percentage of GDP) was falling. This exclusive focus on capex was done with the expectation that this would crowd-in private investment but unfortunately the corporate sector has not responded either to this or to the tax cuts from 30% to 22% in 2019.

It is not surprising why private investment has not picked up. Under conditions of slowdown or lack of demand, investment responds more to the level of activity than to cost considerations. If the existing factories are not running to capacity, why would the firms invest more even if they are flush with funds (in the form of post-tax profits) or have access to cheap credit? It won't be an exaggeration to argue, therefore, that an increase in capex, especially of a capital-using variety, is neither a necessary nor a sufficient condition for revival of the economy.

What should be done instead?

An increase in revenue expenditure, particularly in the social sector, would result in a virtuous cycle of higher income for the workers and therefore to a higher income and employment multiplier, which may kickstart private investment as well. Capital expenditure too must be focused on labour-intensive projects that have a higher multiplier. The experience of 2004-2011 is particularly telling in this regard. What is required, therefore, is a two pronged strategy – (a) fiscal expenditure as a share of GDP has to rise (b) and within that the share of revenue expenditure needs to rise. In other words, a complete reversal in the trend shown in Chart 4.

It remains to be seen on February 1 whether the priority of the government is to placate the markets by keeping such expenses low or to improve the living conditions of the working people of this country to reverse the slowdown.

Dipa Sinha is an independent researcher and Rohit Azad teaches economics at Jawaharlal Nehru University

Prosperity then, slowdown now

We divide the post reform period into three parts — 1991-2004, 2004-2011, and 2011-2023. The period from 2004 to 2011 stands out as the one with sustained high growth rate. This period also saw some revival in state interventions in welfare through rights-based legislations as well as new national schemes

Chart 1: The growth of GDP and consumption since 1991

Compounded annual growth rate in real terms (in %)

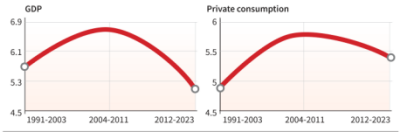


Chart 2: Social sector and development expenditures

As a share of total fiscal expenditure (in %)

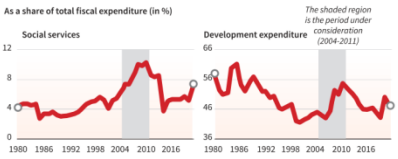


Chart 3: Growth in consumption during 2004-2011

CAGR of real consumption expenditure between 2004 and 2011 (in %)

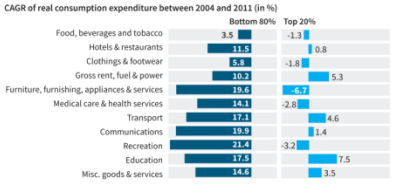
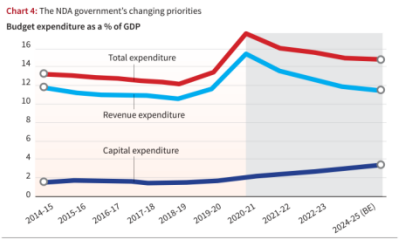


Chart 4: The NDA government's changing priorities

Budget expenditure as a % of GDP



Source: Data from CEIC, Union Budget documents have been used to derive macroeconomic trends, and the India Human Development Survey (IHDS) for household level analysis

THE GIST

- Something unique happened during the high growth phase of 2004-2011. While income and wealth inequality were rising for over a decade, this is the only phase in the post-reform period when the share of consumption of the richest 20%, fell significantly.
- Those at the lower end of the income spectrum have a higher propensity to consume as compared to the richest. If state spending tilts in favour of the working class, the income and employment multiplier effects of such spending would be much larger.
- An increase in revenue expenditure, particularly in the social sector, would result in a virtuous cycle of higher income for the workers and therefore to a higher income and employment multiplier.

- A shift in fiscal policy may be needed to revive growth.

Current Economic Situation

- India's GDP growth rate is lower than expected, despite increased government capital expenditure.

- The Economic Survey highlighted concerns about sluggish private consumption and investment.
- Major economic shocks, such as demonetization, GST implementation, and COVID-19 lockdowns, have contributed to the slowdown.

Three Phases of Post-Reform Growth

- 1991-2004: Initial phase of economic reforms with moderate growth.
- 2004-2011: High growth with poverty reduction, increased state intervention, and welfare schemes.
- Everything You Need To Know About 30 January 2025 : Daily Current Affairs
- 2011-2023: Economic slowdown, particularly after 2019, with weak private consumption and investment.

Reasons for High Growth (2004-2011)

- During this phase, the share of consumption of the richest 20% declined, while the bottom 80% saw an increase in consumption.
- Government policies played a key role in boosting demand among lower-income groups.
- Increased spending on social welfare programs had a strong income and employment multiplier effect.
- Schemes like NREGA ensured job creation and wage growth, particularly in rural areas.
- Investment in agriculture and rural development further strengthened the economy.
- Everything You Need To Know About 30 January 2025 : Daily Current Affairs

Capital vs. Revenue Expenditure

- Capital expenditure (Capex): Includes spending on large infrastructure projects like dams and nuclear plants.
- Limited impact on immediate demand and employment.May lead to higher imports, reducing its domestic economic benefits.Revenue expenditure: Includes spending on social programs like NREGA and pensions.
- Directly boosts consumption among lower-income groups.Creates a stronger demand-driven multiplier effect.
- During the 2004-2011 period, the government increased revenue spending, leading to broad-based economic benefits.

Government's Response to Slowdown

- The government has primarily focused on capital expenditure to revive growth.
- Despite corporate tax cuts from 30% to 22% in 2019, private investment has not increased.
- Weak demand and low capacity utilization prevent companies from investing further.
- The expectation that capex would attract private investment has not materialized.

Proposed Solutions

- The government should increase revenue expenditure to boost demand and employment.
- Focus should shift to labour-intensive capital projects rather than capital-intensive ones.
- Fiscal expenditure as a share of GDP needs to rise to sustain economic recovery.
- A balance between capital and revenue expenditure is essential for long-term growth.

Conclusion

- The upcoming budget will indicate whether the government prioritizes market-friendly policies or social welfare.
- A policy shift toward increasing revenue spending could help reverse the economic slowdown and improve living conditions.

UPSC Mains Practice Question

Ques: Examine the role of fiscal policy in addressing India's economic slowdown. How can a shift towards revenue expenditure boost demand and employment? (250 Words /15 marks)

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The article highlights India's agrarian crisis, emphasizing budget cuts, farmer suicides, and demands for MSP, loan waivers, and public investment in agriculture and rural employment.

Only a radical policy shift can lift farmers from widespread distress

Agriculture received paltry treatment despite the National Crime Records Bureau's (NCRB) data telling that 1,00,474 farmers and agricultural workers committed suicide between 2015-2022; similarly, Global Hunger Index 2024 shows India ranks towards the bottom — 105th out of 127 countries

COMMENT

Ashok Dhawale

Panacea for ills: Loan waiver, reducing cost of production and ensuring MSP at a rate of C2+50% must be done together. THE HINDU

The last Union Budget slashed food subsidy by ₹7,082 crore and fertilizer subsidy by a whopping ₹24,894 crore. Allocations for the Centre's flagship job guarantee scheme were only ₹86,000 crore or less than the amount spent on the programme the previous year. Overall allocations for agriculture/allied sectors slid from 5.44% in 2019 to 3.15% in 2024.

Agriculture received this paltry treatment despite the National Crime Records Bureau's (NCRB) data telling us 1,00,474 farmers and agricultural workers committed suicide between 2015 and 2022. Similarly, the Global Hunger Index 2024 shows India ranks towards the bottom - 105th out of 127 countries. The figures are a tragic indication of agrarian crisis.

As an ominous curtain raiser to the 2025 Budget, the Modi government on November 25, 2024 unveiled the draft 'National Policy Framework on Agricultural Marketing (NPFAM)'. The NPFAM aims at inducting pro-corporate provisions of the three controversial farm laws, which the Centre was forced to repeal after a year-long farmers' struggle led by the *Samyukta Kisan Morcha* (SKM) in 2020-21. There have already been countrywide farmers' protests against the NPFAM in December demanding it must not be implemented.

The most vital issue for farmers nationwide today is statutory minimum support price (MSP) at the rate of C2+50% or one-and-a-half times the comprehensive cost of production, as recommended by the M.S. Swaminathan Commission. The non-implementation of this recommendation is the principal reason for indebtedness, farm suicides and distressed land sales. Most farmers do not get any MSP at all and are at the mercy of private traders who fleece them.

They cannot even recover their production costs. MSP was a promise made by PM Modi and the Bharatiya Janata Party manifesto of 2014. The Centre has not delivered on this promise

Rising costs

But unless Budgetary allocations are made to implement this, India's agrarian distress cannot be resolved. The second point is the rising cost of production. The cost of all agricultural inputs are rising rapidly. Our expectation from this year's Budget is that the government bring down the prices of fertilizers, seeds, insecticides, diesel, water and electricity. If farmers are to be given MSP at C2+50%, the cost of production must be substantially reduced.

The government can bring down these costs by imposing strict controls through the Budget on the corporates who are now the main producers of the inputs and support public sector firms in the production of fertilizers, seeds, and insecticides. This will validate the government's claim of self-reliance. The Budget must also sharply raise subsidies for inputs and outlays for agriculture and allied sectors.

The third expectation is a comprehensive one-time loan waiver for farmers and agricultural workers nationwide. Unless this is done, farm suicides cannot be prevented. This government has written off loans worth ₹14.46 lakh crore of corporates in the past 10 years. They must have the monies to waive a fraction of that sum in farm loans.

Loan waiver, bringing down the cost of production and ensuring MSP at a rate of C2+50% must be done together. If this is done, 70% of the farm sector crisis can be dealt with.

The fourth point is relevant in the context of climate change. As droughts, floods, unseasonal rains and hailstorms recur more frequently and with greater intensity, there must be a comprehensive crop insurance scheme, which is entirely different from the Pradhan Mantri Fasal Bima Yojana (PMFBY). Several States have opted out of it. Some States have begun their own scheme. This is because PMFBY is working in the interest of insurance firms and not farmers. The fifth demand is on irrigation and power. Public sector investment in irrigation and power has been cut in the last decade. These sectors are being handed over to private firms and hence, the cost of water and power is rising. The private sector cannot invest the monies a government can, for example, in building dams.

Large scale investments in irrigation, would therefore, invariably be in government hands. Many irrigation projects are incomplete nationwide. If they are completed, a large section of land could be brought under irrigation leading to higher yields for farmers and larger employment generation and overall agrarian rejuvenation.

Steady power supply

In the power sector too, unless there is public investment, it will be difficult to ensure steady supply of electricity for farmers. The sixth demand is the expansion of the government's 100-day rural job guarantee scheme. Ever since the Modi government came to power, they have been trying to starve MGNREGA of funds. The average number of work-days per year has come down to just 45, instead of the mandatory 100. The government must also raise MNREGA wages to ₹600 and the number of work-days to at least 200. It is a lifeline for rural workers and will be a step toward increasing their purchasing power.

The question is always asked: where will the resources come for all this?

The Centre must impose wealth tax and inheritance tax, which it has consistently refused to do. As per the *Forbes*, the number of billionaires in India has almost doubled from 109 in 2014 to 200 in 2025.

Tax billionaires

Their combined wealth is now $ 1.1 trillion. The government has also greatly reduced corporate tax. They must restore it. India is a country with one of the least rates of corporate taxes. Every year, the country is losing ₹1.45 lakh crore due to cuts in corporate tax. In a shocking development, the Union government in the 2024-25 Budget revealed it now earns more revenue from income tax (30.9%) than from corporate tax (26.5%).

They are cutting income tax across the board, instead of providing relief to middle class and making rich pay more.

Fundamentally, direct taxes must be raised, while reducing indirect taxes and tax evasion be stopped using stringent methods.

(Dr. Ashok Dhawale is a senior leader of the Samyukta Kisan Morcha (SKM) and National President of the All India Kisan Sabha (AIKS).)

Budget Cuts and Agrarian Distress

- The last Union Budget reduced food subsidy by ₹7,082 crore and fertilizer subsidy by ₹24,894 crore.
- Allocations for agriculture fell from 5.44% in 2019 to 3.15% in 2024, despite 1,00,474 farmer suicides between 2015 and 2022.
- India ranks 105th out of 127 countries on the Global Hunger Index 2024, highlighting severe agrarian distress.

Controversial Farm Policy and Protests

- The draft National Policy Framework on Agricultural Marketing (NPFAM) reintroduces pro-corporate provisions from the repealed farm laws.
- Farmers nationwide are protesting against NPFAM, demanding its withdrawal.

Key Demands for Farmers

- **Statutory Minimum Support Price (MSP):**
  - Farmers demand MSP at C2+50% (1.5 times production cost), as recommended by the Swaminathan Commission.
  - Non-implementation of MSP has led to indebtedness, suicides, and distressed land sales.
- **Reduction in Production Costs:**
  - Rising costs of fertilizers, seeds, diesel, and electricity must be reduced.
  - The government should regulate corporate input producers and support public sector firms.
- **Comprehensive Loan Waiver:**
  - A one-time loan waiver for farmers and agricultural workers is essential to prevent suicides.
  - The government has waived ₹14.46 lakh crore of corporate loans in the last decade.
- **Crop Insurance and Climate Change:**
  - A new, farmer-friendly crop insurance scheme is needed to replace the flawed PMFBY.
  - Climate change-induced droughts, floods, and unseasonal rains require robust insurance coverage.
- **Investment in Irrigation and Power:**
  - Public investment in irrigation and power must increase to reduce costs and ensure steady supply.
  - Completing stalled irrigation projects can boost yields and employment.
- **Expansion of MGNREGA:**
  - MGNREGA work-days should increase to 200, with wages raised to ₹600.
  - The scheme is a lifeline for rural workers and boosts purchasing power.

Funding Solutions

- Impose wealth and inheritance taxes on billionaires, whose numbers doubled from 109 in 2014 to 200 in 2025.
- Restore corporate tax rates to generate ₹1.45 lakh crore annually.
- Increase direct taxes on the rich while reducing indirect taxes and curbing tax evasion.

Conclusion

- Addressing agrarian distress requires MSP implementation, reduced production costs, loan waivers, better insurance, and increased public investment.
- Funding can come from taxing the wealthy and restoring corporate taxes.

UPSC Mains Practice Question

Ques: Analyze the causes of India's agrarian distress and suggest measures to address the challenges faced by farmers, focusing on MSP, loan waivers, and public investment. (250 Words /15 marks)

In News : National Critical Minerals Mission

- The Union Cabinet, chaired by Prime Minister Narendra Modi, approved the Rs 16,300-crore National Critical Minerals Mission (NCMM) to boost exploration and self-reliance in critical minerals.

Analysis of the news:

- National Critical Minerals Mission (NCMM) Approved
- The mission aims to reduce India's dependence on imports and secure a stable supply of these essential resources, which are vital for industries like renewable energy, electronics, and defense.

Comprehensive Value Chain Approach

- The NCMM will cover the entire value chain, from exploration and mining to processing and recycling.
- It focuses on intensifying domestic and offshore exploration, streamlining regulatory approvals for mining projects, and offering financial incentives for exploration.
- The mission also emphasizes recovering critical minerals from overburden, tailings, and end-of-life products, promoting sustainable resource utilization.

Global Engagement and Stockpiling

- The mission encourages Indian public and private sector companies to acquire critical mineral assets abroad and strengthen trade ties with resource-rich nations.
- Additionally, it proposes the development of a domestic stockpile of critical minerals to ensure supply security and mitigate global market volatility.

Strategic Importance

- Critical minerals like lithium, cobalt, and rare earth elements are essential for clean energy technologies, electric vehicles, and advanced electronics.
- By securing these resources, the NCMM aims to support India's energy transition, industrial growth, and strategic autonomy.
- The mission aligns with global trends, as countries increasingly focus on securing critical mineral supplies to drive economic and technological advancement.

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The Budget pipeline and India's foreign policy ambitions

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When the Union Budget is presented every year, most of the public attention often centres on taxation, infrastructure, and defence. In this, however, the budget for India's Ministry of External Affairs (MEA) deserves closer scrutiny. Last year, the MEA budget saw a rare 23% spike, up from the modest 4% annual increase between 2017 and 2023. Despite efficient Budget utilisation, exceeding 96% of the revised estimates, the MEA remains one of the least-funded Ministries. The MEA's allocation not only reflects the government's foreign policy priorities but also its capacity to deliver on its global ambitions and commitments.

The vision of a 'Viksit Bharat' by 2047 hinges on sustained global partnerships. Here, India is positioning itself as a global leader: from leading the Global South; strengthening ties with the Association of Southeast Asian Nations; enhancing regional connectivity, engaging with the Quad (India, Australia, Japan and the U.S.) and creating institutions such as the International Solar Alliance and the Coalition for Disaster Resilient Infrastructure.

Impact on plans

Partner countries also expect more from India, requiring a stronger MEA. Countries anticipate timely project delivery, financial support, and diplomatic follow-through. Yet, the MEA's current budget – just 0.4% of India's overall expenditure – falls short to deliver on these plans. In 2022, the Parliamentary Standing Committee on External Affairs suggested raising this to 1% of the total budget. While such an increase (approximately 63%) seems unlikely, even a gradual increase to 0.6% or 0.8% would signal intent.

Two areas demand greater budgetary resources to beef up India's diplomatic clout: economic tools for regional integration and cooperation, and the MEA's institutional capacity by expanding human resources and research expertise. India's regional connectivity faced new challenges in 2024, including Bangladesh's regime change, Myanmar's instability, strained ties with Nepal, and the Maldives' "India Out" stance. But visits by Sri Lanka's President and Bhutan's Prime Minister bolstered commitments in cross-border projects. Sustaining momentum under the 'Neighbourhood First' policy requires economic support, amid China's growing influence. Enhanced financial backing is crucial for advancing connectivity initiatives in South Asia.

> The Ministry of External Affairs remains one of the least-funded Ministries, in turn affecting India's diplomatic outreach

Foreign aid and shifts

Budgetary trends reveal nuanced shifts. India's aid to foreign countries declined by 10% in 2024-25, while loans to foreign governments, increased by 29%. Approximately 50% of India's grants is directed to its neighbourhood. Bhutan remained the largest recipient of Indian aid, reflecting historical ties and a new impetus on energy interdependence, including hydropower development and sub-regional grid connectivity. Aid to Bangladesh declined from ₹200 crore in 2023-24 to ₹120 crore in 2024-25, while Sri Lanka saw a 63% increase in budgetary allocation.

A notable shift is the move from outright grants to lines of credit (LoCs), with 45% of the LoCs directed to the neighbourhood, Bangladesh being the largest recipient at $7.86 billion. While LoCs enable sustainable infrastructure financing, they also demand robust disbursement and oversight mechanisms, stretching India's diplomatic machinery.

Another critical indicator is MEA resources to build institutional capacity. These are less visible but critical catalysts to enable long-term growth, including through a stronger Indian Foreign Service (IFS), supported by an expert research ecosystem.

While the MEA's training budget saw a 30% increase in 2024-25, overall capacity-building allocations remain insufficient. The IFS remains a chronically understaffed diplomatic corps. Coordination challenges, delayed expansion plans, and limited lateral entry efforts hinder progress.

Last year's MEA budget allocation for its foreign missions, training programmes, and cultural diplomacy grew by only 7% but key academic institutions such as Nalanda University and South Asian University experienced cuts of 20% and 22%, respectively. While the MEA has invested massively in convening international conferences and dialogues to foster India's image as a bridging and argumentative power, it must also find more budgetary resources to support policy-relevant and evidence-based research at Indian universities and think tanks.

Need for declassification, digitisation

According to the External Affairs Minister, S. Jaishankar, "Track 1 has been consistently ahead of Track 2 when it comes to diplomacy, foreign policy, and keeping up with the world." If this is the reality, and "needs change" as the Minister beckoned, the MEA could lead by example by allocating specific resources in the next Budget to accelerate the declassification and the digitisation of hundreds of thousands of its records. Public e-access will help scholars map India's rich diplomatic history, contest deeply-held myths and get a better grasp of the underappreciated context and constraints that regulate Track 1 decision-making. And in turn, such Track 2 research may also help current MEA decision-makers to learn from past successes and failures, avoid reinventing the wheel, and articulate India's uniqueness based on the power of historical record, rather than mere political proclamation.

The views expressed are personal

GS Paper 02 : International Relations

GS Paper 03 : Environment

UPSC Mains Practice Question: Discuss the impact of the U.S. withdrawal from the Paris Agreement on global climate governance. How should developing nations respond to such policy reversals? (**150 Words /10 marks)**

Context :

- The U.S. withdrawal from the Paris Agreement under Trump highlights its inconsistent climate commitments – shifting burdens onto developing nations and undermining global climate action.

Impact of U.S. Withdrawal from the Paris Agreement

- U.S. President Trump's decision to pull the country out of the Paris Agreement is a major setback in the fight against global warming.
- The withdrawal will legally take effect in a year.
- The U.S. is the world's richest nation, owning a third of global wealth and having the highest GDP.
- Historically, the U.S. has contributed over a fifth of total carbon dioxide emissions since the pre-industrial era.
- As a signatory of the United Nations Framework Convention on Climate Change (UNFCCC), the U.S. was expected to lead in climate action and support developing nations with financial and technological assistance.

The U.S.'s Weak Commitment to Climate Action

- Regardless of the ruling party, the U.S. has consistently failed to fulfill its global climate responsibilities.
- From 1992 to 2005, U.S. emissions steadily increased, and the country stayed out of the Kyoto Protocol due to bipartisan opposition in Congress.
- While emissions have declined since then, the rate of reduction is much slower than needed.
- The Paris Agreement shifted from legally binding commitments for developed nations (as in the Kyoto Protocol) to voluntary pledges from all countries.
- This shift was designed to accommodate U.S. domestic politics, which resisted binding emission reduction targets.
- The approach was first seen in the 2009 Copenhagen climate summit and later formalized in the 2015 Paris Agreement under President Obama.

Biden Administration's Climate Actions

- Despite efforts at climate action, the U.S. became the world's largest crude oil producer under President Biden.
- The minimal $300 billion annual climate finance target at COP29 (Baku) resulted from resistance by the U.S. and its developed allies.

- Biden's updated climate commitment in December 2024 aimed for only a 60% emission reduction from 2005 levels by 2035.
- This target still allows the U.S. to consume a disproportionate share of the global carbon budget.
- At climate summits in Dubai and Baku, the U.S. pushed developing nations for higher mitigation targets while making weak commitments itself.

Pattern of U.S. Climate Policy

- U.S. climate action has followed a frustrating cycle: weak commitments under Democratic administrations followed by withdrawal under Republican governments.
- This has forced large emerging economies to take on increasing climate burdens.
- Developing nations now face financial withdrawal and pressure to decarbonize early, worsening global inequalities and food insecurity.

Global Reaction to the U.S. Withdrawal

- The dominant belief, influenced by the U.S., is that markets can drive climate action through private sector investments.
- However, over 80% of U.S. and 70% of EU energy still comes from fossil fuels, showing that market-driven solutions have failed.
- Developed countries have weak accountability for climate commitments compared to developing nations, where public sectors play a greater role.
- Academics and civil society in developed nations have promoted the false idea that local governments and businesses can fill the gap left by national policies.
- A 2024 University of Colorado Law School paper highlights that most U.S. states have weak or no emissions reduction policies.

Advice for Developing Nations

- Developing countries should not attempt to compensate for the U.S.'s withdrawal.
- Other developed nations are likely to offer only rhetorical support rather than substantive action.
- During Trump's first term, the Paris Agreement implementation details were finalized in ways that shifted more responsibility onto the Global South.
- A second Trump administration may remain in negotiations but insist on increased commitments from developing nations.
- Despite withdrawing, the U.S. continues to claim global climate leadership.

Maintaining Multilateralism and Development Goals

- Developing nations must continue engaging in global climate discussions, as climate change is a global challenge.
- India and other Global South nations should balance climate action with addressing their development needs.
- There must be greater focus on adaptation strategies to mitigate the impact of climate change.

Conclusion

- Just and effective climate action requires strong political will from all nations.
- Other countries must push the U.S. to rejoin meaningful international cooperation on climate change.
