UNION BUDGET 2022-23

Analysis of Expenditure by Ministries

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Overview

The central government's expenditure is authorised through the Union Budget by the Parliament every year. The Constitution requires all expenditure (other than charged expenditure) to be submitted to Lok Sabha in the form of Ministry-wise Demand for Grants. These Demand for Grants are referred to the respective Departmentally Related Standing Committees for detailed examination. They are then discussed in the House and approved. After Lok Sabha authorises these demands, an Appropriation Bill is introduced and passed to permit this expenditure out of the Consolidated Fund of India.

This document contains a short analysis of the Union Budget, and a close look at the allocations made by 15 ministries, which account for 71% of the total expenditure by the centre (excluding interest payments and transfers to states for Finance Commission grants). Further, we analyse the allocation trends over the years, and the extent of their utilisation. We also examine the implementation of various schemes and policies and their resulting outcomes.

The Union Budget 2022-23 which was presented on February 1, 2022 proposes an expenditure of Rs 39,44,909 (net of devolution of taxes to states) for the year. This amount will be funded through receipts (other than borrowings) of Rs 22,83,713 crore and borrowings of Rs 16,61,196 crore. Fiscal deficit is budgeted at 6.4% of GDP as compared to 6.8% in 2021-22. The target for revenue deficit is 3.8% of the GDP, lower than the revised estimate of 4.7% in 2021-22. Interest expenditure is estimated to be 43% of revenue receipts.

Besides the overall financial outlay, the budget also provides details of tax proposals in the Finance Bill. While there is no change in income tax rates for individuals and corporations, income from the transfer of cryptocurrencies and non-fungible tokens will be taxed at the rate of 30%. Other proposals include: (i) reduction in Alternate minimum tax for co-operatives from 18.5% to 15%, and (ii) extension of deadline by one year to allow domestic manufacturing companies and start-ups.

Allocations to the top 15 schemes account for 12% of the total expenditure. Mahatma Gandhi National Rural Employment Guarantee Scheme (MGNREGS) has the highest allocation at Rs 73,000 crore. This is followed by the allocation to the PM-KISAN scheme (income support to farmers) at Rs 68,000 crore.

The issues discussed in the analysis of each ministry include the following:

- **Defence:** The Ministry of Defence has been allocated Rs 5,25,166 crore which is the highest (13%) among all ministries of the central government. However, defence expenditure as a proportion of total central government expenditure has decreased from 16.4% in 2012-13 to 13.3% in 2022-23. In 2021-22, the funds allocated to the three armed forces was 28% lower than the projected needs. In 2022-23, expenditure on salaries and pensions form the largest portion of the defence budget (54%) while capital outlay forms 27% of the defence budget.
- **Consumer Affairs, Food and Public Distribution:** The Ministry has been allocated Rs 2,17,684 crore which is 28% lower than the revised estimates for 2021-22. Allocation for food subsidy has declined 28% in 2022-23 as compared to the revised estimate of 2021-22. In 2020-21 and 2021-22, the government provided more allocation towards food subsidy to clear the pending subsidy dues of Food Corporation of India and to provide for additional allocation of food grain to tackle economic distress caused by Covid.
- **Road Transport and Highways:** Allocation to the Ministry is estimated at Rs 1,99,108 crore, an increase of Rs 60,000 crore (52%) over the revised expenditure for 2021-22. Nearly all of this additional allocation has been earmarked for investment in NHAI. After many years, NHAI will not have any borrowings. As per the Budget speech, the National Highways network will be expanded by 25,000 km in 2022-23.
- **Home Affairs:** The Ministry of Home Affairs has been allocated Rs 1,85,777 crore, which is 7% higher than the revised estimates for 2021-22. 63% of the Ministry's expenditure is on police (including the central armed police forces and Delhi Police). The CAPFs and Delhi Police have both faced the issue of vacancies over the years. 32% of the Ministry's expenditure is on grants made to UTs, including the new UTs of Jammu and Kashmir, and Ladakh. Allocation to the UTs of Jammu and Kashmir, and Ladakh is 71% of the total amount allocated to UTs. Note that the Finance Commission's recommendations on sharing central taxes with states do not include devolution to UTs; funding for UTs is done through the Home Ministry.
- **Railways:** The Operating Ratio (revenue expenditure as a proportion of traffic receipts) is projected at 96.7% in 2022-23 (98.9% in 2021-22), implying a continued reliance on borrowings to fund capital expenditure. Freight traffic continues to subsidise passenger traffic. Freight is reliant on a few bulk items, with coal contributing 47% of revenue.
- **Rural Development:** The Ministry administers some large schemes such as MGNREGS (employment), PMAY-G (rural housing) and PMGSY (rural roads). In 2022-23, the MGNREGS has been allocated Rs

73,000 crore, which is 26% lower than the revised estimates of 2021-22. This decline is primarily because the scheme received additional allocation in 2020-21 and 2021-22 to address the employment demand during the COVID-19 pandemic.

- **Agriculture:** The Ministry has been allocated Rs 1,32,514 crore in 2022-23, a 5% increase over the revised estimates of 2021-22. 55% of the allocation to the Ministry in 2022-23 is for the PM-KISAN scheme (Rs 68,000 crore), and 26% is towards interest subvention (Rs 19,500 crore) and crop insurance (Rs 15,000 crore). Growth of the sector comprising of agriculture and allied activities has been volatile over the years. In 2021-22, the sector is estimated to grow at 3.9%, as compared to a 3.3% growth in 2020-21.
- **Telecommunications:** The Department of Telecommunications has been allocated Rs 84,587 crore, which is a 138% annual increase over the revised expenditure in 2021-22. This increase is mainly to support BSNL for 4G spectrum, technology upgradation and restructuring. No allocation has been made towards MTNL. Between 2017-18 and 2021-22, in each year, actual expenditure from the Universal Service Obligation Fund (USOF) has been significantly less than the budget estimate. USOF has been established to provide widespread, non-discriminatory and affordable access to quality information and communication technology services to people in rural and remote areas.
- **Education:** In 2022-23, the Ministry has been allocated Rs 1,04,277 crore, which is an increase of 18.5% from the revised expenditure in 2021-22. Allocation to the Department of School Education and Literacy is estimated at Rs 63,449 crore (61% of the Ministry's total allocation). The Department of Higher Education has been allocated Rs 40,828 crore. The share of public investment in education has largely remained constant, at 10% of total government expenditure (centre and states combined) or 3% of GDP. The National Education Policy recommends increasing public investment on education to 6% of GDP.
- **Health:** In 2022-23, the Ministry's estimated expenditure is Rs 86,201 crore, almost the same amount as the revised expenditure in 2021-22. In 2022-23, the only COVID-19 specific allocation under this Ministry is Rs 226 crore allocated towards the Insurance Scheme for Health Care Workers fighting COVID-19. In addition, the Ministry of Finance has allocated Rs 5,000 crore towards COVID-19 vaccination. In 2020-21, India's public health expenditure (centre and states) was 1.8% of the GDP. This was higher than the trend of public investment in the last decade (1.1% to 1.5% of GDP).
- **Jal Shakti:** In 2022-23, the Ministry of Jal Shakti has been allocated Rs 86,189 crore, which is a 25% increase over the revised estimates of 2021-22 (at Rs 69,046 crore). This increase is mainly on account of increased allocation towards the Jal Jeevan Mission (Rs 60,000 crore). This scheme aims to provide a functional tap connection to every rural household by 2024. In 2022-23, Rs 1,400 crore has been allocated to the interlinking of Ken-Betwa project (Rs 4,300 crore in 2021-22 revised estimates). The Budget speech declared plans for five more interlinking projects.
- **Housing and Urban Affairs:** The total expenditure on the Ministry of Housing and Urban Affairs for 2022-23 is estimated at Rs 76,549 crore. This is an increase of 4% over the revised estimates for 2021-22. The highest allocation is towards PMAY-U (urban housing) at 37 % of the total Ministry's budget followed by allocation to Metro projects (31%). Achieving targets is a major challenge. As of 2021, only 38% of the PMAY-U target of having houses for all by 2022 has been achieved.
- **Petroleum and Natural Gas:** The Ministry has been allocated Rs 8,940 crore, which is a 1% increase over the revised estimates for 2021-22. About 65% of the Ministry's budget is towards LPG subsidy. No funds have been allocated for kerosene subsidy. There has been a decrease in allocation towards subsidies in the past two years, while allocation towards promotion of cleaner fuels (PM-JIVAN yojana) has increased.
- **Science and Technology:** In 2022-23, the Ministry of Science and Technology has been allocated Rs 14,217 crore. Almost all the expenditure under the Ministry is revenue expenditure. India's expenditure on Research and Development (R&D) activities remains low in comparison to developed countries. Further, R&D sector in India faces other issues such as: (i) lack of researchers, (ii) inadequate private investment, (iii) delays in approval of patents, and (iv) absence of an integrated approach towards R&D.
- **Environment:** The Ministry has been allocated Rs 3,030 crore, which is a 20% increase over the revised estimates for 2021-22. 31% of the allocation is estimated to be on centrally sponsored schemes on environment, forests and wildlife such as National Mission for Green India and Integrated Development of Wildlife Habitats. Significant investment is needed to finance adaptation and mitigation measures for climate change.

Budget at a Glance 2022-23

Budget Highlights

- **Expenditure:** The government proposes to spend Rs 39,44,909 crore in 2022-23, which is an increase of 4.6% over the revised estimate of 2021-22. In 2021-22, total expenditure is estimated to be 8.2% higher than budget estimate.
- **Receipts:** The receipts (other than borrowings) in 2022-23 are expected to be to Rs 22,83,713 crore, an increase of 4.8% over revised estimate of 2021-22. In 2021-22, total receipts (other than borrowings) are estimated to be 10.2% higher than the budget estimates.
- **GDP**: The government has estimated a nominal GDP growth rate of 11.1% in 2022-23 (i.e., real growth plus inflation).
- **Deficits:** Revenue deficit in 2022-23 is targeted at 3.8% of GDP, which is lower than the revised estimate of 4.7% in 2021-22. Fiscal deficit in 2022-23 is targeted at 6.4% of GDP, lower than the revised estimate of 6.9% of GDP in 2021-22 (marginally higher than the budget estimate of 6.8% of GDP). Interest expenditure at Rs 9,40,651 crore is estimated to be 43% of revenue receipts.
- **Extra Budgetary Resources (EBR)**: After a number of years, the budget has not relied on EBR or loans from National Small Savings Fund.
- **Ministry allocations:** Among the top 13 ministries with the highest allocations, in 2022-23, the highest percentage increase in allocation is observed in the Ministry of Communications (93%), followed by the Ministry of Road Transport and Highways (52%), and the Ministry of Jal Shakti (25%).

Main tax proposals in the Finance Bill

- **Income tax**: There is no change in income tax rates for individuals and corporations.
- **Surcharge on Long Term Capital Gains (LTCG)**: Currently, the surcharge on LTCG on listed equities and equity mutual funds is capped at 15%. The surcharge on other LTCG is 25% if total income is between Rs 2 crore and Rs 5 crore, and 37% if it is above Rs 5 crore. The budget proposes to cap these at 15%.
- **Tax on virtual digital assets:** Income from the transfer of cryptocurrencies and non-fungible tokens will be taxed at the rate of 30%. Any loss incurred from such transfers cannot be set off against any other income or carried forward to subsequent years.
- **Updating return of income:** Taxpayers will be permitted to file an updated return of income within two years of the assessment year. They will have to pay 25% penalty on tax and interest due if it is filed in the year after the assessment year, and 50% penalty in the second year.
- **Co-operatives:** Alternate minimum tax for co-operatives will be reduced from 18.5% to 15%. Surcharge will be reduced from 12% to 7% for co-operatives whose total income is between one crore and ten crore rupees.
- **New companies and start-ups:** New domestic companies engaged in manufacturing have an option to pay tax at 15% (without claiming any deductions) if they start manufacturing by March 31, 2023. Certain types of start-ups have an option for tax holiday for three out of the first ten years if they incorporate by April 1, 2022. Both these deadlines have been extended by one year.
- **Changes in customs duty:** Customs duties on over 500 items have been changed. Many customs exemptions are also being phased out.

Non-tax proposals in the Finance Bill

- **The Reserve Bank of India Act, 1934** is being amended to enable RBI to issue its digital currency.

Policy Highlights

- **Legislative proposals**: The Special Economic Zones Act, 2005 will be replaced with a new legislation that will enable states to become partners in 'Development of Enterprise and Service Hubs', covering all existing and new industrial enclaves. Legislative changes will also be brought in to promote agro-forestry and private forestry. Amendments will be made in the Insolvency and Bankruptcy Code to facilitate cross border insolvency resolution.
- **Fiscal Management:** Rs 51,971 crore has been budgeted in 2021-22 towards settling the liabilities of Air India.
- **MSMEs**: Emergency Credit Line Guarantee Scheme (ECLGS) will be extended up to March 2023 and its guarantee cover will be expanded by Rs 50,000 crore to total cover of five lakh crore rupees. Credit Guarantee Trust for Micro and Small Enterprises will be revamped to facilitate additional credit of two lakh crore rupees.

- **Health and Nutrition:** Under Ayushman Bharat Digital Mission, an open platform for National Digital Health Ecosystem will be established. It will consist of digital registries of health providers and health facilities, unique health identity, consent framework, and universal access to health facilities. A National Tele Mental Health Programme will be launched to provide access to quality mental health counselling and care services.
- **River linking**: The Ken-Betwa Link Project will be implemented at an estimated cost of Rs 44,605 crore. Five more river linking projects are being implemented.
- **Labour and Employment**: The Digital Ecosystem for Skilling and Livelihood (DESH) Stack e-portal will be launched. The portal will help citizens learn skills, acquire credentials, and assist in finding relevant jobs.
- **Infrastructure:** Projects relating to transport and logistics infrastructure in the National Infrastructure Pipeline will be aligned with PM GatiShakti framework, which was launched last year. The Prime Minister's Development Initiative for North-East (PM-DevINE) will be implemented through the North-Eastern Council to fund development projects in the North-East region. Also, one lakh crore rupees is being allocated to states for catalysing investments, in the form of 50 year interest free loans.
- **Roadways:** The PM GatiShakti Master Plan for Expressways will be formulated in 2022-23. The National Highways network will be expanded by 25,000 km in 2022-23.
- **Railways:** One-station-one-product concept will be implemented to help local businesses and supply chains. 400 new Vande Bharat trains will be developed and manufactured during the next three years. Further, 100 cargo terminals for multimodal logistics facilities will also be developed during the next three years.
- **Telecom**: Spectrum auctions will be conducted to facilitate rollout of 5G mobile services within 2022-23. A scheme for design-led manufacturing will be launched to build an ecosystem for 5G as part of the Production Linked Incentive (PLI) Scheme.
- **Energy and Environment:** A battery swapping policy for electric vehicles will be implemented. Four pilot projects for coal gasification and conversion of coal into chemicals required for the industry will be set-up. Sovereign Green Bonds will be issued in 2022-23 for mobilising resources for green infrastructure.

Budget estimates of 2022-23 as compared to revised estimates of 2021-22

- **Total Expenditure:** The government is estimated to spend Rs 39,44,909 crore during 2022-23. This is an increase of 4.6% over the revised estimate of 2021-22. Out of the total expenditure, revenue expenditure is estimated to be Rs 31,94,663 crore (0.9% increase) and capital expenditure is estimated to be Rs 7,50,246 crore (24.5% increase). The increase in capital expenditure is mainly due to a substantial increase in loans and advances to state governments. Loans and advances by the central government are estimated to be Rs 1,40,057 crore in 2022-23, an increase of 153% over the revised estimates for 2021-22.
- **Total Receipts:** Government receipts (excluding borrowings) are estimated to be Rs 22,83,713 crore, an increase of 4.8% over the revised estimates of 2021-22. The gap between these receipts and the expenditure will be plugged by borrowings, budgeted to be Rs 16,61,196 crore, an increase of 4.4% over the revised estimate of 2021-22.
- **Transfer to states:** The central government will transfer Rs 16,11,781 crore to states and union territories in 2022-23. This is a marginal increase of 0.5% over the revised estimates of 2021-22. Transfer to states comprises: (i) devolution of Rs 8,16,649 crore out of the divisible pool of central taxes, and (ii) Rs 7,95,132 crore in the form of grants and loans.
  In 2021-22, as per the revised estimates, Rs 1,59,000 crore will be transferred to states in the form of back-to-back loans in lieu of GST compensation.
- **Deficits:** Revenue deficit is targeted at 3.8% of GDP, and fiscal deficit is targeted at 6.4% of GDP in 2022-23. The target for primary deficit (which is fiscal deficit excluding interest payments) in 2021-22 is 2.8% of GDP.
- **GDP growth estimate:** The nominal GDP is estimated to grow at a rate of 11.1% in 2022-23.

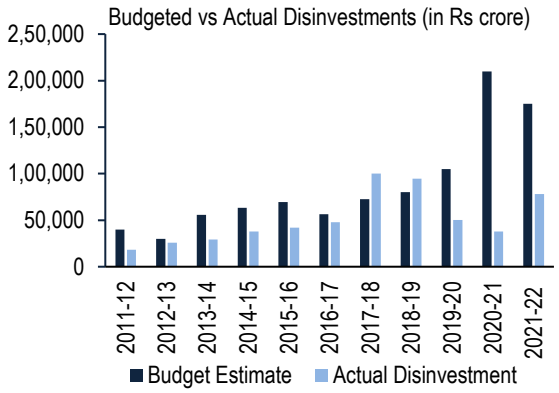
Table 1: Budget at a Glance 2022-23 (Rs crore)

	Actuals 2020-21	Budgeted 2021-22	Revised 2021-22	Budgeted 2022-23	% change (RE 2021-22 to BE 2022-23)
Revenue Expenditure	30,83,519	29,29,000	31,67,289	31,94,663	0.9%
Capital Expenditure	4,26,317	5,54,236	6,02,711	7,50,246	24.5%
of which:					
Capital Outlay	3,15,826	5,13,862	5,47,457	6,10,189	11.5%
Loans and Advances	1,10,491	40,374	55,255	1,40,057	153.5%
Total Expenditure	**35,09,836**	**34,83,236**	**37,70,000**	**39,44,909**	**4.6%**
Revenue Receipts	16,33,920	17,88,424	20,78,936	22,04,422	6.0%
Capital Receipts	57,625	1,88,000	99,975	79,291	-20.7%
of which:					
Recoveries of Loans	19,729	13,000	21,975	14,291	-35.0%
Other receipts (including disinvestments)	37,897	1,75,000	78,000	65,000	
Total Receipts (excluding borrowings)	**16,91,545**	**19,76,424**	**21,78,911**	**22,83,713**	**4.8%**
Revenue Deficit	14,49,599	11,40,576	10,88,352	9,90,241	-9.0%
% of GDP	***7.3%***	***5.1%***	***4.7%***	***3.8%***	
Fiscal Deficit	18,18,291	15,06,812	15,91,089	16,61,196	4.4%
% of GDP	***9.2%***	***6.8%***	***6.9%***	***6.4%***	
Primary Deficit	11,38,422	6,97,111	7,77,298	7,20,545	-7.3%
% of GDP	***5.8%***	***3.1%***	***3.3%***	***2.8%***	

Source: Budget at a Glance, Union Budget Documents 2022-23; PRS.

Expenses which bring a change to the government's assets or liabilities (such as construction of roads or recovery of loans) are capital expenses, and all other expenses are revenue expenses (such as payment of salaries or interest payments). In 2022-23, **capital expenditure** is expected to increase by 24.5% over the revised estimates of 2021-22, to Rs 7,50,246 crore. **Revenue expenditure** is expected to increase by 0.9% over the revised estimates of 2021-22 to Rs 31,94,663 crore.

Disinvestment is the government selling its stakes in Public Sector Undertakings (PSUs). In 2021-22, the government is estimated to meet 45% of its disinvestment target (Rs 78,000 crore against a target of Rs 1,75,000 crore). The disinvestment target for 2022-23 is Rs 65,000 crore.



Note: Actual data for 2021-22 is revised estimate.
Source: Union Budget documents (various years); PRS.

Receipts Highlights for 2022-23

- **Receipts** (excluding borrowings) in 2022-23 are estimated to be Rs 22,83,713 crore, an increase of 4.8% over the revised estimates of 2021-22.
- **Gross tax revenue** is budgeted to increase by 9.6% over the revised estimates of 2021-22, which is lower than the estimated nominal GDP growth of 11.1% in 2022-23. This is mainly on account of a 15% decrease in excise duties. Other taxes are estimated to rise faster than nominal GDP. The net tax revenue of the central government (excluding states' share in taxes) is estimated to be Rs 19,34,771 crore in 2022-23.
- **Devolution to states** from centre's tax revenue is estimated to be Rs 8,16,649 crore in 2022-23. In 2021-22, the devolution to states increased by Rs 79,222 crore from an estimate of Rs 6,65,563 crore at the budgeted stage to Rs 7,44,785 crore at the revised stage.
- **Non-tax revenue** is expected to be Rs 2,69,651 crore in 2022-23. This is 14.1% lower than the revised estimate of 2021-22.
- **Capital receipts** (without borrowings) are budgeted to decrease by 20.7% over the revised estimates of 2021-22. This is on account of disinvestments, which are expected to be Rs 65,000 crore in 2022-23, as compared to Rs 78,000 crore as per the revised estimates of 2021-22.

Table 2: Break up of central government receipts in 2022-23 (Rs crore)

	Actuals 2020-21	Budgeted 2021-22	Revised 2021-22	Budgeted 2022-23	% change (RE 2021-22 to BE 2022-23)
Gross Tax Revenue	**20,27,104**	**22,17,059**	**25,16,059**	**27,57,820**	**9.6%**
of which:					
Corporation Tax	4,57,719	5,47,000	6,35,000	7,20,000	13.4%
Taxes on Income	4,87,144	5,61,000	6,15,000	7,00,000	13.8%
Goods and Services Tax	5,48,778	6,30,000	6,75,000	7,80,000	15.6%
Customs	1,34,750	1,36,000	1,89,000	2,13,000	12.7%
Union Excise Duties	3,91,749	3,35,000	3,94,000	3,35,000	-15.0%
Service Tax	1,615	1,000	1,000	2,000	100.0%
A. Centre's Net Tax Revenue	**14,26,287**	**15,45,397**	**17,65,145**	**19,34,771**	**9.6%**
Devolution to States	**5,94,997**	**6,65,563**	**7,44,785**	**8,16,649**	**9.6%**
B. Non Tax Revenue	**2,07,633**	**2,43,028**	**3,13,791**	**2,69,651**	**-14.1%**
of which:					
Interest Receipts	17,113	11,541	20,894	18,000	-13.9%
Dividend and Profits	96,877	1,03,538	1,47,353	1,13,948	-22.7%
Other Non-Tax Revenue	93,641	1,27,948	1,45,544	1,37,703	-5.4%
C. Capital Receipts (excl. borrowings)	**57,626**	**1,88,000**	**99,975**	**79,291**	**-20.7%**
of which:					
Disinvestment	37,897	1,75,000	78,000	65,000	-16.7%
Receipts (without borrowings) (A+B+C)	**16,91,546**	**19,76,425**	**21,78,911**	**22,83,713**	**4.8%**
Borrowings	**18,18,291**	**15,06,812**	**15,91,089**	**16,61,196**	**4.4%**
Total Receipts (including borrowings)	**35,09,836**	**34,83,236**	**37,70,000**	**39,44,909**	**4.6%**

Sources: Receipts Budget, Union Budget Documents 2022-23; PRS.

- **Indirect taxes:** The total indirect tax collections are estimated to be Rs 13,30,000 crore in 2022-23. Of this, the government has estimated to raise Rs 7,80,000 crore from GST. Out of the total tax collections under GST, 85% is expected to come from central GST (Rs 6,60,000 crore), and 15% (Rs 1,20,000 crore) from the GST compensation cess.
- **Corporation tax:** The collections from taxes on companies are expected to increase by 13% in 2022-23 to Rs 7,20,000 crore. The revised estimates of 2021-22 indicate an increase in corporate tax collections to Rs 6,35,000 crore from Rs 5,47,000 crore at the budget estimate stage.
- **Income tax:** The collections from income tax are expected to increase by 14% in 2022-23 to Rs 7,00,000 crore. According to the revised estimate for 2021-22, income tax collection will be of Rs 6,15,000 which is 9.6% higher than Rs 5,61,000 at the budget estimate stage.

- **Non-tax receipts:** Non-tax revenue consists of interest receipts on loans given by the centre, dividends and profits, external grants, and receipts from general, economic, and social services, among others. In 2022-23, non-tax revenue is expected to decrease by 14% over the revised estimates of 2021-22 to Rs 2,69,651 crore. This is due to a decline of 14% in interest receipts and a decline of 23% in dividend and profits.
- **Disinvestment target:** The disinvestment target for 2022-23 is Rs 65,000 crore. This is 17% lower than the revised estimate of 2021-22 (Rs 78,000 crore).

Expenditure Highlights for 2022-23

- **Total expenditure** in 2022-23 is expected to be Rs 39,44,909 crore, which is an increase of 4.6% over than the revised estimate of 2021-22. Out of this, (i) Rs 11,81,084 crore is proposed to be spent on central sector schemes (1.2% decrease over the revised estimate of 2021-22), and (ii) Rs 4,42,781 crore is proposed to be spent on centrally sponsored schemes (a 6.6% increase over the revised estimate of 2021-22).
- The government has estimated to spend Rs 2,07,132 crore on pension in 2022-23, which is 4.1% higher than the revised estimate of 2021-22. In addition, expenditure on interest payment in 2022-23 is estimated to be Rs 9,40,651 crore, which is 23.8% of the government's expenditure.

Table 3: Break up of central government expenditure in 2022-23 (Rs crore)

	Actuals 2020-21	Budgeted 2021-22	Revised 2021-22	Budgeted 2022-23	% change (RE 2021-22 to BE 2022-23)
Central Expenditure	**27,49,541**	**26,72,604**	**29,17,249**	**30,06,111**	**3.0%**
Establishment Expenditure of Centre	5,94,449	6,09,014	7,00,541	6,92,214	-1.2%
Central Sector Schemes	13,56,817	10,51,703	11,95,078	11,81,085	-1.2%
Other expenditure	7,98,274	10,11,887	10,21,631	11,32,813	10.9%
Grants for CSS and other transfers	**7,60,295**	**8,10,632**	**8,52,751**	**9,38,797**	**10.1%**
Centrally Sponsored Schemes (CSS)	3,83,976	3,81,305	4,15,351	4,42,781	6.6%
Finance Commission Grants	1,84,063	2,20,843	2,11,065	1,92,108	-9.0%
of which:					
Rural Local Bodies	*60,750*	*44,901*	*42,623*	*46,513*	*9.1%*
Urban Local Bodies	*26,710*	*22,114*	*14,614*	*22,908*	*56.8%*
Grants-in-aid	*22,262*	*35,376*	*35,376*	*36,486*	*3.1%*
Post Devolution Revenue Deficit Grants	*74,340*	*1,18,452*	*1,18,452*	*86,201*	*-27.2%*
Other grants	1,92,257	2,08,484	2,26,334	3,03,908	34.3%
Total Expenditure	**35,09,836**	**34,83,236**	**37,70,000**	**39,44,909**	**4.6%**

Sources: Budget at a Glance, Union Budget Documents 2022-23; PRS.

Expenditure by Ministries

The ministries with the 13 highest allocations account for 53% of the estimated total expenditure in 2022-23. Of these, the Ministry of Defence has the highest allocation in 2022-23, at Rs 5,25,166 crore. It accounts for 13.3% of the total budgeted expenditure of the central government. Other Ministries with high allocation include: (i) Consumer Affairs, Food and Public Distribution, (ii) Road Transport and Highways, and (iii) Home Affairs. Table 4 shows the expenditure on Ministries with the 13 highest allocations for 2022-23 and the changes in allocation as compared to the revised estimate of 2021-22.

Table 4: Ministry-wise expenditure in 2022-23 (Rs crore)

	Actuals 2020-21	Budgeted 2021-22	Revised 2021-22	Budgeted 2022-23	% change (RE 2021-22 to BE 2022-23)
Defence	4,85,681	4,78,196	5,02,884	5,25,166	4.4%
Consumer Affairs, Food and Public Distribution	5,66,797	2,56,948	3,04,454	2,17,684	-28.5%
Road Transport and Highways	99,159	1,18,101	1,31,149	1,99,108	51.8%
Home Affairs	1,44,258	1,66,547	1,73,083	1,85,776	7.3%
Railways	1,12,159	1,10,055	1,20,056	1,40,367	16.9%
Rural Development	1,97,593	1,33,690	1,55,043	1,38,204	-10.9%
Agriculture and Farmers' Welfare	1,15,827	1,31,531	1,26,808	1,32,514	4.5%
Chemicals and Fertilisers	1,29,510	80,715	1,41,735	1,07,715	-24.0%
Communications	60,903	75,265	54,517	1,05,407	93.3%
Education	84,219	93,224	88,002	1,04,278	18.5%
Health and Family Welfare	80,694	73,932	86,001	86,201	0.2%
Jal Shakti	23,199	69,053	69,046	86,189	24.8%
Housing and Urban Affairs	46,701	54,581	73,850	76,549	3.7%
Other Ministries	13,63,136	16,41,398	17,43,372	18,39,751	5.5%
Total Expenditure	**35,09,836**	**34,83,236**	**37,70,000**	**39,44,909**	**4.6%**

Sources: Expenditure Budget, Union Budget 2022-23; PRS.

- **Communications:** Allocation to the Ministry of Communications is estimated to increase by Rs 50,890 crore (93%) in 2022-23, over the revised estimate of 2021-22. This is mainly on account of capital infusion of Rs 44,720 crore in BSNL.
- **Road Transport and Highways:** Allocation to the Ministry of Road Transport and Highways is estimated to increase by Rs 67,959 crore (52%) in 2022-23, over the revised estimate of 2021-22. This is mainly on account of an increase in investment in National Highway Authority of India (Rs 1,34,015 crore in 2022-23 as compared to Rs 65,060 crore in 2021-22).
- In 2021-22, transfer to states as support for COVID-19 vaccines was Rs 39,000 crore, higher than the budget estimate of Rs 35,000 crore. Allocation for 2022-23 is Rs 5,000 crore.
- Allocation towards the Ministries of Consumer Affairs, Food and Public Distribution, and Chemicals and Fertilisers have decreased mainly on account of a reduction in food subsidy and fertiliser subsidy, respectively. We discuss the expenditure on subsidies below.

Expenditure on Subsidies

In 2022-23, the total expenditure on subsidies is estimated to be Rs 3,55,639 crore, a decrease of 27.1% from the revised estimate of 2021-22 (Table 5).

- **Food subsidy:** Allocation to food subsidy is estimated at Rs 2,06,831 crore in 2022-23, a 27.8% decrease over the revised estimate of 2021-22. A higher level of food subsidy was budgeted in 2020-21 and 2021-22 mainly on account of: (i) Pradhan Mantri Garib Kalyan Ann Yojana, which provides for free foodgrains to poor to mitigate the impact of COVID-19, and (ii) clearing loans of Food Corporation of India.
- **Fertiliser subsidy:** Expenditure on fertiliser subsidy is estimated at Rs 1,05,222 crore in 2022-23. This is a decrease of Rs 34,900 crore from the revised estimate of 2021-22. Fertiliser subsidy for 2021-22 was increased substantially under the supplementary demands in December 2021. This was in response to a sharp increase in international prices of raw materials used in the manufacturing of fertilisers.
- **Petroleum subsidy:** Petroleum subsidy consists of subsidy for LPG and Kerosene. No kerosone subsidy has been budgeted for either 2021-22 or 2022-23. Expenditure on LPG subsidy is estimated to decrease by 10.8% to Rs 5,813 crore in 2022-23.
- **Other subsidies:** Expenditure on other subsidies includes interest subsidies for various government schemes, subsidies for the price support scheme for agricultural produce, and assistance to state agencies for procurement, among others. In 2022-23, the expenditure on these other subsidies is estimated to decrease by 31% over the revised estimate of 2021-22.

Table 5: Subsidies in 2022-23 (Rs crore)

	Actuals 2020-21	Budgeted 2021-22	Revised 2021-22	Budgeted 2022-23	% change (RE 2021-22 to BE 2022-23)
Food subsidy	5,41,330	2,42,836	2,86,469	2,06,831	-27.8%
Fertiliser subsidy	1,27,922	79,530	1,40,122	1,05,222	-24.9%
Petroleum subsidy	38,455	14,073	6,517	5,813	-10.8%
Other subsidies	50,459	33,460	54,763	37,773	-31.0%
Total	**7,58,165**	**3,69,899**	**4,87,872**	**3,55,639**	**-27.1%**

Sources: Expenditure Profile, Union Budget 2022-23; PRS.

Expenditure on Major Schemes

- Mahatma Gandhi National Rural Employment Guarantee Scheme (MGNREGS) has the highest allocation in 2022-23 at Rs 73,000 crore. This is a decrease of 25.5% over the revised estimate of 2021-22. In 2021-22, allocation to the scheme has increased by 34.2% from Rs 73,000 crore at the budget stage to Rs 98,000 crore at the revised stage, to mitigate the impact of second wave of COVID-19.
- The PM-KISAN scheme (income support to farmers) has the second highest allocation in 2022-23 at Rs 68,000 crore. Allocation to the scheme has seen a marginal increase of 0.7% over the revised estimate of 2021-22.
- Key schemes with the comparatively higher increase in allocation in 2022-23 include: (i) Pradhan Mantri Gram Sadak Yojana (35.7%), (ii) Jal Jeevan Mission (33.3%), and (iii) National Education Mission (28.4%).

Table 6: Scheme wise allocation in 2022-23 (Rs crore)

	Actuals 2020-21	Budgeted 2021-22	Revised 2021-22	Budgeted 2022-23	% change (RE 2021-22 to BE 2022-23)
MGNREGS	1,11,170	73,000	98,000	73,000	-25.5%
PM-KISAN	60,990	65,000	67,500	68,000	0.7%
Jal Jeevan Mission/National Rural Drinking Water Mission	10,998	50,011	45,011	60,000	33.3%
Pradhan Mantri Awas Yojana	40,260	27,500	47,390	48,000	1.3%
National Education Mission	28,088	34,300	30,796	39,553	28.4%
National Health Mission	37,478	37,130	34,947	37,800	8.2%
Saksham Anganwadi and POSHAN 2.0*	-	20,105	20,000	20,263	1.3%
Modified Interest Subvention Scheme*	-	-	-	19,500	-
Pradhan Mantri Gram Sadak Yojana	13,688	15,000	14,000	19,000	35.7%
Pradhan Mantri Fasal Bima Yojana	14,161	16,000	15,989	15,500	-3.1%
National Livelihood Mission-Ajeevika	10,025	14,473	12,505	14,236	13.8%
AMRUT and Smart Cities Mission	9,754	13,750	13,900	14,100	1.4%
Pradhan Mantri Krishi Sinchai Yojana	7,877	11,588	12,706	12,954	2.0%
Rashtriya Krishi Vikas Yojana	-	-	-	10,433	-
PM-POSHAN*	-	-	-	10,234	-

Note: * Saksham Anganwadi and POSHAN 2.0 replaced certain components of the umbrella ICDS scheme. The Modified Interest Subvention Scheme replaced the scheme for interest subsidy for short term credit to farmers (allocation towards this scheme is Rs 18,142 crore in 2021-22 at the revised stage). PM-POSHAN scheme replaced the Mid-Day Meal Scheme. In 2021-22, the Mid-day Meal Scheme has been allocated Rs 10,234 crore at the revised stage.
Sources: Expenditure Profile, Union Budget 2022-23; PRS.

Expenditure on Scheduled Caste and Scheduled Tribe sub-plans and schemes for welfare of women, children and NER

- Programmes for the welfare of women and children have been allocated Rs 2,63,743 crore in 2022-23, an increase of 7.1% over the revised estimate of 2022-23. These allocations include programmes under all the ministries.
- The allocation towards scheduled castes and scheduled tribes in 2022-23 is estimated to increase by 1.7% and 2%, respectively. The allocation towards North Eastern Region is estimated to increase by 11.1% in 2022-23 over the revised estimates of 2021-22.

Table 7: Allocations for women, children, SCs, STs and NER (Rs crore)

	Actuals 2020-21	Revised 2021-22	Budgeted 2022-23	% change (RE 2021-22 to BE 2022-23)
Welfare of Women	1,52,099	1,66,183	1,71,006	2.9%
Welfare of Children	77,482	80,003	92,737	15.9%
Scheduled Castes	71,811	1,39,956	1,42,342	1.7%
Scheduled Tribes	49,433	87,473	89,265	2.0%
North Eastern Region (NER)	-	68,440	76,040	11.1%

Sources: Expenditure Profile, Union Budget 2022-23; PRS.

Fiscal Responsibility and Budget Management targets

The Fiscal Responsibility and Budget Management (FRBM) Act, 2003 requires the central government to progressively reduce its outstanding debt, revenue deficit and fiscal deficit. The central government gives three year rolling targets for these indicators when it presents the Union Budget each year. Note that the Medium Term Fiscal Policy Statement in both 2021-22 and 2022-23 did not provide rolling targets for budget deficits. In the Budget speech, the finance minister noted that the government aims to reduce fiscal deficit to below 4.5% of GDP by 2025-26.

Fiscal deficit is an indicator of borrowings by the government for financing its expenditure. The estimated fiscal deficit for 2022-23 is 6.4% of GDP.

Revenue deficit is the excess of revenue expenditure over revenue receipts. Such a deficit implies the government's need to borrow funds to meet expenses which may not provide future returns. The estimated revenue deficit for 2022-23 is 3.8% of GDP.

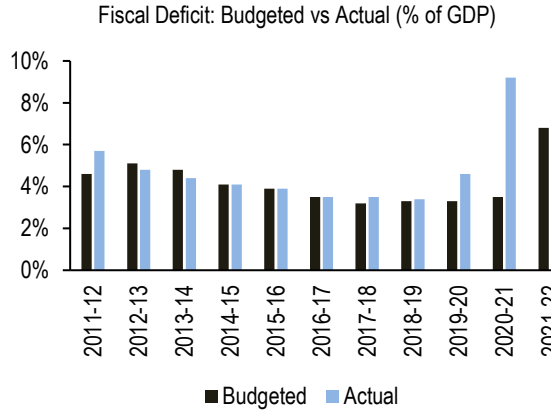
Table 8: FRBM targets for deficits (as % of GDP)

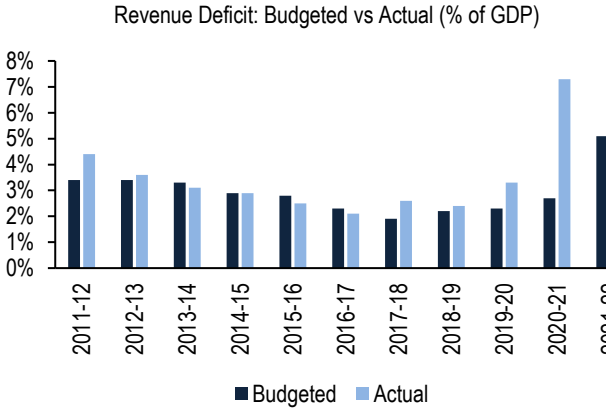
	Actuals 2020-21	Revised 2021-22	Budgeted 2022-23
Fiscal Deficit	9.2%	6.9%	6.4%
Revenue Deficit	7.3%	4.7%	3.8%
Primary Deficit	5.8%	3.3%	2.8%

Sources: Medium Term Fiscal Policy Statement, Union Budget 2022-23; PRS.

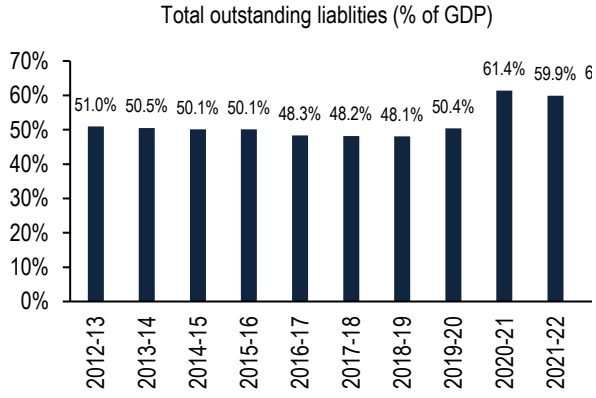
In 2021-22, the government had set a budget estimate of 6.8% of GDP for fiscal deficit, and 5.1% of GDP for revenue deficit. As per the revised estimates, the fiscal deficit is expected to marginally exceed the budget estimate to 6.9% while revenue deficit is estimated to be lower at 4.7%.

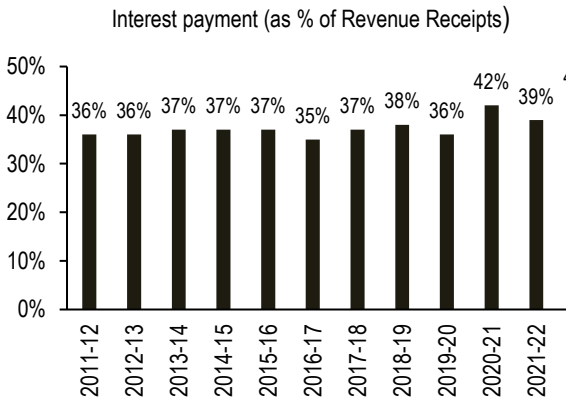
Primary deficit is the difference between fiscal deficit and interest payments. It is estimated to be 2.8% of GDP in 2022-23.





Note: Data for 2021-22 is revised estimate.
Sources: Budget at a Glance, Union Budget (multiple years); PRS.





Note: Data for 2021-22 are revised estimate and for 2022-23 are budget estimate.
Sources: Economic Survey 2021-22, Union budget documents 2022-23; PRS.

- **Outstanding Liabilities**: From 2012-13 onwards, the central government's outstanding liabilities declined from 51% of GDP to 48% of GDP in 2018-19. It increased to 61% of GDP in 2020-21. This is estimated to decrease marginally to 60% of GDP in 2022-23.
- Outstanding liabilities is the accumulation of borrowings over the years. A higher debt implies that the government has a higher loan repayment obligation over the years.
- The interest payments as a percentage of revenue receipts have increased from 36% in 2011-12 to 42% in 2020-21. As per the budget estimates, this figure is expected to increase further to 43% in 2022-23.

Demand for Grants 2022-23 Analysis
Defence

The Ministry of Defence frames policies on defence and security-related matters, and ensures its implementation by the defence services (i.e. Army, Navy and Air Force). In addition, it is responsible for production establishments such as defence public sector undertakings, research and development organisations, and ancillary services that assist the defence services, such as the Armed Forces Medical Services.

This note analyses budgetary allocation and expenditure trends of the Ministry. The note also discusses certain issues such as the persistent shortfall in budget allocation to the defence forces versus projected needs, high burden of payment of pensions, and inadequate production capacity of the domestic defence industry.

Overview of finances

In 2022-23, the Ministry of Defence has been allocated Rs 5,25,166 crore. This includes expenditure on salaries of armed forces and civilians, pensions, modernisation of armed forces, production establishments, maintenance, and research and development organisations.

The allocation to the Ministry of Defence is the highest (13%) among all ministries of the central government.

Budget Announcements

In order to reduce imports and promote self-reliance, the Budget for 2022-23 proposed that 68% of the defence capital procurement budget will be earmarked for the domestic industry. This has been increased from 58% in 2021-22. Defence research and development will be opened up for industry, start-ups and academia. Private industry will be encouraged to take up design and development of military platforms and equipment in collaboration with Defence Research and Development Organisation and other organisations.

Issues to consider

India continues to be among top global military spenders

According to the Stockholm International Peace Research Institute (SIPRI), India was the third-largest defence spender in absolute terms in 2020 after USA and China.[1] While China spends a lower proportion of its GDP on defence than India, its larger economy implies that it spends about 3.5 times as much as India. Pakistan's defence budget is about a seventh of India's, though it is a larger proportion of its GDP.

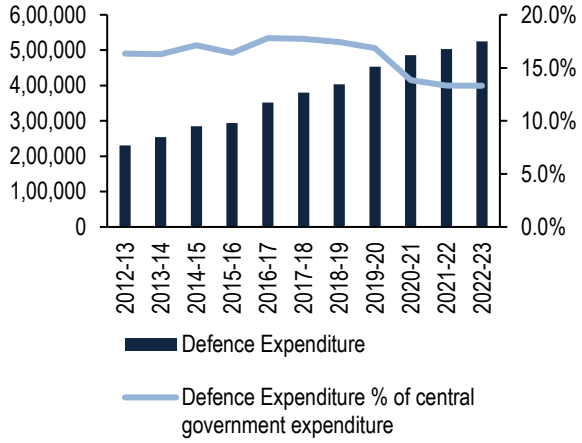
Table 1: Top military spenders and Pakistan (2020)

Country	Expenditure (in USD billion)	Expenditure (as % of GDP)
USA	778	3.7%
China	252	1.7%
India	73	2.9%
Russia	62	4.3%
UK	59	2.2%
Pakistan	10	4.0%

Note: Figures for India include expenditure on Border Security Force, Central Reserve Police Force, Assam Rifles, Indo-Tibetan Border Police, and Sashastra Seema Bal.
Sources: SIPRI Military Expenditure Database, Stockholm International Peace Research Institute, 2021; PRS.

However, India's defence spending as a proportion of its total government expenditure has been decreasing. In the last decade (2012-13 to 2022-23), the budget of the Ministry of Defence has grown at an annual average rate of 8.6%, while total government expenditure has grown at 10.8%. During this period, defence expenditure as a proportion of central government expenditure decreased from 16.4% in 2012-13, to 13.3% in 2022-23. The year-wise budget of the Ministry is shown in Figure 1.

Figure 1: Budget of Ministry of Defence (2012-13 to 2022-23) (in Rs crore)



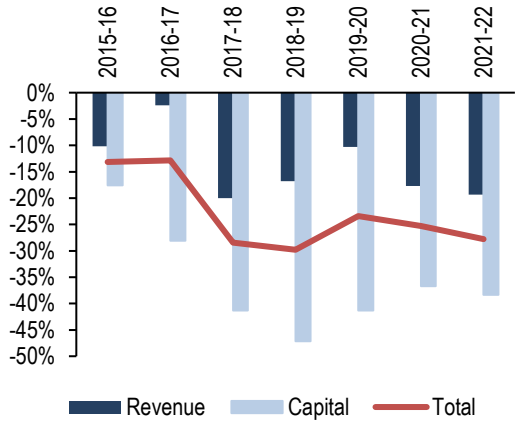
Note: Figures for 2022-23 are Budget Estimates and for 2021-22 are Revised Estimates.
Sources: Union Budget documents (various years); PRS.

Defence expenditure as a percentage of GDP declined from 2.3% in 2012-13 to 2% in 2022-23. The Standing Committee on Defence (2018) had recommended that the Ministry of Defence should be allocated a fixed budget of about 3% of GDP to ensure adequate preparedness of the armed forces.[2]

Budget allocation falls short of resource projection by armed forces

Every year the budget provides a certain amount of funds for the armed forces. This amount is allocated after determining the various needs of the forces such as acquisition of weaponry and payment of salaries and pensions. Figure 2 shows the shortfall between the amount allocated to the armed forces as compared to the projected need for funds over the last seven financial years. As can be seen in Figure 2, in all the years since 2015-16 the funds allocated to the armed forces in the budget was less than what was initially projected by the armed forces.

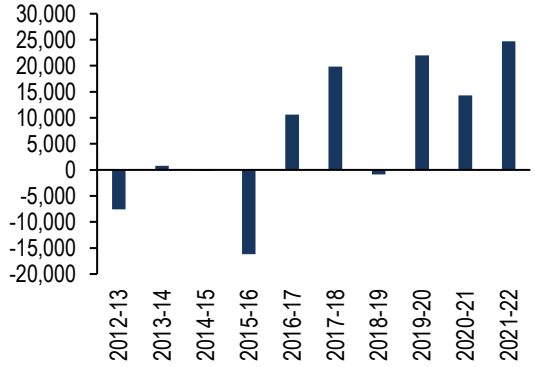
Figure 2: Shortfall in budget allocation versus projected needs



Sources: 20th Report, Demands for Grants, Standing Committee on Defence; PRS.

The shortfall (in percentage) is higher for capital expenditure than for revenue expenditure. In 2021-22, while the projected funds needed for all the three forces was estimated at Rs 4,49,508 crore, the budget allocated a sum of Rs 3,24,658 crore (28% shortfall). The shortfall for revenue expenditure and capital expenditure was 19% and 38% respectively.

Figure 3: Gap between actual expenditure and budget estimate of Ministry of Defence (in Rs crore)



Note: Figures for 2021-22 are based on revised estimates.
Sources: Union Budget documents (various years); PRS.

Note that since 2016-17, the actual expenditure incurred by the Ministry has exceeded the budget allocations in all years, except in 2018-19. This could be due to lesser allocations made for the Ministry at the budget estimate stage as compared to its projections. In 2021-22, the actual expenditure by the Ministry is estimated to exceed the budget estimate by Rs 24,689 crore (increase of 5.2% over budget allocations).

In a memorandum submitted to the 15th Finance Commission, the Ministry of Defence sought adequate funding through alternate sources for meeting its increasing requirements.[3] The Ministry had pointed out that budgetary allocations have declined over the years and are inadequate to fund large defence acquisitions.[3] For the period 2021-26, the Ministry estimated to receive Rs 9.01 lakh crore for capital outlay against the defence plan projection of Rs 17.46 lakh crore (48% shortfall).[3] It was highlighted by the Ministry that consistent shortfalls in the defence budget over a long period has led to serious capability gaps.[3] This has compromised the operational preparedness of the three services. Lack of adequate funds has forced the use of ad-hoc mechanisms such as postponing procurements and delaying payments.[3]

The 15th Finance Commission recommended that the central government may constitute Modernisation Fund for Defence and Internal Security (MFDIS) to bridge the gap between projected budgetary requirements and budget allocation.[3] This fund will be non-lapsable. Its proceeds will be utilised for: (i) capital investment for modernisation of defence services, (ii) capital investment and modernisation of central armed police forces and state police forces. It was proposed that the fund will have four specific sources of incremental funding: (i) transfers from Consolidated Fund of India, (ii) disinvestment proceeds of defence public sector enterprises, (iii) proceeds from monetisation of surplus defence land, and (iv) proceeds of receipts from defence land likely to be transferred to state governments and for public projects in future.[3] The Finance Commission estimated the indicative size of the fund at Rs 2,38,354 crore over 2021-26.[3]

The Standing Committee on Defence (2017) noted that creation of a non-lapsable defence capital fund account is an imperative need for improving operational preparedness of the armed forces.[4] Creating such a fund would ensure that procurement of equipment and ammunitions is not delayed due to lack of money.[4] The Ministry of Finance had not agreed to creation of such a non-lapsable fund.[5] According to the Ministry of Finance, the amount available in the non-lapsable fund will not be available to the Ministry of Defence automatically as it requires sanction from the Parliament.[5]

The Standing Committee on Defence (2021) was informed that a draft Cabinet note for Non-Lapsable Defence Modernisation Fund is under

consideration.[6] The Committee recommended that the Ministry of Defence should expedite the constitution of the non-lapsable fund.[6] The fund may be used exclusively for the procurement of critical defence assets at critical times.[6] According to media reports, the Ministry of Finance has rejected the funding pattern of the fund as recommended by the 15th Finance Commission.[7] It is exploring new means of funding as it is of the opinion that putting money directly in a non-lapsable fund is against good parliamentary practice.[7]

Composition of defence budget

In 2022-23, the allocation made to the Ministry is 4.4% higher as compared to the revised estimate of 2021-22. This is broadly in line with the 4.6% growth in overall central government expenditure in 2022-23. Capital outlay is estimated to see the highest increase of 10% followed by 8% for salaries and 2% for pensions.

Expenditure on salaries and pensions forms the largest portion of the defence budget (Rs 2,83,130 crore which is 54% of the defence budget). Capital outlay of Rs 1,44,304 crore, forms 27% of the defence budget. The remaining allocation is towards stores (maintenance of equipment), border roads, research, and administrative expenses.

Table 2: Defence budget allocation (in Rs crore)

Major Head	Actuals 2020-21	RE 2021-22	BE 2022-23	% change 2021-22 RE to 2022-23 BE
Salaries	1,34,091	1,50,855	1,63,453	8%
Capital Outlay	1,31,803	1,31,350	1,44,304	10%
Pensions	1,28,066	1,16,878	1,19,696	2%
Stores	48,837	46,968	40,561	-14%
Other Expenses	42,884	56,832	57,152	1%
Total	**4,85,681**	**5,02,884**	**5,25,166**	**4%**

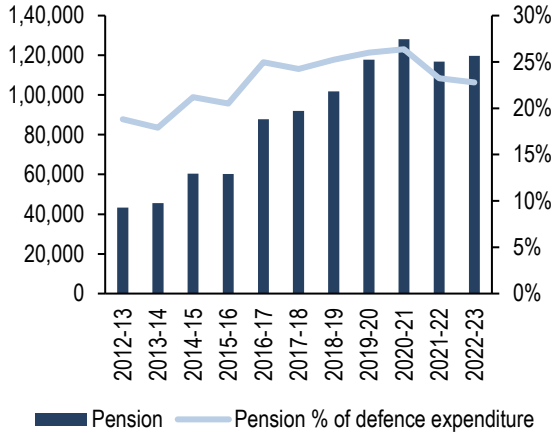
Note: Salaries, pensions and capital outlay are of the three services. Salaries include salary for civilians, auxiliary forces, Rashtriya Rifles, Jammu and Kashmir Light Infantry and Coast Guard. Pensions include rewards. Capital outlay includes capital expenses on border roads and coast guard. Stores includes ammunition, repairs and spares. Others include administration expenses, expense on research and development and housing. RE is revised estimate and BE is budget estimate.
Sources: Expenditure Budget, Union Budget 2022-23; PRS.

Decrease in share of pensions

Defence pensions provide for pensionary charges for retired Defence personnel of the three services (including civilian employees) and also employees of Ordnance Factories. It covers payment of service pension, gratuity, family pension, disability pension, commuted value of pension and leave encashment.

Expenditure on defence pension has grown at an annual average rate of 10.7% between 2012-13 and 2022-23. This is higher than the average annual growth of the defence budget at 8.6%. The share of pension in the defence budget increased from 19% in 2012-13 to 26% in 2019-20. It has since fallen to 23% in 2021-22 and 2022-23. In the budget for 2022-23, the expenditure on defence pension is estimated to be Rs 1,19,696 crore which is 2% higher than the revised estimate of Rs 1,16,878 crore in 2021-22.

Figure 4: Expenditure on pensions (2012-13 to 2022-23) (in Rs crore)



Note: Figures for 2021-22 are Revised Estimates and 2022-23 are Budget Estimates.
Sources: Union Budget documents (various years); PRS.

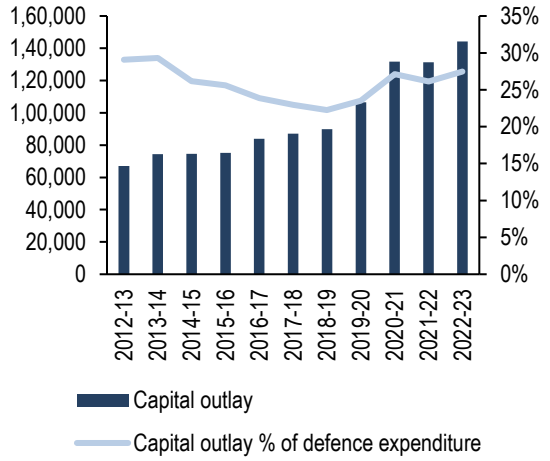
In November 2015, the government decided to implement One Rank One Pension (OROP) with benefits effective from July 1, 2014.[8] Under this framework, soldiers of the same rank who have retired after serving for the same length of service will receive the same pension.[8] This applies irrespective of the date and year of their retirement. A total of Rs 10,795 crore has been disbursed as arrears to 20,60,220 pensioners/family pensioners of defence forces on account of implementation of OROP.[8] The annual recurring expenditure for OROP is about Rs 7,123 crore. Total expenditure under the scheme for six years starting from July 1, 2014 is over Rs 42,740 crore.[8]

The Standing Committee on Defence (2021) noted that the allocation to defence pensions at the budget estimate stage reduced from Rs 1,33,825 crore in 2020-21 to Rs 1,15,850 crore in 2021-22.[9] The Committee was informed that this was due to: (i) liquidation of previous year's carry over pension liabilities and (ii) freezing of dearness allowance (DA) by the central government for a certain time period due to COVID-19 pandemic.[9] The 15th Finance Commission recommended that the Ministry should take steps to reduce salaries and pension liabilities.[3] The Ministry has been examining various reforms in defence pension including: (i) bringing service personnel currently under the old pension scheme into the New Pension Scheme, (ii) increasing retirement age of personnel below officer ranks, and (iii) transfer of retired personnel to other services.

Marginal increase in share of capital outlay

Capital outlay for defence includes expenditure on construction work, machinery, and equipment such as tanks, naval vessels, and aircrafts. Since 2012-13, the share of defence budget spent on capital outlay has declined. It was 29% in 2012-13 and declined to 24% in 2019-20. In 2020-21, share of capital outlay in the defence budget increased to 27%. In 2022-23, it is again estimated to be 27%. Note that between 2012-13 and 2018-19 the average annual growth rate of capital outlay was 5% while between 2019-20 and 2022-23 it was 11%.

Figure 5: Expenditure on capital outlay (2012-13 to 2022-23) (in Rs crore)



Note: Figures for 2021-22 are Revised Estimates and 2022-23 are Budget Estimates.
Sources: Union Budget documents (various years); PRS.

The Standing Committee on Defence (2021) noted that the ratio of revenue to capital outlay in case of the army is at 80:20 which is way short of the ideal ratio of 60:40.[6] With respect to the navy and air force, this ratio is near to the ideal level of 60:40. The Committee recommended that measures should be taken to bridge the gap between the current and the ideal ratio for the army and other services.[6]

Table 3: Capital outlay on three armed forces and coast guard (in Rs crore)

Forces	Actuals 2020-21	BE 2021-22	RE 2021-22	BE 2022-23
Army	26,321	36,532	25,377	32,115
Navy	41,667	33,254	46,022	47,591
Air Force	58,208	53,215	53,215	56,852
Coast Guard	2,503	2,650	3,236	4,246
Total	**1,28,699**	**1,25,651**	**1,27,850**	**1,40,804**

Note: Capital outlay on Army and Air Force includes assistance for prototype development. BE is budget estimate and RE is revised estimate.
Sources: Expenditure Budget, Union Budget 2022-23; PRS.

Table 3 shows the amount of capital outlay of the three armed forces and coast guard. The Army saw a 31% decline in its capital outlay budget for 2021-22 at the revised estimate stage as compared to the budget estimate stage. For Navy and Coast Guard, funds for capital outlay increased 38% and 22% respectively between the budget estimate and revised estimate of 2021-22. In 2022-23, the capital outlay of Coast Guard is expected to increase 31% over the revised estimate of 2021-22. This is followed by the Army which is estimated to see an increase of 27% in its capital outlay budget.

Committed liabilities

Note that capital acquisition of the armed forces consists of two components: (i) committed liabilities, and (ii) new schemes. Committed liabilities are payments anticipated during a financial year in respect of contracts concluded in previous years (as acquisition is a complex process involving long gestation periods). New schemes include new projects which are at various stages of approval and are likely to be implemented in future.

Table 4: Committed liabilities and modernisation budget (in Rs crore)

Year	Committed liabilities	Budget allocation	Shortfall (in %)
2016-17	73,553	62,619	15%
2017-18	91,382	68,965	25%
2018-19	1,10,044	73,883	33%
2019-20	1,13,667	80,959	29%

Note: Figures for committed liabilities have not been publicly disclosed for 2020-21 and 2021-22.
Sources: 3rd Report, Capital Outlay on Defence Services, Procurement Policy and Defence Planning, Standing Committee on Defence, December 2019; PRS.

The Standing Committee on Defence (2019) expressed concern over the shortage in allocation to meet committed liabilities expenditure.[10] The Committee observed that inadequate allocation for committed liabilities could lead to default on contractual obligations.[10] It found the shortage in allocation to cover such expenditure as baffing and observed that if India were to default on payments, it will not go down well in international markets.[10]

The Standing Committee on Defence (2021) noted that despite earlier recommendations to create a dedicated fund for committed liabilities and new schemes, there has been no progress on the same.[6] It again urged the Ministry of Defence to create a dedicated head for committed liabilities and new schemes from next budget onwards. This would ensure that there are no difficulties in meeting the payment deadlines for purchases that have already been committed.[6] The Standing Committee on Defence (2021) was earlier informed by the government that both committed liabilities and new schemes are included in capital acquisition segment of capital budget.[11] Allocations under committed liabilities and new schemes are dependent on ceilings received from the Ministry of Finance.[11]

Analysis of the three armed forces

This section analyses the budget of the three armed forces, as well as issues related to their operational preparedness and modernisation.

In 2022-23, the total allocation of the three forces (including pensions) is Rs 5,25,166 crore which is 94% of the total defence budget. Out of this, allocation for Army accounts for 58% of the defence budget followed by the Air Force at 19% and Navy at 16%. The expenditure on Army, Navy, and Air Force is in the ratio 3.5:1:1.2. The Army has the highest pension obligations. Excluding pensions (which is a cost for former staff and does not contribute to present or future defence preparedness), the expenditure of Army, Navy, and Air Force are in the ratio 2.5:1:1.1. The table below shows the defence budget allocation amongst the three forces.

Table 5: Defence budget allocation (in Rs crore)

Major Head	Actuals 2020-21	RE 2021-22	BE 2022-23	Share of Budget
Army	2,84,143	2,90,673	3,06,055	58%
Navy	75,779	81,747	86,252	16%
Air Force	1,01,673	97,930	1,00,650	19%
Other	24,086	32,534	32,210	6%
Total	**4,85,681**	**5,02,884**	**5,25,166**	**-**

Note: Expenditure for Army includes expense on Border Roads Organisation, and Jammu and Kashmir Light Infantry. Expenditure for Navy includes expense on Coast Guard Organisation. RE is revised estimate and BE is budget estimate.
Sources: Expenditure Budget, Union Budget 2022-23; PRS.

Composition of service budgets

Army

Table 6: Composition of Army budget (2022-23) (in Rs crore)

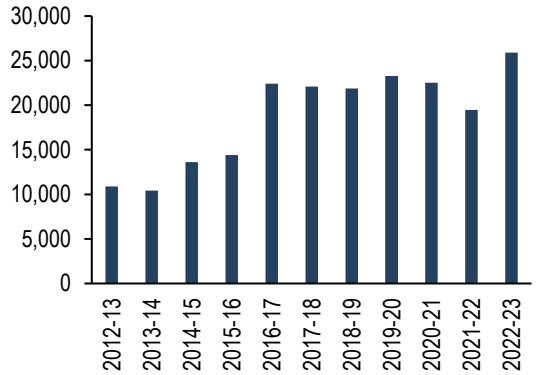
Head	Amount Allocated	% of service budget
Salaries	1,27,693	42%
Pensions	1,02,808	34%
Modernisation	25,909	8%
Maintenance	20,383	7%
Others	29,262	10%
Total	**3,06,055**	**100%**

Note: Salaries include salary for civilians, auxiliary forces, Rashtriya Rifles, Jammu and Kashmir Light Infantry. Modernisation funds for the Army is calculated from the following heads of the capital outlay: (i) Aircraft and Aeroengine, (ii) Heavy and Medium Vehicles, (iii) Other Equipment, (iv) Rolling Stock, (v) Rashtriya Rifles, and (vi) assistance for prototype development.
Sources: Union Budget 2022-23; PRS.

The Army is the largest of the three forces, both in terms of its budget as well as the number of personnel. In 2022-23, Rs 3,06,055 crore has been allocated for the Army. This includes Rs 2,30,501 crore for salaries and pensions which is 76% of the Army's budget. Note that as of January 1, 2019, the Army has an authorised strength of 12.7 lakh personnel.[12] Significant expenditure on salaries and pensions, leaves only 8% of the Army's budget (Rs 25,909 crore) for modernisation. Table 6 provides the composition of the Army's budget for 2022-23.

Modernisation involves acquisition of state-of-the art technologies and weapons systems to upgrade and augment defence capabilities of the forces. Figure 6 shows the expenditure on modernisation of the Army over the last 10 years. Between 2012-13 and 2022-23, funds for modernisation of the army have increased at an annual average rate of 9%. Note that between 2012-13 and 2016-17, the expenditure on modernisation increased at an annual average rate of 20% while it increased at only 2% between 2016-17 and 2022-23. In 2022-23, Army's modernisation expenditure is estimated to increase by 33% over the revised estimate of 2021-22.

Figure 6: Expenditure on modernisation of Army (in Rs crore)



Note: Figures for 2021-22 are Revised Estimates and for 2022-23 are Budget Estimates.
Sources: Union Budget documents (various years); PRS.

The Standing Committee on Defence (2018) has noted that modern armed forces should have one-third of its equipment in the vintage category, one-third in the current category, and one-third in the state-of-the-art category.[13] However, Indian Army had 68% of its equipment in the vintage category, 24% in the current category, and 8% in the state-of-the-art category.[13] The Committee also noted that over the years, the Army has accumulated a substantial deficiency of weapons, stores and ammunition. It found that adequate attention has been lacking with respect to both policy and budget for modernising the aging armoury.[13]

Navy

The Navy has been allocated Rs 86,252 crore (including pensions) in 2022-23. Modernisation comprises 54% (Rs 46,518 crore) of Navy's budget allocation. Table 7 provides the composition of the Navy's budget for 2022-23. The expenditure on

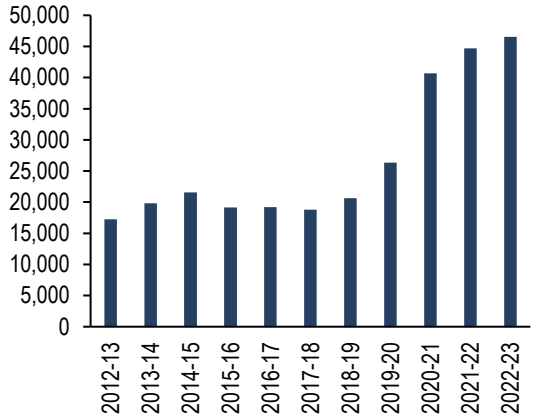
naval fleet is expected to increase to Rs 24,717 crore in the revised estimate of 2021-22 from Rs 16,000 crore at the budget estimate stage (54% increase). In July 2021, the Ministry of Defence issued a request for proposal for acquiring six conventional submarines under Project 75 (India).[14] The project is estimated to cost over Rs 40,000 crore.[14]

Table 7: Composition of Navy budget (2022-23) (in Rs crore)

Head	Amount Allocated	% of service budget
Modernisation	46,518	54%
Salaries	15,722	18%
Maintenance	7,610	9%
Pensions	5,944	7%
Others	10,458	12%
Total	**86,252**	**100%**

Note: Salaries include salary for civilians and coast guard. Modernisation funds for the Navy is calculated from the following heads of the capital outlay: (i) Aircraft and Aeroengine, (ii) Heavy and Medium Vehicles, (iii) Other Equipment, (iv) Joint Staff, (v) Naval Fleet, and (vi) Naval Dockyards and Projects.
Sources: Union Budget 2022-23; PRS.

Figure 7: Expenditure on modernisation of Navy (in Rs crore)



Note: Figures for 2021-22 are Revised Estimates and for 2022-23 are Budget Estimates.
Sources: Union Budget documents (various years); PRS.

Between 2012-13 and 2022-23, funds for modernisation of the Navy have increased at an annual average rate of 10%. Note that between 2012-13 and 2018-19, Navy's modernisation expenditure increased an average annual rate of only 3% while between 2018-19 and 2022-23, it increased at a significantly higher rate of 23%. In 2022-23, Navy's modernisation expenditure is expected to increase by 4% over the revised estimate of 2021-22. The modernisation expenditure of the Navy as a percentage of total defence expenditure decreased from 7% in 2012-13 to 5% in 2018-19. It has since recovered to reach 9% in 2021-22 and 2022-23.

Air Force

The Indian Air Force (IAF) has been allocated Rs 1,00,650 crore for the year 2022-23 (including pensions for retired personnel). Modernisation comprises 52% (Rs 52,750 crore) of the total budget of the IAF.

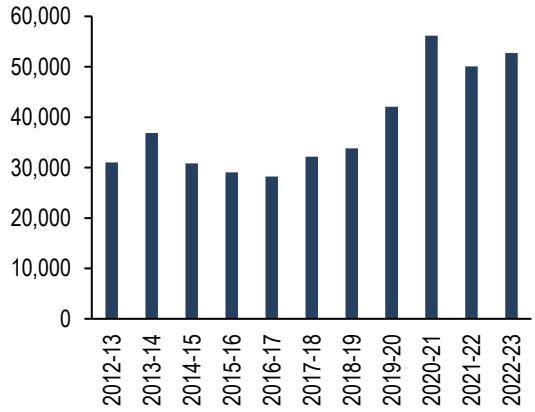
Table 8: Composition of Air Force budget (2022-23) (in Rs crore)

Head	Amount Allocated	% of service budget
Modernisation	52,750	52%
Salaries	20,038	20%
Pensions	10,925	11%
Maintenance	9,679	10%
Others	7,258	7%
Total	**1,00,650**	**100%**

Note: Salaries include salary for civilians. Modernisation funds for the Air Force is calculated from the following heads of the capital outlay: (i) Aircraft and Aeroengine, (ii) Heavy and Medium Vehicles, (iii) Other Equipment, and (iv) assistance for prototype development.
Source: Union Budget 2022-23; PRS.

Figure 8 shows the expenditure on modernisation of IAF over the last 10 years. Funds for modernisation have grown at an annual average rate of 5% between 2012-13 and 2022-23. Note that this is the minimum among all the three forces. Between 2012-13 and 2018-19, the average annual rate of growth of IAF's modernisation funds was only 1% while between 2018-19 and 2022-23 it was 12%. In 2022-23, IAF's modernisation budget is expected to increase by 5% over the revised estimates of 2021-22.

Figure 8: Expenditure on modernisation of IAF (in Rs crore)



Note: Figures for 2021-22 are Revised Estimates and for 2022-23 are Budget Estimates.
Sources: Union Budget documents (various years); PRS.

The CAG has raised issues in relation to the capital acquisition process of the IAF.[15] In its report (2019), the CAG examined 11 contracts of capital acquisition signed between 2012-13 and 2017-18, with a total value of approximately Rs 95,000 crore. It found that the current acquisition system was unlikely to support the operational preparedness of the IAF and recommended that the Ministry of Defence undertake structural reforms of the entire acquisition process.[15]

The Estimates Committee (2018) has noted that there should be 70% serviceability of aircrafts since aircrafts have to undergo standard maintenance checks.[16] However, as of November 2015, the serviceability of aircrafts was 60%.[16] Serviceability measures the number of aircrafts that are mission capable at a point in time.

Defence Procurement

Delays in defence procurement

Defence procurement refers to the acquisition of defence equipment, systems and platforms which is undertaken by the Ministry of Defence, and the three armed forces. In 2016, the government released the Defence Procurement Procedure (DPP) which has been revised and replaced by the Defence Acquisition Procedure (DAP), 2020.[17,18] The Committee on Estimates (2018) noted that procurement and acquisition of defence hardware is a long-drawn process which involves a large number of stakeholders.[16]

Issues of coordination between such large number of stakeholders sometimes lead to avoidable delays.[16] For instance, the Comptroller and Auditor General (CAG) of India observed that in case of procurement of equipment for the air force, it took three to five years to sign the contract, and another three to five years to complete the delivery.[15] The Committee on Estimates observed that such delays adversely impact the defence preparedness of India.[16] It recommended creating an integrated institutional mechanism to reduce the delays in the procurement process.[16]

Indigenisation

In order to promote indigenisation and domestic production of defence equipment, the government has notified 209 items which will be procured from indigenous sources.[19,20] These items, notified through two separate lists in August 2020 and May 2021, are placed under import embargo in a staggered manner. In August 2020, the government estimated that between April 2015 and August 2020, the armed forces had spent close to Rs 3.5 lakh crore on the items that were put under import embargo.[19] It estimated that contracts worth around four lakh crore rupees will be placed with the domestic industry within the next five to seven years.[19]

Table 9 shows the procurement of defence equipment by the three armed services imported from foreign vendors and acquired from indigenous sources. Between 2015-16 and 2018-19, the percentage of defence equipment acquired from foreign vendors increased to up to 50%. It has reduced since then. In the first six months of 2021-22, the armed forces had spent Rs 62,975 crore on procurement of defence equipment out of which 34% of the amount has been spent on procurement from foreign sources.[21]

Table 9: Procurement from domestic and foreign sources (in Rs crore)

Year	Total Procurement	Indian Vendors	Foreign Vendors	% Foreign vendors
2015-16	61,914	39,752	22,163	36%
2016-17	69,080	40,545	28,534	41%
2017-18	72,437	41,892	30,545	42%
2018-19	75,491	37,728	37,764	50%
2019-20	96,438	54,759	41,679	43%
2020-21	75,283	50,898	24,385	32%

Note: Figures for 2020-21 are up to January 2021.
Sources: 21st Report, Demands for Grants (2021-22), Standing Committee on Defence; PRS.

The Standing Committee on Defence (2021) had expressed concern on the increasing import of arms and equipment.[6] In 2020, India was the largest importer of arms according to the data compiled by SIPRI.[22] Between 2016-17 and 2019-20, out of a total 213 contracts, 90 contracts have been signed with foreign vendors for procurement of defence equipment.[6] These 90 contracts were worth around Rs 1,76,569 crore.[6]

The Estimates Committee (2018) noted that dependence on foreign suppliers, especially for military hardware, leads to huge expenditure on import of defence equipment.[16] It also makes India's security vulnerable as during emergency situation the supplier may not provide the required weapons or spare parts.[16] The Committee also expressed concern that the indigenisation level in the defence sector is increasing at a very slow rate.[16] The Committee emphasised that increasing local content in defence platforms and hardware will have a multiplier effect.[16] This will create a strong manufacturing sector, generate substantial number of jobs, and save financial resources.[16]

Low capacity of domestic industry

A key variable that would help to determine the potential of indigenisation of defence procurement is the production capacity of the domestic industry. Table 10 shows the annual turnover of defence public sector undertakings (DPSUs), other public sector undertakings (PSUs), and private companies in the defence sector over the last few years. It also compares the total domestic production of defence equipment to the overall budget for capital outlay of the armed forces.

Table 10: Total production versus capital outlay on defence services (in Rs crore)

Year	Private companies	Defence and other PSUs	Total Production	% Capital outlay budget
2017-18	15,347	63,473	78,820	90%
2018-19	17,350	63,770	81,120	90%
2019-20	15,894	62,676	78,570	74%
2020-21	17,292	67,375	84,667	64%

Note: Capital outlay includes Coast Guard Organisation and Border Roads Development Board.
Sources: Lok Sabha Unstarred Question No. 953, Ministry of Defence; Union Budget documents; PRS.

Note that after 2018-19, the share of total production by the domestic defence industry has fallen as a proportion of capital outlay for the armed forces. In 2020-21, total production by the domestic defence industry amounted to 64% of the overall budget for capital outlay. Decline in production of defence equipment by the domestic industry as a percentage of funds available for capital outlay with the armed services may increase the reliance of the armed forces on imports. The Standing Committee on Defence (2021) had recommended that steps should be taken so that ordnance factories, DPSUs, and private industries work in coordination.[6] This will help to promote import substitution of defence products and expand the export potential of these entities.[6]

An Expert Committee (2015) noted that majority of defence material manufacture in India is in the public sector.[23] In 2020-21, private companies contributed to only 20% of the overall production of the domestic defence industry. This ratio has broadly remained the same since 2017-18. The Expert Committee recommended that the government should support the private defence sector on a long-term basis.[23] This would require both long-term projections and stable current orders along with hand holding in various stages of the procurement cycle.[23]

With effect from October 1, 2021, the central government dissolved the Ordnance Factory Board (OFB) and transferred its operations to seven new DPSUs.[24] OFB was engaged in the production of arms, ammunitions, weapons, and defence equipment. It operated under the administrative control of Department of Defence Production in the Ministry of Defence. According to the government, this is expected to enhance the functional autonomy and efficiency of these entities.[25] The Ministry of Defence has set a target of achieving a turnover of Rs 1.75 lakh crore by 2024 for indigenous manufacturing of aerospace and defence goods and services.[25] This target includes exports worth Rs 35,000 crore.[25]

Defence Acquisition Procedure, 2020

The first DAP was promulgated in 2002 and has been revised periodically.[26] DAP 2020 has been applicable from October 1, 2020. It will remain in force till September 30, 2025 or till it is reviewed. It seeks to enhance indigenous content in the manufacturing of defence equipment.[26] DAP is applicable for the acquisition of capital goods and services.[18] It also provides for leasing of assets as another category of acquisition which can substitute huge initial capital outlays with periodical rental payments.[18]

Categories of acquisition provided in DAP are:

- Buy (Indian-IDDM) refers to the acquisition of products from an Indian vendor that have been indigenously designed, developed and manufactured;
- Buy (Indian) refers to the acquisition of products from an Indian vendor which may not have been designed and developed indigenously;
- Buy and Make (Indian) refers to an initial acquisition of equipment from an Indian vendor who is in a tie-up with a foreign vendor, followed by indigenous production involving transfer of technology;
- Buy (Global-Manufacture in India) refers to a purchase from a foreign vendor which is followed by indigenous production of entire/part of equipment though the vendor's Indian subsidiary; and
- Buy (Global) refers to outright purchase of equipment from foreign or Indian vendors.[18]

Among the categories listed above, Buy (Indian-IDDM) is given the highest priority in procurement. This is followed by Buy (Indian) and Buy and Make (Indian).[18]

Table 11: Enhancement in indigenous content

Category	DPP-2016	DAP-2020
Buy (Indian-IDDM)	40% or more	50% or more
Buy (Indian)	40% or more	50% or more (for indigenous design)
Buy and Make (Indian)	50% or more of 'Make' part	50% or more of 'Make' part
Buy (Global-Manufacture in India)	-	50% or more
Buy (Global)	-	30% or more (for Indian vendor)

Note: Buy and Make category refers to an initial procurement of equipment from a foreign vendor, followed by transfer of technology.
Sources: Press Information Bureau; PRS.

Table 11 shows the increase in indigenous content in the different categories of acquisition. DAP has increased the requirement for indigenous content in most of the categories of acquisition. Indigenous

content is the percent of cost of such content in base contract price (total contract price without taxes and duties).[18]

DAP also provides for a separate mechanism for acquisition of systems designed and developed by Defence Research and Development Organisation (DRDO)/DPSU/OFB. Based on operational requirements, the procuring agency will identify equipment which can be designed and developed by DRDO, DPSUs, or OFBs. Such cases would then be categorised under Buy (Indian-IDDM) for subsequent procurement.

Increase in FDI limit

In September 2020, the central government increased the limit for foreign direct investment (FDI) in defence sector from 49% to 74% under the automatic route.[27] FDI beyond 74% is permitted with government approval which may be given where FDI is likely to result in access to modern technology.[28] Since the increase in limit, an FDI inflow of Rs 186 crore has been reported in the defence sector.[29]

Research and Development

Defence research is primarily carried out by DRDO. It is the research and development (R&D) wing of the Ministry of Defence. It is engaged in developing defence technologies such as aeronautics, armaments, missiles, and engineering systems. The Standing Committee on Defence (2021) observed a steady drop in the research and development expenditure incurred by DRDO as a percentage of India's GDP.[30]

Table 12: DRDO's research and development expenditure (in Rs crore)

Year	R&D Expenditure	% of GDP
2016-17	13,501	0.088%
2017-18	15,399	0.091%
2018-19	17,122	0.09%
2019-20	17,731	0.087%
2020-21	16,466	0.084%

Sources: 22nd Report, Demands for Grants (2021-22), Ordnance Factories, Defence Research and Development Organisation, Directorate General of Quality Assurance and National Cadet Corps, Standing Committee on Defence; PRS.

The Committee noted that the expenditure incurred on defence research and development has remained around 1% of GDP which is substantially less as compared to other developed nations.[30] The Committee recommended providing adequate allocations to DRDO so that it can scale up its research and development activities. There is a need to enhance the expenditure of DRDO as a percentage of GDP as well as a percentage of the total defence budget so that it can take up flagship projects for the design and development of weapon systems.[30]

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Demand for Grants 2022-23 Analysis
Food and Public Distribution

The Ministry of Consumer Affairs, Food and Public Distribution has two Departments: (i) Food and Public Distribution, and (ii) Consumer Affairs. Allocation to the Ministry accounts for 6% of the budget of the central government in 2022-23.[1]

Department of Consumer Affairs is responsible for spreading awareness among consumers about their rights, protecting their interests, implementing standards, and preventing black marketing.[2] In 2022-23, the Department has been allocated Rs 1,725 crore, a 30% decrease over the revised estimate of 2021-22.[3]

Department of Food and Public Distribution is responsible for ensuring food security through procurement, storage, and distribution of food grains, and for regulating the sugar sector.[4] In 2022-23, the Department has been allocated Rs 2,15,960 crore (99% of the Ministry's allocation).[5] This is a decrease of 28% as compared to the revised estimate of 2021-22.

Table 1: Allocation to the Ministry (in Rs crore)

Department	2020-21 Actuals	2021-22 Revised	2022-23 Budgeted	% change in 2022-23 BE over 2021-22 RE
Food & Public Distribution	5,55,432	3,02,000	2,15,960	-28%
Consumer Affairs	11,365	2,454	1,725	-30%
Total	**5,66,797**	**3,04,454**	**2,17,684**	**-28%**

Sources: Expenditure Budget, Union Budget 2022-23; PRS.

This note examines the allocation to the Department of Food and Public Distribution. It also discusses the broad issues in the sector and key observations and recommendations made in this regard.

Overview of Finances

Food subsidy is the largest expenditure by the Department of Food and Public Distribution. 96% of the Department's allocation in 2022-23 is towards food subsidy (see Table 7 in the Annexure for more details). The subsidy is provided to the Food Corporation of India (FCI) and states for procuring food grains from farmers at government notified prices and selling them at lower subsidised prices (known as Central Issue Prices), under the National Food Security Act, 2013. The Act mandates coverage of 75% of the population in rural areas and 50% in urban areas, and covers 81 crore persons.[6,7]

The subsidy also covers the storage cost incurred by FCI in maintaining buffer stocks in order to ensure food security in the country. Table 2 shows the expenditure on food subsidy during 2012-23.

Table 2: Expenditure on food subsidy (Rs crore)

Year	Allocation	Expenditure	% utilisation
2012-13	75,000	85,000	113%
2013-14	90,000	92,000	102%
2014-15	1,15,000	1,17,671	102%
2015-16	1,24,419	1,39,419	112%
2016-17	1,34,835	1,10,173	82%
2017-18	1,45,339	1,00,282	69%
2018-19	1,69,323	1,01,327	60%
2019-20	1,84,220	1,08,688	59%
2020-21	1,15,570	5,41,330	468%
2021-22	2,42,836	2,86,469#	118%
2022-23	2,06,831*	-	-

Note: *Budget estimate; #Revised estimate.
Sources: Expenditure Budget, Union Budgets (various years); PRS.

The central government provides food subsidy to FCI as reimbursement of the loss it incurs in its procurement, storage, and distribution operations. During the period 2016-20, although the Department used to receive sufficient allocation for payment to FCI, due to budget cuts made during the year, the actual amount paid to FCI was much lower. The Comptroller and Auditor General (CAG) of India (2019) observed that when the food subsidy budget is not sufficient to clear FCI's dues, such dues are carried over to the next year.[8] Due to such carryovers every year, payment due to FCI for food subsidy increased from Rs 81,303 crore at the end of 2016-17 to Rs 2,43,779 crore at the end of 2019-20.[9]

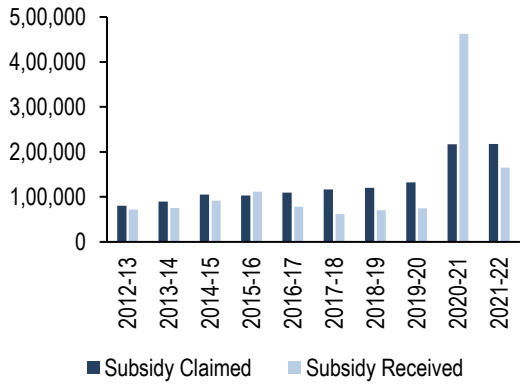
The Department was allocated Rs 1,84,220 crore for food subsidy in 2019-20. However, only 59% of the allocation was utilised as the food subsidy provided to FCI decreased from Rs 1,51,000 crore (budget estimate) to Rs 75,000 crore. As directed by the Ministry of Finance, the Department deferred the payment of food subsidy due to FCI, resulting in an underspending of Rs 76,000 crore.[10]

In the meanwhile, the government provided loans to FCI from the National Small Savings Fund (NSSF) to meet its operational requirements. NSSF loans worth Rs 2,54,600 crore were outstanding with FCI at the end of 2019-20.[11] In her 2021-22 budget speech, the Finance Minister announced that the government will discontinue the NSSF loans given to FCI and accordingly make budget provisions in 2020-21 and 2021-22.[12] Following this announcement, the total expenditure on food subsidy increased to Rs 5,41,330 crore in 2020-21, an increase of 398% over the expenditure in 2019-20. Out of this the food subsidy given to FCI was Rs 4,62,789 crore in 2020-21. According to the

revised estimate for 2021-22, there are estimated to be no NSSF loans outstanding with respect to FCI.[13]

Note that in 2021-22, FCI has claimed Rs 2,17,460 crore as food subsidy which is 95% of the food subsidy bill for the entire year. Against this, in the revised estimate of 2021-22, the central government has provided Rs 2,10,929 crore which is lesser than the subsidy claimed by FCI. In 2022-23, the central government has allocated Rs 2,06,831 crore for food subsidy out of which Rs 1,45,920 (71%) crore is for providing food subsidy to FCI.

Figure 1: Food subsidy claimed vs subsidy received by FCI (in Rs crore)



Note: Data for 2021-22 is up to January 31, 2022.
Sources: Report of Comptroller and Auditor General of India on Compliance of the Fiscal Responsibility and Budget Management Act, 2003 (2018); Food Corporation of India; PRS.

Since April 2020, the government has been implementing the Pradhan Mantri Garib Kalyan Anna Yojana (PMGKAY) in phases. Under the programme, which was announced in March 2020, the government has been allocating additional 5 kg of wheat or rice to 80 crore people free of cost under the National Food Security Act, 2013.[14] This is over and above the monthly entitlements under the National Food Security Act. In the first and second phases of the scheme, the government allocated one kg of pulses and chana respectively to the beneficiaries.[15] The fifth phase of the scheme, which was approved by the Cabinet in November 2021, will run from December 2021 till March 2022.[16] The government is expected to incur an expenditure of nearly Rs 2.6 lakh crore under the five phases of the scheme.[16] The fifth phase alone is estimated to entail an additional food subsidy bill of Rs 53,345 crore.

Components of food subsidy

Expenditure on food subsidy can be classified under the following three heads (break-up in Table 3):

- **Subsidy to FCI:** The Food Corporation of India (FCI) receives subsidy for procuring food grains from farmers at government notified prices and selling them at lower subsidised prices. It also receives subsidy for the storage cost incurred in maintaining buffer stocks.
- **Subsidy to states:** Under the decentralised procurement scheme, states may choose to undertake the operations of procurement, storage, and distribution on behalf of FCI. In such cases, states are provided with subsidy. Currently, 17 states undertake procurement of rice and wheat.
- **Sugar subsidy:** Sugar subsidy is provided for giving one kg of sugar per month at subsidised rates to families covered under the Antyodaya Anna Yojana (i.e., poorest of the poor families).

In 2022-23, subsidies to FCI and states form 71% and 29% of the allocation for food subsidy, respectively.

Table 3: Break-up of food subsidy (in Rs crore)

Subsidy	2020-21 Actuals	2021-22 Revised	2022-23 Budgeted	% change in 2022-23 BE over 2021-22 RE
Subsidy to FCI	4,62,789	2,10,929	1,45,920	-31%
Subsidy to states (decentralised procurement)	78,338	75,290	60,561	-20%
Sugar subsidy	203	250	350	40%
Total	**5,41,330**	**2,86,469**	**2,06,831**	**-28%**

Sources: Expenditure Budget, Union Budget 2022-23; PRS.

Issues in the Sector

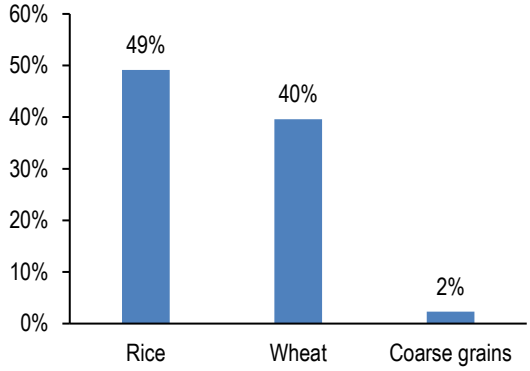
FCI and state agencies procure food grains from farmers at the government notified Minimum Support Prices (MSPs). These food grains are provided to the economically weaker sections at subsidised prices through fair price shops under the Public Distribution System (PDS). The central and state governments provide subsidised food grains to beneficiaries under the National Food Security Act, 2013 as well as under certain other welfare schemes such as the Mid-Day Meal scheme. In this section, we examine some issues relating to the: (i) factors increasing food subsidy bill, (iii) procurement and storage of food grains, and (iv) sugarcane dues to farmers.

Minimum support price and farm production

Minimum support price is the assured price announced by the central government at which food grains are procured from the farmers by central and state governments along with their agencies.[6] This procurement is done for the central pool from which allocations are made under PDS and also kept as reserves. MSPs are announced each year for 23 crops. However, procurement is limited to a few crops such as rice, wheat, pulses, and coarse grains. Figure 2 shows that 49% of the rice produced in 2020-21 was procured by the government while the figure for wheat was 40%. Under the National Food Security Act, the central and state governments have to undertake necessary reforms in targeted PDS.[6]

One of those reforms is to diversify the commodities distributed under PDS.[6]

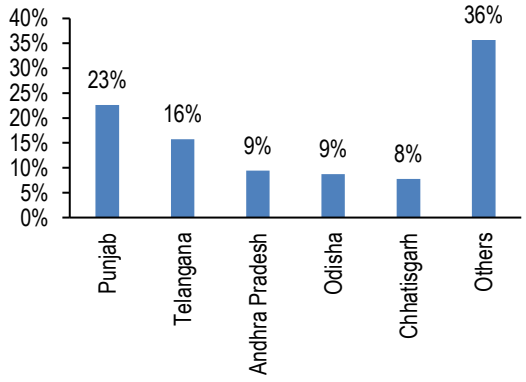
Figure 2: Procurement of major crops produced in crop year 2020-21



Note: Wheat produced in 2020-21 was procured in 2021-22.
Sources: Department of Food and Public Distribution; PRS.

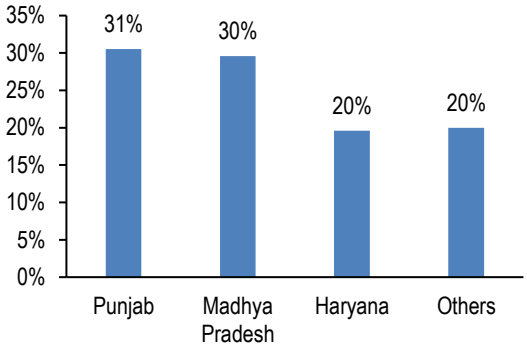
The Economic Survey of 2019-20 noted that the government procures around 40-50% of the total market surplus of rice and wheat.[17] MSP was designed to be indicative prices for farmers at the start of the sowing season and act as an insurance in times of fall in prices. The Survey pointed out that the increasing trend in MSPs gives a signal to farmers to opt for the crops that have an assured procurement system.[17] This also shows that market prices do not offer remunerative options for farmers and MSPs act as maximum prices that farmers can realise.[17] This puts pressure on the water table as these crops (especially paddy and sugarcane) are water-intensive.[18] Also, the bulk of MSP procurement is geographically concentrated in a few states. As shown in Figure 3, in 2020-21, 64% of the rice procured was from five states. However, the contribution of these states in the total production of rice in the same year was only 36%. Similarly, 80% of the wheat procured in 2021-22 was from the three states of Punjab, Madhya Pradesh and Haryana. Taken together these states contributed to only 43% of the total wheat production in 2020-21. Note that the National Food Security Act provides for geographical diversification of procurement operations.[6]

Figure 3: Rice procurement in 2020-21



Sources: Department of Food and Public Distribution; PRS.

Figure 4: Wheat procurement in 2021-22



Note: Wheat procured in 2021-22 is for crop produced in 2020-21.
Sources: Department of Food and Public Distribution; PRS.

Revision of central issue price (CIP)

Under the National Food Security Act, 2013, food grains are allocated to the beneficiaries at the CIP. These prices have not changed since July1, 2002.[19]

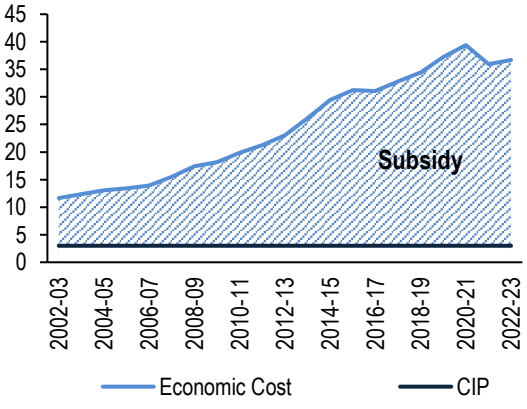
Table 4: Central Issue Price (in Rs per kg)

Food grain	AAY	BPL	APL
Rice	3.00	5.65	8.30
Wheat	2.00	4.15	6.10

Note: AAY – Antyodaya Anna Yojana, BPL – Below Poverty Line, APL – Above Poverty Line.
Sources: FCI; PRS.

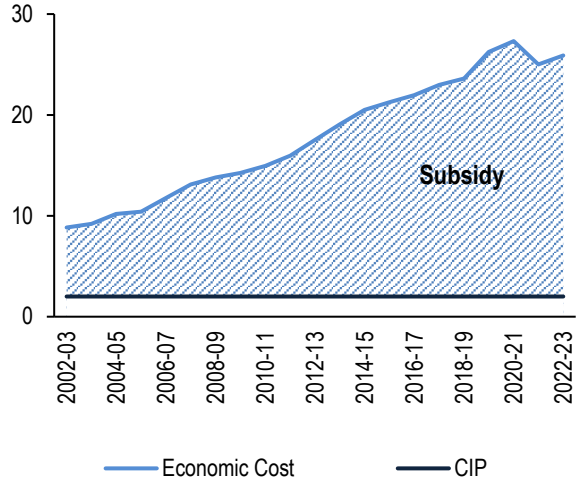
Food subsidy has three elements: (i) consumer subsidy, (ii) cost of maintaining buffer stock, and (iii) subsidy on coarse grains, regularisation of FCI's operational losses and other non-plan allocation to states.[20] Consumer subsidy is the difference between the economic cost and CIP. Economic cost includes cost of procurement, acquisition, and distribution. In 2002-03, from when the CIP has been effective, the economic cost of rice was Rs 11.7 per kg and for wheat it was Rs 8.8 per kg.[20] In 2022-23, the economic cost of rice and wheat is estimated to increase to Rs 36.7 per kg and Rs 25.9 per kg repectively.[20] Due to non-revision of CIP to reflect the increase in economic cost of food grains distributed under PDS, the food subsidy bill has increased over the years.

Figure 5: Subsidy on a kg of rice (in Rs)



Sources: FCI; PRS.

Figure 6: Subsidy on a kg of wheat (in Rs)



Sources: FCI; PRS.

The Standing Committee on Food, Consumer Affairs and Public Distribution (2017) noted that the food subsidy bill has increased due to increase in MSP of wheat and rice with respect to the CIP, increased off take of food grains under targeted PDS, and implementation of national Food Security Act, 2013 in all states/UTs. [21] The 15th Finance Commission observed that the increase in economic cost of food grains will need to be partially offset by increasing CIP of subsidised food grains.[22] The Economic Survey 2020-21 noted that the central government's food subsidy bill is becoming unmanageably large.[23] The Survey said that while it is difficult to reduce the economic cost of food management, there is a need to consider revising CIP to reduce food subsidy bill.[23]

Delivery of food subsidy

Leakages in PDS: Leakages refer to food grains not reaching the intended beneficiaries. Note that recent data on leakage is not publicly available. The latest available data is for 2011. According to the 2011 data, leakages in PDS were estimated to be 46.7%.[24,25]

Leakages may be of three types: (i) pilferage or damage during transportation of food grains, (ii) diversion to non-beneficiaries at fair price shops through issue of ghost cards, and (iii) exclusion of people entitled to food grains but who are not on the beneficiary list.[26,27] Studies have shown that targeting mechanisms such as TPDS are prone to large exclusion and inclusion errors.[28]

Exclusion errors occur when entitled beneficiaries do not get food grains. It refers to the percentage of poor households that are entitled to but do not have PDS cards. Exclusion errors had declined from 55% in 2004-05 to 41% in 2011-12.[29]

Inclusion errors occur when those who are ineligible get undue benefits. Inclusion errors had increased from 29% in 2004-05 to 37% in 2011-12.[29]

For eliminating leakages, states/UTs have been suggested two, options: (i) direct cash transfer and (ii) automation of fair price shops (FPSs).[30] The direct cash transfer scheme is being implemented in Chandigarh and Puducherry from September 2015 and in part of Dadra and Nagar Haveli from March 2016.[30] Direct cash transfers give the option to beneficiaries to buy the food grains of their choice and diversify consumption based on dietary preferences. However, beneficiaries may have to face higher costs in accessing the cash transfer due to factors such as distance and higher waiting time for cash withdrawal.[30] There have also been certain reports of inadequate availability of food grain in the open market.

The High-Level Committee on Restructuring of FCI (2015) had suggested that switching to DBT for food subsidy would reduce the food subsidy bill of the government by more than Rs 30,000 crore annually.[30] It suggested that cash transfers can be indexed with the overall price level to protect the amount of real income transfers.

The High-Level Committee had also recommended the introduction of biometric authentication and Aadhaar to address leakages in PDS.[24] In February 2017, the Ministry made it mandatory for beneficiaries under the National Food Security Act, 2013 to use Aadhaar as proof of identification for receiving food grains.[31] Note that non-linking of Aadhaar with ration cards is not a ground for cancellation of ration cards.[32] The deadline for applying for Aadhaar enrolment in order to avail subsidised food grains or cash transfer of food subsidy, has been extended to March 31, 2022.[33] As on December 9, 2020, 91% of the ration cards have been seeded with Aadhaar. States and UTs have deleted 4.28 crore bogus ration cards during 2014-2021.[32] This is due to measures such as the use of information technology reforms, digitisation of ration cards data, de-duplication process, permanent migration, and identification of ineligible/duplicate ration cards.

Note that beneficiaries may face issues with Aadhaar authentication while availing PDS benefits. According to the data submitted by UIDAI to the Supreme Court in Justice K. S. Puttaswamy vs Union of India, the Aadhaar authentication failure rate (across all purposes) was 8.5% for iris scans and 6% for fingerprints.[34] In its judgement, the Court held that services cannot be denied to beneficiaries due to Aadhaar authentication failure.[34]

In addition to implementing cash transfers, automation of FPSs is done by installing electronic point of sale devices (ePoS). This helps in transparent distribution of food grains after unique identification of beneficiaries[30]. In addition to this, ePoS devices also upload the electronic records of sale transactions to centralised servers in states/UTs.[30] At all India level, as of December

2020, 92% of FPSs have been automated.

Table 5: States where complete FPS automation is pending

State/UT	Total FPS	Operational ePoS	% FPS Automation
Andaman and Nicobar	464	445	96%
Arunachal Pradesh	1,943	683	35%
Assam	38,237	0	0%
Chhattisgarh	12,304	12,004	98%
Delhi	2,018	0	0%
Karnataka	19,935	19,762	99%
Manipur	2,333	2,307	99%
Meghalaya	4,709	3,930	83%
Mizoram	1,241	1,233	99%
Sikkim	1,362	1,352	99%
Uttarakhand	9,908	7,634	77%

Note: Data as on December 9, 2020.
Sources: 12th Report, Standing Committee on Food, Consumer Affairs and Public Distribution (2020-21); PRS.

One Nation One Ration Card (ONORC): From April 2018, the Department has been implementing the Integrated Management of Public Distribution System scheme.[35] The scheme aims to provide nation-wide portability of ration cards through ONORC.[35] It allows all beneficiaries under the National Food Security Act, 2013 to collect their entitled food grains from any FPS in the country. As of August 2021, the scheme has been implemented in 34 states/UTs with 24 crore portability transactions carried out between April 1, 2020 and September 30, 2021.[36] Note that between August 2019 and November 2020, out of 18.98 crore portability transactions, only 22,087 transactions were for inter-state portability while the rest were for intra-state portability.[30] This could be due to: (i) restrictions by states on biometric authentication of beneficiaries due to COVID-19 and (ii) lack of awareness among beneficiaries.[30]

Procurement of Food Grains

The Department of Food and Public Distribution is the nodal department for making policies with regard to procurement, movement, scientific research, storage, distribution, and sale of food grains. FCI and other state agencies procure wheat and paddy at MSP.[37] Coarse grains are procured by state government agencies for the central pool as per the direction of the central government.[37]

There are two broad procurement systems: (i) centralised procurement and (ii) decentralised procurement.[38] Under the centralised procurement system, food grains are procured either directly by the FCI or by state government agencies. The food grains procured by state agencies are handed over to FCI for storage, distribution, or transportation. Under decentralised procurement, state government/agencies procure, store, and distribute rice/wheat/coarse grains within the state. The excess stocks of rice and wheat are handed over to FCI in the central pool. 15 states procure rice and eight states procure wheat under decentralised procurement. Presently, FCI plays only a supporting role in procurement of food grains and direct procurement by FCI is less than 5%. All operations are conducted by state agencies.

Table 6: Procurement of rice and wheat for central pool (in lakh metric tonnes)

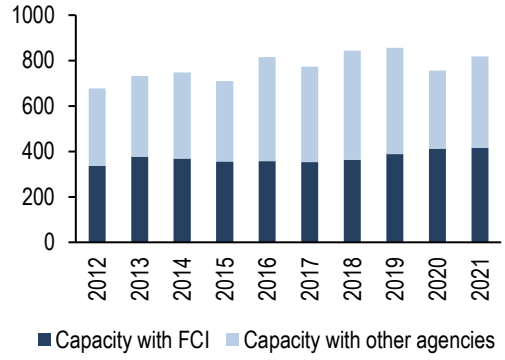
Year	Rice	Wheat
2015-16	342.18	280.88
2016-17	381.06	229.61
2017-18	381.74	308.24
2018-19	443.99	357.95
2019-20	518.26	341.32
2020-21	601.85	389.92
2021-22*	452.26	433.44

Note: *Data for rice procurement for 2021-22 is up to February 10, 2022.
Sources: FCI; PRS.

The Standing Committee on Food, Consumer Affairs, and Public Distribution (2021) noted that after 23 years of its inception, decentralised procurement is not carried out in all states.[35] Decentralised procurement has increased the efficiency of PDS by making it possible to supply food grains suited to local tastes.[35] The Committee expected the central government to take steps for motivating the remaining states to adopt the scheme. This will help lower the cost of distribution. It recommended the Department/FCI to take steps to create necessary infrastructure in coordination with state governments.[35]

Storage Capacity

Figure 7: Storage capacity for central pool stocks (in lakh metric tonnes)

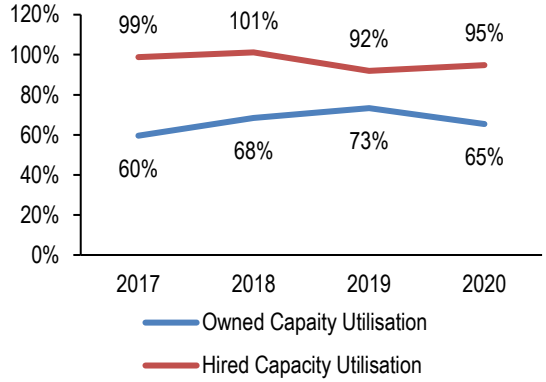


Note: Data as on April 1 of each year.
Sources: FCI; PRS.

The Department also has the responsibility to ensure availability of storage capacities in various states. In 2022-23, the central government has allocated Rs 33 crore for creation of storage capacity through FCI and state governments.[5] FCI has its own network of storage infrastructure. It also hires additional storage facilities from state warehousing corporations and Central Warehousing Corporation.[35] The existing storage facilities are primarily conventional godowns where food grains

are stacked in bags.[35] During peak procurement periods, FCI also uses cover and plinth (CAP) facilities for short-term storage of food grains.[35] As on April 1, 2021, FCI had storage capacity of 415 lakh metric tonnes.[39]

Figure 8: Hired and owned storage capacity utilisation of FCI



Note: Data as on June 1 of every year. Data for covered and CAP storage.
Sources: Standing Committee on Food, Consumer Affairs and Public Distribution; PRS.

The Standing Committee (2021) noted that the utilisation of hired storage capacity is much higher than the storage capacity owned by FCI.[35] This is despite internal audit, audit by Comptroller and Auditor (CAG) of India, and review of capacity utilisation. The Committee recommended that godowns should be hired only when it is absolutely necessary.[35] It recommended that FCI should utilise its own storage capacity to the maximum to save funds spent on renting storage space.

The Standing Committee (2021) was informed that storage capacity is hired only when there is absolute necessity for it.[35] This is the reason that hired capacity is utilised fully. Also, once constructed, owned capacity cannot be shifted to a different location due to change in procurement pattern or change in offtake of food grains.[35]

The Standing Committee noted that during 2020-21, FCI could not achieve physical and financial targets for construction of godowns.[35] For instance, the physical targets for construction of godowns in north-eastern states was 30,020 metric tonnes. However, as on January 31, 2021, no construction had taken place. Similarly, for states other than north-eastern states, the target was 6,220 metric tonnes. But, again, no construction took place. The Committee observed that the Department/FCI should make efforts to expedite completion of ongoing godown construction projects. FCI faces problems in the construction of godowns in the north eastern regions due to: (i) difficult terrain, (ii) land acquisition restrictions, (iii) law and order situation, and (iv) inclement weather.[35] The Committee recommended that the Department should take up the matter with the states/UTs to solve the problem of storage. It also recommended creating mini godowns in different parts of states/UTs.[35]

Sugarcane

The Department is also responsible for formulation of policies and regulations for the sugar sector. This includes fixing the Fair and Remunerative Price (FRP) of sugarcane which is payable to farmers by sugar factories, training in sugar technology, and regulation of supply of free sale sugar. As of November 26, 2021, Rs 4,940 crore are pending in dues to sugar farmers for the sugar seasons (October-September) of 2018-19, 2019-20, and 2020-21.[40]

Sugarcane dues: The sugar sector has been facing certain issues related to profitability and liquidity in the last few years.[41] Depressed sugar prices have often led to sugar mills unable to pay the entire compensation to farmers for buying sugarcane. Certain state governments fix their own State Advised Price at levels higher than the FRP announced by the central government. This causes further strain on the financial health of the sugar mills.[41] A Task Force on Sugarcane and Sugar Industry (2020) recommended that sugarcane prices must be linked to sugar prices.[41] Increases in FRP should be kept moderate and state announcing SAP should bear the additional costs associated with it.[41]

The Task Force recommended a staggered payment mechanism for sugarcane so that the entire dues to the farmers are cleared within two months. The central government also fixes the minimum selling price for white/refined sugar. This was increased from Rs 29 per kg to Rs 31 per kg with effect from February 14, 2019.[42] The task force had recommended increasing the minimum selling price of sugar to Rs 33 per kg with it being reviewed six months after notification.[41] This would aid sugar mills to cover their cost of production and maintenance costs.

The central government has taken measures to divert excess sugarcane/sugar for production of ethanol.[43] Note that in every sugar season, the production of sugar is around 320-330 lakh metric tonne as against the domestic consumption of 260 lakh metric tonne.[43] This subdues the price of sugar in the domestic market leading to loss for sugar mills. In the last three sugar seasons, about Rs 22,000 was generated by sugar mills/distilleries from sale of ethanol to oil marketing companies.[43] In sugar season 2021-22, 35 lakh metric tonne of excess sugar is likely to be diverted for producing ethanol as compared to around 24 lakh metric tonne in 2020-21.[43]

Sugar Development Fund (SDF): SDF was established in 1982 and grants loans to sugar mills for schemes such as modernisation and expansion of sugar factory, and cane development.[44] The task force recommended to levy a cess on sugar at Rs 50 per quintal for three years.[41] This would add about

Rs 4,500 crore to the fund which can act as a comfort for banks lending to sugar mills for paying dues to farmers and improving technologies.

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Annexure

Table 7: Allocation to major heads of expenditure under the Department in 2022-23 (Rs crore)

	2020-21 Actuals	2021-22 Budgeted	2021-22 Revised	2022-23 Budgeted	% change in 2022-23 BE over 2021-22 RE
Food subsidy	5,41,330	2,42,836	2,86,469	2,06,831	-28%
Subsidy to Food Corporation of India (FCI)	4,62,789	2,02,616	2,10,929	1,45,920	-31%
Subsidy to states (decentralised procurement)	78,338	40,000	75,290	60,561	-20%
Sugar subsidy payable under PDS	203	220	250	350	40%
Assistance to state agencies for intra-state movement of food grains and for margin of fair price shops' dealers	6,483	4,000	6,000	-	-100%
Investment in equity capital of FCI	1,000	2,500	2,500	1,900	-24%
Scheme for defraying expenditure on transport and marketing of sugar exports, including handling and processing	301	2,000	3,503	-	-100%
Scheme for assistance to sugar mills for 2019-20 season	3,900	1,000	2,150	-	-100%
Scheme for creation and maintenance of buffer stock of sugar	600	650	765	-	-100%
Financial assistance to sugar mills for enhancement and augmentation of ethanol production capacity	150	300	160	300	88%
Schemes for development of sugar industries	175	187	143	85	-41%
Scheme for extending soft loan to sugar mills	418	-	-	-	-
Department	**5,55,432**	**2,53,974**	**3,02,000**	**2,15,960**	**-28%**

Sources: Demand no. 15, Department of Food and Public Distribution, Expenditure Budget, Union Budget 2022-23; PRS.

Table 8: Procurement, offtake, and stocks of food grains (in million tonnes)

Year	Procurement			Offtake			% Offtake	Stocks		
	Rice	Wheat	Total	Rice	Wheat	Total		Rice	Wheat	Total
2004-05	24.7	16.8	41.5	23.2	18.3	41.5	100%	13.3	4.1	18.0
2005-06	27.6	14.8	42.4	25.1	17.2	42.3	100%	13.7	2.0	16.6
2006-07	25.1	9.2	34.3	25.1	11.7	36.8	107%	13.2	4.7	17.9
2007-08	28.7	11.1	39.8	25.2	12.2	37.4	94%	13.8	5.8	19.8
2008-09	34.1	22.7	56.8	24.6	14.9	39.5	70%	21.6	13.4	35.6
2009-10	32.0	25.4	57.4	27.4	22.4	49.8	87%	26.7	16.1	43.3
2010-11	34.2	22.5	56.7	29.9	23.1	53.0	93%	28.8	15.4	44.3
2011-12	35.0	28.3	63.3	32.1	24.3	56.4	89%	33.4	20.0	53.4
2012-13	34.0	38.2	72.2	32.6	33.2	65.8	91%	35.5	24.2	59.8
2013-14	31.9	25.1	57.0	29.2	30.6	59.8	105%	30.6	17.8	49.5
2014-15	31.6	28.0	59.6	30.7	25.2	55.9	94%	23.8	17.2	41.3
2015-16	34.1	28.1	62.2	31.8	31.8	63.6	102%	28.8	14.5	43.6
2016-17	36.5	23.6	60.1	32.8	29.1	61.9	103%	29.8	8.1	38.1
2017-18	37.6	30.6	68.2	35.0	25.3	60.3	88%	30.0	13.2	43.3
2018-19	42.7	35.0	77.7	34.4	31.5	65.9	85%	37.7	34.9	72.7
2019-20	46.1	34.1	80.2	35.0	27.2	62.2	78%	49.2	24.7	74.0
2020-21	58.2	39.0	97.2	56.3	36.8	93.1	96%	49.9	27.3	78.0

Sources: Database on Indian Economy, Reserve Bank of India, as of February 7, 2022; PRS.

Table 9: Status of end-to-end computerisation of PDS operations

State/ UT	Digitisation of Ration Cards	Aadhaar Seeding with Ration Cards	Online Allocation of Food grains	Computerisation of Supply Chain
Andhra Pradesh	100%	100%	Implemented	Implemented
Arunachal Pradesh	100%	45%	-	-
Assam	100%	0%	Implemented	-
Bihar	100%	83%	Implemented	Implemented
Chhattisgarh	100%	100%	Implemented	Implemented
Goa	100%	100%	Implemented	Implemented
Gujarat	100%	98%	Implemented	Implemented
Haryana	100%	100%	Implemented	Implemented
Himachal Pradesh	100%	94%	Implemented	Implemented
Jharkhand	100%	97%	Implemented	Implemented
Karnataka	100%	100%	Implemented	Implemented
Kerala	100%	98%	Implemented	-
Madhya Pradesh	100%	92%	Implemented	Implemented
Maharashtra	100%	96%	Implemented	Implemented
Manipur	100%	31%	Partial	-
Meghalaya	100%	0%	-	-
Mizoram	100%	83%	Implemented	-
Nagaland	100%	57%	-	-
Odisha	100%	92%	Implemented	Implemented
Punjab	100%	98%	Implemented	-
Rajasthan	100%	96%	Implemented	-
Sikkim	100%	87%	Implemented	-
Tamil Nadu	100%	100%	Implemented	Implemented
Telangana	100%	100%	Implemented	Implemented
Tripura	100%	98%	Implemented	Implemented
Uttar Pradesh	100%	92%	Implemented	Implemented
Uttarakhand	100%	90%	Implemented	-
West Bengal	100%	63%	Implemented	Implemented
Andaman and Nicobar Islands	100%	100%	Implemented	Implemented
Chandigarh	100%	100%	Direct Benefit	Direct Benefit
Dadra and Nagar Haveli	100%	100%	Implemented	Implemented
Daman and Diu	100%	100%	Implemented	Implemented
Delhi	100%	100%	Implemented	Implemented
Jammu and Kashmir	100%	59%	-	-
Lakshadweep	100%	98%	-	NA
Puducherry	100%	100%	Direct Benefit	Direct Benefit
Total	**100%**	**84%**	**30**	**21**

Sources: Department of Food and Public Distribution; PRS.

Table 10: Minimum Support Prices for paddy and wheat during 2011-22 (in Rs/quintal)

Year	Paddy (common)	% increase over last year	Wheat	% increase over last year
2011-12	1,080	8.0%	1,285	14.7%
2012-13	1,250	15.7%	1,350	5.1%
2013-14	1,310	4.8%	1,400	3.7%
2014-15	1,360	3.8%	1,450	3.6%
2015-16	1,410	3.7%	1,525	5.2%
2016-17	1,470	4.3%	1,625	6.6%
2017-18	1,550	5.4%	1,735	6.8%
2018-19	1,750	12.9%	1,840	6.1%
2019-20	1,815	3.7%	1,925	4.6%
2020-21	1,868	2.9%	1,975	2.6%
2021-22	1,940	3.9%	2,015	2.0%

Sources: Commission for Agricultural Costs and Prices, Ministry of Agriculture and Farmers' Welfare; PRS.

Table 11: Sugarcane dues as of November 26, 2021 (Rs crore)

State	Arrears of 2018-19	Arrears of 2019-20	Arrears of 2020-21	Total Arrears
Andhra Pradesh	37	43	37	117
Bihar	50	39	4	93
Chhattisgarh	6	-	64	70
Goa	2	-	-	2
Gujarat	-	-	44	44
Haryana	-	-	63	63
Karnataka	9	5	-	14
Madhya Pradesh	2	-	1	3
Maharashtra	81	-	394	475
Odisha	-	-	-	0
Punjab	-	43	9	52
Tamil Nadu	73	-	25	98
Telangana	-	-	-	0
Uttar Pradesh	-	-	3,752	3752
Uttarakhand	105	-	52	157
Total	**365**	**130**	**4,445**	**4,940**

Sources: Lok Sabha Starred Question No. 466, December 1, 2021; PRS.

Demand for Grants 2022-23 Analysis

Road Transport and Highways

The Ministry of Road Transport and Highways formulates and administers policies for road transport, and transport research. It is also involved with the construction and maintenance of the National Highways (NHs) through the National Highways Authority of India (NHAI), and the National Highways and Infrastructure Development Corporation Limited (NHIDCL). It also deals with matters relating to road transport, safety, and vehicle standards, through the implementation of the Motor Vehicles Act, 1988.

In 2022-23, the Ministry of Road Transport and Highways has been allocated nearly Rs 68,000 crore more than the revised expenditure in 2021-22. In absolute terms, this is the highest increase (from revised estimates of 2021-22) among all ministries in 2022-23. Nearly all of this additional allocation has been earmarked for investment in NHAI. After many years, NHAI will not have any borrowings, and rely entirely on budgetary resources. As of November 2021, NHAI's total debt stood at Rs 3.38 lakh crore.[1] This is nearly 150% more than the allocation to NHAI in 2022-23.

This note looks at the proposed expenditure of the Ministry for the year 2022-23, its finances over the last few years, and issues with the same.

Announcements in the 2022-23 Budget Speech[2]

In the budget speech, the Finance Minister made the following announcements regarding the roads sector:

- PM GatiShakti Master Plan for Expressways will be formulated in 2022-23 to facilitate faster movement of people and goods.
- The National Highways network will be expanded by 25,000 km in 2022-23.
- Rs 20,000 crore will be mobilised through innovative ways of financing to complement public resources.

Allocations in Union Budget 2021-22

Fund allocation[3]

The total expenditure on the Ministry of Road Transport and Highways for 2022-23 is estimated at Rs 1,99,108 crore. This is 52% higher than the revised estimates for 2021-22.

Table 1: Budget allocation for the Ministry of Road Transport and Highways (in Rs crore)

	2020-21 Actual	2021-22 RE	2022-23 BE	% Change (2022 BE over 2021 RE)
Revenue	9,964	9,898	11,364	15%
Capital	89,195	1,21,251	1,87,744	55%
Total	**99,159**	**1,31,149**	**1,99,108**	**52%**

Note: BE – Budget Estimate; RE – Revised Estimate.
Sources: Demands for Grants 2022-23, Ministry of Road Transport and Highways; PRS.

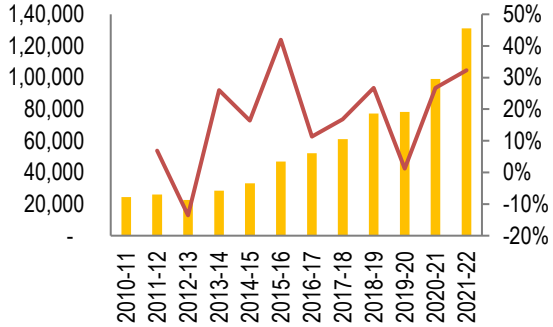
In 2022-23, capital expenditure is estimated at Rs 1,87,744 crore while revenue expenditure is estimated at Rs 11,364 crore. Since 2015-16, the share of capital expenditure of the Ministry has increased significantly, while revenue expenditure has gradually declined. In 2022-23, 94% of the Ministry's spending is estimated to be on capital expenditure.

Overview of Finances

Utilisation of funds

In the past few years, the expenditure of the Ministry has seen a significant increase. Between 2011-12 to 2016-17, the compounded annual growth rate (CAGR) of the actual expenditure was 15%. For the period of 2016-17 to 2021-22, the CAGR stands at 20%.

Figure 1: Actual expenditure by the Ministry (in Rs crore) and year-on-year change (in%)

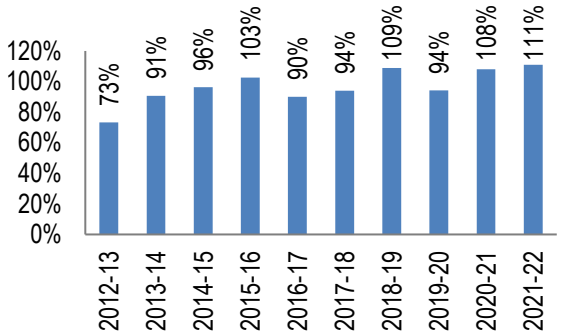


Note: Figures for 2021-22 are revised estimates.
Sources: Ministry of Road Transport and Highways budget documents 2010-22; PRS.

Between 2012-13 and 2017-18, the actual expenditure by the Ministry has been lower than the budget estimates (see Figure). As per the revised estimates of 2021-22, the Ministry is expected to exceed its budgeted expenditure by 11%. Before this, the Ministry had exceeded its budgeted expenditure by 8% in 2020-21 and 9% in 2018-19. This was largely due to additional

expenditure incurred on capital outlay towards roads and bridges.

Figure 2: Actual expenditure as a percentage of Budgeted expenditure (in %)



Note: Figures for 2021-22 use revised estimates.
Sources: Ministry of Road Transport and Highways budget documents 2012-22; PRS.

Expenditure of the central government

In 2022-23, of the total allocation to the Ministry, the highest is towards NHAI at Rs 1,34,015 crore (67%).[3] This is followed by allocation towards roads and bridges at Rs 64,573 crore (32%).[3]

Table 2: Expenditure heads for the Ministry of Road Transport and Highways (in Rs crore)

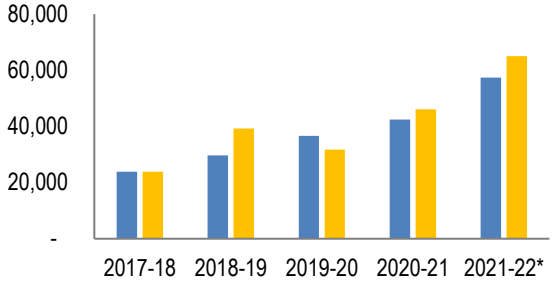
Major head	Actual 2020-21	RE 2021-22	BE 2022-23	% Change
NHAI	46,062	65,060	1,34,015	106%
Roads and bridges	53,112	65,707	64,573	-2%
Road transport and safety	231	229	356	56%
Secretariat	131	154	163	6%
Recoveries	-376	0	0	0
Total	**99,159**	**1,31,149**	**1,99,108**	**52%**

Note: BE – Budget Estimate; RE – Revised Estimate. Percentage change is from RE 2021-22 to BE 2022-23.
Sources: Demands for Grants 2022-23, Ministry of Road Transport and Highways; PRS.

NHAI: The central government develops and maintains NHs through the NHAI. In 2022-23, NHAI has been allocated Rs 1,34,015 crore, which is 106% more than the revised estimate of 2020-21. Of the budgeted amount, 75% (Rs 1,00,100 crore) will be provided from the Central Road and Infrastructure Fund, 15% (Rs 20,000 crore) will come from the monetisation of the National Highways, and the remaining 10% (Rs 13,915 crore) will be provided from the Permanent Bridge Fees Fund.[3]

Note that the allocation towards NHAI has more than tripled from 2019-20 (budget estimates) to 2022-23 (revised estimates). In 2020-21, the actual expenditure exceeded the budget estimates by 8%. In 2021-22, the revised estimates are again expected to exceed the budget estimates by 8%. Note that in 2019-20, the actual expenditure fell short of the budgeted estimate by 14%,

Figure 3: Budget vs actual allocation towards NHAI (in Rs crore)



Note: Figures for 2021-22 are revised estimates.
Sources: Ministry of Road Transport and Highways budget documents 2010-22; PRS.

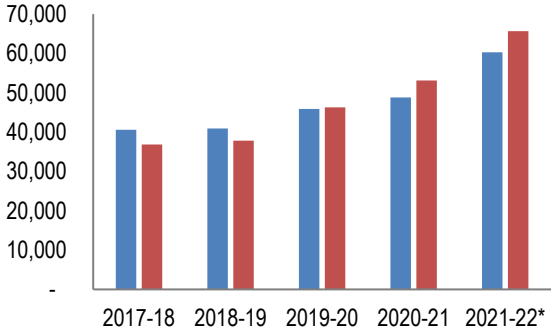
Expenditure on the NHAI includes funding towards the umbrella highway scheme, Bharatmala Pariyojana. This scheme seeks to optimise the efficiency of freight and passenger movement by bridging critical infrastructure gaps. It also aims to increase the number of districts with NH linkages from 300 to 550.[4] Under Phase I of Bharatmala Pariyojana, 34,800 km of roads will be developed over a period of five years (2017-18 to 2021-22) . Phase I will also subsume 10,000 km of balance roadworks under the National Highway Development Programme. The estimated cost of Phase I is Rs 5,35,000 crore, spread over five years.

As of December 2021, road projects with an aggregate length of 19,926 km, and costing Rs 5.98 lakh crore have been approved under Bharatmala Pariyojana Phase-I.[5] Of this, road length of 6,976 km has already been completed.[5] This corresponds to 35% of the approved project length.

Roads and bridges: Expenditure under roads and bridges includes development of NHs, projects related to expressways, increasing the number of lanes under various projects, and development of road connectivity in left-wing extremism affected areas. In 2022-23, the allocation towards roads and bridges is Rs 64,573 crore. This is a decrease of 2% over the revised estimates of 2021-22.

In 2019-20 and 2020-21, the actual expenditure for roads and bridges exceeded the budget estimates by 1% and 9% respectively. As per the revised estimates of 2021-22, the revised allocation towards roads and bridges is estimated to again exceed the budget estimate by 9%. In 2017-18 and 2018-19, the actual allocation was less than budget estimates by 9% and 8% respectively.

Figure 4: Budget vs actual allocation towards roads and bridges (in Rs crore)



Note: Figures for 2021-22 are revised estimates.
Sources: Ministry of Road Transport and Highways budget documents 2010-22; PRS.

Funds managed by the Ministry

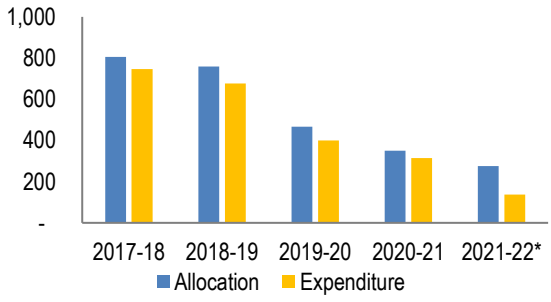
The Ministry manages its expenditure through various funds. Their details are provided below.

Central Road and Infrastructure Fund (CRIF): A majority of the Ministry's expenditure is managed through transfers from the CRIF. A portion of the cess collected on motor spirit and high-speed diesel is earmarked for the development of NHs and SHs, and the amount is transferred to the non-lapsable CRIF. This amount is eventually released to the NHAI, and to the state/UT governments for the development of road infrastructure, and other projects (such as ports, railway track, airports) in the country.[3]

For 2022-23, the transfer from CRIF towards the Ministry is estimated at Rs 1,59,616 crore.[1] This is 61% more than the revised transfer in 2021-22 (Rs 99,239 crore).

The Ministry also allocates funds for state roads using the CRIF (Figure).[6] The allocation for state roads from the CRIF in 2022-23 is estimated to be Rs 250 crore. Between 2017-18 and 2020-21, the total utilisation by states for these funds was above 86%.

Figure 5: Allocation vs Expenditure for state roads under CRIF



Note: For 2021-22, the data is upto September 2021.
Source: 312th Standing Committee Report (2021); PRS.

Permanent Bridge Fees Fund (PBFF): Funds transferred to the PBFF relate to the revenue collected by the government through: (i) fees levied for the use of certain permanent bridges on NHs by motor vehicles, (ii) toll on NHs, and (iii) revenue share received on some PPP projects. These funds are then released to the NHAI for the development of NHs entrusted to it.[3]

For 2022-23, the transfer from PBFF is estimated at Rs 13,921 crore.[1] This is a 10% increase from the transfer in 2021-22 at the revised estimates stage (Rs 12,670 crore).

National Investment Fund (NIF): The NIF was created in 2005, and is credited with proceeds from disinvestments of public sector enterprises. The Ministry finances the Special Accelerated Road Development Programme in North East (SARDP-NE) with funds from the NIF.

For 2022-23, the transfer from NIF is estimated at Rs 10,565 crore.[1] This is an 25% increase from the transfer in 2021-22 (Rs 8,430 crore) at the revised estimates stage.

National Highways Fund (NHF): In August 2016, the Union Cabinet had authorised NHAI to monetise certain public funded NH projects.[7] Such monetisation includes transferring operations and maintenance of stretches of NHs to private contractors on a long-term basis. In 2022-23, Rs 20,000 crore is estimated to be generated through such monetisation. This is a 54% annual increase from the monetisation amount in 2021-22 (Rs 13,000 crore) at the revised stage.

Table 3: Summary of transfers from funds (in Rs crore)

Funds	2020-21 Actual	2021-22 RE	2022-23 BE	% Change
CRIF	79,286	99,239	1,59,616	61%
PBFF	11,519	12,670	13,921	10%
NHF	7,262	13,000	20,000	54%
NIF	2,963	8,430	10,565	25%

Note: BE – Budget Estimate; RE – Revised Estimate. Percentage change is from RE 2021-22 to BE 2022-23.
Sources: Demands for Grants 2021-22, Ministry of Road Transport and Highways; PRS.

Issues to consider

As of March 2019, India had about 64 lakh km of roads, second only to the United States which has about 66 lakh km of road length.[15] This road length includes National Highways (NHs), Expressways, State Highways (SHs), district roads, PWD roads, and project roads. As of March 2019, there were 1.3 lakh km of National Highways, and nearly 1.8 lakh km of State Highways.[8]

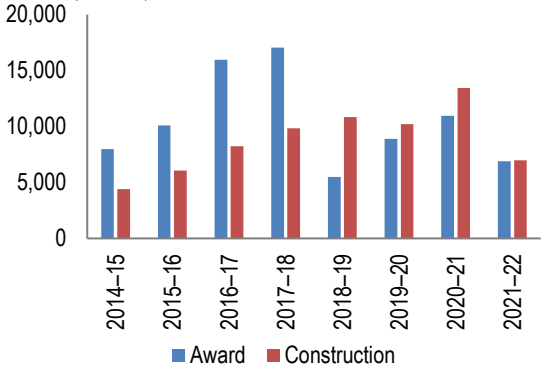
In India, road infrastructure is used to transport over 60% of total goods and 85% of total passenger traffic.[9] NHs comprise about 2% of the road network but carry about 40% of the total road traffic.[10] The Economic Survey (2020) also noted that road transport is the dominant mode of transportation in the country.[11] The entire transport sector contributed to about 4.6% of the Gross

Value Added in 2018-19, of which road transport contributed about 67%.[11]

In April 2018, the Ministry of Road Transport and Highways switched from the linear system to the lane-kilometres for calculating the amount of work completed.[12] The linear system doesn't distinguish between roads of equal length, but different width. The 'lane-mile' system is used in the USA, while 'lane-kilometre system' is used in Canada.[13,14]

The figure below shows the trend of award and construction of road projects in India (Figure).

Figure 6: Award and construction of roads in India (in km)



Note: Data for 2021-22 is as on February 10, 2022.
Sources: Economic Survey 2020-21; Ministry of Roads Dashboard; PRS.

In the Budget Speech in 2020-21, the Union Finance Minister made several announcements for the roads sector. This included awarding 8,500 km and constructing another 11,000 km of NH corridors. In 2021-22 (as of February 2022), 6,895 km of road projects have been awarded, and 6,968 km of NHs have been constructed. This accounts for 81% of the award target and 63% of the construction target, respectively.[5] In the Budget Speech 2022-23, the Finance Minister announced that by March 2023, the NH network will be expanded by 25,000 km.[2]

Other announcements in the 2020-21 Budget included: (i) development of National Highways in Tamil Nadu (3,500 km), Kerala (1,100 km), West Bengal (675 km), and Assam (1,300 km), and (ii) further progress on some key economic corridors (such as the Delhi-Mumbai Expressway, Bengaluru-Chennai Expressway). For details on the status of implementation of these announcements, refer to Table in the Annexure (on page 10).

The daily road construction increased from 28 km/day in 2019-20 to 36.5 km/day in 2020-21. As per the Economic Survey (2021-22), this is due to the nearly 30% increase in public expenditure by the central government.[15] To achieve the target of expanding the NH network by 25,000 km, construction pace will have to be about 68 km/day.[2] This is 87% higher than the pace in 2020-21 (of 36.5 km/day).

The length of the National Highway network has increased from 91,300 km in March 2014, to 1,40,000 km in December 2021.[8,16] Note that since 2014-15, nearly 49,100 km of State Roads have been notified as National Highways.[17]

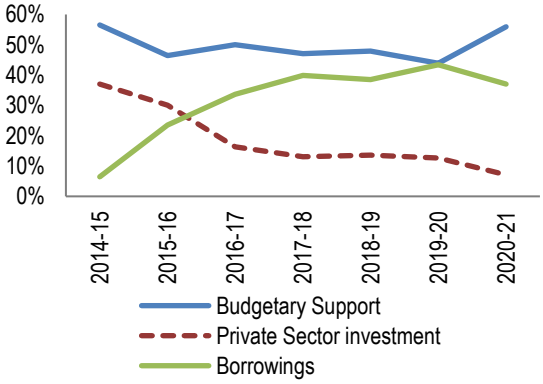
As per the Ministry of Statistics and Programme Implementation (2021), 888 projects worth Rs 5.45 lakh crore are underway in the roads sector. This accounts for more than 50% of all infrastructure projects in India by volume (1,673 projects), and more than 21% by value (Rs 25 lakh crore).[18] Of these 888 projects, 97 projects have witnessed time delays, while 144 projects have a cost overrun.[18] This may be due to several constraints, such as: (i) lack of equity with developers, (ii) higher cost of financing, (iii) shortfall in funds for maintenance, (iv) unavailability of land for the expansion of NHs, (v) significant increase in land acquisition cost, and (vi) bottlenecks and checkpoints on NHs which could adversely impact benefits of GST.[19]

The Standing Committee on Transport (2020) had also highlighted NHAI's increasing debt which could lead to severe financial issues in the future.[20] We discuss some of these issues below.

Issues with financing

The figure below highlights the share of total investment in the roads sector in India.[6] The total investment in road sector has grown at a CAGR of 22% from 2014-15 to 2020-21. The share of borrowings in this investment has grown from 6% in 2014-15 to 37% in 2020-21. In 2019-20, 43% of the investment in roads sector was sourced from borrowings. Further, the share of budgetary support declined from 57% in 2014-15 to 44% in 2019-20. In 2020-21, the budgetary support to the roads sector has again increased to 56%.[6,15] The share of private investment has also declined from 37% in 2014-15, to only 7% in 2020-21.

Figure 7: Investment in road sector



Sources: 312th Standing Committee Report (2022); PRS.

The Standing Committee on Transport (2020) noted that increasing the gross budgetary support to the Ministry while the private sector investment is

declining may not be a sustainable growth plan.[20] The Committee had made similar observations in 2016 and 2018 and had suggested that the government should devise ways to mobilise funds from other sources and establish appropriate financial institutions and models to encourage the return of private investment to the road sector.[21,22]

The Kelkar Committee (2015) had also observed that since infrastructure projects span over 20-30 years, a private developer may lose bargaining power because of abrupt changes in the economic or policy environment.[33] It recommended that the private sector must be protected against such loss of bargaining power. To revive private sector participation, a new mode of contract called the Hybrid Annuity Mode (HAM) was introduced.[20] Under this model, 40% of the project cost is paid by the government/ executing agency as grant to the private developer. Further, the traffic risk is taken by the project executing agency. The concessionaire is responsible for the Operation & Maintenance during the concession period, while tolling rights remain with the employer.[23] Between 2017-18 and 2019-20, HAM projects worth Rs 1.15 lakh crore were approved for NHAI. This was 44% of all projects by value.[24]

The Ministry expects to raise Rs 86,182 crore up to 2024-25 to fund projects under the National Infrastructure Pipeline, by monetising its assets under the Toll-Operate-Transfer (TOT) model.[20]The Standing Committee (2020) had observed that in 2019-20, the Ministry could only raise Rs 5,000 crore by monetising assets in TOT mode, against a target of Rs 10,000 crore. In 2020-21, against a monetisation revenue of Rs, 10,250 crore, only Rs 7,262 crore could be raised (70%). In 2022-23, the Ministry plans to raise Rs 20,000 crore through such monetisation.

In August 2021, the central government unveiled the National Asset Monetisation Pipeline (NMP). The NMP aims to monetise core brownfield infrastructure assets (such as roads, rail, ports, power transmission lines) to mobilise Rs 5.97 lakh crore from 2021-25.[25] The central government targets monetising 26,700 km of roads, with a potential revenue of Rs 1.60 lakh crore (27% of the total potential monetisation value).[26] Only NHs with four lanes and above have been considered for asset monetisation.

As of February 2022, 20 stretches (1,407 km) have already been monetised through TOT mode in four Bundles.[5] A sum of Rs 15,703 crore has already been realised and remitted to the Consolidated Fund of India.[5]

Borrowings

After many years, no borrowing have been estimated for NHAI in 2022-23. Between 2017-18 and 2021-22, NHAI has been borrowing an average of Rs 63,300 crore per year. NHAI's total debt grew from Rs 1.22 lakh crore in March 2018 to Rs 3.38 lakh crore in November 2021.[27,1]

The Standing Committee on Transport (2020) had noted that NHAI's debt has been increasing and as of March 2020, the amount of debt NHAI had to repay was more than twice the annual budgetary allocation of the Ministry for 2020-21.[20]

To reduce debt servicing costs of NHAI, the Committee (2021) recommended: (i) exploring funding from insurance companies and pensions funds, both Indian and foreign, and (ii) requesting the RBI to make the road infrastructure sector eligible for priority sector lending.[28] Taking note of the stressed assets of banks in the road sector, the Committee also recommended mandating the National Infrastructure Investment Fund and the upcoming Development Finance Institution (announced in 2021-22 Budget session) to facilitate offloading long term infrastructure loans from banks.

In its Annual Report (2018), NHAI had noted that with the debt obligations increasing due to deferment of debt repayment, exposure of financial institutions that lend to the roads sector has increased significantly, reaching defined exposure norms for the sector.[10]

The Comptroller and Auditor General of India (2016) had also noted several procedural inefficiencies with NHAI.[29] For example, NHAI could not realise toll on certain projects due to delays in approvals, toll operations, and other procedural lapses. NHAI did not adhere to the Ministry's guidelines on maintenance of project wise balance sheet and cash flow.[29] Inefficient bidding processes for engaging toll collection agencies also led to the loss of revenue.[29] The Committee on Public Undertakings (2017) had also noted several issues in the financial performance of NHAI such as: (i) insufficiency of funds, (ii) gap between the funds allocated to the Ministry, and released to NHAI, and (iii) under-utilisation of funds.[30]

The Standing Committee on Transport (2020) had recommended that the Ministry should constitute an Advisory Committee to look into the increasing debt of NHAI, and the efficacy of the measures undertaken by the Ministry and NHAI to monetise their assets.[20] Further, the Ministry may increase toll charges across the country and postpone certain projects, as the present financial health of NHAI is not sustainable in the long run and may create bigger issues in the roads sector in the future.

Committees have also suggested more due diligence on the part of NHAI. The Standing Committee on Transport (2019) recommended that NHAI should compare its project cost estimates with the actual costs incurred on road projects.[31] If there is a substantial difference between the bid price offered by the concessionaire and the project

cost estimates made by the government, NHAI should review its cost estimation methodologies. The Committee (2019) also suggested that the NHAI or central government should appoint a credit rating agency to assess the financial strength of private players and their ability to meet debt repayment obligations.[31]

Private financing and contracts

In its Annual Report (2018), NHAI had noted that the recent economic slowdown has led to lower revenue realisation than expected. Several developers had significantly leveraged their balance sheets in anticipation of high revenue, and with lower revenue realisation they face issues with debt servicing.[10] This also adds stress on the existing road infrastructure loan portfolios of financial institutions.

It has been noted that private financing for the roads sector is a challenge.[10,32] Several PPP road projects have not been able to attract bids.[32] The major highway developers in the country are also facing financial capacity constraints. Further, there is a lack of debt products that are aligned with the revenue stream profile of highway projects (long-term projects where toll collection can begin only after the entire project is completed). This makes financing of such projects difficult, and has resulted in some projects getting stalled at the construction stage. This also discourages prospective bidders.[32]

The Committee on Revisiting and Revitalising the PPP model of Infrastructure Development (Chair: Dr. Vijay Kelkar) had looked at issues with PPP projects in India, in November 2015.[33] It had recommended setting up an independent regulator for the roads sector to help bring in and regulate private players in the sector. It had also noted that service delivery (such as constructing roads) to citizens is the government's responsibility and should not be evaded through PPPs.

Non-performing assets: The Standing Committee on Transport (2016) had observed that several long term loans disbursed for the road sector are turning into non-performing assets (NPAs).[21] Project bids are often made without proper study, and projects are awarded in a hurry. This results in stalling of projects, and concessionaires leave mid-way.

Banks and other infrastructure lending institutions have also been reluctant to finance the highways sector. This has led to difficulties in debt servicing, putting additional stress on the road infrastructure portfolios. Besides increasing the cost of the project, delays also make it difficult to obtain additional debt.[21]

The Standing Committee on Transport (2016) recommended that banks should take due diligence while disbursing loans to concessionaires. It also suggested that the bank NPAs (related to the roads sector) may be supported by government allocation. Banks could be empowered to recover the bad debts. Further, in light of huge NPAs lying with a single bank, the Standing Committee (2019) recommended that guidelines prescribing a limit up to which a bank can lend to a single borrower be framed to minimise the risk involved in lending.[31]

The Standing Committee on Transport (2019) also suggested that NHAI should revisit the financial requirements for bidders to ensure their eligibility for the bidding process.[31] While the onus of the feasibility of the bids made by the concessionaire lies mainly with the banks, NHAI should exercise due diligence while awarding projects to concessionaire with poor performance history.

Project delays and increase in project costs

The Committee on Public Undertakings (2017) had noted that from 1995, till June 2016, out of the total 388 projects completed, only 55 projects were completed on or before time.[30] Delays in the completion of the projects were mainly attributed to: (i) the long time taken in land acquisition, and obtaining environment and forest clearances, (ii) poor performance of concessionaires due to economic slowdown, (iii) cash flow problems, and (iv) law and order issues.[30] The Ministry has also noted that recently projects have also been halted due to NCLT proceedings against the developer.[34]

Such delays increase project costs, eventually making certain projects unviable. As of December 2021, the cumulative cost overrun of projects in the road sector is estimated to be greater than Rs 8,120 crore.[18]

In order to resolve languishing projects the Ministry has taken some steps which include: (i) implementing an exit policy which allows private developers to take out their entire equity and exit operational Build-Operate-Transfer (BOT) projects two years from the start of operations irrespective of date of award; (ii) providing rationalised compensation to concessionaires for languishing NH projects in BOT mode for delays not attributable to concessionaires; and (iii) a one-time fund infusion by NHAI which enables revival and physical completion of languishing BOT projects that have achieved at least 50% physical progress, on a case to case basis, among others.[31]

Increase in land acquisition costs

From January 1, 2015, the compensation for land acquired by NHAI is determined as per the Right to Fair Compensation and Transparency in Land Acquisition Rehabilitation and Resettlement Act, 2013. The Committee on Public Undertakings (2017) had noted that due to higher compensation under the 2013 Act, the expenditure by the Ministry of Road Transport on land acquisition increased from Rs 9,097 crore in 2014-15 to Rs 21,933 crore in 2015-16.[30] In 2017-18, NHAI spent more funds on land acquisition (41% of the

expenses) as compared to project expenditure (39%).[10] The Standing Committee on Transport (2020) noted that the average rate of land acquisition has increased significantly from about Rs 0.92 crore per hectare in 2013-14 to Rs 3.13 crore per hectare (ha) in 2019- 20 (an increase of 240%).

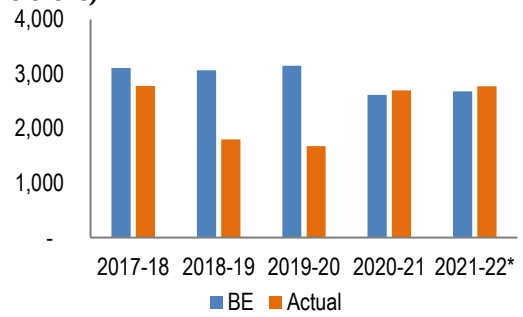
The Committee on Public Undertakings (2017) also observed that farmers who were entitled to lesser compensation under the older law, have been approaching courts for increased compensation.[30] This has further delayed the land acquisition process and added to the cost of projects.

In October 2021, the central government issued new guidelines for public procurement and project management. Most government procurement for public works (such as construction of highways and buildings) uses the L1 system (least cost). The Economic Survey (2021) notes that the L1 system may not be appropriate for complex projects needing innovation, quality, speed, and functionality. The revised guidelines allow the use of quality-cum-cost based system for selecting bidders. The new guidelines also stipulate timely release of 75% or more of bills, raised within 10 working days of the submission of the bill. This will help reduce delays in project execution, cost overruns, and disputes.

Investment in maintenance of roads

In 2022-23, the Ministry has allocated Rs 2,586 crore towards the maintenance of roads and highways (including toll bridges). This is 7% lesser than revised expenditure on maintenance in 2021-22. In both 2018-19 and 2019-20, the actual expenditure on maintenance was less than 60% of the budget estimates (Figure).

Figure 8: Budget vs actual on maintenance (in Rs crore)



Note: Figures for 2021-22 are revised estimates.
Sources: Ministry of Road Transport and Highways budget documents 2010-22; PRS.

The amount allocated towards maintenance, Rs 2,586 crore, is about 1.3% of the ministry's budget. This is for a total NH length of 1.4 lakh km (as of December 2021).[35] In comparison, in 2020-21, the US government seeks to allocate $23.74 billion (about Rs 1.7 lakh crore, which is 51% of its total budget on highways) towards its National Highway Performance Program, to improve the condition and performance of their National Highway System (roughly 3.5 lakh km of length).[36]

The National Transport Development Policy Committee (2014) had noted that the amount spent on maintenance of roads is low.[37] This results in roads with potholes, weak bridges, and poor pavements, and has safety consequences. Further, maintenance is carried out only when required, as opposed to being a part of preventive measures.[37]

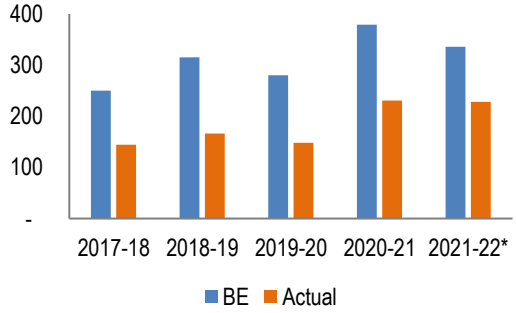
The Standing Committee on Transport (2018, 2020) had also raised concerns that the entire amount allocated towards maintenance does not get fully utilised as well.[20,22] Over the years, the Standing Committee has repeatedly noted that the entire length of NHs in the country cannot be maintained with this amount. NITI Aayog (2018) had noted that the amount allocated for maintenance is about 40% of the amount required.[38]

Maintenance of roads should be given top priority as it increases the life span of roads. The Standing Committee (2020) has recommended that the budget for maintenance of NHs should be increased.[20] NITI Aayog has suggested that 10% of the Ministry's annual budget should be earmarked for maintenance.[38] The Standing Committee (2015) had suggested that an effective monitoring mechanism for repair and maintenance of roads should be put in place.[32] Further, there should be penalties for contractors and engineers in case of poor quality repair, maintenance, and construction.

Investment in road safety

In 2022-23, the Ministry has allocated Rs 356 crore towards road transport and safety. This is a 56% increase over the revised expenditure on maintenance in 2021-22. Note that between 2017-18 and 2020-21, the actual expenditure on safety has not exceeded 61% of the budget estimates (Figure).

Figure 9: Budget vs actual on safety (in Rs crore)



Note: Figures for 2021-22 are revised estimates.
Sources: Ministry of Road Transport and Highways budget documents 2010-22; PRS.

The allocation towards safety provides for various things such as road safety programmes, setting up of facilities on NHs, extending relief to accident

victims, strengthening of public transport, research and development, and training.

The amount allocated towards road safety in 2022-23 is less than 0.2% of the Ministry's total budget. In comparison, in 2019 the US federal government spent about $2.7 billion on its Highway Safety Improvement Programme (6% of its total expenditure on highways).[36] The Standing Committee on Transport (2020) suggested that the Ministry may seek higher fund allocation towards road safety, and driver training programmes.

In 2019, there were about 4.5 lakh road accidents in India, which killed about 1.5 lakh people and injured about 4.5 lakh people.[39] In 2020, the number of accidents reduced to 1.3 lakh, killing 1.3 lakh people.[40] In 2020, the major causes of road accident deaths were over-speeding (57%) and careless driving (26%).[40]

This reduction in accidents and fatalities could be due to the Covid-19 lockdown, which restricted movement of people. As per the World Road Statistics, 2018, India ranks first in the number of road accident deaths (among 199 countries reported), followed by China and the US. As per the WHO Global Report on Road Safety 2018, about 11% of the accident related deaths in the world occur in India.[39]

The Standing Committee (2021) observed that a large number of black spots still remain unidentified, given the extremely high number of road accidents that take place in India each year.[28] During the last five years, the Ministry has identified 5,803 blackspots.[41] Out of these, 3,996 blackspots have been identified on NHs currently entrusted to NHAI.[41] As of August 2021, 60% of the blackspots identified during 2015-18 have been rectified.[41]

Further, as of August 2021, only 70% of the blackspots identified during 2011-14 have been rectified. The Standing Committee (2022) recommended the Ministry to speed up the rectification of black spots to avoid potential road accidents.[41] The Standing Committee (2021) also recommended detailed examination of all projects, especially to eliminate geometrical design errors that may compromise the safety of the road users.[28]

Further, the Standing Committee (2021) observed that the number of ambulances (111), patrol vehicles (509), tow away cranes (443) available with the Ministry are not commensurate with the size of the NH network in India.[28] The Committee (2022) recommended finalising the tender for Computer Aided Dispatch System for on-road units at the earliest, to provide timely emergency care to accident victims during the golden hour.[41]

In 2019, Parliament passed the Motor Vehicles (Amendment) Bill, 2019 which seeks to address various issues around road safety. It increases the penalties for various offences under the Act, and provides for a Motor Vehicle Accident Fund which would be used for the treatment of persons injured in road accidents. In August 2021, the central government constituted the National Road Safety Board, which will advise the central and state governments on all aspects of road safety and traffic management.[42] The Ministry has notified several Rules to implement provisions of the Act, such as: (i) protection of Good Samaritans, (ii) conditions for states to levy higher penalties than those in the Act, and (iii) amendments to obtaining driving licenses, among others.[35]

In August 2021, the Ministry notified Rules for electronic monitoring of roads.[43] As per these Rules, state governments must place electronic enforcement devices (like speed camera, CCTVs, speed gun, body wearable cameras) at: (i) high-risk and high density corridors on national and state highways, and (ii) critical junctions in major cities with more than one million population.[43]

Connectivity in remote areas

The Ministry also allocates funds towards the development of highways in areas with poor connectivity. Some of these projects include the Special Accelerated Road Development Programme in North East (SARDP-NE), Externally Aided Projects and Roads Projects in Left-Wing Extremism Affected Areas.

In 2022-23, Rs 10,565 crore has been allocated towards the SARDP-NE project. This is a 25% annual increase from the revised expenditure in 2021-22. Between 2017-18 and 2019-20, the fund utilisation of the project has been consistently greater than 90%. In 2020-21, the actual expenditure exceeded the budgeted expenditure by 17%.

The Standing Committee on Transport has repeatedly (2018, 2020) noted under-achievement of targets in SARDP-NE.[20,22] The Standing Committee (2020) noted that projects in the north eastern region face delays of almost a decade in completion. This causes inconvenience to the commuters, and also adds to the project cost.[20] To ensure timely completion of projects, the Committee (2021) recommended the Ministry to: (i) ensure that contractors with poor track record are not awarded road projects, and (ii) work in close coordination with Environment and Forest Departments to avoid issues related to obtaining environment/forest/wildlife clearances.[44] The Committee (2021) also recommended investing in research for the best construction techniques in the hilly and flood prone regions of the north east.[44]

In 2020-21, Rs 425 crore was allocated for development of road connectivity in areas affected by Left Wing Extremism.[45] This is similar to the allocations in 2019-20 (Rs 415 crore) and 2018-19 (Rs 490 crore).[45] The Ministry aims to develop 1,177 km of NHs, and 4,276 km of state roads in Left Wing Extremism affected areas. The Standing Committee on Transport (2021) asked the Ministry to evaluate the reasons for the slow pace of progress in this scheme.[45] Some of these reasons are: (i) poor availability of law and order situation, (ii) limited availability of dedicated security forces, and (iii) delays in land acquisition.[45,46] The Ministry has taken some steps to improve the participation of private contractors. These include: (i) authorising the government to accept bids up to 10% above the schedule of rates, and (ii) clubbing and splitting of works to reduce risk.[45]

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Annexure

Table 4: Status of implementation of some Union Budget (2020-21) announcements in roads sector

Budget Announcements	Status of implementation
Developing National Highways (NHs) in various states	
Developing 3,500 km of NHs in Tamil Nadu	Project length of 125 km is completed, and 2,214 km is ongoing.
Developing 1,100 km of NHs in Kerala	Project length of 632 km is ongoing.
Developing 675 km of NHs in West Bengal	Project length of 21 km is completed, and 1,194 km is ongoing.
Developing 1,300 km of NHs in Assam	Project length of 20 km is completed, and 743 km is ongoing.
Delhi-Mumbai Expressway: 260 km will be awarded before 31.3.2021.	Out of the total length of 1,380 km, 1,337 km length has been awarded for construction. Of this, 450 km has been completed, and 887 km is under construction.
Developing flagship corridors in various states	
Bengaluru – Chennai Expressway: 278 km will be initiated in the current financial year. Construction will begin in 2021-22.	The complete corridor of 262 km has been awarded in the month of September 2021.
Delhi – Dehradun economic corridor: 210 km corridor will be initiated in the current financial year. Construction will begin in 2021-22	As on date, out of the 329 km complete length of the corridor, 220 km has been awarded for construction.
Kanpur – Lucknow Expressway: 63 km expressway will be initiated in 2021-22.	Bids for the Kanpur –Lucknow Expressway have been invited and in advanced stage of land acquisition.
Chennai – Salem corridor: 277 km expressway will be awarded, and construction would start in 2021-22.	The flagship 277 km Chennai Salem corridor is in pre-construction stage with studies undertaken like Social Impact Assessment (SIA) to analyse and create proper alternatives as per guidelines of the Supreme Court.
Raipur – Vishakhapatnam: 464 km will be awarded in the current year. Construction will start in 2021-22.	Out of the total corridor length of 464 km, projects have already been awarded for 356 km.
Amritsar – Jamnagar: Construction will commence in 2021-22.	As on date, over 260 km of the corridor has already been constructed. The complete greenfield section of 762 km from Sangriya to Santalpur and 63 km brownfield section from Bhatinda to Sangriya have been awarded.
Delhi – Katra: Construction will commence in 2021-22.	Out of a total corridor length of 670 km, 580 km has been awarded. The remaining stretches to be awarded in FY 2021-22.

Sources: Implementation of Budget Announcements (2020-21); PRS.

Demand for Grants 2022-23 Analysis
Home Affairs

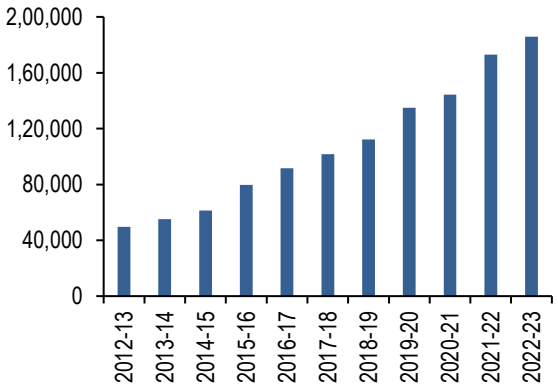
The Ministry of Home Affairs is responsible for matters concerning internal security, central armed police forces, border management, disaster management, census, and centre-state relations. In addition, the Ministry makes certain grants to union territories (UTs), since they are not covered by the Finance Commission's recommendations on devolution and, thus, do not have any share in central taxes. This note analyses the expenditure trends and budget proposals for the Ministry of Home Affairs for 2022-23, and discusses issues across the sectors administered by the Ministry.

Overview of Finances

In 2022-23, the Ministry of Home Affairs has been allocated Rs 1,85,777 crore. This is an increase of 7% over the revised estimates for 2021-22 (Rs 1,73,083 crore). The budget for the Ministry constitutes 4.7% of the total expenditure budget of the union government in 2022-23, and is the fourth highest allocation.

Figure 1 shows the expenditure of the Ministry between 2012 and 2023. Since 2019, expenditure of the Ministry also includes grants to the newly formed UTs of Jammu and Kashmir, and Ladakh. The average annual growth rate in expenditure over the last ten years has been 14.3%.

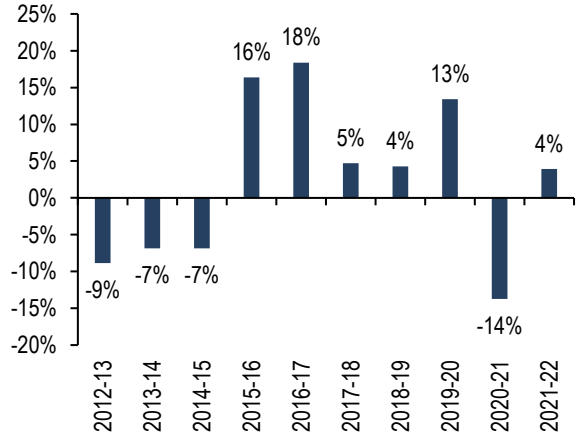
Figure 1: Expenditure of the Ministry of Home Affairs (2012-23) (in Rs crore)



Note: Figures for 2021-22 are Revised Estimates and for 2022-23 are Budget Estimates.
Source: Union Budgets 2014-15 to 2022-23; PRS.

Figure shows the percentage of over/under utilisation of funds allocated to the Ministry between 2012-13 and 2021-22. Since 2015-16, the expenditure of the Ministry has been higher than the budgeted expenditure in all years except in 2020-21, when the actual expenditure was 14% lower than the allocation. This was due to restricted spending by the government owing to the COVID-19 pandemic.[1]

Figure 2: Budget estimates v/s actual expenditure (2012-22) (in Rs crore)



Note: Figures for 2021-22 are Revised Estimates.
Source: Union Budgets 2013-14 to 2022-23; PRS.

Of the Ministry's total budget for 2022-23, (i) 63% of the expenditure is on police, (ii) 32% is on grants to UTs, and (iii) 5% is on miscellaneous items such as disaster management, rehabilitation of refugees and migrants, and conducting the Census. Table1 shows the allocations to these three heads.

Table 1: Ministry of Home Affairs budget estimates (2022-23) (in Rs crore)

Major Head	2020-21 Actuals	2021-22 Revised	2022-23 Budget	% Change (BE 2022-23/ RE 2021-22)
Police	91,611	1,09,266	1,17,688	8%
UTs	47,605	57,533	58,757	2%
Others	5,042	6,284	9,332	49%
Total	**1,44,258**	**1,73,083**	**1,85,777**	**7%**

Note: BE – Budget Estimates, RE – Revised Estimates.
Expenditure under 'Others' includes disaster management and administrative matters.
Source: Union Budget 2022-23; PRS.

Police: Expenditure on police includes allocation towards the Central Armed Police Forces, the Intelligence Bureau, and the Delhi Police. For 2022-23, Rs 1,17,688 crore has been allocated towards police. This is an increase of 8% over the revised estimates for 2021-22.

Grants and loans to UTs: In 2022-23, Rs 58,757 crore has been allocated towards grants and loans for the administration of UTs. This is an increase of 2% over the revised estimates for 2021-22 (Rs 57,533 crore). The allocation to the UTs of Jammu and Kashmir, and Ladakh (both formed after the reorganisation of the former state of Jammu and Kashmir in 2019) is 71% of the total amount allocated to all UTs.

Other items: Other expenditure items of the Ministry include disaster management, rehabilitation of refugees and migrants, and administrative matters (relating to the Census, the secretariat and Cabinet). In 2022-23, these items have been allocated Rs 9,332 crore. This is 49% higher than the revised estimates for 2021-22 (Rs 6,284 crore). This is primarily on account of increase in allocation towards the Census survey and the office of the Registrar General of India, from Rs 520 crore (at the revised estimate stage) in 2021-22 to Rs 3,676 crore in 2022-23.

Analysis of key areas of expenditure

Police

In 2022-23, Rs 1,17,688 crore has been budgeted for police expenditure. This includes allocations to various police organisations, including: (i) the Central Armed Police Forces, primarily responsible for border protection and internal security, (ii) Delhi Police, responsible for maintenance of law and order in Delhi, and (iii) Intelligence Bureau, the nodal agency for collection of domestic intelligence. Further, funds are also allocated for modernisation of police, and border infrastructure.

Table 2: Major expenditure items under police (in Rs crore)

Department	2020-21 Actual	2021-22 Revised	2022-23 Budget	% Change (BE 2022-23/ RE 2021-22)
Central Armed Police Forces	73,650	81,396	87,444	7%
Delhi Police*	8,016	11,136	10,096	-9%
Police Infrastructure	1,951	3,023	3,919	30%
Intelligence Bureau	2,351	2,793	3,168	13%
Modernisation of police	2,057	3,346	2,754	-18%
Border Infrastructure	1,534	2,701	2,745	2%
Others**	2,053	4,871	7,562	55%
Total	**91,611**	**1,09,266**	**1,17,688**	**8%**

Note: *Includes expenditure on traffic management, expansion of communication infrastructure, and induction of latest technology. **Includes schemes for safety of women, central police organisations, and Land Port Authority of India.
BE – Budget Estimates, RE – Revised Estimates.
Source: Union Budget 2022-23; PRS.

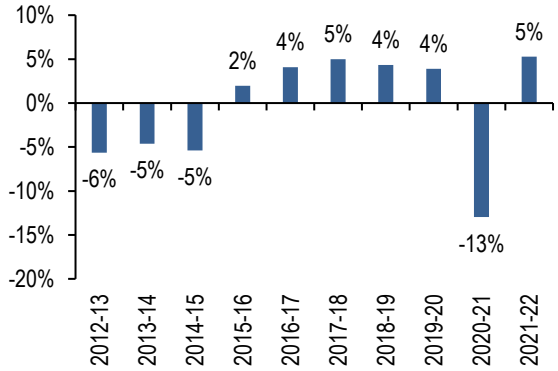
The total budget for police in 2022-23 has increased by 8% over the revised estimates for 2021-22. Over the last ten years (2013-23), expenditure on police has increased at an average annual rate of 10.3% (Figure).

Figure 3: Expenditure on police (2013-23) (in Rs crore)

Note: Revised Estimates used for 2021-22 and Budget Estimates for 2022-23. Actuals used for all other years.
Source: Union Budgets 2015-16 to 2022-23; PRS.

Figure shows the percentage over/under utilisation of the amount budgeted for police from 2012-22. Since 2015-16, the actual expenditure on police has been higher than the budget estimate, except in 2020-21, when spending was 13% lower than the budget.

Figure 4: Budget estimates v/s actual expenditure on police (2012-22) (in Rs crore)



Note: Figures for 2021-22 are Revised Estimates.
Source: Union Budgets 2013-14 to 2022-23; PRS.

Central Armed Police Forces

The Central Armed Police Forces (CAPFs) comprise seven forces: (i) the Central Reserve Police Force (CRPF) which assists in internal security and law and order, (ii) Central Industrial Security Force (CISF) which protects vital installations (such as airports) and public sector undertakings, (iii) the National Security Guard (NSG) which is a special counter-terrorism force, and (iv) four border guarding forces, namely, the Border Security Force (BSF), the Indo-Tibetan Border Police (ITBP), the Sashastra Seema Bal (SSB), and the Assam Rifles (AR). Table 13 in the Annexure shows the expenditure on each of the CAPFs in the past ten years.

The CAPFs have been allocated Rs 87,444 crore in 2022-23. This accounts for 74% of the expenditure on police, and is 7% higher than the revised estimates for 2021-22 (Rs 81,396 crore). Of this, the highest expenditure is towards the CRPF, which will receive 34% (Rs 29,325 crore) of the total allocation for CAPFs, followed by the BSF, which will receive 27% (Rs 22,718 crore) of the allocation.

In 2022-23, out of the total spending on CAPFs, only 2% is on capital expenditure, while the remaining 98% is on revenue expenditure. This is in line with the average trend in the last ten years (Table 3). Capital expenditure includes spending on procuring machinery, equipment and vehicles, while revenue expenditure includes spending on salaries, arms and ammunition, and clothing. Note that the capital component does not include funds for construction.

Table 3: Revenue vs Capital Expenditure for CAPFs (2013-23) (in Rs crore)

Year	Revenue	% Revenue	Capital	% Capital
2013-14	34,679	98%	651	2%
2014-15	39,333	98%	654	2%
2015-16	43,935	98%	734	2%
2016-17	51,529	98%	946	2%
2017-18	56,801	98%	1,206	2%
2018-19	66,507	98%	1,164	2%
2019-20	74,366	98%	1,306	2%
2020-21	72,796	99%	855	1%
2021-22	80,391	99%	1,005	1%
2022-23	85,648	98%	1,796	2%

Note: Figures for 2021-22 are Revised Estimates and for 2022-23 are Budget Estimates. Figures for all other years are actuals.
Source: Union Budgets 2015-16 to 2022-23; PRS.

Vacancies

As on January 1, 2020, 10% of the total sanctioned posts in CAPFs were vacant.[2] Of these vacancies, 26% were in BSF and 24% in the CRPF. Table shows the percentage of vacancies in each CAPF.

Table 4: Vacancies in CAPFs (as of January 2020)

CAPFs	Sanctioned Strength	Actual Strength	% Vacancies
CRPF	3,24,340	2,99,410	8%
BSF	2,65,173	2,37,750	10%
CISF	1,62,541	1,41,650	13%
SSB	97,244	78,809	19%
ITBP	89,567	82,631	8%
AR	66,408	60,524	9%
NSG	10,844	9,857	9%
Total	**10,16,117**	**9,10,631**	**10%**

Note: CRPF – Central Reserve Police Force; BSF – Border Security Force; CISF – Central Industrial Security Force; SSB – Sashastra Seema Bal; ITBP – Indo-Tibetan Border Police; AR – Assam Rifles; NSG – National Security Guard.
Source: Bureau of Police Research and Development; PRS.

The Standing Committee on Home Affairs (2019) noted that continued vacancies were observed in the CAPFs.[3,4] The Standing Committee (2018) observed that there was a lack of planning and estimation of future vacancies, leading to delays in recruitment.[5] It recommended the Ministry to proactively identify and report vacancies to recruitment agencies on time.

Modernisation of CAPFs

The Modernisation Plan II (2012-17) aimed at providing financial support to CAPFs for arms, clothing, and equipment. The Estimates Committee (2018) noted that the procurement process under the Modernisation Plan was cumbersome and time-consuming.[6] It recommended the Ministry to take action to address bottlenecks in procurement. It also recommended the Ministry and CAPFs to hold negotiations with ordnance factories and manufacturers to ensure uninterrupted supply of equipment and other infrastructure.[6]

In 2022-23, the Modernisation Plan IV has been allocated Rs 248 crore, up from the revised estimate for 2021-22 (Rs 100 crore).

The 15th Finance Commission (2021) recommended establishing the Modernisation Fund for Defence and Internal Security to bridge the gap between budgetary requirements and allocation for capital outlay in defence and internal security. The fund will have an estimated corpus of Rs 2.4 lakh crore over 2021-26.[7]

Training and management

All CAPFs have set up training institutes to meet their training requirements and impart professional skills on specialised topics. The Estimates Committee (2020) recommended that the contents of training should include latest technologies such as IT and cyber security alongside conventional training.[8] The Standing Committee on Home Affairs (2022) noted that the CAPFs are often roped in to assist state police forces to contain regional issues such as naxalism and organised crimes.[9] It recommended establishing training centres where personnel of both the forces may undergo joint training programmes.

In terms of organisational management, the Standing Committee (2019) highlighted the issue of stagnation in promotion among personnel of the CAPFs. For example, promotion from constable to head constable takes 12-13 years (against the required period of five years) in the ITBP, and 22 years in the CISF.[5,10] In this context, the Standing Committee (2018) recommended expediting cadre review of the CAPFs to ensure that promotions take place on time.[10]

Living conditions

The Standing Committee on Home Affairs (2018, 2019) has highlighted shortfall in housing, poor quality of food, and lack of access to clean drinking water as issues faced by CAPFs personnel.[3,4,5]

The Standing Committee (2019) observed that the housing satisfaction level as against authorised dwelling units (39%) in the border-guarding CAPFs was quite low.[4] It noted that the housing problem was even more acute when comparing the satisfaction level against the sanctioned strength. Within the available housing, there was a further shortage of housing for non-gazetted officers. The government stated that this is primarily due to

difficulty in land acquisition and limited executive power at the local level. Housing shortage has also been highlighted as an issue for other CAPFs.[4] As of November 2021, housing satisfaction level in CAPFs was 47% as against authorised dwelling units.[11] Further, CAPFs also face challenges pertaining to food quality and access to drinking water. In case of the border guarding CAPFs, the Standing Committee (2019) observed that it was difficult to ensure a regular supply of nutritious food due to postings in remote areas. Additionally, as per government estimates, 82% of ITBP, 78% of SSB, 43% of AR, and 16% of BSF out-posts had not been provided with potable water. The Committee, thus, recommended routine inspection of the quality and supply of food, and to ensure continued access to water for personnel.[3,4,5] For other CAPFs, it recommended establishing location-specific systems of procurement and provision of food, and ensuring quality checks through external food inspections.[4]

Mobility and connectivity in border areas

Mobility of border guarding forces is an issue which affects their operational efficiency.[5] The Standing Committee on Home Affairs (2018) noted that there is: (i) a shortage of 4,210 km of road at the Indo-Pakistan and Indo-Bangladesh border where BSF personnel are located, and (ii) a lack of adequate all-weather roads in remote areas where Assam Rifles personnel are posted.[5] The Standing Committee (2019) also noted that there is no provision for mobile connectivity in many border outposts, and recommended the Ministry to provide optical fibre cable connectivity and expand telecom connectivity.

In 2022-23, Rs 2,745 crore has been budgeted for border infrastructure and management (Table 5). This is an increase of 2% over the revised estimates for 2021-22 (Rs 2,701 crore). This includes allocations for maintenance of border works, border check posts and out posts, and capital outlay for various items including barbed wire fencing, construction of roads, and hi-tech surveillance on the Indo-Bangladesh and Indo-Pakistan borders.

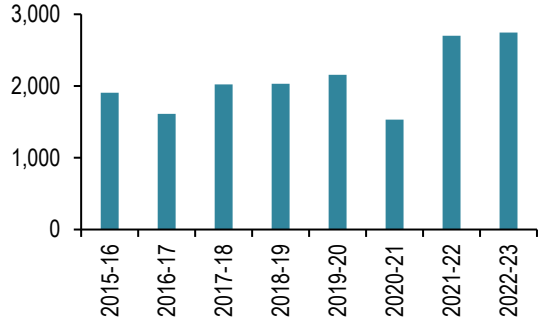
Table 5: Expenditure related to border infrastructure and management (in Rs crore)

Department	2020-21 Actuals	2021-22 Revised	2022-23 Budget	% Change (BE 2022-23/ RE 2021-22)
Maintenance and Border Check post	226	314	228	-28%
Capital Outlay	1,308	2,387	2,517	5%
Total	**1,534**	**2,701**	**2,745**	**2%**

Note: BE – Budget Estimates, RE – Revised Estimates.
Source: Union Budget 2022-23; PRS.

Between 2015-16 and 2022-23, the expenditure on border infrastructure and management has increased at an average annual growth rate of 9%, with a significant increase in 2021-22 (Figure).

Figure 5: Expenditure on border infrastructure and management (2015-23) (in Rs crore)



Note: Revised Estimates used for 2021-22 and Budget Estimates used for 2022-23. Figures for all other years are actuals.
Source: Union Budgets 2017-18 to 2022-23; PRS.

Delhi Police

An amount of Rs 10,096 crore has been allocated to the Delhi Police in 2022-23. This is 9% lesser than the revised estimates for 2021-22 (see Table).

Vacancies and inadequate women representation

As on March 15, 2021, 15% of the total sanctioned posts in the Delhi Police were vacant.[12] Vacancies in Delhi Police from 2015 to 2021 are given in Table 6.

Table 6: Vacancies in Delhi Police (2015-21)

Year	Sanctioned strength	Actual strength	% Vacancies
2015	82,242	77,083	6%
2016	82,242	76,348	7%
2017	84,417	82,979	2%
2018	86,531	74,712	14%
2019	91,963	82,190	11%
2020	91,962	82,195	11%
2021*	94,353	80,074	15%

Note: *as on March 15, 2021.
Source: Bureau of Police Research and Development; Starred Question No. 302, Rajya Sabha, March 24, 2021; PRS.

The Standing Committee on Home Affairs (2014) stated that steps should be taken to assess the actual requirement of police strength to improve the police-population ratio.[14] It recommended that the Delhi Police may take the assistance of the Bureau of Police Research and Development to improve the operational efficiency of the organisation.

Further, the Standing Committee (2021) noted that women were not adequately represented in the Delhi Police.[13] Despite the Ministry having advised states/ UTs to provide 33% reservation to women in their police forces, women representation was less than 14% in the Delhi Police.[13] The Committee noted that low representation of women in police forces acts as a barrier for women victims of crime seeking to approach police stations. It recommended the Ministry along with Delhi Police to conduct special recruitment drives to increase the representation of women on priority and in a time-bound manner.

Quality of investigation

The number of cases of crimes reported to and solved by Delhi Police from 2015 to 2018 is given below.

Table 7: Number of cases reported to and solved by the Delhi Police (2015-2018)

Year	Cumulative Cases reported	Cumulative Cases solved	% Cases unsolved
2015	1,91,377	52,091	73%
2016	2,09,519	55,957	73%
2017	2,33,580	81,219	65%
2018*	1,25,668	37,390	70%

Note: Data pertains only to crimes under the Indian Penal Code, 1860.
*Up to July 15, 2018.
Source: Starred Question No. 227, Rajya Sabha, August 8, 2018; PRS.

The Standing Committee on Home Affairs in its report on the functioning of Delhi Police (2014) had recommended that investigation should be separated from law-and-order duties.[14] This is primarily because police personnel were found to be overburdened by a variety of tasks including administration and personal security. In 2015, the Committee was informed that the proposal for creation of additional posts in the Delhi Police for separating functions of investigation from law and order had been cleared by the Ministry of Home Affairs and sent to the Ministry of Finance for approval.[15] In 2021, the Delhi Police Commissioner issued a standing order to ensure segregation of these functions (with exceptions in certain situations) by designating separate inspectors for both functions.[16] The Standing Committee (2014) had also suggested that since investigation requires legal expertise, the training module of Delhi Police must include advanced courses on law and jurisprudence.[14]

Corruption and transparency

The Standing Committee on Home Affairs (2014) stated that public perception and anecdotal evidence pointed towards widespread corruption and rent-seeking within the Delhi Police.[14] It also observed that extraneous pressure on investigating agencies was impacting quality of investigations and delaying resolution of cases.[14] In this regard, it recommended several measures including: (i) establishing vigilance squads and ensuring strict follow-up actions to investigations, (ii) prompt enquiry into complaints of corruption, and (iii) mandatory filing of returns of assets by officers of every rank.

The central government has stated that vigilance units of Delhi Police strictly monitor police personnel and are empowered to take suo-moto action. Helplines to complain about instances of corruption have also been established by the Ministry.[17]

Intelligence Bureau

The Intelligence Bureau (IB) is responsible for collecting intelligence within India, and is the primary agency for counter-intelligence. In 2022-23, an amount of Rs 3,168 crore has been allocated to the IB, which is 13% higher than the revised estimates for 2021-22 (Rs 2,793 crore).

Multi Agency Centre

In 2000, the central government set up a Group of Ministers (GoM) to comprehensively review the national security framework.[18] The GoM recommended the Ministry of Home Affairs to put in place arrangements for intelligence sharing, in which the IB would play the lead role, along with representatives of the state and central police forces.[18] Based on these recommendations, the Multi Agency Centre was set up in the IB, to collate and share intelligence with all other security agencies.[18] Further, Subsidiary Multi Agency Centres have been set up at the state level to ensure better coordination between intelligence agencies.[18]

The Standing Committee on Home Affairs (2017) had observed that state agencies have made lower contribution in the overall inputs received by the Multi Agency Centre.[18] It recommended the Ministry to hold consultations with states to find out the reasons for this low level of contribution. Further, the Committee recommended that there should be a mechanism to perform validity checks on information obtained from other agencies, before it is shared with the Multi Agency Centre.[18]

Modernisation of Police Forces

For 2022-23, the central government has made allocations towards four items related to modernisation of police forces. These are: (i) Modernisation of State Police Forces Scheme; (ii) the Crime and Criminal Tracking Network and Systems (CCTNS) scheme; (iii) Security Related Expenditure (SRE) scheme; and (iv) Special Infrastructure Scheme (SIS) for Left Wing Extremist (LWE) Areas.

In 2022-23, Rs 2,754 crore has been allocated for modernisation of police forces, which is 18% lower than the revised estimates for 2021-22 (Table). However, there has been a 158% increase in allocation towards the Modernisation of State Police Forces Scheme and the CCTNS scheme.
Note that the central government has approved continuation of the umbrella scheme for modernisation of police forces with a central outlay of Rs 26,275 crore for the period 2021-22 to 2025-26.[19] This includes Rs 4,846 crore for modernisation of state police forces, and Rs 18,839 crore for security related expenditure for the UT of Jammu and Kashmir, insurgency-affected north eastern states, and areas affected by left wing extremism.[19]

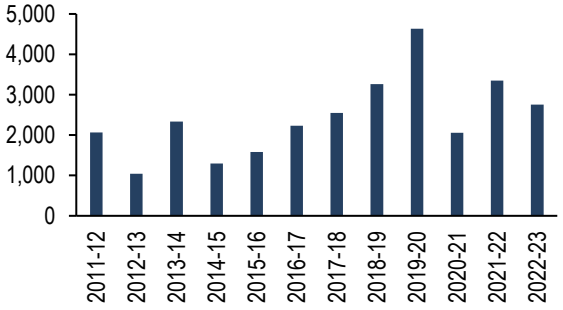
Table 8: Expenditure related to modernisation of police (in Rs crore)

Major Head	2020-21 Actuals	2021-22 Revised	2022-23 Budget	% Change (BE 2022-23/ RE 2021-22)
SRE and SIS for LWE areas	1,897	3,105	2,133	-31%
Modernisation of State Police Forces and CCTNS	160	240	621	158%
Total	**2,057**	**3,346**	**2,754**	**-18%**

Note: BE – Budget Estimates, RE – Revised Estimates.
Source: Union Budget 2022-23; PRS.

Between 2011-12 and 2022-23, the expenditure on modernisation of police forces has increased at an average annual rate of 15%, despite a reduction in the last three years (Figure).

Figure 6: Expenditure on modernisation of police forces (2011-23) (in Rs crore)



Note: Revised Estimates used for 2021-22 and Budget Estimates used for 2022-23. Actuals used for all other years.
Source: Union Budgets 2013-14 to 2022-23; PRS.

Scheme for modernisation of state police forces

The Modernisation of State Police Forces Scheme is a centrally sponsored scheme aimed at reducing the dependence of states on the army and CAPFs for the purposes of internal security and law and order.[20] The focus of the scheme is on equipping state police forces with infrastructure such as modern weaponry and communication equipment. It also includes construction of police stations and police housing. Allocation and release of funds under the scheme in the last nine years is shown below.

Table 9: Funds allocated and released under the modernisation scheme (2012-21) (in Rs crore)

Year	Allocation	Funds released
2013-14	1,342	1,338
2014-15	1,398	1,397
2015-16	662	662
2016-17	595	594
2017-18	769	452
2018-19	769	769
2019-20	811	781
2020-21	771	103

Source: Ministry of Home Affairs, Standing Committee on Home Affairs (2022); PRS.

The funds allocated under the modernisation scheme lapse at the end of the year if they are not released to states. Table shows that almost the entire amount allocated under the scheme was released in most years. In other years, funds allocated to most states could not be released, as they had substantial unspent balances and had not submitted utilisation certificates in respect of funds released during the previous year.[9]

The cost-sharing pattern between centre and states under the scheme is: (i) 90:10 for north-eastern and Himalayan states, and (ii) 60:40 for all other states.[21] The Standing Committee on Home Affairs (2022) recommended bringing more states with strategic international borders under the first category, so that they can avail additional funds under the scheme.[9] At present, the scheme allows expenditure under two items (viz., mobility, and construction of police infrastructure including housing) only to Jammu and Kashmir, insurgency affected north-eastern states, and districts affected by left wing extremism. The Standing Committee (2022) recommended the Ministry to consider including these items under the scheme for all states/UTs, to help increase the number of operational vehicles and improve the housing satisfaction level of police personnel.[9]

The Standing Committee (2022) noted that as on January 1, 2020, 257 police stations did not have vehicles, 638 police stations did not have telephones, and 143 police stations did not have wireless/ mobiles.[9] Many of these police stations were in sensitive states/UTs (such as Punjab, and Jammu and Kashmir).[9] The Committee recommended the Ministry to take certain steps in coordination with states for modernising their police forces. These include: (i) setting up adequate manufacturing units for non-lethal weaponry in India, (ii) developing a scientific approach to policing by leveraging technologies such as artificial intelligence and big data, (iii) deploying drones or unmanned aerial vehicles for surveillance of crime hotspots, crowd control, and disaster management, and (iv) installing CCTV cameras in police stations and court premises.

The Comptroller and Auditor General of India (CAG) has highlighted lapses in the implementation of the modernisation scheme in various states. Issues including shortage of modern weaponry, obsolete communication sets susceptible to interception, and slow progress of planned construction work were observed by the CAG in Karnataka (2018), Maharashtra (2017), and Jharkhand (2020).[22,23,24]

Crime and Criminal Tracking Network and Systems (CCTNS) scheme

CCTNS is a project aimed at creating a nationwide IT-enabled tracking system for investigation of crime and detection of criminals. As on August 11, 2021, Rs 1,949 crore (out of an allocation of Rs 2,000 crore) had been spent on CCTNS since its commencement. The Standing Committee on Home Affairs (2022) noted that CCTNS has been made

operational in all states/UTs.[9] It recommended integrating CCTNS data in real time with data of courts, prisons, prosecution, and forensics, as part of the Interoperable Criminal Justice System (ICJS). This will reduce duplication of work and errors, speed up trials, and increase police efficiency.

The Committee also recommended digitising certain services rendered by police personnel (such as issuance of passport verification reports, arms license verification reports, and character certificates).[9] This would not only save citizens from multiple visits to police stations, but also avoid the diversion of police personnel for such routine administrative work and they could be utilised in handling core functions of investigations and maintenance of law and order.

The Standing Committee (2022) noted that FIRs are being registered electronically in 16,074 police stations. It observed that e-FIR facility is presently available in Delhi, Rajasthan, Uttar Pradesh and Odisha for registering certain cases. The Committee recommended the Ministry to coordinate with states to: (i) initiate the facility in the remaining states/UTs, and (ii) extend the facility to non-heinous crimes.

Disaster management

The Ministry of Home Affairs is the nodal ministry for handling all types of disasters other than drought (which is handled by the Ministry of Agriculture).[25] Disaster management includes capacity building, mitigation, and response to natural calamities and man-made disasters. Allocation towards various items is shown in Table .

Table 10: Expenditure on major items related to disaster management (in Rs crore)

Department	2020-21 Actuals	2021-22 Revised	2022-23 Budget	% Change (BE 2022-23/ RE 2021-22)
National Disaster Response Force	1,030	1,313	1,336	2%
National Cyclone Risk Mitigation Project	76	185	300	62%
Disaster management infrastructure	106	128	86	-33%
Other schemes	113	239	107	-55%
Total	**1,324**	**1,865**	**1,828**	**-2%**

Note: BE – Budget Estimates, RE – Revised Estimates.
Source: Union Budget 2022-23; PRS.

Currently, the central and state governments share costs for disaster management initiatives. The cost-sharing pattern between centre and states is: (i) 90:10 for north-eastern and Himalayan states, and (ii) 75:25 for all other states. In 2021, the 15th Finance Commission recommended retaining this pattern.[7]

National Disaster Response Force

The National Disaster Response Force is a specialised force responsible for disaster response and relief. For 2022-23, the budget estimate for the Force is Rs 1,336 crore, which is 2% higher than the revised estimates for 2021-22.

The Standing Committee on Home Affairs (2018) noted that there was a standard operating procedure for deployment of the National Disaster Response Force during a disaster, according to which states can requisition for forces.[32] However, states may be unable to make optimal assessment of the requirements, which could lead to competing demands for mobilisation of forces in disaster-stricken areas. The Committee, therefore, recommended the National Disaster Management Authority to make an independent assessment of the number of battalions required to be deployed. This would ensure rational assessment of needs and optimal prepositioning of the Force.[32]

National Cyclone Risk Mitigation Project

The National Cyclone Risk Mitigation Project (NCRMP) was launched by the Ministry of Home Affairs with the aim of minimising vulnerability in states/UTs that are prone to cyclone hazards. Key objectives of the project include: (i) improving early warning dissemination systems, and (ii) construction and maintenance of cyclone shelters.[26]
For 2022-23, a budgetary allocation of Rs 300 crore has been made towards this project. This is a 62% increase from the revised estimates for 2021-22.
The Standing Committee (2018) noted that forecasting the rapid intensification of cyclones is an area of concern. It stated that rapid intensification of cyclones is no longer a rare phenomenon due to global warming, and recommended bolstering the existing capacity for advanced cyclone warning.[32]
The Standing Committee (2020) further stated that commissioning of early-warning dissemination systems in states including Odisha and Andhra Pradesh may increase pre-cyclone preparedness.[32] However, it noted that construction had not begun for projects commissioned in 2015, which may have adverse impacts during the cyclonic season.

National Disaster Response Fund

The Disaster Management Act, 2005 mandates the creation of a National Disaster Response Fund and State Disaster Response Funds.[27] Relief assistance is provided to states from the National Disaster Response Fund in case of severe natural calamities, where the State Disaster Response Fund is insufficient to cover the required expenditure.[28]
Allocations to the National Disaster Response Fund are made by the Ministry of Finance, though it is administratively controlled by the Ministry of Home Affairs.[28] The National Disaster Response Fund is financed through the National Calamity Contingency Duty (NCCD) imposed on specified goods under central excise and customs.[29] For the year 2022-23, a budgetary allocation of Rs 6,400 crore has been made to the fund, which is a 4% increase from the revised estimates for 2021-22 (Rs 6,130 crore).

Table 11: Budget allocation for National Disaster Response Fund (in Rs crore)

Department	2020-21 Actuals	2021-22 Revised	2022-23 Budget	% Change (BE 2022-23/ RE 2021-22)
National Disaster Response Fund	5,820	6,130	6,400	4%

Note: Allocation to the National Disaster Response Fund is made by the Ministry of Finance.
BE – Budget Estimates, RE – Revised Estimates.
Source: Union Budget 2022-23; PRS.

The 15th Finance Commission has recommended setting up national- and state-level mitigation funds, in addition to the existing disaster response funds (together known as disaster risk management funds).[30] This would address the full cycle of disaster management needs, namely, response and relief, recovery and reconstruction, preparedness and capacity building, and mitigation. The mitigation funds will be used for local and community-based interventions which reduce risks and promote environment-friendly settlements and livelihood practices. Further, the 15th Finance Commission (2021) recommended providing central assistance to states on a graded cost-sharing pattern. States must contribute: (i) 10% of assistance for grants of up to Rs 250 crore, (ii) 20% of assistance for grants of Rs 250-500 crore, and (iii) 25% of assistance for grants of over Rs 500 crore.[7]

Damage assessment

In order to receive assistance from the NDRF, state governments must submit a memorandum indicating the damage and requirement of funds.[31] On receipt of the memorandum, an Inter-Ministerial Central Team (IMCT) is constituted, which will submit a report after an on-the-spot assessment of the damage. After this, a High-Level Committee approves the amount of relief to be released from the NDRF.

The Standing Committee on Home Affairs (2018) noted that there was a significant difference between funds sought by state governments and amounts approved by the High-Level Committee.[32] The shortfall was more than 70% in most cases, and even more than 95% in some. According to the Standing Committee, a reason for this shortfall could be that by the time the IMCT reaches the disaster-affected area, the signs of disaster are on the verge of diminishing. Thus, it recommended that the IMCT should make a preliminary visit to the affected areas within one week of the disaster. Further, a joint preliminary damage assessment should be done with the state governments concerned.[32]
For recovery and reconstruction assistance from the disaster response funds, the 15th Finance Commission in its report for the year 2020-21 recommended that each disaster should be followed by a post-disaster needs assessment (PDNA).[30] This will be undertaken by the state governments for small-scale disasters, and jointly by the central and state governments for disasters of rare severity. The PDNA should cover the damage, loss, recovery and reconstruction needs of different sectors (such as housing, infrastructure, and livelihood), and indicate inter-sectoral needs as well as the annual requirements of each sector. The governments will contribute only part of the requirements of each sector, while the rest will be contributed by the disaster-affected people. The Finance Commission also recommended that there should be a third-party audit of funds released under this mechanism.

Grants to UTs

For 2022-23, Rs 58,757 crore has been allocated towards grants and loans for the administration of UTs. This is an increase of 2% over the revised estimates for 2021-22 (Rs 57,533 crore). Of the total allocation, the highest share is for the UTs of Jammu and Kashmir (61%), and Ladakh (10%). These two UTs were formed after the reorganisation of the former state of Jammu and Kashmir in 2019. Allocation towards each of the UTs is shown below.

Table 12: Expenditure on grants to Union Territories (in Rs crore)

Union Territory	2020-21 Actuals	2021-22 Revised	2022-23 Budget	% Change (BE 2022-23/ RE 2021-22)
Jammu and Kashmir	30,757	34,704	35,581	3%
Ladakh	2,374	5,958	5,958	0%
Andaman and Nicobar Islands	4,825	5,924	5,704	-4%
Chandigarh	4,224	4,428	4,847	9%
Dadra & Nagar Haveli and Daman & Diu	1,379	2,313	2,374	3%
Puducherry	1,703	1,880	1,730	-8%
Lakshadweep	1,232	1,296	1,395	8%
Delhi	1,112	1,030	1,168	13%
Total	**47,605**	**57,533**	**58,757**	**2%**

Note: BE – Budget Estimates, RE – Revised Estimates.
Source: Union Budget 2022-23; PRS.

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[3] Report No. 220: 'Action Taken by Government on the Recommendations/Observations Contained in the Two Hundred Fifteenth Report on Working Conditions in Non-Border Guarding Central Armed Police Forces (Central Industrial Security Force, Central Reserve Police Force and National Security Guard)', Standing Committee on Home Affairs, December 11, 2019, https://rajyasabha.nic.in/rsnew/Committee_site/Committee_File/ReportFile/15/122/220_2020_9_12.pdf.

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[5] Report No. 214: 'Working Conditions in Border Guarding Forces (Assam Rifles, Sashastra Seema Bal, Indo-Tibetan Border Police and Border Security Force)', Standing Committee on Home Affairs, 2018, https://rajyasabha.nic.in/rsnew/Committee_site/Committee_File/ReportFile/15/107/214_2018_12_15.pdf.

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[10] Report No. 215: 'Working Conditions in Non-Border Guarding Central Armed Police Forces', Standing Committee on Home Affairs, December 12, 2018, https://rajyasabha.nic.in/rsnew/Committee_site/Committee_File/ReportFile/15/107/215_2018_12_15.pdf.

[11] "Ministry of Home Affairs – Review of 2021", Ministry of Home Affairs, Press Information Bureau, January 10, 2022.

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[13] Report No. 230: 'Atrocities and Crimes against Women and Children', Standing Committee on Home Affairs, Rajya Sabha, March 15, 2021, https://rajyasabha.nic.in/rsnew/Committee_site/Committee_File/ReportFile/15/143/230_2021_3_12.pdf.

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[18] Report No. 203: 'Border Security: Capacity Building and Institutions', Standing Committee on Home Affairs, April 11, 2017, https://rajyasabha.nic.in/rsnew/Committee_site/Committee_File/ReportFile/15/15/203_2017_4_11.pdf.

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Annexure

Table 13: Expenditure on the Central Armed Police Forces in the last ten years (in Rs crore)

Department	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22	2022-23
CRPF	11,124	12,747	14,327	16,804	18,560	21,974	25,133	24,410	27,307	29,325
BSF	10,294	11,687	12,996	14,909	16,019	18,652	20,254	19,322	21,491	22,718
CISF	4,301	4,955	5,662	6,563	7,614	9,115	10,421	11,218	11,373	12,202
SSB	2,719	3,148	3,418	4,045	4,641	5,420	6,382	6,017	6,940	7,654
ITBP	3,051	3,399	3,773	4,641	5,078	5,699	6,625	6,143	6,965	7,461
AR	3,276	3,450	3,848	4,724	5,031	5,694	5,632	5,499	6,046	6,658
NSG	498	527	569	697	968	1,007	1,114	930	1,151	1,293
Departmental Accounting	66	74	78	92	95	110	111	112	122	132
Total	**35,329**	**39,988**	**44,669**	**52,474**	**58,007**	**67,670**	**75,672**	**73,650**	**81,396**	**87,444**

Note: Revised Estimates used for 2021-22, and Budget Estimates used for 2022-23; actuals used for all other years.
CRPF – Central Reserve Police Force; BSF – Border Security Force; CISF – Central Industrial Security Force; AR – Assam Rifles; ITBP – Indo-Tibetan Police Force; SSB – Sashastra Seema Bal; NSG – National Security Guard.
Source: Union Budgets 2015-16 to 2022-23; PRS.

Table 14: Vacancies in CAPFs (2012-20) (in lakhs)

Year	Sanctioned strength	Actual strength	Vacancies (in %)
2012	8.9	7.6	14%
2013	9.1	8.3	9%
2014	9.3	8.7	6%
2015	9.5	8.9	7%
2016	9.7	9	7%
2017	10.8	9.2	15%
2018	9.9	9.3	6%
2019	10.1	9.2	9%
2020	10.2	9.1	10%

Note: Figures for each year are as of January 1 of that year.
Source: Bureau of Police Research and Development; PRS.

Table 15: State-wise releases from NDRF in 2021-22 (as on December 9, 2021) (in Rs crore)

State	Releases from NDRF	% of total releases
Gujarat	1,000	28%
Jharkhand	200	6%
Karnataka	629	18%
Maharashtra	701	20%
Odisha	500	14%
Tamil Nadu	214	6%
West Bengal	300	8%
Total	**3,544**	

Source: Unstarred Question No. 2668, Lok Sabha, December 14, 2021; PRS.

Demand for Grants 2022-23 Analysis
Railways

The Railways finances were presented on February 1, 2022, by the Finance Minister Ms. Nirmala Sitharaman along with the Union Budget 2022-23. The Ministry of Railways manages the administration of Indian Railways and policy formation through the Railway Board. Indian Railways is a commercial undertaking of the central government.[1]

Expenditure of Railways is financed through: (i) its internal resources (freight and passenger revenue, and leasing of railway land), (ii) budgetary support from the central government, and (iii) extra-budgetary resources (primarily borrowings but also includes institutional financing, public-private partnerships, and foreign direct investment). Railways' working expenses (salaries, staff amenities, pension, asset maintenance) are met through its internal resources. Capital expenditure (such as procurement of wagons and station redevelopment) is financed through internal resources, budgetary support from the central government, and extra-budgetary resources.

This note looks at the proposed expenditure of Railways for the year 2022-23, its finances over the last few years, and issues with the same.

Highlights

- **Revenue**: Railways' internal revenue for 2022-23 is estimated at Rs 2,40,000 crore, an increase of 19% over the revised estimates of 2021-22. In 2021-22, revenue is estimated to be 7% lower than the budget estimate.
- **Traffic revenue**: Total revenue from traffic for 2022-23 is estimated to be Rs 2,39,600 crore, an increase of 19% over revised estimates of 2021-22. Freight revenue is estimated to be Rs 1,65,000 crore in 2022-23, an increase of 14% over the revised estimates of 2021-22. The passenger revenue is estimated to be Rs 58,500 crore, an increase of 32% over a low base in 2021-22 (due to COVID-19). In 2021-22, passenger revenue is estimated to be 27% lower than the budget estimate, whereas freight revenue is estimated to be 5% higher than the budget estimate.
- **Expenditure**: The total revenue expenditure by Railways for 2022-23 is projected to be Rs 2,34,640 crore, an increase of 17% over revised estimates of 2021-22. In 2021-22, revenue expenditure is estimated to be 5% lower than the budget estimate. In 2022-23, capital expenditure is projected at Rs 2,45,800 crore, an increase of 14% over the revised estimates of 2021-22. The revised estimates for capital expenditure in 2021-22 is marginally higher than the budget estimate.
- **Operating Ratio**: Operating Ratio is a ratio of working expenses to the receipts from traffic. A lower ratio implies better profitability and availability of resources for capital spending. In 2022-23, the Railways' Operating Ratio is estimated to be 96.98%. This would be an improvement over the operating ratio of 98.93% in 2021-22 (revised estimates). Operating ratio of 96.15% was estimated at the budget stage in 2021-22.

2022-23 Budget announcements[2]

Key announcements and proposals related to Railways made in Budget 2022-23 include:

- Railways will develop new products and efficient logistics services for small farmers, and small and medium enterprises. It will also take steps towards integration of postal and railway networks to provide seamless solutions for movement of parcels.
- 100 PM-GatiShakti Cargo Terminals for multimodal logistics facilities will be developed over next three years.
- Multimodal connectivity between mass urban transport and railway stations will be facilitated on priority.
- 400 new-generation Vande Bharat trains will be manufactured over next three years.
- 2,000 km of network will be brought under Kavach, the indigenous technology for safety and capacity augmentation.
- 'One Station-One Product' concept will be popularised to help local businesses and supply chains.

For information on status of 2021-22 budget announcements, please see Table 12 in annexure.

Overview of Finances

Railways' Internal Revenue

Railways earns its internal revenue primarily from passenger and freight traffic. In 2022-23, Railways is estimated to earn 69% of its internal revenue from freight and 24% from passenger traffic. The remaining 7% will be earned from other miscellaneous sources such as parcel service, coaching receipts, and sale of platform tickets.

Growth in Revenue

Railways' total internal revenue for 2022-23 is estimated at Rs 2,40,000 crore, an increase of 19% over the revised estimates of 2021-22. In 2021-22, total internal revenue is estimated to be 7% lower than the budget estimate. While freight earnings are estimated to be 5% higher than the budgeted, passenger earnings are estimated to be 27% lower. In both 2019-20 and 2020-21, Railways' internal revenue registered a negative growth year-on-year (Figure 1 on next page). In 2019-20, freight revenue was 11% lower than the previous year, whereas passenger revenue was severely hit in 2020-21. Passenger services were suspended for about 10 days in March 2020 and through April-May 2020 to mitigate the impact of COVID-19.[3] After that, services were resumed in a phased manner.[4] Railways ran special trains in place of regular trains up until November 2021.[5] Pre-COVID regular trains have been resumed since then.[5] The second class of such trains continue to run as reserved, except if any relaxation permitted in special case.[5] Between 2018-19 and 2022-23, Railways' revenue is estimated to grow at a compounded annual growth rate (CAGR) of 5.9%. This is lower than the CAGR of 7.1% observed between 2012-13 and 2018-19. While revenue from freight traffic is estimated to grow at 6.7% between 2018-19 and 2022-23, revenue from passenger traffic is estimated to grow at 3.5%. Between 2012-13 and 2018-19, freight and passenger revenue had grown at a CAGR of 6.9% and 8.5%, respectively.

Shortfall in Revenue

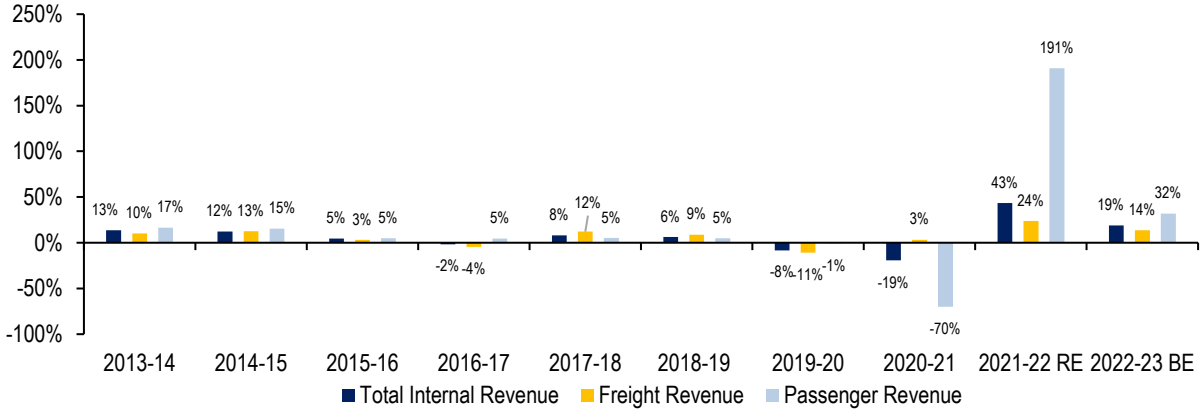
As discussed above, Railways' internal revenue registered a negative year-on-year growth in both 2019-20 and 2020-21. This resulted in a significant difference in actual revenue as compared to the budget estimates (Figure 2 on next page). On average, between 2011-12 and 2018-19, internal revenue realised by Railways was 6% lower than the budget estimates. While freight revenue saw a shortfall of 3% as compared to the budget estimates during this period, the corresponding figure for passenger services was higher at 8%.

Table 1: Overview of Railways Receipts and Expenditure for 2022-23 (in Rs crore)

		2020-21	2021-22 BE	2021-22 RE	% Change (2021-22 BE to 2021-22 RE)	2022-23 BE	% Change (2021-22 RE to 2022-23 BE)
	Receipts						
1	Passenger Revenue	15,248	61,000	44,375	-27%	58,500	32%
2	Freight Revenue	1,17,232	1,37,810	1,45,275	5%	1,65,000	14%
3	Other traffic sources	8,090	18,300	12,100	-34%	16,100	33%
4	**Gross Traffic Receipts (1+2+3)**	**1,40,571**	**2,17,110**	**2,01,750**	**-7%**	**2,39,600**	**19%**
5	Miscellaneous	213	350	250	-29%	400	60%
6	**Total Internal Revenue (4+5)**	**1,40,784**	**2,17,460**	**2,02,000**	**-7%**	**2,40,000**	**19%**
7	**Budgetary Support from Government**	**29,926**	**1,07,300**	**1,17,300**	**9%**	**1,37,300**	**17%**
8	**Extra Budgetary Resources**	**1,23,196**	**1,00,258**	**95,200**	**-5%**	**1,01,500**	**7%**
9	Special Loan from Govt.*	79,398					
10	**Total Receipts (6+7+8+9)**	**3,73,303**	**4,25,018**	**4,14,500**	**-2%**	**4,78,800**	**16%**
	Expenditure						
11	Ordinary Working Expenses	1,35,845	1,54,399	1,49,800	-3%	1,70,000	13%
12	Appropriation to Pension Fund	523	53,300	49,000	-8%	60,000	22%
13	Appropriation to Depreciation Reserve Fund	200	800	500	-38%	2,000	300%
14	**Total Working Expenditure (11+12+13)**	**1,36,568**	**2,08,499**	**1,99,300**	**-4%**	**2,32,000**	**16%**
15	Miscellaneous	1,669	2,400	1,825	-24%	2,640	45%
16	**Total Revenue Expenditure (14+15)**	**1,38,236**	**2,10,899**	**2,01,125**	**-5%**	**2,34,640**	**17%**
17	**Total Capital Expenditure**	**1,55,181**	**2,15,058**	**2,15,000**	**0%**	**2,45,800**	**14%**
18	Appropriation of Special Loan from Govt.*	79,398					
19	**Total Expenditure (16+17+18)**	**3,72,815**	**4,25,957**	**4,16,125**	**-2%**	**4,80,440**	**15%**
20	***Net Revenue (6-16)***	**2,547**	**6,561**	**875**	**-87%**	**5,360**	**513%**
21	***Operating Ratio***	**97.45%#**	**96.15%**	**98.93%**		**96.98%**	

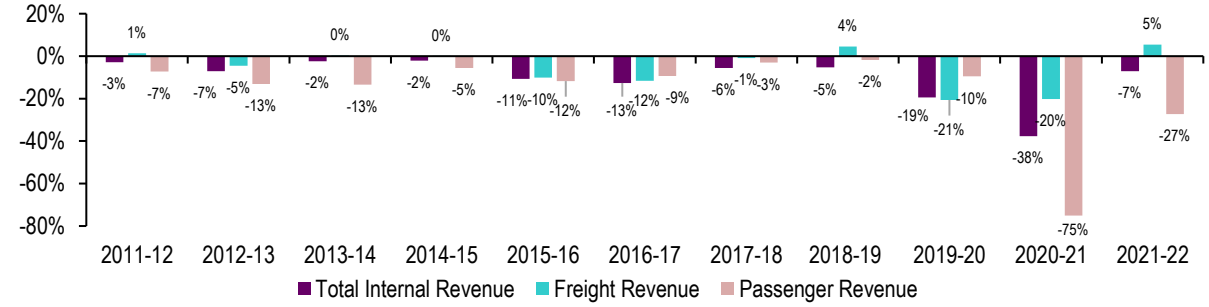
Note: *The central government provided a special loan from its general revenue for COVID related resource gap in 2020-21 and to liquidate adverse balance in Pension Fund in 2019-20.
#If the appropriation to the Pension Fund were to be per the requirement, the operating ratio for 2020-21 would have been 131.5%.
RE – Revised Estimate, BE – Budget Estimate.
Source: Expenditure Profile; Union Budget 2022-23; PRS.

Figure 1: % Growth in Revenue during 2013-23 (year-on-year)



Note: RE: Revised Estimates; BE: Budget Estimates.
Sources: Railways Budget of various years; Union Budget of various years; PRS.

Figure 2: Shortfall in Revenue during 2011-22 (Difference between Budget and Actuals)



Note: Revised estimates for 2021-22 taken as Actual.
Sources: Railways Budget of various years; Union Budget of various years; PRS.

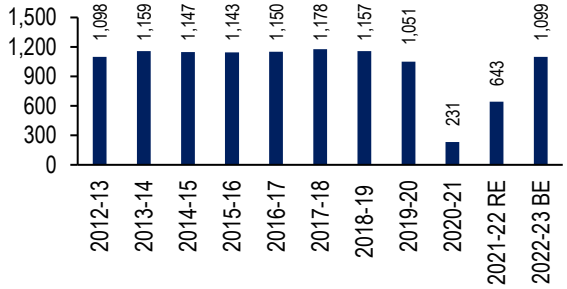
Challenges in raising revenue

Sluggish growth in traffic volume

Over the last decade, both rail-based passenger and freight traffic have grown at a modest rate (see Figure 3 and Figure 4). Between 2012-13 and 2022-23, freight and passenger traffic volume are estimated to grow at a CAGR of 2.3% and 0.01%, respectively. This has affected Railways' earnings from its core business of running freight and passenger trains. Railways is estimated to register passenger traffic volume of 1,099 billion Passenger km (PKM) in 2022-23. 1 PKM implies 1 passenger was transported over 1 km. Passenger traffic in 2022-23 is estimated to be lower than every year between 2013-14 and 2018-19. In freight traffic volume, there has been an uptick during 2021-22, which Railways expects to sustain in 2022-23.

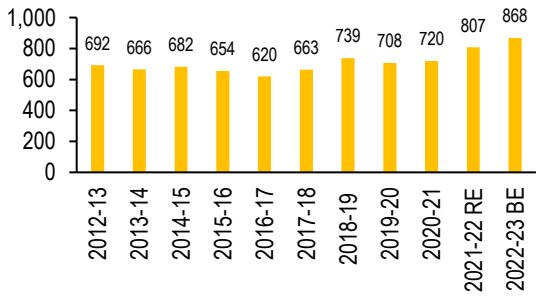
In 2022-23, Railways is estimated to register freight traffic volume of 868 billion Net Tonne km (NTKM), which is 8% higher than the revised estimates for 2021-22 (807 billion NTKM). This is mainly on account of estimated increase in coal freight (Table 2 on next page). In 2021-22, freight traffic volume as well as revenue is expected to be 5% higher than the budget estimate. 1 NTKM implies 1 tonne of freight was transported over 1 km. The freight traffic volume is estimated to grow at CAGR of 4.1% between 2018-19 and 2022-23.

Figure 3: Passenger Traffic Volume during 2012-23 (in billion PKM)



Note: RE: Revised Estimates; BE: Budget Estimates.
Sources: Railways Budget of various years; Union Budget of various years; PRS.

Figure 4: Freight Traffic Volume during 2012-23 (in billion NTKM)



Note: RE: Revised Estimates; BE: Budget Estimates.
Sources: Railways Budget of various years; Union Budget of various years; PRS.

Table 2: Trends in components of Freight Traffic Volume (in billion NTKM)

	18-19	21-22 RE	22-23 BE	% change 21-22 to 22-23	CAGR 18-19 to 22-23
Coal	311	314	354	13%	3.3%
Cement	68	77	84	9%	5.4%
Other goods	59	77	81	5%	8.2%
Iron ore	43	66	72	9%	13.5%
Foodgrains	58	77	65	-15%	3.3%
Container services	58	58	63	9%	2.1%
Pig iron & finished steel	50	51	57	10%	3.3%
Fertilisers	47	42	44	4%	-1.5%
Petroleum & lubricants	29	30	31	6%	1.7%
Raw material for steel plants	15	16	17	7%	2.4%
Total	**739**	**807**	**868**	**8%**	**4.1%**

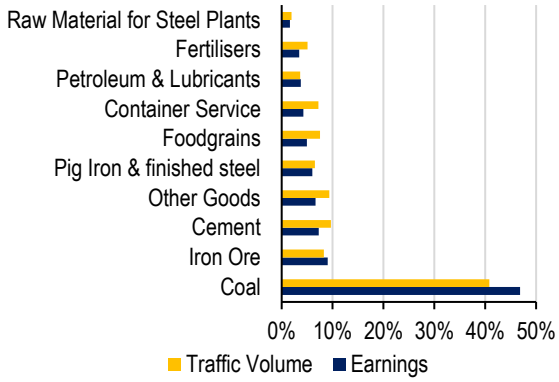
Note: RE: Revised Estimates, BE: Budget Estimates.
Sources: Union Budget of various years; PRS.

Note that over the years, Railways has steadily lost freight traffic share to other modes of transport. Share of Railways in total freight traffic had declined from 89% in 1950-51 to 30% in 2011-12.[6] During the same period, the share of roads on total freight traffic increased from 11% to 61%. As per the draft National Rail Plan 2030 (NRP), the share of Railways in total freight traffic stood at 27% in 2020.[7] NRP aims to increase Railways' modal share in freight traffic to 45% by 2050. NITI Aayog (2018) had highlighted a shortfall in carrying capacity and a lack of price competitiveness as some of the reasons for the decline in freight share.[8] It had observed that since passenger and freight traffic run on the same tracks, India has not been able to increase speed or capacity in a significant manner when compared to global benchmarks. Note that various dedicated freight corridors have been planned by Railways for improvement in facilities for freight. It has taken certain initiatives to attract freight including: (i) operation of Kisan Rail to attract freight for agricultural produce (1,806 trains on 153 routes as of December 2021), and.(ii) time tabled parcel services for courier and e-commerce companies. [9,10]

Dependence on coal for freight revenue

The freight basket has mostly been limited to raw materials for certain industries such as power plants, and the iron and steel plants (Figure 5). In 2022-23, three commodities are estimated to contribute 63% of the total freight revenue: (i) coal (47%), (ii) iron ore (9%), and (iii) cement (7%).

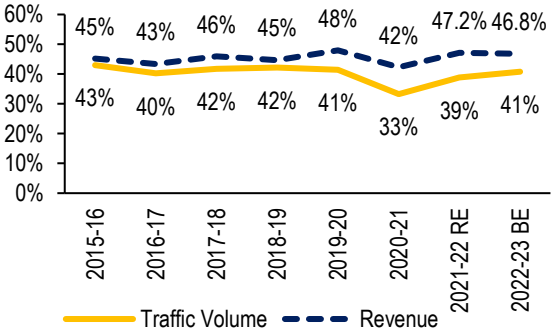
Figure 5: Estimated share in freight volume and freight earnings in 2022-23



Source: Expenditure Profile, Union Budget 2022-23; PRS.

While the share of coal in freight volume has been slowly coming down (from 43% in 2015-16 to 39% in 2021-22), its contribution to revenue has been increasing (from 45% in 2015-16 to 47% in 2021-22). This may be indicative of an increasing dependency on coal for revenue as compared to other items in the freight basket. However, as per the budget estimates, share of coal in traffic volume is estimated to increase in 2022-23, whereas its contribution to revenue is estimated to decrease.

Figure 6: Share of coal in Railways' freight



Sources: Railways Budget of various years; Union Budget of various years; PRS.

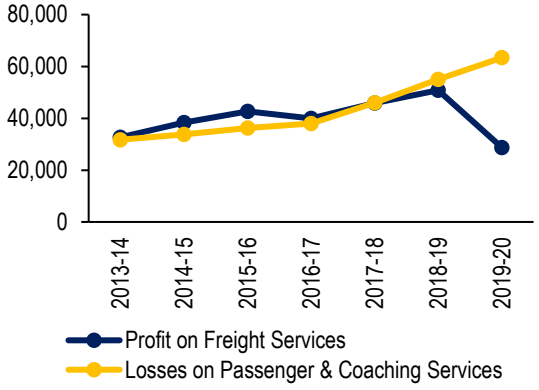
Implications of clean energy transition on Railways' freight revenue

In 2022-23, about 46% of the total coal freight volume is estimated to be for thermal power plants. As part of its initiatives in response to climate change, India has pledged to: (i) install 500 GW of non-fossil energy capacity by 2030, (ii) meet 50% of energy requirements from renewable energy by 2030, (iii) reduce carbon emissions by one billion tonnes by 2030, (iv) reduce carbon intensity of its economy to less than 45% by 2030, and (v) achieve target of net zero emission by 2070.[11] Action towards these targets would involve phasing down coal-fired power plants and other usage of coal. Any significant shift in coal usage in the country might pose a challenge for Railways' freight revenue and overall sustainability of its finances.[12]

Widening losses from passenger services

Passenger traffic is broadly divided into two categories: suburban and non-suburban traffic. Suburban trains are passenger trains that cover short distances of up to 150 km and help move passengers within cities and suburbs. Majority of the passenger revenue (94.4% in 2019-20) comes from the non-suburban traffic (or the long-distance trains). Over the years, Railways has been unable to meet its operational cost of passenger services. Except AC-3 Tier segment, all other segments of passenger services have registered losses during the 2015-20 period (Table 3). These losses are compensated by earnings from freight services. NITI Aayog (2016) noted that such cross-subsidisation has resulted in high freight tariffs.[14] It also observed (2018) that high freight tariffs are one of the reasons for a sub-optimal share of Railways in freight.[8]

Figure 7: Losses on Passenger and Other Coaching Services vis-a-vis Profit on Freight Services (Rs crore)



Source: CAG; PRS.

Table 3: Operational profit/loss of various classes of passenger services (in Rs crore)

Class	2015-16	2016-17	2017-18	2018-19	2019-20
AC-1st Class	-176	-139	-165	-249	-403
1st Class	-58	-53	-35	-39	-38
AC 2 Tier	-463	-559	-604	-908	-1378
AC 3 Tier	**898**	**1,041**	**739**	**318**	**65**
AC Chair car	-6	**118**	**98**	**243**	-182
Sleeper Class	-8,301	-9,313	-11,003	-13,012	-16,056
Second class	-8,570	-10,025	-11,524	-13,214	-14,457
Ordinary Class	-13,238	-14,648	-16,568	-19,124	-20,450
EMU suburban services	-5,125	-5,324	-6,184	-6,754	-6,938
Total	**-36,286**	**-37,937**	**-46,025**	**-55,020**	**-63,364**

Source: CAG; PRS.

In 2019-20, Railways made losses of Rs 63,364 crore on passenger and other coaching services, a 15% increase in losses over the previous year (Rs 55,020 crore).[12,13] Profit from freight services in 2019-20 was Rs 28,746 crore, inadequate to completely subsidise the losses from passenger services.[13]

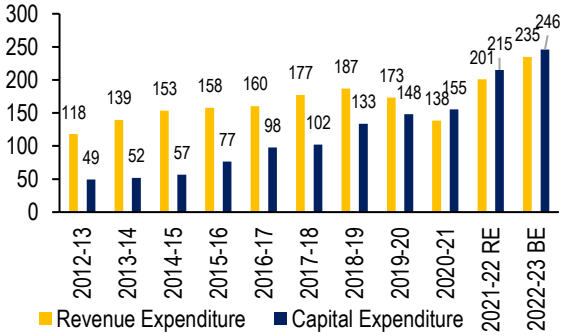
The revenue from passenger services was Rs 50,669 crore. Thus, Railways spent Rs 2.3 to earn one rupee from passenger services.[13]

Losses in passenger services are primarily caused due to: (i) passenger fares being lower than the costs, and (ii) concessions to various categories of passengers (senior citizens, National award winners etc.).[14] Railways classifies these provisions as social service obligations. The Committee on Restructuring Railways (2015) had observed that several decisions on the Indian Railways such as increase in fares, introduction of new trains, and provision of halts are not taken based on commercial considerations.[16] The Standing Committee on Railways (2020) had recommended that both freight and passenger fares should be rationalised prudently.[15] It observed that any fare increase needs to take into account the competition from other transport modes.[15] The Committee recommended that the social service obligations of Railways should be revisited.[15]

Expenditure

Over the last decade, Railways' expenditure has increased at a comparatively higher rate than its internal revenue. This is mainly on account of a higher capital spending supported by grants from the central government and extra-budgetary resources (Figure 8). Between 2012-13 and 2022-23, the internal revenue is estimated to increase at a CAGR of 6.6%, whereas revenue and capital expenditure are estimated to increase at a CAGR of 7.1% and 17.4%, respectively.

Figure 8: Railways' expenditure during 2012-23 (in Rs thousand crore)



Note: RE: Revised Estimates; BE: Budget Estimates.
Sources: Railways Budget of various years; Union Budget of various years; PRS.

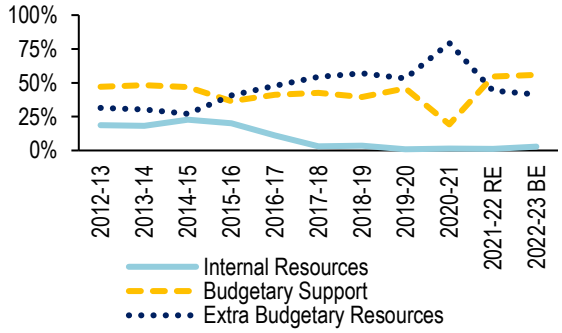
Reliance on budgetary support and extra-budgetary resources to fund capital expenditure

Owing to modest revenue surplus observed by Railways, capital expenditure has largely been funded through: (i) budgetary support from the central government, and (ii) extra-budgetary resources. For instance, only 2.8% of the total estimated capital expenditure in 2022-23 will be funded through internal revenue of Railways. Extra Budgetary Resources (such as market borrowings and external investments).

External investments in Railways could be in the form of public-private partnerships (PPPs), joint ventures, or market financing by attracting private investors to potentially buy bonds or equity shares in Railways. Railways mostly borrows funds through the Indian Railways Finance Corporation (IRFC). IRFC borrows funds from the market (through taxable and tax-free bond issuances, term loans from banks and financial institutions), and then follows a leasing model to finance the rolling stock assets and project assets of Indian Railways.

Up until 2014-15, budgetary support from the central government used to be the primary source for funding capital expenditure (Figure 9). However, between 2015-16 and 2020-21, the increase in capital expenditure was sustained through an increased reliance on extra budgetary resources. The Committee on Restructuring Railways (2015) had observed that increased reliance on borrowings could further exacerbate the financial situation of Railways.[16]

Figure 9: Source of funds - capital expenditure



Note: RE: Revised Estimates; BE: Budget Estimates.
Sources: Railways Budget of various years; Union Budget of various years; PRS.

In 2021-22 and 2022-23, budgetary support from the central government has seen a significant increase. However, note that this might have been made possible due to the central government running a large fiscal deficit in these two years (6.9% and 6.4% of GDP respectively).[2] The central government aims to bring down its fiscal deficit to 4.5% of GDP by 2025-26.[2] This might pose a challenge in sustaining the budgetary support levels seen in 2021-22 and 2022-23.

Table 4: Capital Expenditure (in Rs crore)

	2020-21 Actuals	2021-22 Revised	2022-23 Budget	% Change (21-22 RE to 22-23 BE)
Gross Budgetary Support	29,926	1,17,300	1,37,300	17%
Extra Budgetary Resources	1,23,196	95,200	1,01,500	7%
Internal Resources	2,059	2,500	7,000	180%
Total	**1,55,181**	**2,15,000**	**2,45,800**	**14%**

Source: Expenditure Profile, Union Budget 2022-23; PRS.

Inadequate resources for debt servicing

Railways pays lease charges to IRFC. The lease charges have a principal and interest component. The principal component of the lease charges forms part of the capital expenditure of Railways. In 2022-23, allocation towards payment of principal component of lease charges is estimated at Rs 22,188 crore, an increase of 51% over 2021-22 (Rs 14,702 crore as per revised estimates).

CAG (2020) had observed that ideally, the principal component of lease charges should be paid from the Capital Fund.[12] Capital Fund is a dedicated fund of Railways to repay the principal component of market borrowing and financing works of capital nature. However, no allocation has been made to this fund between 2015-16 and 2021-22. In 2022-23, apportionment to capital fund is estimated to be Rs 2,360 crore. The Ministry of Railways noted that appropriation to the Capital Fund is made from net revenue after meeting obligatory revenue expenditure.[12] The Ministry further observed that no appropriation is being made to the Capital Fund due to inadequate internal resources. Hence, gross budgetary support provided by the central government has been used to pay the principal component of lease charges. CAG (2020) observed that utilisation of gross budgetary support for repayment of lease charges is not a healthy trend as it deprives Railways of additional investments in capital works.[12] CAG (2019) had observed that if obligations towards IRFC have to be met from budgetary support, the government might as well borrow directly from the market, as the cost of borrowings would be lower.[17]

Future Capital Expenditure Requirements

The Ministry of Railways has prepared the National Rail Plan 2030 for augmenting its infrastructure during the 2021-51 period.[7] The draft of the National Rail Plan 2030 (NRP), released in December 2020, noted that Railways could be left with a financing gap of over two lakh crore rupees for its capital expenditure projects in next five years.[7] This relates to the funding gap for projects under the annual work plan of Railways and the National Infrastructure Pipeline prior to the National Rail Plan.[7] The National Infrastructure Pipeline is a plan of infrastructure projects worth Rs 102 lakh crore between 2019-20 and 2024-25. It includes projects worth Rs 13.7 lakh crore for Railways pertaining to track infrastructure, terminal infrastructure, rolling stock, and urban public transport (Table 5 on next page). The draft National Rail Plan envisages an additional capital expenditure worth Rs 5.8 lakh crore during the 2021-26 period (Table 6 on next page).[7] However, note that there may be some overlap in projects envisaged under the National Rail Plan and the National Infrastructure Pipeline.[7]

Table 5: Capital Expenditure Requirement for Railways under the National Infrastructure Pipeline (in Rs crore)

Year	Amount
2019-20	1,33,387
2020-21	2,62,465
2021-22	3,08,800
2022-23	2,73,831
2023-24	2,21,209
2024-25	1,67,870
Total	**13,67,563**

Source: Draft National Rail Plan, Ministry of Railways; PRS.

The draft National Rail Plan estimates that on average, funds available with Indian Railways for capital expenditure over the next five years will be: (i) about Rs 60,000 crore per annum as gross budgetary support, (ii) about Rs 7,000 crore per annum from internal resources, and (iii) a maximum of Rs 1,30,000 crore per annum from extra budgetary resources.[7] It noted that it would be challenging to fund the projects envisaged under the National Rail Plan from internal resources due to persistently high operating ratio.[7]

Table 6: Proposed expenditure under National Rail Plan (in Rs lakh crore)

Head	2021-26	2026-31	2031-41	2041-51	Total
Dedicated Freight Corridors	-	1.5	0.5	0.3	2.3
High Speed Rail Corridors	-	5.1	2.9	7.0	15.0
Network improvements	1.3	0.7	2.2	1.8	6.0
Flyovers and Bypasses	0.8	-	-	-	0.8
Terminals	0.6	0.2	0.1	0.04	0.9
Rolling Stock	3.1	1.7	3.6	4.8	13.2
Total	**5.8**	**9.2**	**9.3**	**13.9**	**38.2**

Source: Draft National Rail Plan, Ministry of Railways; PRS.

Revenue Expenditure

In 2022-23, the total revenue expenditure by Railways is estimated at Rs 2,34,640 crore, which is an increase of 17% over the revised estimates of 2021-22 (Rs 2,01,125 crore). In 2022-23, key items of revenue expenditure include: (i) staff costs (43%), (ii) pension (22%), (iii) fuel (15%), and (iv) interest component of lease charges (9%).

Staff wages and pension

Staff wages and pension constitute about 68% of the Railways' estimated revenue expenditure in 2022-23. For 2022-23, the expenditure on staff is estimated at Rs 99,840 crore, which is an increase of 10% over 2021-22. The Committee on Restructuring Railways (2015) had observed that the Railways' expenditure on staff is extremely high and unmanageable.[16] It also sees a significant jump every few years due to revisions by the Pay Commission. In 2021-22, staff wages are estimated at Rs 90,619 crore at the revised stage, which is 3% less than the budget estimate. Note that Railways has a total of 15,07,694 sanctioned posts, out of which around 2,37,295 posts are lying vacant, i.e., there is a vacancy of about 16% (as of March 2020).[19] If all of these posts were to be filled, staff costs for Railways would be higher than the current level.

Allocation to the Pension Fund in 2022-23 is estimated at Rs 60,000 crore, which is an increase of 22% over the revised estimates for 2021-22. Appropriation to the pension fund was much less than required in 2019-20 and 2020-21 (59% and 99% less than the budget estimate, respectively). A special loan of Rs 79,398 crore was extended by the central government to Railways to meet the obligations towards the pension fund for 2019-20 and 2020-21. In 2021-22, appropriation to pension fund is estimated to be 8% less than the budget estimate. The Standing Committee on Railways (2017) had observed that the pension bill may increase further in the next few years, as about 40% of the Railways staff was above the age of 50 years in 2016-17.[20] The Standing Committee on Railways (2020) noted that the new pension scheme implemented in 2004 to reduce the pension bill will show results only around 2034-35.[15]

National Monetisation Pipeline

In August 2021, the central government launched the National Monetisation Pipeline (NMP). NITI Aayog (2021) had noted that traditional sources of capital are expected to finance 83-85% of capital expenditure envisaged under National Infrastructure Pipeline.[18] About 15%-17% of the aggregate outlay is expected to be met through innovative mechanisms such as asset recycling and monetisation. For NMP aims to monetise assets which are central to business objectives of a government body and are being utilised for delivering infrastructure services. The pipeline will be implemented over four years (between 2022-23 and 2024-25). Monetisation under NMP will not involve disinvestment and monetisation of non-core assets such as land, building, and pure play real estate assets.

Under NMP, value of Railways' assets to be monetised is estimated to be Rs 1,52,496 crore. This is about 26% of the value of all the assets of the central government covered under NMP (six lakh crore rupees in value terms).

Table 7: Railway assets to be monetised under NMP

Asset Class	Details
Railway Stations	400 (5.5% of total stations)
Passenger Trains	90 (5% of total trains)
Railway Track	1 route of 1,400 km (2% of network)
Konkan Railways	741 km
Hill Railways	four in number (a total of 244 km route)
Railway owned Goods sheds	265 (21% of total good sheds)
Dedicated Freight Corridor (DFC) track and allied infra	673 km (20% of total DFC network)
Railway colonies and stadia	15

Source: NITI Aayog; PRS.

The Committee recommended that feasibility of bearing a part of pension liabilities from the general revenue of the central government till 2034-35 should be explored.[15] The Committee on Restructuring Railways (2015) had also observed that employee costs (including pensions) reduce Railways' ability to generate a surplus and allocate resources towards operations.[16] It had recommended that Railways should rationalise its manpower, and make the organisation more business-oriented. It should be amenable to private participation while retaining an optimal level of functional specialisation within.[16]

Fuel and electricity

In 2022-23, the expense on fuel and electricity is estimated to be Rs 31,854 crore, an increase of 15% over 2021-22 (Rs 27,629 crore).

Lease Charges

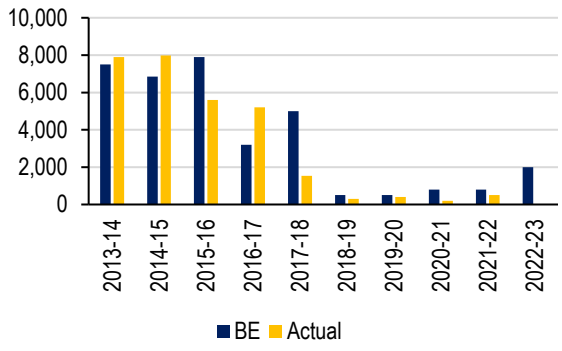
The interest component of lease charges forms part of the revenue expenditure of Railways. In 2022-23, Rs 20,013 crore is estimated to be spent on the interest component of lease charges, which is an increase of 33% over 2021-22 (Rs 15,068 crore).

Appropriation to Funds

Depreciation Reserve Fund (DRF)

Appropriation to the DRF is intended to finance the costs of new assets replacing old ones. In 2022-23, appropriation to DRF is estimated at Rs 2,000 crore. In the last few years, appropriation to DRF has declined (Figure 10). In recent years, appropriation has also been lower than the budget estimates. As per CAG (2021), at the end of 2019-20, the value of over-aged assets pending for replacement using this fund was estimated to be Rs 95,217 crore.[13] This includes: (i) Rs 58,887 crore on track renewal and (ii) Rs 26,547 crore on rolling stock. It observed that in the backdrop of declining revenue surplus, replacement and renewal of over aged assets could become a burden for the central government.[13]

Figure 10: Appropriation to DRF (in Rs crore)



Note: BE: Budget Estimates; RE: Revised Estimates. Revised estimates for 2021-22 shown as Actuals.
Sources: Railways Budget of various years; Union Budget of various years; PRS.

Private sector participation in operating trains

In July 2020, proposals were invited for private participation in the operation of passenger train services over 109 origin-destination pairs of routes through the introduction of 151 trains across 12 clusters.[21] The private entity would be responsible for financing, procuring, operating, and maintaining these trains. Bids were opened in July 2021.[22] In all, five bids were received for three clusters.[22] No bids were received for the remaining nine clusters.[22]

The Ministry of Railways observed that the decline in appropriation to DRF is due to major part of renewal and replacement works having safety implications being financed through Rashtriya Rail Sanraksha Kosh (RRSK).[15] RRSK was created in 2017-18 to finance critical safety-related works of renewal, replacement, and augmentation of assets.

The fund has a corpus of one lakh crore rupees over five years (partially funded by the central government). Railways is required to allocate Rs 5,000 crore annually to RRSK during these five years.[15] The Ministry observed that RRSK will not continue beyond 2021-22. Beyond 2021-22, all renewal and replacement works will be financed from DRF. This could lead to an increase in appropriation to DRF in the coming years. Note that allocation has been made towards RRSK in 2022-23 at the budget stage.

Rashtriya Rail Sanraksha Kosh (RRSK)

In 2022-23, Railways has allocated Rs 2,000 crore towards RRSK. However, the actual appropriation to RRSK has been less than the requirement of Rs 5,000 crore in all four years between 2018-19 and 2021-22. In 2021-22, at the revised stage, no allocation has been made towards the fund. The Ministry of Railways noted that the desired level of appropriation to RRSK has not been made due to adverse resource position.[15] The Standing Committee on Railways (2020) observed that the purpose of RRSK is gradually being eroded due to non-appropriation of required funds from internal resources of Railways.[15]

Table 8: Appropriation to RRSK (in Rs crore)

Year	Budget	Actual	% change (Budget to Actual)
2017-18	1,000	0	-100%
2018-19	5,000	3,024	-40%
2019-20	5,000	201	-96%
2020-21	5,000	1,000	-60%
2021-22 RE	5,000	0	-100%
2022-23 BE	2,000	-	-

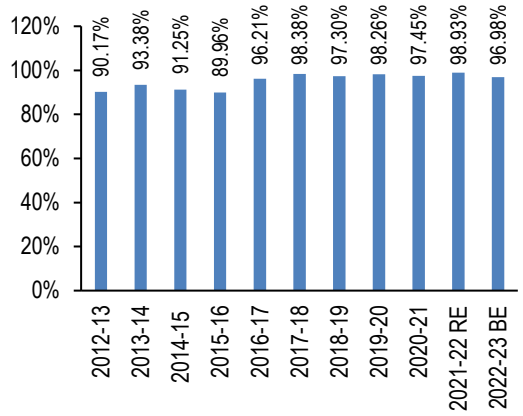
Note: RE: Revised Estimates, BE: Budget Estimates.
Sources: Union Budget of various years; PRS.

Revenue Surplus and Operating Ratio

Railways' surplus is calculated as the difference between its total internal revenue and its total expenditure (this includes working expenses and appropriation to pension and depreciation funds). In 2022-23, Railways expects to generate a surplus of

Rs 5,360 crore. This is an increase of 513% over revised estimates for 2021-22 (Rs 875 crore). In 2021-22, Railways had estimated a surplus of Rs 6,561 crore at the budget stage.2021-22, Railways had estimated a surplus of Rs 6,561 crore at the budget stage.

Figure 11: Railways' Operating Ratio



Sources: Railways Budget of various years, Union Budget of various years; PRS.

Operating Ratio is the ratio of the working expenditure (expenses arising from day-to-day operations of Railways) to the revenue earned from traffic. Therefore, a higher ratio indicates a poorer ability to generate a surplus that can be used for capital investments such as laying new lines or deploying more coaches. Operating Ratio of Railways has consistently been higher than 90% for more than a decade (Figure 11). In 2022-23, Railways has estimated an operating ratio of 97.0%, an improvement over operating ratio of 98.9% estimated in 2021-22. In 2019-20, the operating ratio worsened to 98.4% as compared to the estimated ratio of 95%. The CAG (2020) had noted that if certain advances for 2019-20 were not included in receipts for 2018-19, the operating ratio for 2018-19 would have been 101.8%.[12]

If appropriation to the pension fund were to be as per the requirement, the operating ratio for 2019-20 and 2020-21 would have been 114.2% and 131.5%, respectively.[23,24]

Network expansion and modernisation

Railways has not been able to meet some key physical targets for expansion and modernisation in recent years. It has missed its budget targets in all three years between 2017-18 and 2020-21 for: (i) construction of new lines, and (ii) gauge conversion (Table 9). While examining the progress of construction of new lines, the Standing Committee on Railways (2020) had observed that revision in allocation towards capital expenditure requires reworking of priorities and rescheduling of activities, which leads to tardy progress in the construction of new lines.[15] In 2018-19 and 2019-20, Railways also missed targets for electrification of railway lines. Note that Railways aims to achieve 100% electrification of all broad-gauge routes by 2023. As per revised estimates for 2021-22, achievement will be less than the initial target in case of wagons and track renewals. Table 13 in annexure provides details on key physical targets.

Table 9: Physical targets- Underachievement

Indicator	2017-18	2018-19	2019-20	2020-21	2021-22 RE
Construction of new lines (Route Kms)	-49%	-52%	-28%	-43%	0%
Gauge conversion (Route Kms)	-50%	-40%	-32%	-22%	0%
Doubling of lines (Route Kms)	-45%	20%	-45%	-15%	0%
Wagons (vehicle units)	-48%	-20%	-24%	-16%	-20%
Track renewals (Route Kms)	12%	7%	15%	9%	-10%
Electrification (Route Kms)	2%	-12%	-37%	0%	0%

Note: RE: Revised Estimates. Positive number means higher achievement than targeted.
Sources: Union Budget of various years; PRS.

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ANNEXURE

Table 10: Freight traffic details (traffic volume in million NTKM; Earnings in Rs crore)

	2020-21		2021-22 Revised		2022-23 Budget		% change (2021-22 RE to 2022-23 BE)		% share in 2022-23 BE	
Commodity	Earning	Volume	Earning	Volume	Earning	Volume	Earning	Volume	Earning	Volume
Coal	49,578	2,39,390	68,520	3,13,869	77,250	3,54,008	12.7%	12.8%	47%	41%
Iron Ore	12,661	62,523	13,690	65,640	14,949	71,843	9.2%	9.5%	9%	8%
Cement	9,714	73,605	11,069	77,117	12,022	83,752	8.6%	8.6%	7%	10%
Other Goods	8,510	66,465	10,493	77,305	11,019	81,180	5.0%	5.0%	7%	9%
Miscellaneous earnings	1,493	-	2,600	-	10,000	-	284.6%	-	6%	-
Pig Iron & finished steel	7,417	49,123	9,036	51,437	9,970	56,755	10.3%	10.3%	6%	7%
Foodgrains	9,213	80,681	9,605	76,691	8,196	65,434	-14.7%	-14.7%	5%	8%
Container Service	5,114	55,331	6,452	57,653	7,042	62,815	9.1%	9.0%	4%	7%
Petroleum & Lubricants	5,727	29,970	5,879	29,644	6,227	31,396	5.9%	5.9%	4%	4%
Fertilisers	5,826	49,011	5,436	42,258	5,666	44,044	4.2%	4.2%	3%	5%
Raw Material for Steel Plants	1,979	13,663	2,494	15,616	2,659	16,650	6.6%	6.6%	2%	2%
Total	**1,17,232**	**7,19,762**	**1,45,275**	**8,07,230**	**1,65,000**	**8,67,877**	**13.6%**	**7.5%**	**100%**	**100%**

Note: NTKM – Net Tonne Kilometre (One NTKM is the net weight of goods carried for a kilometre).
RE: Revised Estimates; BE: Budget Estimates.
Source: Expenditure Profile; Union Budget 2022-23; PRS.

Table 11: Passenger traffic details (traffic volume in million PKM; Earnings in Rs crore)

	2020-21		2021-22 Revised		2022-23 Budget		% change (2021-22 RE to 2022-23 BE)	
	Earning	Volume	Earning	Volume	Earning	Volume	Earning	Volume
Total Suburban	**589**	**30,075**	**1,259**	**73,721**	**2,623**	**1,57,435**	**108%**	**114%**
Total Non-Suburban	**14,659**	**2,01,051**	**43,116**	**5,68,914**	**55,877**	**9,41,692**	**30%**	**66%**
Sleeper Class (M&E)	5,436	98,476	15,840	2,59,098	18,181	3,04,243	15%	17%
Second Class (M&E)	2,132	55,447	6,667	1,63,835	14,521	3,65,063	118%	123%
AC 3 Tier	4,750	32,174	14,128	97,538	12,905	91,149	-9%	-7%
AC 2 Tier	1,472	7,609	4,023	20,288	4,679	24,137	16%	19%
Second Class (Ordinary)	217	4,456	374	18,930	2,758	1,42,806	637%	654%
AC Chair Car	390	2,153	1,299	7,028	1,904	10,537	47%	50%
AC First class	233	671	612	1,751	636	1,860	4%	6%
Executive Class	28	72	156	386	205	520	32%	35%
Sleeper Class (Ordinary)	-2	-14	1	21	45	972	4,424%	4,529%
First Class (M&E)	2	1	15	16	25	27	65%	69%
First Class (Ordinary)	1	6	1	23	17	378	1,507%	1,543%
Total	**15,248**	**2,31,126**	**44,375**	**6,42,635**	**58,500**	**10,99,127**	**32%**	**71%**

Note: PKM – Passenger Kilometre (One PKM is when a passenger is carried for a kilometre).
RE: Revised Estimates; BE: Budget Estimates.
Source: Expenditure Profile; Union Budget 2022-23; PRS.

Table 12: Status of 2021-22 Budget Announcements for Railways

Announcement	Status
▪ **Monetisation of assets**: Monetising operating public infrastructure assets is a very important financing option for new infrastructure construction. A National Monetisation Pipeline of potential brownfield infrastructure assets will be launched. Railways will monetise Dedicated Freight Corridor (DFC) assets for operations and maintenance, after commissioning.	▪ **Land Monetisation**: Rail Land Development Authority has been involved for monetisation of identified Railway assets of: (i) 111 Railway land parcels, (ii) 84 Railway colonies, (iii) four Hill Railways in Darjeeling, Kalka-Shimla, Matheran and Nilgiri, (iv) Karnail Singh Stadium & 15 other stadiums, and (v) 84 Multi-Functional Complexes (MFCs). 13 MFCs have been completed and balance are in different stages. ▪ **Monetisation of DFC** is planned to be taken up after the Western DFC and Eastern DFC become fully operational. ▪ **Private Train Operators**: Bids were invited in July 2021 for private sector participation in operating trains in 12 clusters. In all, five bids were received for three clusters. No bids were received for the remaining nine clusters. ▪ **CONCOR Divestment**: Central government is considering strategic divestment of 30.8% equity in CONCOR. Department of Investment and Public Asset Management has appointed Advisors for this purpose. Issuance of Expression of Interest is the next step in this process which will be issued after finalisation of Railway's proposed Land License Policy.
▪ **National Rail Plan (NRP)**: Indian Railways has prepared a National Rail Plan for India – 2030. The Plan is to create a 'future ready' Railway system by 2030.	▪ The NRP is already being used in prioritising projects as super critical/critical and fixing the timelines. Vision 2024 has been developed as part of NRP for execution of super critical/critical projects. ▪ The NRP has also emphasised the justification for new DFC corridors for which surveys are underway. ▪ In addition, the NRP lays a pipeline of projects to be completed by 2030, which are in process for inclusion in future budgets as per timeframe provided in the NRP.
▪ **Capital Expenditure**: A record sum of Rs 1,10,055 crore is being provided for Railways, of which Rs 1,07,100 crore is for capital expenditure.	▪ In 2021-22, gross budgetary support is estimated to be Rs 1,17,300 crore (revised estimates).
▪ **Commissioning of DFCs**: It is expected that Western Dedicated Freight Corridor (DFC) and Eastern DFC will be commissioned by June 2022. The Sonnagar – Gomoh Section (263.7 km) of Eastern DFC will be taken up in PPP mode in 2021-22. Gomoh-Dankuni section of 274.3 km will also be taken up in short succession. ▪ **New DFCs**: We will undertake future dedicated freight corridor projects namely (i) East Coast corridor from Kharagpur to Vijayawada, (ii) East-West Corridor from Bhusaval to Kharagpur to Dankuni, and (iii) North-South corridor from Itarsi to Vijayawada.	▪ As of March 2021, total 1,110 Km has been commissioned out of total 2,843 Route km. Balance to be commissioned section-wise in phases by June 2022. Approval of Public Private Partnership Appraisal Committee received for Sonnagar-Gomoh section on December 27, 2021. ▪ Preliminary reports are targeted by January 2022 including FIRR and EIRR, and Final Reports by October 2022.
▪ **Electrification**: Broad Gauge Route Kilometers (RKM) electrified is expected to reach 46,000 RKM by the end of 2021 from 41,548 RKM on October 1, 2021. 100% electrification of Broad-Gauge routes will be completed by December 2023.	▪ Total 47,807 RKMs (74%) have been electrified up to December 31, 2021.
▪ **Introduction of Vista Dome LHB coaches**: We will introduce the aesthetically designed Vista Dome LHB coach on tourist routes to give a better travel experience to passengers.	▪ 20 LHB VISTADOME coaches have been manufactured till December 31, 2021. (7 in 2020-21 and 13 in 2021-22)
▪ **Safety**: The safety measures undertaken in the past few years have borne results. To further strengthen this effort, high density network and highly utilized network routes of Indian railways will be provided with an indigenously developed automatic train protection system that eliminates train collision due to human error.	▪ 23,215 RKM work has been approved by competent authority.

Source: Statement on Implementation of Budget Announcements 2021-22, Union Budget 2022-23; PRS.

Table 13: Key physical targets

	2020-2021		2021-2022		2022-23
	Budget Target	Achievement	Budget Target	Revised Target	Budget Target
Construction of New Lines (Route Kms)	500	286	300	300	300
Gauge conversion (Route Kms)	600	470	500	500	500
Doubling of Lines (Route Kms)	1,900	1,614	1,600	1,600	1,700
Rolling Stock					
a (i) Diesel Locomotives	...	10	0	0	0
a (ii) Electric Locomotives	725	754	905	981	685
b Coaches	6,534	4,903	6,695	8,115	7,551
c Wagons (vehicle units)	12,000	10,062	12,000	9,600	13,000
Track renewals (Route Kms)	4,000	4,363	4,000	3,600	3,700
Electrification Projects (Route Kms)	6,000	6,015	6,000	6,000	6,500

Sources: Union budget documents of various years; PRS.

Demand for Grants 2022-23 Analysis
Rural Development

The Ministry of Rural Development is responsible for the development of and welfare activities in rural areas. It aims at increasing livelihood opportunities, providing social safety nets, and improving infrastructure for growth. The Ministry has two departments: (i) Rural Development, and (ii) Land Resources. This note presents the budgetary allocations to the Ministry for 2022-23, and analyses various issues related to the schemes implemented by it.

Allocation in Union Budget 2022-23

The Ministry of Rural Development has been allocated Rs 1,38,204 crore in 2022-23.[1] Table 1 gives the trend in budgetary allocation towards the Ministry over the past three years.

In 2022-23, the Department of Rural Development has been allocated Rs 1,35,944 crore, which is an 11% decrease from the revised estimates of 2021-22. The Department of Land Resources has been allocated Rs 2,259 crore, which is a 52% increase over the revised estimates of 2021-22.

Table 1: Budgetary allocation to the Ministry of Rural Development (Rs crore)

Department	20-21 Actuals	21-22 RE	22-23 BE	% Change (22-23 BE/ 21-22 RE)
Rural Development	1,96,417	1,53,558	1,35,944	-11%
Land Resources	1,176	1,485	2,259	52%
Total	**1,97,593**	**1,55,043**	**1,38,204**	**-11%**

Note: BE is budget estimate and RE is revised estimate.
Sources: Demands for Grants 2022-23, Ministry of Rural Development; PRS.

Policy announcements in the Budget Speech 2022-23

- The one lakh crore allocation towards states for capital expenditure will include supplemental funding for priority segments of PM Gram Sadak Yojana, including support for the states' share.
- Border villages will be covered under the new Vibrant Villages Programme. The activities will include construction of village infrastructure, housing, tourist centres, road connectivity, provisioning of decentralised renewable energy, direct to home access for Doordarshan and educational channels, and support for livelihood generation.
- To enable affordable broadband and mobile service proliferation in rural and remote areas, five per cent of annual collections under the Universal Service Obligation Fund will be allocated.
- Use of 'Kisan Drones' will be promoted for crop assessment, digitisation of land records.

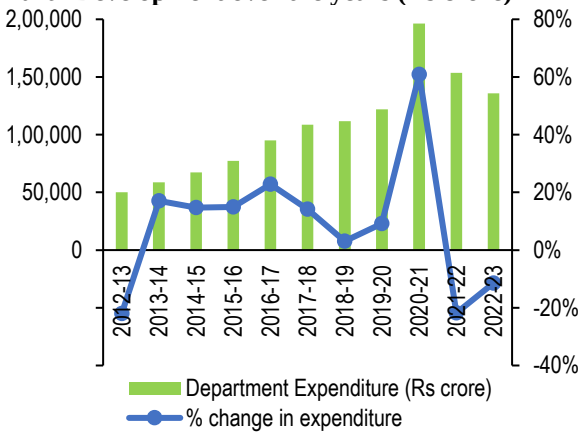
Overview of finances: Department of Rural Development

The Department implements schemes targeted at poverty reduction, provision of basic services, employment generation, and habitation development. Since 2012, expenditure of the Department has seen an average annual growth of 10.5%.

In 2020-21, expenditure of the Department increased significantly primarily due to the additional expenditure on the Mahatma Gandhi National Rural Employment Guarantee Scheme (MGNREGS) and direct benefit transfer towards PM Jan Dhan Yojana account holders. In 2020-21, while the budgeted allocation towards the Department was Rs 1,20,147 crore, the actual expenditure was 61% higher at Rs 1,96,417 crore.

The Standing Committee on Rural Development (2020) had noted that the allocation to the Department is much lower than the amount demanded by the Ministry.[2] Such lack of funds could affect the timely progress of the schemes. However, in 2021-22, the Committee noted that unspent balance of Rs 40,294 crore had accrued over all the schemes of the Department, which may raise questions on utilisation of the funds.[3]

Figure 1: Expenditure by the Department of Rural Development over the years (Rs crore)

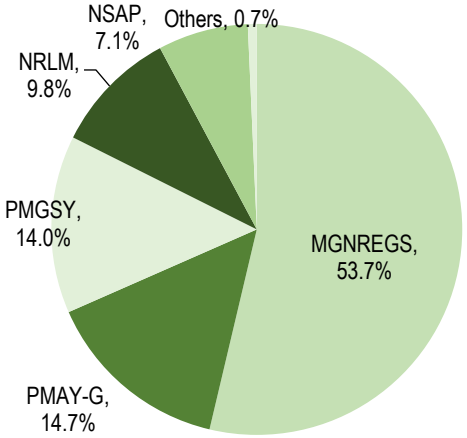


Note: Values for 2021-22 and 2022-23 are revised estimates and budget estimates respectively.
Sources: Union Budgets 2012-13 to 2022-23; PRS.

Major schemes under the Department

In 2022-23, 54% of the Department's expenditure is estimated to be on MGNREGS. This is followed by the rural component of Pradhan Mantri Awaas Yojana – Gramin (PMAY-G) (15%), and Pradhan Mantri Gram Sadak Yojana (PMGSY) (14%).

Figure 2: Top expenditure heads in 2022-23 (as % of total departmental allocation)



Note: MGNREGS is Mahatma Gandhi National Rural Employment Scheme, PMAY-G is Pradhan Mantri Awaas Yojana – Gramin, PMGSY is Pradhan Mantri Gram Sadak Yojana, NRML is National Rural Livelihood Mission, NSAP is National Social Assistance Program, Others include Rurban Mission, and projects like socio-economic and caste survey.
Sources: Demands for Grants 2022-23, Department of Rural Development: PRS.

Table 2: Allocation to schemes under the Department of Rural Development (Rs crore)

Scheme	20-21 Actuals	21-22 RE	22-23 BE	% Change (22-23 BE/ 21-22 RE)
MGNREGS	1,11,170	98,000	73,000	-26%
PMAY-G	19,269	20,390	20,000	-2%
PMGSY	13,688	14,000	19,000	36%
NRLM	9,208	11,710	13,336	14%
NSAP	42,443	8,730	9,652	11%
Others	639	728	956	31%
Total	**1,96,417**	**1,53,558**	**1,35,944**	**-11%**

Note: BE is budget estimate and RE is revised estimate. Others include projects like management support to rural development programs, socio-economic and caste census survey and centre's expenditure.
Sources: Demands for Grants 2022-23, Department of Rural Development, Ministry of Rural Development; PRS.

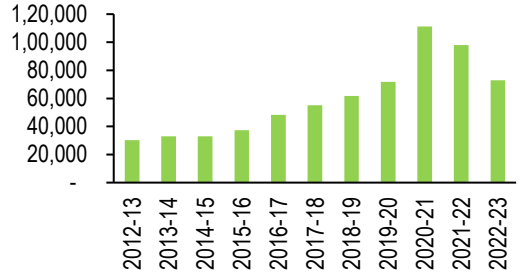
Key issues and analysis

Expenditure on MGNREGS shot up during COVID-19

MGNREGS seeks to provide guaranteed 100 days of wage employment per year to every rural household whose adult member volunteers to do unskilled manual work.[4] The scheme has statutory backing through the Mahatma Gandhi National Rural Employment Guarantee Act, 2005. The Act specifies a list of works that can be undertaken to generate employment. These are related to water conservation, land development, construction, and agriculture, among others. The scheme covers all districts of the country barring the ones with 100% urban population.[5]

Figure 3 shows the expenditure on the scheme from 2012-13 to 2022-23.

Figure 3: Expenditure on MGNREGS over the years (Rs crore)



Note: Values for 2021-22 and 2022-23 are revised estimates and budget estimates respectively.
Sources: Union Budgets 2012-13 to 2022-23; PRS.

In 2022-23, the scheme has been allocated Rs 73,000 crore. This is 26% lower than the revised estimates of 2021-22. This decline is primarily because the scheme received additional allocation in 2020-21 and 2021-22 to address the employment demand during the COVID-19 pandemic. In 2020-21, the scheme was allocated Rs 61,500 crore at the budget stage, however the actual expenditure went up to Rs 1,11,170 crore (an increase of 81%). In 2021-22, allocation to the scheme was increased to Rs 73,000 crore at the budget stage. The revised expenditure is estimated to be Rs 98,000 crore (an increase of 34%). Note that as on September 1, 2021, funds amounting to Rs 52,223 crore had already been released.[6]

This suggests that the actual expenditure on the scheme overshot the budget estimates due to the pandemic induced distress. However, since 2015-16, expenditure on the scheme has consistently been higher than the amount estimated at the budget stage. Table 3 shows the trends in allocation and actual expenditure on MGNREGS since 2012-13.

Table 3: Budgeted versus actual expenditure on MGNREGS (Rs crore)

Year	Budgeted	Actuals	% utilised
2012-13	33,000	30,273	-8%
2013-14	33,000	32,992	0%
2014-15	34,000	32,977	-3%
2015-16	34,699	37,341	8%
2016-17	38,500	48,215	25%
2017-18	48,000	55,166	15%
2018-19	55,000	61,815	12%
2019-20	60,000	71,687	19%
2020-21	61,500	1,11,170	81%
2021-22	73,000	98,000	34%
2022-23	73,000		

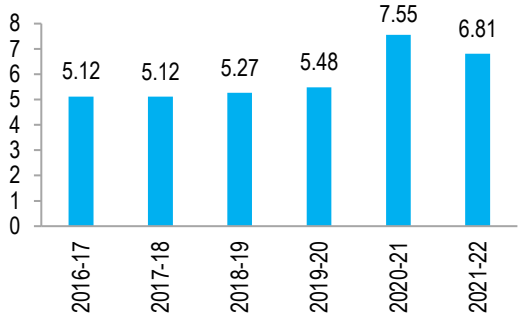
Note: The 'actuals' figure for 2021-22 is the revised estimate.
Sources: Union Budgets 2012-13 to 2022-23; PRS.

While demand for MGNREGA work has increased, uptake of employment has been poor

Demand for work: MGNREGS is a demand driven scheme. According to the Ministry, in 2021-22 (as on December 15, 2021), 7.27 crore households had demanded employment under the scheme.[7] Of these, 7.24 crore households were offered employment, while 6.36 crore households (87%) availed such employment. As per the Ministry, this could be due to better employment opportunities available elsewhere, or illness, and other such factors. The number of households engaged in MGNREGA work has increased from 5.12 crore in 2016-17 to 6.81 crore in 2021-22.[8]

Demand for work also shot up significantly during the pandemic. According to the Ministry, 1.85 crore persons were offered work in May 2021, which was 52% higher than the work offered in May 2019.[9]

Figure 4: Total Households Worked (in crore)



Source: Dashboard, Mahatma Gandhi National Rural Employment Guarantee Act, Ministry of Rural Development, last accessed on February 11, 2022; PRS.

The demand under MGNREGS is related to the movement of migrant labour. That is, states from which labour migrates would have seen higher demand under the scheme since migrant labourers returned to their home states during the COVID-19 pandemic. The Economic Survey 2021-22 noted that for several migrant source states such as Bihar, Madhya Pradesh, Odisha, and West Bengal the MGNREGS employment in most months of 2021 was lower than the corresponding levels in 2020.[10] On the other hand, the demand for MGNREGS employment was higher for migrant recipient states like Karnataka, Maharashtra, Punjab, and Tamil Nadu for most months in 2021 over 2020.[10]

Employment provided: The scheme guarantees 100 days of employment. However, from 2016-17 to 2020-21, the average number of days of employment has been 48 days, with a maximum of 52 days of employment in 2020-21.[11] Since 2016-17, on average, less than 10% of the households completed 100 days of wage employment. The Standing Committee on Rural Development (2022) noted that despite MGNREGA being a demand driven scheme where workers can move to better opportunities, these figures are quite low.[6] According to the Committee workers opt out of MGNREGA works due to low wage rates which hampers the amount of work completed.

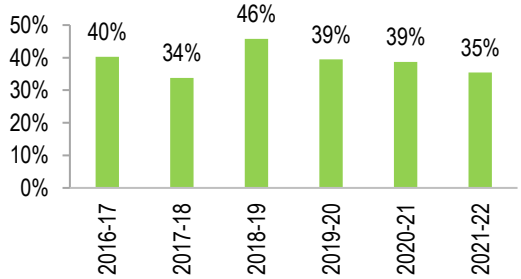
Table 4: Average days of employment provided per household

Year	Employment days / household
2016-17	46
2017-18	46
2018-19	51
2019-20	48
2020-21	52
2021-22	45

Sources: Dashboard, Mahatma Gandhi National Rural Employment Guarantee Act, Ministry of Rural Development, last accessed on February 11, 2022; PRS.

Work Completed: The scheme also aims to create durable assets to improve rural livelihood through the work done while providing employment. In 2020-21 and 2021-22, while the demand for work has increased and the number of persons being employed has also increased, the percentage of work completed under the scheme has been lower than 40%.[11]

Figure 5: Percentage of work completed



Sources: Dashboard, Mahatma Gandhi National Rural Employment Guarantee Act, Ministry of Rural Development, last accessed on February 11, 2022; PRS.

Delays in wage payments have improved but persist; wage rates are low in a few states

Indexing of minimum wage rate: The Ministry of Rural Development notifies the MGNREGA wage rate every year for states/UTs. Each state/UT may notify wages over and above the wage-rate notified by the central government. Skilled wage rate is decided by states governments. The minimum wage rate is fixed by the central government on the basis of the Consumer Price Index-Agricultural Labourers (CPI-AL). If this is not available, the minimum wage rate fixed by the states for agricultural labourers is considered.[12] The Ministry revises the wage rate every year based on changes in CPI-AL.[13]

The Standing Committee on Rural Development (2020) had noted that the wage rate under

MGNREGS is less than the minimum wages fixed by states.[2] Further, the agricultural labourers receive wages higher than the MGNREGS workers. It recommended increasing the minimum wages under MGNREGS periodically after taking inflation into account.[2] Note that in March 2020, under the Pradhan Mantri Garib Kalyan Yojana, MGNREGA wage was increased from Rs 182 a day to Rs 202 a day.[14] In 2021-22, till February 2022, the average wage rate was Rs 209 per day per person.[15] However, in six states the average wage paid was less than the minimum wage notified by the centre (Bihar,Chhattisgarh, Madhya Pradesh, Rajasthan, Telangana, and Tripura).[16]

The Committee on Alignment of MGNREGS wages under the Ministry of Rural Development (2017) noted that the type of work done by agricultural labourers and MGNREGS workers is different.[17] Thus, there should be difference in their minimum wages. It also noted that the Consumer Price Index-Rural was more recent and provided for higher expenditure on education and medical care compared to CPI-AL.[17] It recommended using CPI-Rural instead of the existing CPI-AL for revising MGNREGS wages.[17]

The Standing Committee on Rural Development (2020) noted the disparity in MGNREGS wages in various states. The Committee on Alignment of MGNREGS (2017) noted that this variation is not desirable for a programme where wage component is fully funded by the centre. It recommended convergence on Schedule of Rates across states to avoid variation.[17]

Payment delays have reduced: Under MGNREGS wage payments must be made within 15 days of the date of closure of the muster roll.[5] Delays in payments are calculated from the 16th day onwards. Table 5 shows the percentage of delayed payments out of the total payments over the past six years, and delay in payments. The proportion of delayed payments has reduced from 71.6%% in 2014-15 to 1.4% in 2021-22. The Economic Survey (2018-19) noted that the implementation of direct benefit transfer has helped in reducing delays in payments.[18] However, the Standing Committee on Rural Development (2022) noted that failed transactions and non-completion of Aadhaar based payments affects timely transfer of wages.[6] It also noted that there were several instances where the amount transferred does not credit to the beneficiaries' accounts and causes delays in the actual realisation of wages.

Table 5: Trends in delayed payment of wages under MGNREGS (in %)

Year	% Delayed Payment	Composition of delayed payments(%)			
		>90 days	61-90	31-60	15-30
2014-15	71.6%	13.4%	9.8%	22.0%	26.3%
2015-16	63.1%	9.5%	8.1%	19.0%	26.5%
2016-17	56.6%	14.2%	8.4%	15.9%	18.1%
2017-18	15.5%	1.8%	0.9%	3.6%	9.2%
2018-19	10.5%	1.9%	0.7%	2.0%	5.8%
2019-20	6.2%	1.9%	0.7%	1.1%	2.6%
2020-21	3.5%	1.5%	0.3%	0.5%	1.3%
2021-22	1.4%	0.5%	0.1%	0.2%	0.6%

Sources: MGNREGS MIS Report, Delayed Payments, last accessed on February 11, 2022; PRS.

No unemployment allowance given in 2021-22 so far: Currently under MGNREGS, a daily unemployment allowance is paid from state government funds (if employment is not provided by the state government within 15 days of application).[4] A CAG report (2013) on the scheme had stated that this puts an additional burden on the states.[19] It suggested that the Ministry of Rural Development should consider partial reimbursement of unemployment allowance.[19]

In recent years, the amount of unemployment allowance paid by states has reduced. In 2017-18, the total unemployment allowance paid by 11 states was Rs 2.82 lakh.[6] This further reduced to Rs 63,000 in 2018-19 (paid by eight states), and Rs 12,000 in 2019-20 (paid by four states).[6] In 2020-21, only Maharashtra had paid such allowance, amounting to a total of three thousand rupees. The Standing Committee on Rural Development (2022) noted that in 2021-22, till November 5, no states had paid such allowance.[6] The Ministry had responded to this stating that in 2021-22 (as on August 31, 2021), 99.26% beneficiaries who had demanded for work had been offered the work.[6]

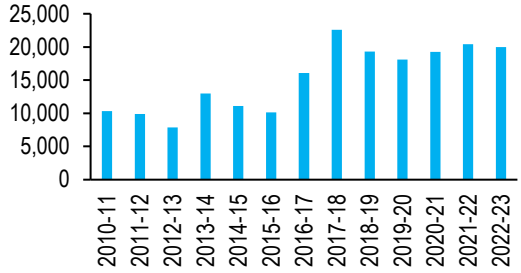
The Standing Committee (2022) noted that low or no payment of unemployment allowance is a blatant violation of the MGNREG Act.[6] It noted that even though it is the states' responsibility to provide the allowance, the centre being the nodal agency should act upon this issue, and devise measures to oversee the implementation of the provision of unemployment allowance.

Target of houses to be constructed under Pradhan Mantri Awaas Yojana- Gramin (PMAY-G) has not been met

PMAY-G has the second highest allocation in the Department's budget in 2022-23, at Rs 20,000

crore, which is 2% lower than the revised estimate of 2021-22. Since 2010-11, expenditure on the scheme has seen an average annual growth of 6%. The scheme was launched in 2016, as part of the central government's target to provide housing for all by 2022. PMAY-G subsumed the erstwhile Indira Awaas Yojana for rural housing.

Figure 6: Expenditure on PMAY-G over the years (Rs crore)

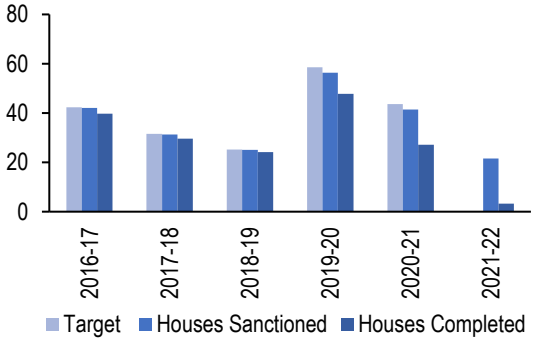


Note: Value for 2021-22 is revised estimate, value for 2022-23 is budget estimate. Values for years prior to 2016-17 relate to Indira Awaas Yojana.
Sources: Union Budgets from 2010-11 to 2022-23; PRS.

Houses constructed: Since the scheme was announced in 2016-17, the target for construction for houses has not been met in any of the years. The rate of construction (completed vs sanctioned) has also declined since 2019-20. In 2021-22, the completion rate (till February 2021) was at 15%. Poor construction rates for 2020-21 and 2021-22 may be due to the inability to carry out construction due to the COVID-19 pandemic.

The Standing Committee on Rural Development (2020) had noted that progress under the scheme has been slow.[2] It observed that one of the biggest hurdles for the timely completion of houses, is delay in the release of instalments under PMAY-G to beneficiaries. It recommended the Department of Rural Development to streamline the method for the timely release of instalments and explore ways to ensure that construction of houses is completed within the targeted time frame.

Figure 7: Construction rate under PMAY-G (number of houses in lakh)



Note: No target set for 2021-22.
Sources: Dashboard, PMAY-G, Ministry of Rural Development, last accessed on February 11, 2022; PRS.

Increase in financial assistance under PMAY-G: Under PMAY-G, financial assistance of Rs 1,20,000 in plain areas and Rs 1,30,000 in hilly areas is provided to rural BPL households for construction of a dwelling unit. The Standing Committee on Rural Development (2019) had noted that the financial assistance provided is not proportionate with the rising inflationary cost of the construction, material and other aspects of house building.[20] Further, Standing Committee on Rural Development (2020-21) noted the disparity in assistance for constructing a house in rural and urban areas (assistance of about Rs 2,50,000 per house). It noted that there are several logistical issues in rural areas that may not be there in urban areas. It recommended the Ministry to increase the assistance provided by them under the PMAY-G scheme and bring parity between the per-unit assistance in rural and urban areas.[20]

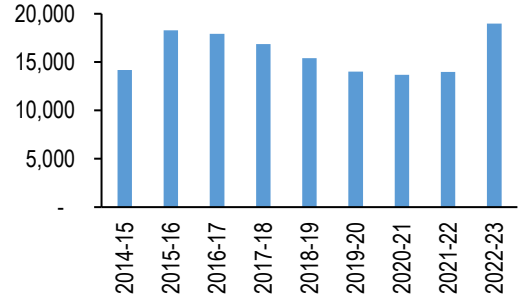
Coverage of the scheme: Questions have also been raised around the coverage of the scheme and whether all intended beneficiaries are included. Under PMAY-G beneficiaries are selected based on the housing deficiency and other social deprivation parameters in the Socio Economic and Caste Census, 2011 (SECC), and as verified by the Gram Sabhas. The Standing Committee on Rural Development (2021) had noted that to ensure that Gram Sabhas are making fair assessments, the rejected applicants should be cross-checked by independent agencies and more accountability be brought into the process.[21] Anomalies in the SECC 2011 data could also exclude people from benefitting under the scheme. It recommended that a new strategy be designed to identify beneficiaries.

Pradhan Mantri Gram Sadak Yojana

Pradhan Mantri Gram Sadak Yojana (PMGSY) seeks to provide all-weather road connectivity to all eligible unconnected habitations, existing in the core network in rural areas of the country. The scheme has been allocated Rs 19,000 crore in 2021-22, which is an increase of 36% over the revised estimate of 2021-22.

Declining fund allocation and poor utilisation: While the allocation in 2022-23 sees a significant increase from the revised estimates of last year, the expenditure on the scheme has been decreasing since 2015-16 (see Figure 8). Further since 2016-17, the Ministry has been spending less than the amount allocated at the budget stage (see Table 6). This trend of underutilisation has been worsening between 2016-17 and 2020-21.

Figure 8: Expenditure on PMGSY over the years (Rs crore)



Note: Value for 2020-21 is the revised estimates.
Sources: Union Budgets from 2014-15 to 2022-23; PRS.

Table 6:Budgeted versus actual expenditure on PMGSY (Rs crore)

Year	Budgeted	Actuals	% utilisation
2014-15	14,391	14,188	-1%
2015-16	14,291	18,290	28%
2016-17	19,000	17,923	-6%
2017-18	19,000	16,862	-11%
2018-19	19,000	15,414	-19%
2019-20	19,000	14,017	-26%
2020-21	19,500	13,688	-30%
2021-22	15,000	14,000	-7%
2022-23	19,000		

Note: The 'Actuals' figure for 2021-22 is the revised estimate.
Sources: Union Budgets from 2014-15 to 2022-23; PRS.

Slow pace of work under the scheme: Till December 8, 2021, under phase I of the scheme, 6,45,627 km of road length has been sanctioned, of which, 6,10,179 km has been completed.[22]

PMGSY II was launched in 2013 to consolidate the existing rural road network, under which 50,000 km of road length was targeted for upgradation. As on December 8, 2021, 49,885 km has been sanctioned and 45,573 km has been constructed.[22] In July 2019, PMGSY III was approved for consolidation of 1.25 lakh km roads length through routes and major rural links connecting habitations. As on December 8, 2021, 71,902 km has been sanctioned and 19,649 km has been constructed.[22] Phase III is to be implemented till March 2025.

Table 7: Status of road construction (in km) under PMGSY (as on December 8, 2021)

	Sanctioned	Constructed	Balance
Phase I	6,45,627	6,10,179	20,340
Phase II	49,885	45,573	3,860
Phase III	71,902	19,649	52,152

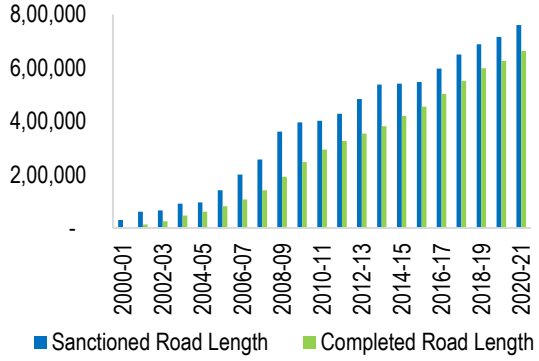
Source: Lok Sabha Starred Question No. 226, December 14, 2021; PRS.

While targets under various phases of the scheme are being met, the progress has been slow. The Standing Committee on Rural Development (2021) noted that projects under PMGSY do not get completed in the prescribed time frame.[3] Such delays result in escalation of the project costs which affects the overall expenditure. Delays are also caused due to delays in obtaining clearances for projects from various ministries.

In 2020, the Committee had noted that the pace of work under the scheme has been slow, especially in hilly states like Uttarakhand.[2] It noted that the delay in approval of Detailed Project Reports (DPRs) is the main cause for the slow pace of the scheme. It recommended that the Department of Rural Development ensure timely preparation and approval of DPRs and increase the pace of completion of projects.

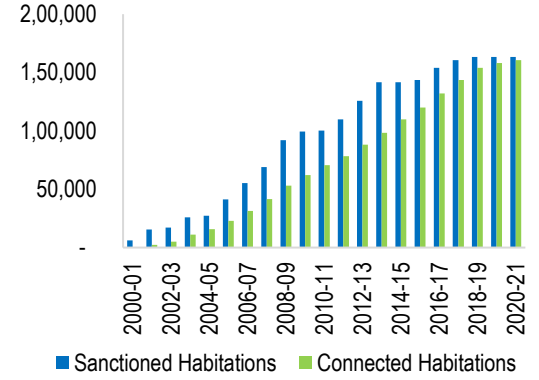
Figures 9 and 10 give details of length of roads constructed and habitations connected in the last ten years, under the scheme.

Figure 9: Length of road constructed (in km) under PMGSY (as on February 11, 2022)



Note: Road length includes roads constructed under Road Connectivity Project for Left Wing Extremism Affected Areas (RCPLWEA).
Sources: Sanctioned road length under PMGSY, Rural Dashboard, Monitoring and Accounting System (OMMS), Ministry of Rural Development, last accessed on February 11, 2022; PRS.

Figure 10: Habitations connected under PMGSY (as on February 11, 2022)



Note: Road length includes roads constructed under Road Connectivity Project for Left Wing Extremism Affected Areas (RCPLWEA).
Sources: Sanctioned road length under PMGSY, Rural Dashboard, Monitoring and Accounting System (OMMS), Ministry of Rural Development, last accessed on February 11, 2022; PRS.

Issues with contracting and poor maintenance affects quality of roads built under PMGSY

The Standing Committee on Rural Development (2021) noted that contractors tend to quote 25-30% lower than the minimum bid amount to acquire project tenders under the scheme.[3] This affects the quality of roads constructed under PMGSY. Often contracts are also sublet to petty contractors who are not involved at the time of awarding bids. This is done for further cost-cutting in projects and profiteering.

For ensuring sustainability of roads built under PMGSY, each contractor has to provide for: (i) defect liability for five years, and (ii) paid routine maintenance after completion of work. The Standing Committee on Rural Development (2020, 2021) has consistently noted that roads constructed are not up to the prescribed standards and there has been deterioration in the roads despite the five-year warranty period.[2,3] It has recommended the Ministry to ensure stricter norm compliance and hold the contractors and agencies accountable for their negligence.

National Social Assistance Program

The National Social Assistance Program (NSAP) is a welfare program comprising of sub-schemes aimed at providing assistance to citizens in case of unemployment, old age, sickness, and any form of disability. The major schemes include Indira Gandhi National Old Age Pension Scheme, Indira Gandhi National Widow Pension Scheme, and Indira Gandhi National Disability Pension Scheme. It also includes funds provided to Pradhan Mantri Jan Dhan Yojana (PMJDY) account holders through direct benefit transfers (DBT).

In 2022-23, the scheme has been allocated Rs 9,652 crore, which is a 11% increase over the revised estimates of 2021-22. The expenditure on the scheme was increased substantially in 2020-21, owing to Rs 30,945 crore spent on DBT to women account holders of PMJDY (Rs 500 for three months).[23] This was an initiative under the PM Garib Kalyan Package to combat the economic effects of the COVID-19 pandemic.

Table 8: Allocation under NSAP (in Rs crore)

	20-21 Actuals	21-22 RE	22-23 BE
Indira Gandhi National Old Age Pension Scheme	8,965	5,945	6,564
Indira Gandhi National Widow Pension Scheme	1,881	1,845	2,027
National Family Benefit Scheme	375	583	675
DBT to PMJDY Women Account Holders	30,944	-	-
Others	278	358	386
Total	**42,443**	**8,730**	**9,652**

Sources: Demands for Grants 2022-23, Department of Rural Development; PRS.

Table 9 shows the budget estimates and actual expenditure under the scheme since 2014-15.

Table 9: Expenditure under NSAP (Rs crore)

Year	Budgeted	Actuals	% utilised
2014-15	10,635	7,087	-33%
2015-16	9,082	8,616	-5%
2016-17	9,500	8,854	-7%
2017-18	9,500	8,694	-8%
2018-19	9,975	8,418	-16%
2019-20	9,200	8,692	-6%
2020-21	9,197	42,443	361%
2021-22	9,200	8,730	-5%
2022-23	9,652		

Note: The 'Actuals' figure for 2020-21 is the revised estimate.
Sources: Union Budgets from 2014-15 to 2022-23; PRS.

Increase of assistance amount: The Standing Committee on Rural Development (2020,21) has consistently noted that the assistance amount (ranging from Rs 200 to Rs 500 per month) under the different components of the scheme is inadequate. It recommended the Department of Rural Development to increase the assistance amounts under the scheme.

PM Jan Dhan Yojana: PMJDY was launched in August 2014 to increase banking penetration, promote financial inclusion and provide at least one bank account per household across the country. As on February 2, 2022, 44.58 crore accounts have been opened under PMJDY (since its launch).[24] 67% of these accounts have been opened in rural and semi-urban bank branches. The remaining 33% are in urban metro centres. Deposits of Rs 1.58 lakh crore have been made and 31.38 crore RuPay debit cards have been issued.[24]

National Rural Livelihoods Mission

The National Rural Livelihoods Mission (NRLM) aims to reduce poverty through promotion of diversified and gainful self-employment and skilled wage employment opportunities. In 2022-23, the scheme has been allocated Rs 13,336 crore, which is a 14% increase over the revised estimates of 2021-22.

Table 10 shows the actual expenditure by states under the scheme since 2012-13.

Table 10: Expenditure under NRLM (Rs crore)

Year	Budgeted	Actuals	% utilisation
2012-13	3,915	2,195	-44%
2013-14	4,000	2,022	-49%
2014-15	4,000	1,413	-65%
2015-16	2,505	2,514	0%
2016-17	3,000	3,157	5%
2017-18	4,500	4,327	-4%
2018-19	5,750	5,783	1%
2019-20	9,024	9,022	0%
2020-21	9,210	9,208	0%
2021-22	13,678	11,710	-14%
2022-23	13,336		

Note: Actuals for 2021-22 are revised estimates. From 2015-16, allocation to start-up village entrepreneurship program has also been included.
Sources: Union Budgets from 2012-13 to 2022-23; PRS.

Table below shows progress under components of the scheme since 2016-17.

Table 11: Households mobilised into self-help groups

	Number of households mobilised into Self Help Groups
2016-17	74,01,665
2017-18	88,29,599
2018-19	97,37,594
2019-20	89,17,895
2020-21	62,06,775
2021-22	45,37,327

Source: Aajeevika - Deen Dayal Antyodaya Yojana - NRLM, Rural Dashboard, Ministry of Rural Development, last accessed on February 11, 2022; PRS.

Table 12: Progress under key components of NRLM

	SHGs provided Revolving Fund	Revolving fund disbursed to SHGs (in Rs lakh)	SHGs provided Community Investment Fund (CIF)	CIF disbursed to SHG (in Rs lakh)
2016-17	1,91,734	26,762	1,35,033	80,847
2017-18	2,95,303	41,756	2,33,094	1,38,356
2018-19	4,29,557	62,221	2,73,485	1,67,613
2019-20	4,37,881	63,459	3,26,505	2,10,188
2020-21	5,03,485	72,712	4,07,600	2,47,260
2021-22	3,87,996	59,315	3,85,576	2,79,453

Source: Aajeevika - Deen Dayal Antyodaya Yojana - NRLM, Rural Dashboard, Ministry of Rural Development, last accessed on February 11, 2022; PRS.

Overview of finances: Department of Land Resources

The Department of Land Resources aims to increase productivity of degraded land through integrated watershed management. It also aims to develop an integrated land information management system to improve real-time information on land, and to optimise use of land resources. It implements two key schemes: (i) Integrated Watershed Development Component of Pradhan Mantri Krishi Sinchai Yojana (WDC-PMKSY), and (ii) the Digital India Land Records Modernisation Programme (DILRMP).

In 2021-22, the Department has been allocated Rs 2,259 crore, which is a 52% increase over the revised estimates of 2021-22.

Table 13: Budgetary allocation to the Department of Land Resources (Rs crore)

Major Heads	20-21 Actuals	21-22 RE	22-23 BE	% Change (22-23 BE/ 21-22 RE)
WDC - PMKSY	938	1,216	2,000	64%
DILRMP	225	250	239	-4%
Secretariat	13	19	20	8%
Total	**1,176**	**1,485**	**2,259**	**52%**

Note: WDC – PMKSY is the Watershed Development Component under Pradhan Mantri Krishi Sinchai Yojana. DILRMP is Digital India Land Records Modernisation Programme. BE is budget estimate and RE is revised estimate.
Sources: Demands for Grants 2022-23, Department of Land Resources, Ministry of Rural Development; PRS.

Watershed Development Component of Pradhan Mantri Krishi Sinchai Yojana

The Integrated Watershed Management Programme aims to develop rain fed portions of net cultivated area and culturable wastelands.[25] In 2015, it was subsumed as one of the components of Pradhan Mantri Krishi Sinchayee Yojana (PMKSY). Activities under the Watershed Development Component are drainage line treatment, soil and moisture conservation, rain water harvesting, and afforestation, among others.

The scheme has been allocated Rs 2,000 crore in 2022-23, which is a 64% increase over the revised estimate of 2021-22. Note that there has been under-utilisation of the budgeted amounts for the last five years.

Slow progress of projects: The Standing Committee on Rural Development (2020, 2021) noted the slow pace of completion of projects under the scheme. As of February 10, 2022, 1,139 projects were ongoing and under various stages of implementation.[26] The Standing Committee (2021) noted that projects are delayed in some states due to lack of focus

by state governments and delay in release of central funds to the state level nodal agencies. The Committee recommended accelerating the pace of project completion. The centre must work with the state level nodal agencies to ensure that projects are not delayed.

Table 14: Expenditure under WDC-PMKSY (Rs crore)

Year	Budgeted	Actuals	% utilised
2015-16	1,530	1,527	0%
2016-17	1,550	1,510	-3%
2017-18	2,150	1,671	-22%
2018-19	2,251	1,786	-21%
2019-20	2,066	1,467	-29%
2020-21	2,000	938	-53%
2021-22	2,000	1,216	-39%
2022-23	2,000	-	

Note: The 'Actuals' figure for 2021-22 is revised estimate.
Sources: Union Budgets from 2015-16 to 2022-23; PRS.

Digital India Land Records Modernisation Programme (DILRMP)

DILRMP is a part of the Digital India initiative.[27] The scheme was changed into a Central Sector Scheme in April 2016.[28] With this change, the scheme is now implemented by the central government with 100% of the grants coming from the centre. Major components of the programme include: (i) computerisation of all existing land records, (ii) digitisation of maps, (iii) survey/re-survey, and updating of all settlement records, and (iv) computerisation of the registration process and its integration with the land records maintenance system.

In 2022-23, the scheme has been allocated Rs 239 crore which is a 4% decrease from the revised estimates of 2021-22. Over the past few years the amount allocated towards the scheme at the budget stage has typically not been fully utilised, with the actual expenditure in some years being 50% less than the amount allocated at the budget stage. However, in 2021-22, expenditure on the scheme is estimated to be 67% more than the amount allocated at the budget stage.

Table 15: Budgeted versus actual expenditure on DILRMP (Rs crore)

Year	Budgeted	Actuals	% utilised
2015-16	90	40	-56%
2016-17	150	139	-7%
2017-18	150	93	-38%
2018-19	250	68	-73%
2019-20	150	44	-71%
2020-21	239	225	-6%
2021-22	150	250	67%
2022-23	239	-	

Note: The 'actuals' figure for 2021-22 is the revised estimate.
Sources: Union Budgets 2015-16 to 2022-23; PRS.

Progress of components under DILRMP:
DILRMP is currently being implemented in all states, but with differential progress.[29] While significant progress has been made across various components of the scheme, several key components are still lagging behind. Land records have been computerised for 93% of the villages.[29] The record of rights have been digitised for 84% of the villages.[29] Survey/re-survey work has been completed in only 12% of the villages. 68% of the cadastral maps have been digitised. Land records and property registration has been integrated in 75% of villages. Textual and spatial data has been integrated in 56% villages.

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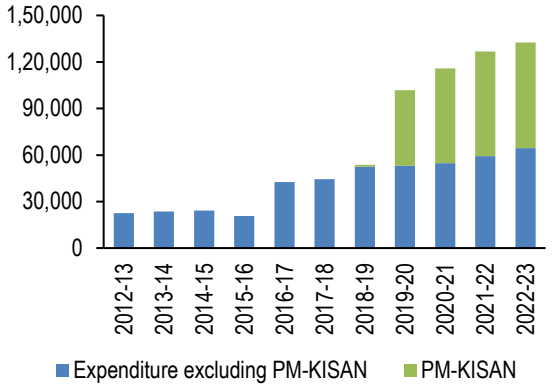
Demand for Grants 2022-23 Analysis
Agriculture and Farmers' Welfare

The Ministry of Agriculture and Farmers' Welfare has two Departments: (i) Agriculture, Cooperation and Farmers' Welfare, which implements policies and programmes related to crop husbandry and manages agriculture inputs, and (ii) Agricultural Research and Education, which coordinates and promotes agricultural research and education. This note examines the budget allocations and expenditure of the two Departments of the Ministry, major schemes of the departments, and discusses issues in the agriculture sector.

Overview of Finances

The Ministry has been allocated Rs 1,32,514 crore in 2022-23, a 4.5% increase over the revised estimates of 2021-22.[1] Allocation to the Ministry accounts for 3.4% of the government's budget. 55% of the allocation to the Ministry in 2022-23 is for the PM-KISAN scheme (Rs 68,000 crore). All other programmes of the Ministry, including interest subsidy and crop insurance, have been allocated Rs 64,514 crore in 2022-23. In 2021-22, the expenditure of the Ministry is estimated to be Rs 1,26,808 crore as per the revised estimate, which is 4% lower than the budget estimate.[2]

Figure 1: Expenditure of the Ministry (Rs crore)



Note: Revised estimate in 2021-22; Budget estimate in 2022-23.
Sources: Expenditure Budget, Union Budgets (2014-22); PRS.

Before PM-KISAN, the Ministry's expenditure saw a large increase in 2016-17 due to the interest subsidy provided on short-term credit to farmers. The subsidy, earlier provided by the Ministry of Finance, is being provided by the Ministry of Agriculture and Farmers' Welfare since 2016-17. This year, the subsidy has been provided under the Modified Interest Subvention Scheme (MISS).

Policy Proposals in the Budget Speech

In the 2022-23 budget speech, the Finance Minister made the following proposals regarding agriculture:

- A fund will be set up to finance start-ups relevant for farm produce supply chains, under the co-investment model. It will be facilitated through the National Bank for Agriculture and Rural Development.
- Legislative changes will be brought in to promote agro-forestry.
- A scheme in Public-Private Partnership (PPP) model will be launched for the delivery of digital and hi-tech services to farmers. It will include public sector research and extension institutions, private agri-tech players and stakeholders of agri-value chain.

Departments of the Ministry of Agriculture and Farmer's Welfare

Within the two departments under the Ministry, the Department of Agriculture, Cooperation and Farmers' Welfare has received 94% of the allocation to the Ministry in 2022-23, while 6% has been allocated to the Department of Agricultural Research and Education (Table 1).

Table 1: Allocation to the Ministry (in Rs crore)

Department	2020-21 Actuals	2021-22 Revised	2022-23 Budget	% change 2022-23 over 2021-22
Agriculture, Cooperation and Farmers' Welfare	1,08,273	1,18,294	1,24,000	5%
Agricultural Research and Education	7,554	8,514	8,514	0%
Ministry	**1,15,827**	**1,26,808**	**1,32,514**	**5%**

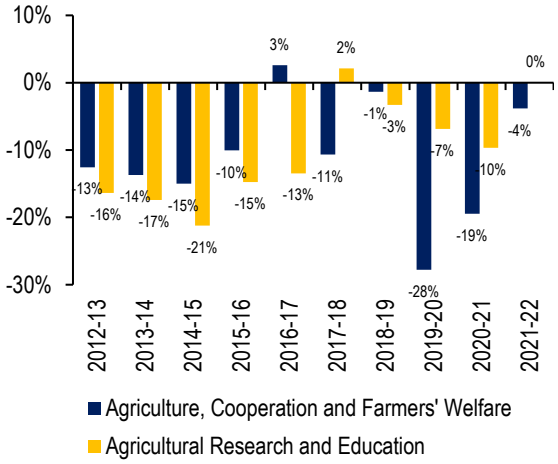
Sources: Expenditure Budget, Union Budget 2022-23; PRS.

The Department of Agriculture, Cooperation and Farmers' Welfare has been allocated Rs 1,24,000 crore in 2022-23, which is a 5% increase over the revised estimates of 2021-22. 83% of the Ministry's budget is proposed to be spent on three schemes under this Department: (i) the income support scheme, i.e., PM-KISAN (55%), (ii) Modified Interest Subvention Scheme (MISS) (16%), and (iii) the crop insurance scheme, i.e., Pradhan Mantri Fasal Bima Yojana (13%).

The Department of Agricultural Research and Education has been allocated Rs 8,514 crore in 2022-23, the same amount as the revised estimate for 2021-22.[3] Allocation to the Indian Council of Agricultural Research (ICAR) accounts for 69% of the Department's allocation in 2022-23. See Tables 6 and 7 in the Annexure for more details.

Allocation vs actual expenditure: Expenditure of both the Departments has been lower than their budget allocations in almost all years during the period 2012-22 (Figure). The Ministry spent 19% less than its budget allocation in 2020-21. The Standing Committee on Agriculture (2020-21) noted in March 2021 that large amount of funds surrendered adversely affect the implementation of the schemes under the department and the flow of expenditure should be resolved with state governments.[4]

Figure 2: Deviation from budgeted expenditure



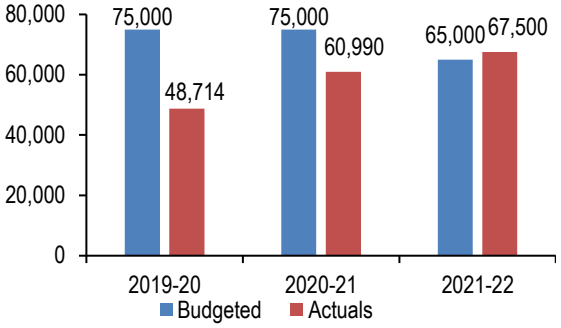
Note: Figures for 2021-22 are revised estimates.
Sources: Expenditure Budget, Union Budgets (2012-23); PRS.

Major Schemes of the Ministry

PM-KISAN

In February 2019, the government launched the PM-KISAN scheme to provide income support of Rs 6,000 per year to farmer families (disbursed in three instalments of Rs 2,000). The scheme aims to supplement the financial needs of farmers in procuring inputs for appropriate crop health and yields.[5] Earlier, only small and marginal landholder farmer families, i.e., families with total cultivable landholding of up to two hectares, were eligible for the scheme. In May 2019, the Union Cabinet approved the extension of the scheme to all farmer families irrespective of their size of landholdings. With this increase in coverage, expenditure on the scheme was estimated to increase from the budget allocation of Rs 75,000 crore to Rs 87,218 crore in 2019-20.[6] However, in 2019-20, the Ministry spent Rs 48,714 crore on the scheme, 35% lower than the budget allocation. Figure 3 shows the difference in the budgeted and actual expenditure under the scheme. For 2022-23, the allocation has been increased to Rs 68,000 crore, 1% increase over the revised estimate in 2021-22 (Rs 67,500 crore).

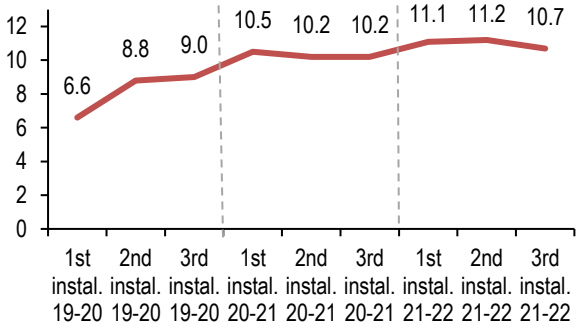
Figure 3: Budgeted and actual expenditure under PM-KISAN (Rs crore)



Note: Figures for 2021-22 are revised estimates.
Sources: Expenditure Budget, Union Budgets (2019-23); PRS.

Implementation: Initially, the scheme was expected to cover 12.5 crore beneficiaries.[6] With the increase in coverage, this was revised to 14.5 crore beneficiaries.[6] Till December 2022, 11.61 crore beneficiaries have been covered (farmers registered and seeking benefit under the scheme) which is close to 3 crore below the estimated beneficiaries .[7] However, the coverage under different instalments vary. Figure depicts the number of payments from 2019-20 to 2021-22 per instalment.[8] 2021-22 has highest number of instalments across the three periods from 2019-22.

Figure 4: Number of payments instalment-wise (in crore)

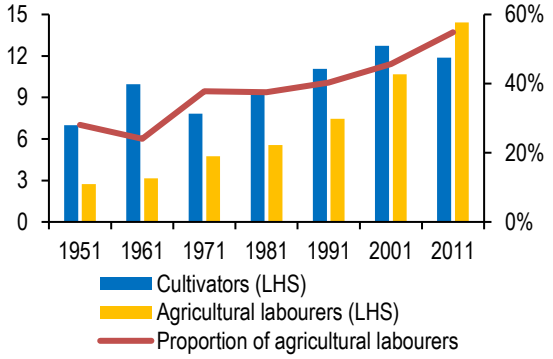


Sources: PM-KISAN Scheme dashboard; PRS.

The Standing Committee (2021) recommended that necessary steps should be taken to register all eligible farmers under the scheme.[9] The Standing Committee on Agriculture (2020) had noted that the scheme is facing the following issues in implementation: (i) non-availability of proper land records in some states, (ii) slow identification of beneficiaries and delay in the uploading of data by states, (iii) issues with the matching of demographic data between the PM-KISAN database and Aadhaar data, (iv) incorrect bank accounts, and (v) poor internet connectivity in rural areas hampering the uploading of data.[10] In a response to the Standing Committee in 2021, the Ministry re-iterated that many of the above issues still prevail. The Committee recommended that the government should hold regular consultation with states to resolve issues and take corrective steps.

Land as an eligibility criterion: Farmer families owning cultivable landholding are eligible for receiving income support under the scheme. The beneficiaries are identified by states based on their land records. The scheme does not cover landless agricultural labourers who form 55% of the agricultural workers in the country (Figure).[11] Agricultural workers include cultivators and labourers working in the agriculture sector. The share of landless agricultural labourers in total agricultural workers has increased over the years from 28% in 1951 to 55% in 2011. The Standing Committee (2020) noted that tenant farmers, who are a significant part of landless farmers in many states, do not receive the income support benefits.[10] It recommended the government to examine this issue in coordination with states so that landless farmers can also receive benefits under the scheme.

Figure 5: Breakup of agricultural workers into cultivators and agricultural labourers (in crore)



Sources: Agricultural Statistics at a Glance 2020, Ministry of Agriculture and Farmers' Welfare; PRS.

Rashtriya Krishi Vikas Yojana

The Rashtriya Krishi Vikas Yojana (RKVY) umbrella scheme was initiated in 2007 for ensuring holistic development of agriculture and allied sectors by allowing states to choose their own development activities as per district and state agriculture plans.[12] With the aim of making farming a remunerative economic activity, the Ministry provides financial assistance to states to spend on sub-schemes such as: (i) pre-harvest and post-harvest infrastructure, (ii) value addition using agri-business models, and (iii) projects based on local and national priorities. It was revised in 2017 as RKVY- Remunerative Approaches for Agriculture and Allied sector Rejuvenation (RKVY-RAFTAAR) with similar objectives to be completed until 2019-20.[13] The scheme was further extended till March 31, 2022.[14,15] While the administrative approval for 2022-23 is pending, it is likely to be provided by the end of March, 2022.

The allocation for Rashtriya Krishi Vikas Yojana, has seen a significant jump in allocation from Rs 2,000 crore in 2021-22 (revised estimate) to Rs 10,433 crore in 2022-23 (budget estimate). This is because the scheme has been restructured and erstwhile schemes viz. Pradhan Mantri Krishi Sinchai Yojna-Per Drop More Crop, Paramparagat Krishi Vikas Yojna, National Project on Soil and Health Fertility, Rainfed Area Development and Climate Change, Sub-Mission on Agriculture Mechanization including Management of Crop Residue. have been merged with RKVY.[16] Table in the Annexure provides details on the components of RKVY and their previous allocations. The Standing Committee on Agriculture (2017) observed that the allocations for the scheme under the Green Revolution Programme are not utilised optimally and timely.[25] This is due to a delay in the approval of projects and funds by states and consequent slow pace of implementation, causing a reduction in the release of funds. For instance, in 2021-22, budget allocation of Rs 3,712 crore to the scheme has been revised down to Rs 2,000 crore.[17]

The Standing Committee on Agriculture (2020) noted that the scheme's allocation gets cut at the revised stage as states are not able to timely submit their utilisation certificates, due to the delays in completion of infrastructure projects.[10] The Standing Committee on Agriculture (2021) recommended that the guidelines of the scheme should be changed to ensure that the states are provided funds for their upcoming projects in the agriculture sector.[9] It recommended that there is a need to increase the time period for submission of utilisation certificates for schemes involving infrastructure projects.

Soil Health Cards: In order to provide farmers with information regarding the quality of their soil, the Soil Health Card scheme was launched in 2015.[18] Under the scheme, farmers are issued soil health cards, which contain information such as nutrient status of soil and recommended dose of nutrients to be provided to improve its fertility. This scheme has now been merged with RKVY.

In 2021-22, Rs 315 crore had been allocated for the National Project on Soil Health and Fertility which decreased by 68% at the revised stage (at Rs 100 crore). During the first cycle (2015-17) of the scheme, 10.74 crore soil health cards were provided as per the target.[19] During the second cycle (2017-19), 11.87 crore soil health cards were provided against the target of 12.41 crore cards. During the period 2019-21, 19.6 lakh soil health cards have been distributed under the Model Village Programme (84% of the target).[20]

Pradhan Mantri Fasal Bima Yojana

Pradhan Mantri Fasal Bima Yojana (PMFBY) was launched in 2016-17 to provide crop insurance to farmers.[21] All farmers, including sharecroppers and tenant farmers, who are growing notified crops in notified areas are eligible under the scheme. In 2022-23, the scheme has been allocated Rs 15,500 crore, a 3% decrease over the 2021-22 revised estimate.

Participation of states: The Standing Committee on Agriculture (2021) noted that some recent revisions in the scheme guidelines may lead state governments to withdraw from it. The Committee has recommended revising amendments which: (i) prohibit states which delay the release of subsidies (beyond specified timeline) from participating in the scheme, and (ii) mandate state governments to bear the entire subsidy for areas/ crops which have a higher premium rate than the specified rates.[25] The Committee further noted that several states such as Bihar and West Bengal have withdrawn from the scheme, while Punjab never implemented it. It attributed this to financial constraints and low claim ratios during the normal seasons. It recommended enacting measures to increase participation by states.

Delays in settlement: The Standing Committee (2021) recognised delays in settlement of insurance claims as one of the biggest challenges in implementation of the scheme.[24] It recommended implementing a timeline for settlement of claims by insurance companies. In cases where delays are caused by failure of the state governments to pay subsidy, it suggested returning the premium with interest to farmers within a fixed time frame.

Coverage of farmers: During the period 2016-19, the scheme covered 36-40% of the farmers.[22] Note that before Kharif season 2020, enrolment was mandatory for farmers with loans and optional for others. To address the demand of farmers, the scheme has been made voluntary for all farmers.[23] Further, the Standing Committee on Agriculture (2021) noted that farmers who have taken loans can opt out of the scheme by submitting a declaration form.[24] However, due to lack of awareness, several farmers do not submit the requisite form and face mandatory deduction of premium from their bank accounts. It recommended amending this provision to require such farmers who have taken a loan and want to avail the scheme, to opt in separately.

Assessment of losses: The Standing Committee on Agriculture (2017) observed that states are not readily accepting and adopting the technologies used for assessing yield loss.[25] The Committee recommended the Ministry to pursue states to adopt technology aids and satellite imagery for crop cutting experiments. Under the revised guidelines of the scheme, the government has proposed a two-step process of using weather and satellite indicators for an early assessment of yield loss.[23] However, the Standing Committee (2021) observed that yield-related disputes and delayed transmission of yield data are now a major reason for delays in settlement of claims.[24] It noted that this data is provided by state governments based on crop cutting experiments which are highly time consuming and labour intensive. It recommended the adoption of smart sampling techniques by all states to address this.

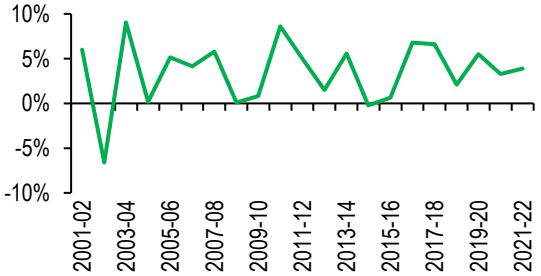
Grievance redressal: The Standing Committee on Agriculture (2019) observed that farmers are facing issues in lodging complaints with the insurance companies due to the absence of local offices of the companies at the district and block-level.[22] It recommended that the Ministry should ensure the availability of a common helpline number for lodging of complaints. Under the revised scheme guidelines, states have to constitute grievance redressal committees at the district and state level.[26] However, in 2021, the Standing Committee on Agriculture noted that only 15 states and union territories have notified Grievance Redressal Committees at both the state and district level. It recommended ensuring the formulation of these Committees in all other states.[24]

Key Issues in the sector

Growth of the agriculture sector

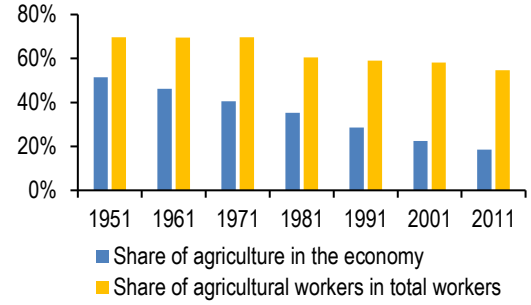
Growth of the sector comprising of agriculture and allied activities has been volatile over the years (Figure). In 2021-22, the sector is estimated to grow at 3.9%, as compared to a 3.3% growth in 2020-21.[27,28]

Figure 6: Growth of agriculture sector (in %)



Sources: MOSPI; PRS.

Figure 7: Share of agriculture in the economy and in the total number of workers (in %)



Sources: Agricultural Statistics at a Glance 2020, Ministry of Agriculture and Farmers' Welfare; CSO, MOSPI; PRS.

The contribution of the agriculture sector in the economy has significantly decreased from 51% in 1951 to 19% in 2011, and further to an estimated 16% in 2020-21.[28] Meanwhile, the share of workers who are dependent on agriculture has decreased at a lower rate from 70% in 1951 to 55% in 2011. This implies that the average income of these workers grew at a slower pace than that of workers in other sectors.

The Committee on Doubling Farmers' Income (Chair: Mr. Ashok Dalwai, 2017) observed that one

way of significantly improving income of farmers, and hence, growth of the sector is by shifting the agricultural workforce to more productive employment in non-farm sectors.[29] However, as of 2018-19, receipts from non-farm businesses only contributed to 6% of an agricultural household's average monthly income. Table provides details on the growth in the farmer's income, including income from crop production and farming of animals, from 2012-13 to 2018-19.

Table 2: Estimated average monthly income (in Rs) from different sources per agricultural household

Year	2012-13	2018-19	% change
Income: wages	2071	4063	96%
Net receipt: crop production	3081	3798	23%
Net receipt: farming animals	763	1582	107%
Net receipt: non-farm business	512	641	25%
Total Income	**6426**	**10218**	59%

Note: In 2018-19, total income includes Rs 134 per month from leasing of land. Data for the same is unavailable for 2012-13. CP stands for crop production, NFB for non-farm business.
Sources: NSS 70th and NSS 77th Round, MOSPI; PRS.

Agricultural credit

Agriculture credit is provided to farmers at a subsidised cost through interest subsidy.[30] An interest subsidy of two percent is provided to farmers on their short-term crop loans of up to three lakh rupees. An additional interest subsidy of three percent is provided to farmers repaying their loan on time, i.e., within a year. Under the Agricultural Infrastructure Fund, interest subsidies on loans for long-term credit are provided to farmers.

In 2022-23, Rs 19,500 crore has been allocated for interest subsidy under a new Modified Interest Subvention Scheme (MISS). The previous scheme on interest subsidy for short-term credit to farmers scheme from previous years has not been allocated an amount this year. The allocation for MISS is an increase of 7% over the 2021-22 revised estimate for the interest subsidy for short-term credit to farmers scheme (Rs 18,142). However, a significant difference has been observed in the last few years between the estimates presented in the budget (even the revised estimate) and the actual expenditure at the end of the year (Table 3).

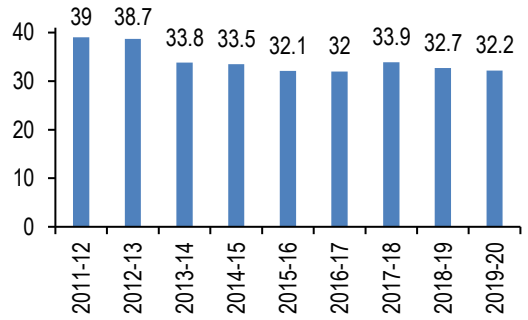
Table 3: Comparison of the estimates with the actual expenditure on interest subsidy (Rs crore)

Year	Budgeted	Revised	Actuals	% shortfall
2016-17	15,000	13,619	13,397	-11%
2017-18	15,000	14,750	13,046	-13%
2018-19	15,000	14,987	11,496	-23%
2019-20	18,000	17,863	16,219	-10%
2020-21	21,175	19,832	17,790	-16%
2021-22	19,468	18,142	-	-7%

Sources: Expenditure Budget, Union Budgets (2016-21); PRS.

Short-term vs long-term loans: In 2015, the Committee on Medium-term Path on Financial Inclusion under the Reserve Bank of India (RBI) observed that the interest subsidy provided for short-term crop does not incentivise farmers to take up long term loans for capital formation.[31] Short-term crop loans are used for pre-harvest activities such as weeding, harvesting, sorting, and transporting. Long-term loans are taken to invest in agricultural machinery and equipment, or irrigation system. The Committee observed that the scheme does not incentivise long-term capital formation in agriculture, which is essential to boost productivity in the sector. Capital formation through investment in agriculture helps in improving the stock of equipment, tools and productivity of natural resources, which, in turn, enables the farmers to use their resources, particularly land and labour, more productively.[32] However, the rate of capital formation over the past few years has been decreasing. provides details on the rate of capital formation from 2011-12 to 2019-20.

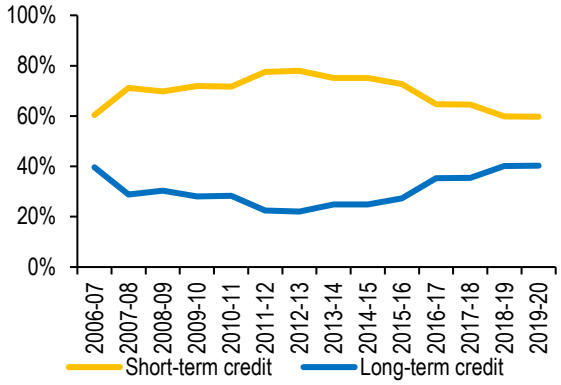
Figure 8: Rate of gross capital formation at current prices (in %)



Source: Agricultural Statistics at a Glance 2020, Ministry of Agriculture and Farmers' Welfare; CSO, MOSPI; PRS

Over the past few decades, the trend of short-term and long-term agricultural credit has reversed. In 1990-91, a majority of the agricultural credit were long-term loans, whereas short-term loans were only about a quarter of the total credit.[33] In 2019-20, the share of long-term loans in total agricultural credit was at 40% (Figure 9).[34] A lower share of long-term agricultural credit implies that farmers are taking more loans for recurring expenditure rather than to fund long-term investments.

Figure 9: Share of short and long-term credit



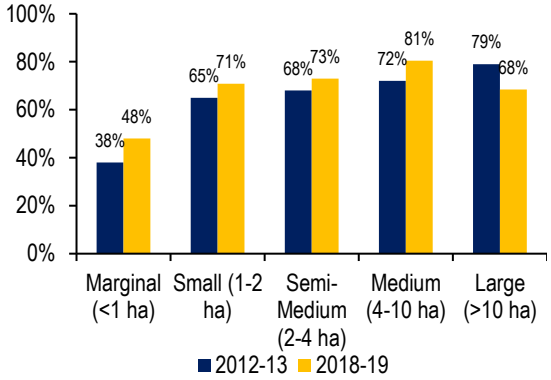
Sources: Reports of the Standing Committee on Agriculture (2020) and the RBI Working Group on Agriculture Credit; PRS.

The Committee on Doubling Farmers' Income (2017) recommended that the central and state governments should provide interest subsidy on long-term or investment credit taken by farmers, particularly small and marginal farmers.[35] In May 2020, under the Aatmanirbhar Bharat Economic Package, the central government announced the setting up of an Agriculture Infrastructure Fund (AIF) of one lakh crore rupees for financing farm-gate infrastructure.[36] Under the AIF, the government provides an interest subsidy of 3% on loans of up to two crore rupees issued under the Fund. This subvention will be available for a maximum period of seven years.[37] In case of loans beyond two crore, the interest subvention will be limited up to two crore.[37] AIF has been allocated Rs 500 crore in 2022-23, which is a 150% increase from the revised estimates of 2021-22 (Rs 200 crore).

Small and marginal farmers: Farmers with landholdings of less than a hectare primarily borrow from informal sources of credit such as moneylenders, whereas those with landholdings of one or more hectares primarily borrow from banks (Figure 10).[31] Informal sources of credit are typically offered at higher rates of interests, and may not have proper documentation.

Note that 68% of the agricultural landholdings in the country belong to the marginal (less than one hectare) category.[38] Another 18% belong to the small category (between one to two hectare). Further, the share of the marginal category in total agricultural landholdings has been increasing over the years, from 51% in 1970-71 to 68% in 2015-16.[38] The RBI Internal Working Group on Agricultural Credit (2019) noted that only 41% of the small and marginal farmers have been covered by banks.

Figure 10: Share of borrowings from institutional sources across various landholding households (2012-13 and 2018-19)



Sources: NSS 77th Round, MoSPI; PRS.

Land ownership: Access to agricultural credit is linked to formal land titles. The RBI Committee on Financial Inclusion (2015) observed that the owner of the land is often not the cultivator, even in the case of small and marginal holdings. For example, a landowner may get the benefit of subsidised credit at times and may be the moneylender to his cultivator.[31] The Committee recommended that agricultural credit must flow to the actual cultivator for which substantial reform is necessary.[31] Further, it stated that the subsidised credit increases the probability of misuse. The Committee on Comprehensive Financial Services for Small Businesses and Low-Income Households (2016) also recommended the transfer of benefits to farmers directly, instead of subsidy and waivers that are implemented through other authorities.[39]

An Internal Working Group of the RBI constituted to review Agricultural Credit (2019) noted that the absence of a proper land leasing framework and a lack of land records restricted access to institutional credit.[40] It recommended the central government to encourage states to digitise and update land records in a time-bound manner.

The 2015 RBI Committee on Financial Inclusion recommended that credit eligibility certificates, which would act as tenancy or lease certificates, should be issued to tenant farmers.[31] These certificates would enable landless tenant cultivators to obtain agricultural credit.

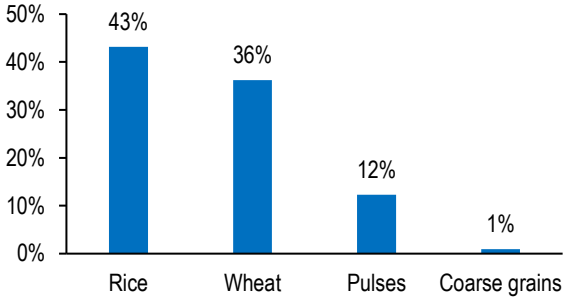
Minimum Support Prices (MSPs)

MSP is the assured price announced by the central government at which foodgrains are procured from farmers by the central and state governments and their agencies, for the central pool of foodgrains.[41] The central pool is used for providing foodgrains under the Public Distribution System and other welfare schemes at subsidised prices and also kept as reserve in the form of buffer stock. The cost of procuring from farmers at MSP and distributing under PDS at subsidised prices is borne by the Department of Food and Public Distribution.

However, MSPs are notified based on the recommendations of the Commission for Agricultural Costs and Prices, an attached office of the Ministry of Agriculture and Farmers' Welfare.[42] The Union Budget for 2018-19 had announced the pre-determined principle to keep MSP at levels of 1.5 times of the cost of production.[43]

While MSPs are annually announced for 23 crops, public procurement is limited to a few crops such as paddy, wheat, and, to a limited extent, pulses.

Figure 11: Percentage of crop production procured at MSP in crop year 2019-20



Sources: Unstarred Question No. 331, Lok Sabha, September 15, 2020; PRS.

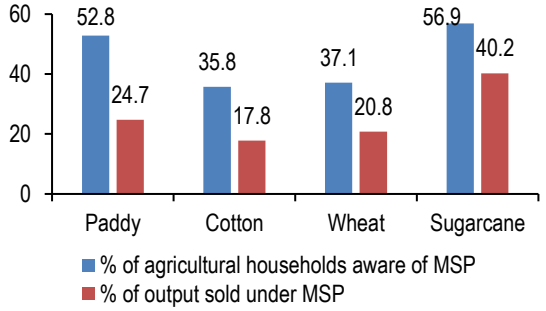
The foodgrain procurement is largely concentrated in a few states. Three states (Madhya Pradesh, Punjab, and Haryana) producing 46% of the wheat in the country account for 85% of its procurement. For rice, six states (Punjab, Telangana, Andhra Pradesh, Chhattisgarh, Odisha, and Haryana) with 40% production have a 74% share in procurement.

According to the central government's procurement policy, the objective of public procurement is to ensure that farmers get remunerative prices for their produce and do not have to resort to distress sale.[44] If farmers get a better price in comparison to MSP, they are free to sell their produce in the open market. The Economic Survey 2019-20 observed that the regular increase in MSP is seen by farmers as a signal to opt for crops which have an assured procurement system (for example, rice and wheat).[45] It also noted that this indicates market prices do not offer remunerative options for farmers, and MSP has, in effect, become the maximum price that the farmers are able to realise.

Thus, MSP incentivises farmers to grow crops which are procured by the government. As wheat and rice are major food grains provided under the PDS, the focus of procurement is on these crops. This skews the production of crops in favour of wheat and paddy (particularly in states where procurement levels are high) and does not offer an incentive for farmers to produce other items such as pulses. Further, this puts pressure on the water table as these crops are water-intensive crops.

In a report to measure the efficacy of MSPs, NITI Aayog (2016) found that a low proportion of farmers (10%) were aware of MSPs before the sowing season.[46] 62% of the farmers were informed of MSPs after sowing their crops. Figure 12 depicts the percentage of agricultural households that were aware about MSP in 2019.

Figure12: Agricultural households reporting sale of crops and awareness about MSP for selected crops (2019)



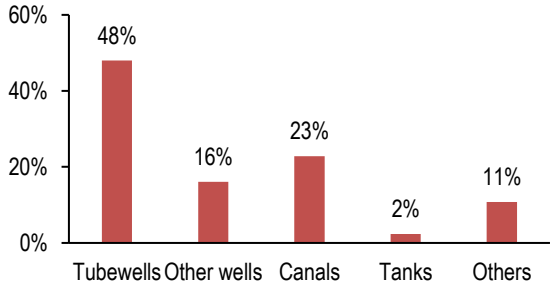
Sources: NSS 77th Round, MoSPI; PRS.

The pricing policy of MSPs would be effective only if farmers are aware of it at the time of deciding what crops to grow. NITI Aayog recommended that the awareness level of farmers regarding MSPs must be increased and the mediums of dissemination of this information must be strengthened.[46] Other issues with the implementation of the MSP regime include long distances to the procurement centres, increasing transportation cost for farmers, irregular hours of the procurement centres, lack of covered storage godowns and inadequate storage capacity, and delays in the payment of MSPs to farmers.

Irrigation

As of 2020-21, 49% of the country's net sown area was under irrigation.[47] The remaining agricultural area in the country depends on rainfall. As of 2016-17, major irrigation sources for agriculture include tubewells (48%) and other wells (16%), and canals (23%).

Figure 13: Sources of irrigation (2016-17)



Sources: Land Use Statistics at a Glance (2018-19), Ministry of Agriculture and Farmers' Welfare; PRS.

Sources such as canals and tubewells use the flood irrigation technique, where water is allowed to flow in the field and seep into the soil.[48] This results in wastage of water since excess water seeps into the soil or flows off the surface without being utilised. It has been recommended that farmers move from flood irrigation to micro-irrigation systems (drip or sprinkler irrigation systems) to conserve water.[49]

The Pradhan Mantri Krishi Sinchai Yojana was launched in 2015 to increase the coverage of the area under irrigation.[50] The Ministry implemented the 'Per Drop More Crop' component until 2021-22 under the scheme to increase water efficiency through micro-irrigation and other interventions. The component of the scheme now continues under RKVY for 2022-23. During the period 2013-21, 60.3 lakh hectares of area has been covered under micro-irrigation (Table 4).[51]

Table 4: Area covered under micro-irrigation in lakh hectares (as of February 1, 2022)

Year	Target	Achievement	Achievement %
2013-14	6.6	4.3	66%
2014-15	5.7	4.3	74%
2015-16	5.0	5.7	115%
2016-17	8.0	8.4	105%
2017-18	12.0	10.5	87%
2018-19	16.0	11.6	72%
2019-20	14.0	11.7	84%
2020-21	-	9.4	-
2021-22	-	2.7	-
Total	**67.3**	**72.4**	**90%**

Sources: Pradhan Mantri Krishi Sinchai Yojana website; PRS.

Shortfall in funds: Allocation to the scheme for 2021-22 has been revised down by 50% from Rs 4,000 crore to Rs 2,000 crore (revised estimate). Over the years, the budget of the scheme is usually cut down at the revised stage, resulting in a lower expenditure than the allocation (Table 5).

Table 5: Comparison of the allocation to the scheme with its actual expenditure (in Rs crore)

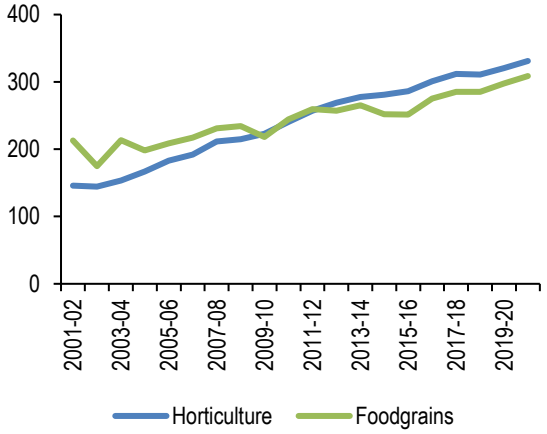
Year	Allocation*	Expenditure	% shortfall
2015-16	1,800	1,556	14%
2016-17	2,340	1,991	15%
2017-18	3,400	2,819	17%
2018-19	4,000	2,918	27%
2019-20	3,500	2,700	23%
2020-21	4,000	2,562	36%
2021-22	4,000	2,000#	50%

Note: *Budget estimate; #Revised estimate used as expenditure.
Sources: Expenditure Budget, Union Budgets (2015-22); PRS.

Horticulture

Between 2001-02 and 2020-21, the production of horticulture crops increased from 146 million tonnes to 331 million tonnes (Figure 14).[52] This implies that the horticulture production increased at an average rate of 4.4%. Production of food grains increased at a rate of 2% during the same period. In 2020-21, vegetables and fruits are estimated to contribute to 60% and 31% of the total horticultural production, respectively.[53]

Figure 14: Comparison of horticulture and food grain production during 2001-21 (million tonne)



Sources: Directorate of Economics and Statistics, Ministry of Agriculture and Farmers' Welfare; PRS.

The National Mission on Horticulture seeks to promote horticulture by providing availability of quality inputs such as planting material, and post-harvest interventions such as reduction in losses and access to markets. This Mission has been subsumed as Integrated Development of Horticulture component under the Krishionnati Yojana. The component has been allocated Rs 1,900 crore in 2022-23, 19% higher than the allocation for the horticulture mission in 2021-22 (Rs 1,594 as per the revised estimate). However, over the past few years, the actual expenditure on horticulture schemes has been lower than the allocation made in the budget (Table 6).

Table 6: Comparison of the allocation to the scheme with its actual expenditure (in Rs crore)

Year	Allocation*	Expenditure	% shortfall
2016-17	1,620	1,493	8%
2017-18	2,320	2,027	13%
2018-19	2,536	1,997	21%
2019-20	2,225	1,331	40%
2020-21	2,300	1,423	38%
2021-22	2,385	1,594#	33%

Note: *Budget estimate; #Revised estimate used as expenditure.
Sources: Expenditure Budget, Union Budgets (2016-22); PRS.

Use of fertilisers

While the Ministry of Chemicals and Fertilisers is responsible for monitoring the production, distribution, and prices of fertilisers, the Ministry of Agriculture and Farmers' Welfare is responsible for the promotion of balanced use of fertilisers.[54] Balanced use refers to the use of a proper combination of various nutrients and other micro-nutrients. Three major nutrients are primarily used: Nitrogen (N), Phosphatic (P), and Potassic (K). The government subsidises fertilisers through: (i) subsidy for urea (containing N fertiliser), and (ii) nutrient-based subsidy for P and K fertilisers. The fertiliser subsidy is provided to the fertiliser

manufacturers and importers so that farmers can directly buy them at affordable or subsidised prices.

In 2022-23, Rs 1,05,262 crore has been allocated to the Department of Fertilisers for fertiliser subsidy, a decrease of 25% over the revised estimates of 2021-22 (Table 7). Further, the allocation for subsidies of Urea and nutrient-based fertiliser in 2022-23 is 17% and 35% lower than the revised estimates of 2021-22. In 2021-22, the department has been allocated Rs 1,40,122 crore at the revised stage, which is 75% higher than budget estimate (Rs 80,011 crore). Note that the government had increased the subsidy rate for Phosphate by 204% from Rs 14.9 per kg in 2020-21 to Rs 45.3 per kg in 2021-22.[55,56,57] This was in response to a sharp increase in international prices of raw materials used in the manufacture of fertilisers.[58] In 2020-21, the actual expenditure included one-time allocation of Rs 32,155 crore to clear off pending dues of fertiliser subsidy of previous financial years.[59] Dues had built up due to insufficient budget allocation over the years. Adjusted for this one-time expenditure in 2021-22 RE, the decrease in allocation for 2022-23 BE is 2.5%.

Table 7: Fertiliser subsidy allocation (Rs crore)

Subsidy	2020-21 Actuals	2021-22 Revised	2021-22 Budgeted	% change in BE 2022-23 over RE 2021-22
Urea	90,549	75,930	63,222	-16.7%
Nutrient based	37,372	64,192	42,000	-34.6%
Fertiliser subsidy	**1,27,922**	**1,40,122**	**1,05,262**	**-24.9%**

Sources: Expenditure Budget No.6, Union Budget 2022-23; PRS.

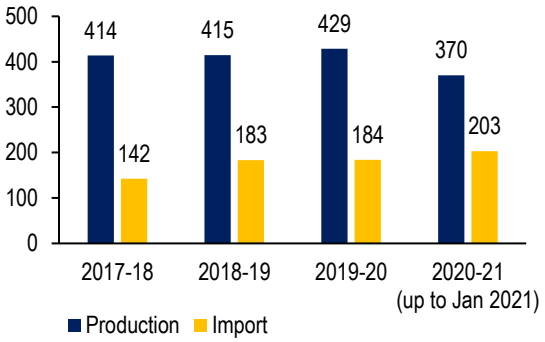
Subsidy policy of government

The Standing Committee on Chemicals and Fertilisers (2020) observed that many fertiliser manufacturing plants are operating with very old technology and systems, and not at their highest efficiency.[60] The government bears the cost of their inefficiency in the form of higher subsidy. The Committee recommended that the companies should be set free to manufacture and sell fertilisers as per their own system. A farmer should have the choice to buy from various brands of fertilisers while getting the subsidy directly in his bank account. This will push manufacturers to produce and sell their fertilisers in the most cost-effective manner and push the inefficient ones out. It recommended that the government should set out a clear and firm roadmap for switching to a direct subsidy system, where the manufacturing and importing of fertilisers is set free to market forces.

Import Dependence for fertilisers

The Standing Committee on Chemicals and Fertilisers (2021) had observed that India is dependent on imports of different fertilisers either in the form of finished fertilisers or their raw material.[61] This is due on non-availability or scarce availability of resources in cases of phosphatic and potassic fertilisers. Import dependence is up to 25% in case of urea, 90% in case of phosphatic fertilisers (either as raw material or finished fertilisers) and 100% in case of potassic fertilisers. Figure provides details on the production and import of major fertilisers during the last few years. The Standing Committee (2020) took note of the rise in import of fertilisers and recommended that the department should take measures to augment domestic production of urea.[61] It should find ways to increase domestic production of potassic and phosphatic fertilisers through: (i) import of necessary raw material or (ii) setting up of production facilities in those countries where raw material including potash and phosphates are available in plenty. Table 13 in Annexure give fertiliser-wise details on consumption, import and production.

Figure 15: Production of major fertilizers (in lakh metric tonne)



Note: comprises Urea, DAP, MOP, NPKS, and SSP.
Source: Report no. 20, Standing Committee On Chemicals & Fertilizers (2020-21): 'Demands for Grants (2020-21)', Lok Sabha, March 17, 2021; PRS

Prices of urea are controlled by the government, whereas that of P and K fertilisers are market-driven.[54] This has led to lower prices of urea (N) over the years, whereas the market prices of P and K fertilisers have remained higher. This is one of the reasons for imbalanced use of nutrients as urea is used more than other fertilisers.[54] While the ratio recommended for use of the N, P, and K fertilisers is 4:2:1, the ratio was 6.3:2.5:1 in 2019-20.[62] Table 12 in the Annexure shows their consumption trend.

Non-availability of fertilisers

The Standing Committee on Chemicals and Fertilisers (2021) had observed that there are numerous reports of non-availability or delayed availability of fertilisers in different parts of the country, particularly during peak cultivation seasons. The Department in its response had noted that it makes fertilisers available to states. State government distribute fertilisers as per their own distribution plans. The Committee recommended that: (i) the department should implement ground

level monitoring mechanism up to block and village levels, (ii) conduct periodic review of district and state level availability of fertilisers, and (iii) ensure that states are taking necessary action in cases of artificial scarcity, black marketing, or hoarding.

Balanced use of fertilisers

With the usage of urea more than other fertilisers, there has been an imbalance use of nutrients for soil fertilisation. This is because of lower prices of urea (N) over the years, whereas the market prices of P and K fertilisers have remained higher. Prices of urea are controlled by the government, whereas that of P and K fertilisers are market-driven.[54] While the ratio recommended for use of the N, P, and K fertilisers is 4:2:1, the ratio was 6.3:2.5:1 in 2019-20.[63] Table 12 in the Annexure shows their consumption trend.

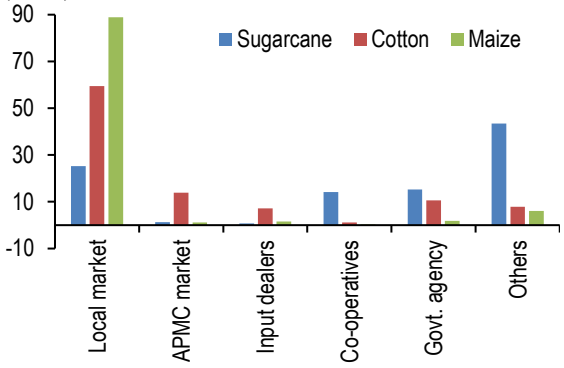
Agricultural Marketing

The Integrated Scheme on Agriculture Marketing (ISAM) includes sub-schemes such as: (i) agriculture marketing infrastructure, to create storage capacity and farmer consumer markets, (ii) market research and information network, (iii) strengthening of Agmark grading facilities, (iv) agro-business development to provide market linkages to farmers, and (v) e-NAM (National Agriculture Market), which is a national electronic market platform on which farmers can sell their produce. It will now be continued as the Agricultural Marketing Scheme under Krishionnati Yojana in 2022-23.

In 2022-23, the scheme has been allocated Rs 500 crore. This is an 89% increase over 2021-22 revised estimate for ISAM. However, the allocation for 2021-22 has been revised down by 36%, from Rs 410 crore to Rs 264 crore. Till February 11, 2022, 1,000 mandis across 18 states and three union territories have been integrated with e-NAM.[64,65]

Regulation: Agriculture markets in most states are regulated by the Agriculture Produce Marketing Committees (APMCs) established by the state governments. APMCs were set up to ensure fair trade between buyers and sellers for effective price discovery of farmers' produce.[66] APMCs can: (i) regulate the trade of farmers' produce by providing licenses to buyers, commission agents, and private markets, (ii) levy market fees or any other charges on trade, and (iii) provide necessary infrastructure within their markets to facilitate the trade. Figure provides details of percentage of agricultural households reporting sale of crops according to market type for major foodgrain crops.

Figure 16: % of agricultural households reporting sale of crops sold by agency type (2019)



Source: NSS 77th Round, MOSPI; PRS

The Standing Committee on Agriculture (2019) observed that the APMC laws are not implemented in their true sense and need urgent reforms.[66] Issues identified by the Committee include: (i) most APMCs have a limited number of traders operating, which leads to cartelization and reduces competition, and (ii) undue deductions in the form of commission charges and market fees.[66] Traders, commission agents, and other functionaries organise themselves into associations, which do not allow easy entry of new persons into market yards, stifling competition.[67] The Acts are highly restrictive in promotion of multiple channels of marketing and competition in the system.[66]

Parliament enacted three laws in September 2020: (i) the Farmers' Produce Trade and Commerce (Promotion and Facilitation) Act, 2020, (ii) the Farmers (Empowerment and Protection) Agreement on Price Assurance and Farm Services Act, 2020, and (iii) the Essential Commodities (Amendment) Act, 2020.[68,69,70] These laws collectively sought to: (i) facilitate barrier-free trade of farmers' produce outside the markets notified under the various state APMC laws, (ii) define a framework for contract farming, and (iii) impose stock limits on agricultural produce only if there is a sharp increase in retail prices. The three laws together aimed to increase opportunities for farmers to enter into sale contracts, increase the availability of buyers, and permit buyers to purchase bulk produce. However, following protests against the laws, in January 2021, the Supreme Court stayed their implementation until further orders.[71] In November 2021, these Acts were repealed with the passage of the Farm Laws Repeal Bill, 2021.[72]

Marketing infrastructure: The Standing Committee on Agriculture (2019) noted that the availability of a transparent, easily accessible, and efficient marketing platform is a pre-requisite to ensure remunerative prices for farmers.[66] Most farmers lack access to government procurement facilities and APMC markets.[66] Small and marginal farmers (who hold 86% of the agricultural landholdings in the country) face various issues in

selling their produce in APMC markets such as inadequate marketable surplus, long-distance to the nearest APMC markets, and lack of transportation facilities. The average area served by an APMC market is 496 sq. km., much higher than the 80 sq. km. recommended by the National Commission on Farmers (Chair: Dr. M. S. Swaminathan) in 2006.[66] The Standing Committee (2019) noted that Gramin Haats (small rural markets) can emerge as a viable alternative for agricultural marketing if they are provided with adequate infrastructure facilities.[66] It recommended that the Gramin Agricultural Markets scheme (which aims to improve infrastructure and civic facilities in 22,000 Gramin Haats across India) should be made a fully funded central scheme and scaled to ensure the presence of a Haat in each panchayat of the country.[66]

The central government has proposed development of basic infrastructure in Gramin Haats through the MGNREGS and of marketing infrastructure through the Agri-Market Infrastructure Fund.[73] The Fund will be set up by NABARD to provide Rs 1,000 crore to states at a concessional interest rate for development of marketing infrastructure in Gramin Haats.

Agricultural Research

The Indian Council of Agricultural Research (ICAR) is an autonomous organisation under the Department of Agricultural Research and Education (DARE).[74] The Council is the apex body for co-ordinating, guiding and managing research and education in agriculture including horticulture, fisheries and animal sciences in the entire country.

Of the Rs 8,013 crore allocated to research and education under DARE, ICAR has been allocated Rs 5,877 crore (73%) for the year 2022-23. This is 7% higher than the revised estimate of 2021-22. The allocation is primarily for salaries, pensions, administrative expenses, and different schemes under ICAR. The Standing Committee on Agriculture (2019) noted that almost 75% of the allocation to the Department of Agricultural Research and Education is incurred on items such as salaries and pensions, and only 25% is available for research activities.[75] The Committee recommended that more funds should be provided to the Department to promote agricultural research and education. It also recommended the Department to work towards attracting Corporate Social Responsibility (CSR) funds for investment in agricultural research.

Research under crop sciences and animal sciences has been allocated Rs 719 crore and Rs 343 crore in 2022-23, respectively. Both allocations have decreased by more than 14% over their revised estimates of 2021-22. This is despite the recommendation of Standing Committee on Agriculture (2021) that the Department should continue to make persistent efforts to ensure the allocations to the department are adequately increased and are not reduced at any stage.[76]

International comparison: The Committee on Doubling Farmers' Income (Chair: Mr. Ashok Dalwai, 2017) observed that the expenditure on agricultural research in India has remained around 0.3-0.4% of the agriculture GDP since 2001 (except in 2011 when it was 0.52% because of higher plan allocations by the government).[77]

The Committee observed that this is substantively lower in comparison to many developed countries, and also vis-à-vis comparable developing economies. The share of agricultural research in agriculture GDP is much higher in Brazil (1.8%), Mexico (1.05%), Malaysia (0.99%), and China (0.62%). It observed that in the high-income countries, the share stands at 3.01%. The Committee recommended that expenditure on agricultural research should be increased to up to one percent of agriculture GDP.

Agricultural machinery

Mechanisation is another aspect which has a significant impact on agricultural productivity. The use of agricultural machinery in agriculture enables agricultural labour to be used in other activities. It makes activities such as tilling, spreading of seeds and fertilizers and harvesting more efficient, so that the cost of inputs is offset. It can also make the use of labour in agriculture more cost-effective.

The status of mechanisation in agriculture varies for different activities: as of 2018, the penetration of powered machines in various farm activities is assessed in the range of 40 to 45 per cent.[78] The highest level of mechanisation is observed in harvesting and threshing activities and irrigation. The lowest level of mechanisation is found in seeding and planting. To increase productivity, durable, light-weight, and low-cost farm equipment, specific to different crops and regions, should be made available for small and marginal farmers.

Some challenges faced in farm mechanisation include: (i) different soil and climatic zones which require customised farm machinery, and (ii) dominance of small and marginal landholdings which makes investment in mechanisation unviable. To promote an inclusive growth of farm mechanization in the country, a Sub Mission on Agricultural Mechanization (SMAM) was launched in the year 2014-15.[78] Under the scheme, assistance is given to state governments for: (i) providing training and demonstration of agricultural machinery, (ii) assisting farmers in procurement of various agricultural machinery and equipment, and (iii) setting up setting up of Custom Centre (CHC). During 2014-15 to 2020-21, a total of 27,828 CHC were established under the SMAM scheme.[78] The Government has also developed and

launched Multi lingual Mobile App called Farm Machinery Solutions (FARMS) which helps the farmers in getting rented farm machinery and implements through CHC in their area.

[1] Ministry-wise Summary of Budget Provisions, Union Budget 2022-23, https://www.indiabudget.gov.in/doc/eb/sumsbe.pdf.

[2] Demand No. 1, Department of Agriculture, Cooperation and Farmers' Welfare, Expenditure Budget, Union Budget 2022-23, https://www.indiabudget.gov.in/doc/eb/sbe1.pdf.

[3] Demand No. 2, Department of Agricultural Research and Education, Expenditure Budget, Union Budget 2022-23, https://www.indiabudget.gov.in/doc/eb/sbe2.pdf.

[4] Report no. 23, Standing Committee on Agriculture: 'Demand for Grants (2021-22), Department of Agriculture, Cooperation and Farmers' Welfare', Lok Sabha, March 2021, http://164.100.47.193/lsscommittee/Agriculture,%20Animal%20Husbandry%20and%20Food%20Processing/17_Agriculture_24.pdf.

[5] Operational Guidelines of "Pradhan Mantri Kisan Samman Nidhi (PM-KISAN)", Ministry of Agriculture and Farmers Welfare, http://agricoop.gov.in/sites/default/files/operational_GuidePM.pdf.

[6] "PM-KISAN Scheme extension to include all eligible farmer families irrespective of the size of landholdings", Press Information Bureau, Cabinet, May 31, 2019.

[7] Starred Question no. 43, Lok Sabha, December 12, 2021, http://loksabhaph.nic.in/Questions/QResult15.aspx?qref=31718&lsno=17.

[8] PM-KISAN scheme dashboard, Ministry of Agriculture and Farmers' Welfare, as on February 10, 2022, https://pmkisan.gov.in/.

[9] Report no. 31, Standing Committee on Agriculture: 'Demand for Grants (2021-22), Department of Agriculture, Cooperation and Farmers' Welfare', Lok Sabha, December 2021, http://164.100.47.193/lsscommittee/Agriculture,%20Animal%20Husbandry%20and%20Food%20Processing/17_Agriculture_Animal_Husbandry_and_Food_Processing_31.pdf.

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[11] "March of Agriculture since Independence and Growth Trends", Report of the Committee on Doubling Farmers' Income, Ministry of Agriculture and Farmers Welfare, August 2017, http://farmer.gov.in/imagedefault/DFI/DFI%20Volume%201.pdf.

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Annexure

Allocation to major expenditure heads under the Departments

Table 6: Allocation under the Department of Agriculture, Cooperation and Farmers' Welfare (Rs crore)

Item	2020-21 Actuals	2021-22 Budgeted	2021-22 Revised	2022-23 Budgeted	% change in BE 2022-23 over RE 2021-22
PM-KISAN	60,990	65,000	67,500	68,000	1%
Interest subsidy for short-term credit to farmers/ Modified Interest Subvention Scheme (MISS)#	17,790	19,468	18,142	19,500	7%
Pradhan Mantri Fasal Bima Yojana	14,161	16,000	15,989	15,500	-3%
Pradhan Mantri Krishi Sinchai Yojana (Per Drop More Crop)	2,562	4,000	2,000	-	-
Market Intervention Scheme and Price Support Scheme (MIS-PSS)	1,358	1,501	3,596	1,500	-58%
Agriculture Infrastructure Fund	22	900	200	500	150%
Formation and Promotion of 10,000 Farmer Producer Organisations	241	700	250	500	100%
Green Revolution/ RKVY and Krishionnati Yojana	9,748	13,408	8,889	17,616	98%
Department	**1,08,273**	**1,23,018**	**1,18,294**	**1,24,000**	**-4%**

Note: Expenditure and estimates of Rashtriya Krishi Vikas Yojna for 2020-22 were allocated as a part of Green Revolution.
**: RKVY and Krishionnati Yojana for 2022-23 includes the merged schemes of National Project on Soil Health and Fertility, Sub-Mission on Agriculture Mechanisation, National Project on Agro- Forestry etc. moved from Green Revolution.*
#:The Interest Subsidy for short-term credit to farmers has been discontinued in 2022-23. Instead, the Modified Interest Sub-Scheme (MISS) has been launched in 2022-23.
Sources: Demand no. 1, Expenditure Budget, Union Budget 2022-23; PRS.

Table 7: Allocation under the Department of Agricultural Research and Education (Rs crore)

Item	2020-21 Actuals	2021-22 Budgeted	2021-22 Revised	2022-23 Budgeted	% change in BE 2022-23 over RE 2021-22
ICAR headquarters	4,985	5,322	5,561	5,877	6%
Crop sciences	805	968	840	719	-14%
Agricultural education	526	613	553	455	-18%
Central agricultural universities	428	471	563	599	6%
Animal and Fisheries sciences	400	462	400	343	-14%
Department	**7,554**	**8,514**	**8,514**	**8,514**	**0%**

Sources: Demand no. 2, Expenditure Budget, Union Budget 2022-23; PRS.

Table 8: Restructuring of Green Revolution in 2022-23

Previous Umbrella Scheme	Schemes	New Umbrella Scheme
Green Revolution	Information Technology	Krishionnati Yojana
Green Revolution	Integrated Scheme on Agriculture Census and Statistics	
Green Revolution	Integrated Scheme on Agriculture Marketing	
Green Revolution	National Food Security Mission	
Green Revolution	Sub- Mission on Seed and Planting Material	
Green Revolution	National Mission on Horticulture	
Green Revolution	National Bamboo Mission	
Green Revolution	National Mission on Oil Seed and Oil Palm	
Green Revolution	Organic Value Chain Development for North East Region	
Green Revolution	Sub - Mission on Agriculture Extension	
Green Revolution	Integrated Scheme on Agricultural Cooperation	Integrated Scheme on Agricultural Cooperation
Pradhan Mantri Krishi Sinchai Yojna	Pradhan Mantri Krishi Sinchai Yojana (PMKSY)- Per Drop More Crop	Rashtriya Krishi Vikas Yojna
Green Revolution	National Project on Soil Health and Fertility	
Green Revolution	Paramparagat Krishi Vikas Yojana	
Green Revolution	Rashtriya Krishi Vikas Yojna	
Green Revolution	Rainfed Area Development and Climate Change	
Green Revolution	Sub- Mission on Agriculture Mechanisation	
Green Revolution	Sub- Mission on Plant Protection and Plant Quarantine	Moved to Establishment Expenditure
Green Revolution	National Project on Agro- Forestry	Subsumed in other CSS
Green Revolution	National Project on Organic Farming	Moved to Establishment Expenditure

Source: Statement 4AA, Expenditure Profile, Union Budget 2022-23; PRS.

Table 9: Components of RKVY in 2022-23 and their allocation across the years (in Rs crore)

Scheme	2021-22 Budgeted	2021-22 Revised	2022-23 Budgeted
Rashtriya Krishi Vikas Yojna	3,712	2,000	10,433
Pradhan Mantri Krishi Sinchai Yojana (PMKSY)- Per Drop More Crop	4,000	2,000	-
National Project on Soil Health and Fertility	315	100	-
Rainfed Area Development and Climate Change	180	110	-
Sub-Mission on Agriculture Mechanisation	1,050	850	-
Paramparagat Krishi Vikas Yojana	450	100	-
Total	9,707	5,060	10,433

Sources: Demand no. 1, Expenditure Budget, Union Budget 2022-23; PRS.

Consumption of Fertilisers

Table 10: Consumption of fertilisers in terms of N, P, and K nutrients (in lakh tonnes)

Year	Urea (N)	Phosphatic (P)	Potassic (K)	Total (N+P+K)
2006-07	137.7	55.4	23.3	216.5
2007-08	144.2	55.1	26.4	225.7
2008-09	150.9	65.1	33.1	249.1
2009-10	155.8	72.7	36.3	264.9
2010-11	165.6	80.5	35.1	281.2
2011-12	173.0	79.1	25.8	277.9
2012-13	168.2	66.5	20.6	255.4
2013-14	167.5	56.3	21.0	244.8
2014-15	169.4	60.9	25.3	255.8
2015-16	173.7	69.8	24.0	267.5
2016-17	167.4	67.1	25.1	259.5
2017-18	169.6	68.5	27.8	265.9
2018-19	176.3	69.7	27.8	273.8
2019-20	191.0	76.6	26.1	293.7

Sources: Agricultural Statistics at a Glance 2020, Ministry of Agriculture and Farmers' Welfare; PRS.

Table 11: Import, production, and consumption of fertilisers (in lakh metric tonne)

Year	Urea	DAP	MOP	NPK-S	SSP	Total
Production						
2017-18	240	47	-	88	39	414
2018-19	240	39	-	95	41	415
2019-20	245	46	-	96	43	429
2020-21*	210	34	-	85	41	370
Import						
2017-18	60	43	35	5	-	142
2018-19	76	69	30	7	-	183
2019-20	92	54	29	9	-	184
2020-21*	98	57	33	15	-	203
Consumption						
2017-18	303	90	30	91	54	568
2018-19	320	95	27	96	43	582
2019-20	337	101	28	105	44	615
2020-21*	305	108	28	106	40	587

Note: * Figures for 2020-21 is up to January 2021. DAP stands for Di-Ammonium Phosphate, MOP stands for Muriate of Potash, NPK-S stands for Nitrogen, Phosphorus and Potassium-S , SSP stands for Single Super Phosphate-Powder.
Source: Report no. 20, Standing Committee On Chemicals & Fertilizers (2020-21): 'Demands for Grants (2020-21)', Lok Sabha, March 17, 2021

Demand for Grants 2022-23 Analysis
Telecommunications

The Department of Telecommunications under the Ministry of Communications is responsible for policy, licensing, monitoring, regulation, research, and international co-operation in the field of telecommunications. The Department administers several Public Sector Undertakings involved in providing telecommunication services, consultancy, and equipment manufacturing. This note presents the allocation to the Department in 2022-23 and trends in expenditure over the last few years, and discusses some of the issues in the sector.

Overview of Finances

Expenditure[1,2]

In 2022-23, the Department has been allocated Rs 84,587 crore, an increase of 138% over revised estimates of 2021-22. This significant increase is mainly on account of capital infusion in BSNL.

Table 1: Allocation to the Department of Telecommunications (in Rs crore)

	2020-21	2021-22 BE	2021-22 RE	2022-23 BE	% change (21-22 RE to 22-23 BE)
Revenue	37,954	32,803	30,080	30,436	1%
Capital	4,356	25,934	5,470	54,150	890%
Total	**42,310**	**58,737**	**35,550**	**84,587**	**138%**

Note: RE: Revised Estimates; BE: Budget Estimates.
Sources: Expenditure Budget; Union Budget 2022-23; PRS.

In October 2019, Union Cabinet had approved a revival plan for BSNL and MTNL.[3] The revival plan provides for: (i) capital infusion for allotment of 4G spectrum and (ii) costs to be incurred towards voluntary retirement scheme (VRS). The estimated outlay for the revival plan was Rs 40,983 crore. In addition, the cost for pension, gratuity, and commutation of employees opting for VRS was to be borne by the central government. The capital component of the revival plan comprises Rs 20,410 crore for administrative allotment of 4G spectrum. No allocation towards capital component was made in 2020-21. In 2021-22, the budgeted allocation towards this has been revised down to zero. This explains the decrease in capital expenditure of the department in 2021-22 from the budget stage to the revised stage. In 2022-23, capital infusion in BSNL is estimated to be Rs 44,720 crore, significantly higher than the initially approved amount (Table 2). As per the note to the demands of the Department, provision has been made for 4G spectrum, technology upgradation, and restructuring in BSNL. No allocation has been made towards MTNL.

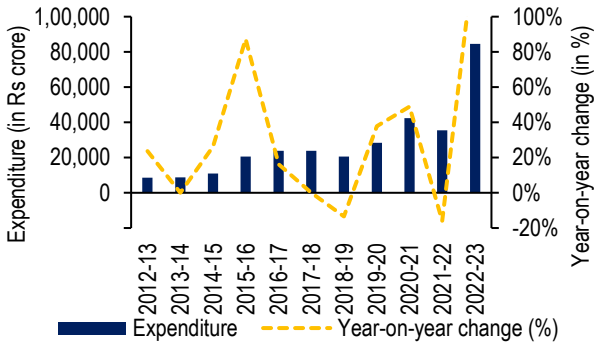
Table 2: Allocation towards Revival Plan for BSNL and MTNL (Rs crore)

Particular	2020-21	2021-22 BE	2021-22 RE	2022-23 BE
Capital infusion-BSNL	0	14,115	0	44,720
Capital infusion for 4G spectrum-MTNL	0	6,295	0	0
Implementation of VRS (BSNL/MTNL)	3,028	3,000	3,530	3,300
Ex-gratia payment to voluntarily retiring employees (BSNL/MTNL)	11,162	0	0	0
Grants for payment of GST-BSNL	0	2,541	0	3,550
Grants for payment of GST-MTNL	0	1,133	0	0
Total	**14,190**	**27,084**	**3,530**	**51,570**

Note: RE: Revised Estimates; BE: Budget Estimates.
Sources: Union Budget of various years; PRS.

Between 2012-13 and 2022-23, the expenditure of the Department is estimated to increase at a CAGR of 14% (excluding allocation towards revival plan). A higher increase in expenditure since 2015-16 as compared to previous years is due to allocation towards Bharatnet (a scheme to connect all gram panchayats through optical fibre) and Optical Fibre Network for Defence Services schemes. A notable increase in 2020-21 and 2022-23 is due to expenditure towards revival plan for BSNL/MTNL.

Figure 1: Trend in expenditure

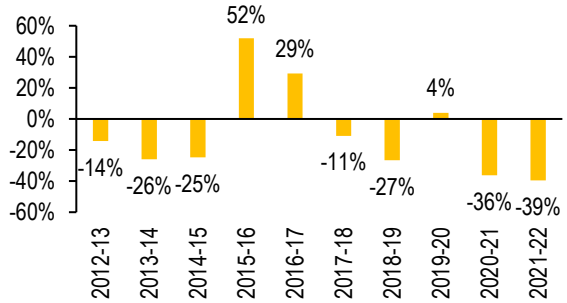


Note: Revised Estimates used for 2021-22. Budget Estimates used for 2022-23.
Sources: Union Budget documents of various years; PRS.

Over the last 10 years, the actual expenditure by the Department has varied significantly as compared to the budget estimates (Figure 2 on next page). In 2015-16 and 2016-17, actual expenditure exceeded budget estimates by 52% and 29% respectively. In 2019-20, actual expenditure was 4% higher than the budgeted expenditure. In 2020-21 and 2021-22, the actual expenditure by the department is estimated to be significantly lower than the budget estimates. This is mainly due to the carryover of

allocation towards the revival plan for BSNL/MTNL from one year to another. High variability in budget estimates and actual expenditure may be indicative of issues with budget forecasting as well as scheme implementation.

Figure 2: Underspending – Department of Telecommunications (2012-22)



Note: Revised Estimates used for 2021-22.
Sources: Union Budget documents of various years; PRS.

Major Expenditure Heads

In 2022-23, Rs 52,154 crore has been allocated towards support for PSUs, which is 62% of the total allocation for the department. Of this, Rs 51,570 crore (99%) has been allocated towards the revival of BSNL and MTNL (details in Table 2).

Table 3: Major expenditure heads in 2022-23 (in Rs crore)

Expenditure Head	2020-21 Actuals	2021-22 RE	2022-23 BE	% change (21-22 RE to 22-23 BE)
Support to PSUs	14,765	3,994	52,154	1,206%
Pension	14,928	16,374	19,000	16%
Bharatnet	5,920	7,000	7,000	0%
Compensation to TSPs	1,280	1,300	2,000	54%
Network for defence services	4,000	5,200	1,961	-62%
PLI Scheme for Telecom Sector	0	0	528	-
Others	1,417	1,682	2,472	47%
Total	**42,310**	**35,550**	**84,587**	**138%**

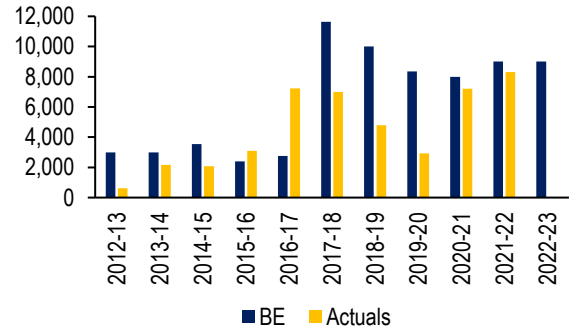
Note: BE – Budget Estimate; RE – Revised Estimate; TSP: Telecom Service Providers; PLI: Production-linked Incentive Scheme.
Sources: Expenditure Budget; Union Budget 2022-23; PRS.

The next highest allocation is towards pension (22%), followed by Bharatnet (8%), and compensation to Telecom Service Providers (TSPs) for augmentation of infrastructure in rural and remote areas, and maintenance of village public telephones. The pension provision is for pensionary benefits of the employees of the Department including employees absorbed in BSNL, and employees of MTNL with effect from April 2014.[2] In 2022-23, allocation towards Network for Defence Services is estimated to be 62% lower than the revised estimate for 2021-22. This may be due to the scheme nearing completion. The scheme provides for optical fibre cable based network for defence services. In February 2021, a Production-Linked Incentive Scheme was notified to promote telecom and network products manufacturing in India.[4] The scheme provides incentives to companies on the incremental sale of products manufactured in India. This scheme has been allocated Rs 528 crore in 2022-23.

Expenditure from USOF

The Universal Service Obligation Fund (USOF) has been established to provide widespread, non-discriminatory, and affordable access to quality Information and Communication Technology services to people in rural and remote areas. The resources for the fund are raised through a Universal Access Levy (UAL) which is 5% of the Adjusted Gross Revenue (AGR) earned by all the operators under various licenses currently.[5] Adjusted Gross Revenue is the value of gross revenue after deduction of taxes and roaming/PSTN charges from Gross Revenue. UAL is first credited to the Consolidated Fund of India and then disbursed to the USOF as per the budgetary proposal of the Department of Telecommunications. The schemes being funded through USOF include: (i) Bharatnet, (ii) setting up of towers in left-wing extremism affected areas, and (iii) comprehensive telecom development plan for the northeast region. A total expenditure of Rs 9,000 crore from this fund has been planned in 2022-23, an increase of 8% over the revised estimates of 2021-22 (Rs 8,300 crore). This includes Rs 7,000 crore for the Bharatnet scheme and Rs 2,000 crore for compensation to TSPs.

Figure 3: Expenditure from USOF (in Rs crore)



Note: Revised Estimates used for 2021-22.
Sources: Union Budget documents of various years; PRS.

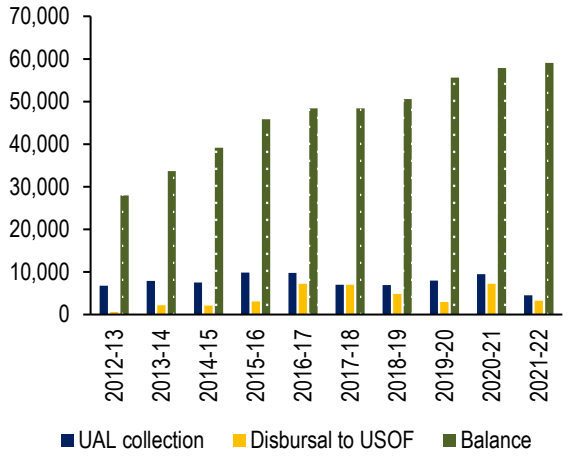
Between 2017-18 and 2021-22, in each year, actual expenditure from USOF has been significantly less than the budget estimate. In 2020-21 and 2021-22, actual expenditure is estimated to be 10% and 8% less than the budget estimate, respectively. Corresponding figure for 2017-18, 2018-19, and 2019-20 was 40%, 52%, and 65%.

Balance of Funds under USOF

In its audit report of the Ministry of Communications for the FY 2017-18, the Comptroller and Auditor General of India (CAG) observed that a large amount earned as UAL is yet to be transferred to the USOF.[6] As of November 2021, a total of Rs 59,082 crore is yet to be transferred to the USOF by the central government.[7] A total of Rs 1,21,569 crore has been earned as UAL between 2002-03 and 2021-22 (as of November 2021), out of which only Rs 62,487 crore has been disbursed (51%).[7] The gap between UAL collected and disbursal has been high over the years, which has led to a rise in balance (Figure 4).

In January 2015, the Telecom Regulatory Authority of India (TRAI) had observed that the Department has not been able to devise enough schemes to utilise the earnings of UAL.[8] It also recommended reducing UAL from 5% to 3%.[8] The Standing Committee on Information Technology (2018) noted that with increasing outlay on schemes including Bharatnet, Mobile Towers in Left Wing Extremism Affected Areas Phase-II and Comprehensive Telecom Development Plan for the North-East, the utilisation of USOF funds will improve.[5]

Figure 4: Balance under USOF as of November 2021 (in Rs crore)

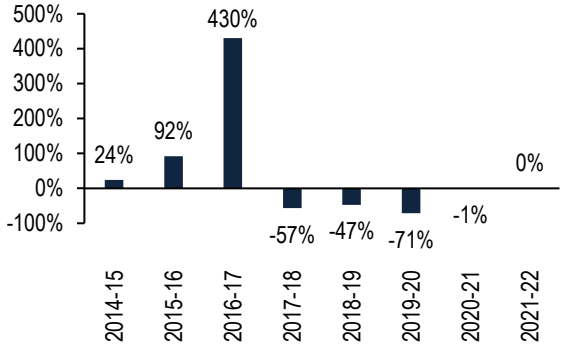


Note: UAL: Universal Access Levy; Balance: Balance at the end of that Financial Year.
Sources: USOF Website as accessed on February 13, 2022; PRS.

Bharatnet

Bharatnet aims to create a network to connect all the Gram Panchayats (about 2.5 lakh) by broadband by laying around 6.5 lakh km of optical fibre. It seeks to provide all telecom service providers with non-discriminatory access to the network. These service providers include mobile operators, Internet Service Providers (ISPs), Cable TV operators, content providers. Bharat Broadband Network Limited (BBNL) is a special purpose vehicle to create, operate, maintain, and manage the Bharatnet infrastructure. The project is financed through the USOF. The estimated total cost of the project is Rs 42,068 crore. Bharatnet is divided into three phases. Phase-I to connect about 1.2 lakh GPs was completed in December 2017. Phase-II to connect the remaining gram panchayats is underway. Phase-III is earmarked for future purposes. The scheme also aims to provide last-mile connectivity through Wi-Fi by creating five access points per gram panchayat (12.5 lakh hotspots).[9] In 2022-23, Rs 7,000 crore has been allocated towards Bharatnet, same as the revised estimates for 2021-22. Between 2017-18 and 2019-20, the actual expenditure under the scheme was much lower as compared to the budget estimates. In 2021-22, expenditure is estimated to be same as the budget estimate (Figure 5).

Figure 5: Underspending-Bharatnet (2014-22)



Note: Revised Estimates used for 2021-22.
Sources: Union Budget Documents of various years; PRS.

Delay in Completion

The Standing Committee on Information Technology (2018) noted that although approved in 2011, the initial target of Bharatnet had to be revised in 2014 due to inadequate planning and design, and unpreparedness to address the issues.[10] Under the revised deadline, the phase-I was due by March 2017 but could be completed by December 2017.[10] Phase-II which was to be initially completed by March 2019, the target was then revised to March 2020.[10, 11] The Standing Committee on Information Technology (2020) noted that the project is estimated to be completed by August 2021.[12] As of February 2022, the project is far from completion. Thus, the delay in the completion of phase-II is about 2 years and 11 months so far. Table 4 shows the status of Bharatnet as of December 2021.[13,14] Under phase-II, as of December 2021, optical fibre cable (OFC) has been laid in 57,078 gram panchayats out of targeted 1.42 lakh gram panchayats (40%). Out of these, 45,340 gram panchayats have been made service-ready. Note that the National Digital Communications Policy 2018 aims to provide: (i) provide universal broadband connectivity at 50 Mbps to every citizen by 2022, and (ii) provide one Gbps connectivity to all gram panchayats by 2020, and 10 Gbps by 2022.

Table 4: Status of Bharatnet (as of December 2021)

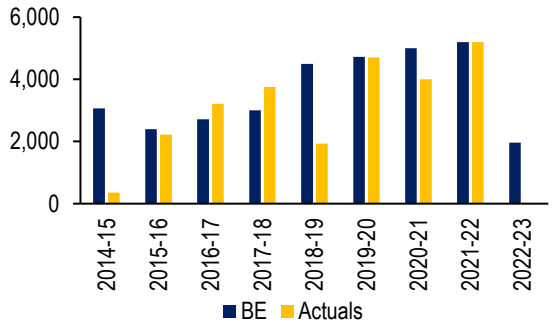
Parameter	Target	Achievement	Achievement in %
Length of OFC laid*	6.5 lakh km	5.58 lakh km	86%
Number of panchayats where OFC laid*	2.5 lakh	1.81 lakh	72%
Number of panchayats which are service-ready*	2.5 lakh	1.71 lakh	68%
Number of panchayats where Wi-Fi installed#	2.5 lakh	1.04 lakh	42%
Number of panchayats where Wi-Fi operational#	2.5 lakh	0.53 lakh	22%

Note: *as of December 6, 2021, #as of December 10, 2021.
Sources: BBNL website as accessed on February 13, 2022; PRS.

Network for Defence Services

The Network for Defence Services project aims to provide a dedicated pan-India optical fibre cable-based network for use by defence services. The original total sanctioned cost of the project was Rs 13,334 crore.[5] In May 2018, the central government announced that the budget of the project has been increased to Rs 24,664 crore.[15] BSNL is the implementing agency for the project. A total of 60,000 km of the optical fibre network is to be laid under this project. In 2022-23, Rs 1,900 crore has been allocated towards this project, a decrease of 62% over revised estimates of 2021-22. Under this scheme, in 2018-19, only 43% of the allotted fund was utilised. In 2020-21, the actual expenditure was 20% less than the budget estimates (Figure 6).

Figure 6: Allocation towards Network for Defence Services (in Rs crore)



Note: Revised Estimates used for 2021-22.
Sources: Union Budget Documents of various years; PRS.

Delay in completion

The network for defence services project was to be completed by July 2015.[5] The revised deadline for completion was set for May 2020, however, the target was subsequently revised to December 2020. As of February 2022, the project is still ongoing. The Standing Committee on Information Technology (2018) had observed that the delay has resulted in a massive cost overrun from the initial estimation of Rs 8,098 crore in 2009 to Rs.24,664 crore in 2018 (205% increase).[5]

Non-Tax Revenue from communication services[16]

Communication services are one of the major sources of non-tax revenue of the central government. In 2022-23, non-tax revenue from communication services is estimated to be Rs 52,806 crore, about 20% of the total non-tax revenue of the central government. This includes receipts from spectrum auctions, one-time fees from new operators and recurring license fees and spectrum charges from telecom service providers which is a percentage share of the AGR of the operators. In 2022-23, non-tax revenue from communication services is estimated to register a decrease of 27% over revised estimates of 2021-22. This may be due to the rationalisation of certain levies in September 2021 (discussed later).

The Finance Minister in her budget speech in February 2022 noted that auction of 5G spectrum is expected to be conducted in 2022-23, however, as stated earlier, non-tax revenue in 2022-23 is estimated to be 27% lower than the revised estimates of 2021-22. In 2021-22, at the budget stage, non-tax revenue from communication services was projected to be Rs 53,987 crore. As per the revised estimates, this revenue is estimated to be Rs 71,959 crore, 33% higher than the budget estimate.

Table 5: Non-tax revenue-communication services (in Rs crore)

Year	Budget	Actual	% change from Budget to Actual	% change Year-on-Year
2016-17	98,995	70,241	-29%	24%
2017-18	44,342	32,066	-28%	-54%
2018-19	48,661	40,816	-16%	27%
2019-20	50,520	69,846	38%	71%
2020-21	1,33,027	45,501	-66%	-35%
2021-22	53,987	71,959	33%	58%
2022-23	52,806	-	-	-27%

Note: Revised estimate for 2021-22 shown as actuals.
Source: Union Budget Documents of various years; PRS.

Support for the Telecom Sector

In November 2019, the Union Cabinet had approved deferred payment of spectrum auction instalments due for years 2020-21 and 2021-22 to provide relief to telecom service providers.[17] In September 2021, the Union Cabinet approved several measures for the telecom sector.[18] These will have implications for the level of non-tax revenue of the central government from the communications sector going forward.

- **Definition of AGR**: Non-telecom revenue will be excluded from the definition of Adjusted Gross Revenue (AGR) on a prospective basis. AGR is the value of gross revenue after deduction of certain taxes and certain charges

such as roaming charges from gross revenue. Earlier, AGR also included revenue from any non-telecom operations such as income from investments and income from property rent.

- **Spectrum Usage Charges**: Earlier, the TSPs paid a percentage of their AGR to the central government in the form of license fees and spectrum usage charges. No spectrum usage charges will be levied for spectrum acquired in future auctions.
- **Charges for spectrum sharing**: Additional charges for spectrum sharing will be removed.
- **Interest and penalty on overdues**: The interest rate applicable on late payment of dues will be reduced from October 1, 2021 (2% less than earlier). No penalty and interest on penalty will be levied on such delayed payments.
- **Moratorium on outstanding dues**: A moratorium of up to four years will be allowed to the TSPs on payment of: (i) dues on account of license fees and spectrum usage charges for the years between 2003 and 2019 (as per a 2019 Supreme Court Judgement), and (ii) dues for spectrum purchased in past auctions (excluding 2021 auction).
- **Conversion of interest dues into equity**: TSPs may pay interest amounts arising due to deferment of payment by way of equity. The central government will have an option to get equity in place of the outstanding dues at the end of the moratorium period.

Issues for Consideration

Performance of BSNL and MTNL

Mounting losses

BSNL and MTNL are the public sector undertakings (PSUs) engaged in providing telecommunication services in the country. BSNL and MTNL have been incurring losses continuously since FY 2009-10.[19] As per the Department of Public Enterprises guidelines, both these PSUs have been declared as 'Incipient Sick'.[19] A PSU is considered 'Incipient Sick' if its net worth is less than 50% of its paid-up capital in any financial year, or if it had incurred losses for three consecutive years.[20] Between 2016-17 and 2021-22, BSNL is estimated to make a cumulative loss of Rs 59,833 crore (Table 6), whereas MTNL is estimated to make a cumulative loss of Rs 18,058 crore (Table 7). Losses reduced in 2020-21 due to a reduction in salary expenditure owing to the implementation of the voluntary retirement scheme. In 2021-22, BSNL and MTNL are projected to make a loss of Rs 9,201 crore and Rs 2,520 crore, respectively. In 2021-22, losses are projected to increase as compared to 2020-21.

Table 6: Financial Performance of BSNL (Amounts in Rs crore)

Year	Income	Expenses	Profit (+)/Loss(-)
2016-17	31,533	36,327	-4,794
2017-18	25,071	33,809	-7,993
2018-19	19,321	34,225	-14,904
2019-20	18,907	34,406	-15,500
2020-21	18,595	26,036	-7,441
2021-22*	20,885	30,086	-9,201

Note: *Figures for 2021-22 are projections.
Source: Reports of the Standing Committee on Communication and Information Technology, Annual Reports of BSNL; PRS.

Table 7: Financial Performance of MTNL (Amounts in Rs crore)

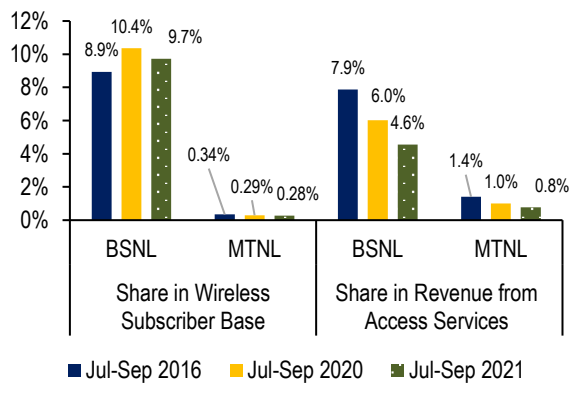
Year	Income	Expenses	Profit (+)/Loss(-)
2016-17	3,552	6,494	-2,942
2017-18	3,116	6,090	-2,974
2018-19	2,606	5,997	-3,391
2019-20	2,227	5,997	-3,770
2020-21	1,788	4,250	-2,462
2021-22*	2,020	4,540	-2,520

Note: *Figures for 2021-22 are projections.
Source: Reports of the Standing Committee on Communication and Information Technology, Annual Reports of MTNL; PRS.

Declining market share

The market share of both BSNL and MTNL has declined in terms of share in the revenue. During the second quarter of 2016, BSNL and MTNL had a share of about 9.3% in the adjusted gross revenue of the sector from access services, which declined to 5.4% during the third quarter of 2021. As of September 2021, BSNL had a 9.7% share among the wireless subscribers, up from 8.9% as of September 2016. However, between September 2020 and 2021, BSNL lost about 5% of its wireless subscribers. During the same period, MTNL saw a further decline in its already modest market share in terms of subscriber base.

Figure 7: Market Share of BSNL and MTNL



Source: TRAI; PRS.

Two years on, the revival plan for BSNL and MTNL yet to be fully implemented

The Standing Committee on Information Technology (2019) had noted that challenges for the PSU operators in earning revenue include: (i) absence of 4G services (except in a few places for BSNL) in data-centric telecom market, (ii) lack of cash flows hindering capital outlay and expansion, (iii) sharp decline in average revenue per user across all services due to competition in the sector, and (iv) rapid decline in landline business due to changing market needs. In October 2019, the Union Cabinet approved a revival plan for BSNL and MTNL. The plan also provided in-principle approval for the merger of both PSUs. However, the merger plan was called off in January 2021.[21] Key features of the plan are as follows: (i) allotment of 4G spectrum with funding from the central government of Rs 23,814 crore, (ii) sovereign guarantee for raising long-term bonds of Rs 15,000 crore for restructuring debt and meeting expenditure requirements, and (iii) funding of Rs 17,169 crore for offering voluntary retirement scheme to employees aged 50 years and above, along with coverage of cost towards pension and gratuity. In addition, BSNL and MTNL were to monetise their assets to raise funds.

- **Capital infusion**: As discussed earlier, capital infusion in both BSNL and MTNL for allotment of 4G spectrum is yet to take place. In both 2020-21 and 2021-22, the allocation was made in this regard at the budget stage, however, no funds were released. This expenditure is now estimated to be incurred in 2022-23 for BSNL. There is no allocation for MTNL on this account. The Standing Committee on Information Technology (2021) observed that while other parts of the revival plan such as VRS were successfully implemented, the revenue of BSNL and MTNL did not grow due to the non-commencement of 4G services.[22]
- **Monetisation of assets**: Total value of land/building assets identified for monetisation in BSNL and MTNL is Rs 67,837 crore, and Rs 17,985 crore, respectively.[22] Expected revenue from monetisation in 2021-22 is Rs 1,200 crore for BSNL, and Rs 300 crore for MTNL.[22] BSNL is raising about Rs 1,000 crore per annum from renting its towers (13,000 out of a total 68,000 towers).[22] BSNL also raised Rs 400 crore from monetising fibre.
- **Voluntary Retirement Scheme (VRS)**: BSNL and MTNL spend a significant share of their income on staff salaries. As of June 2019, the employee cost for BSNL and MTNL was 75% and 87% of their total income respectively.[23] In comparison, the employee cost for private telecom service providers varied between 5%-7% of their total income. BSNL had 1,55,296 employees as of October 2019. Under the voluntary retirement scheme implemented as part of the revival plan, 78,569 employees of BSNL opted for VRS.[22] This has helped reduce the salary expenditure in BSNL by about 50% (about Rs 600 crore per month).[22] Also, 75% of the employees of MTNL opted for VRS.[22]
- **Debt restructuring with sovereign guarantee bond:** As of March 2021, BSNL has raised Rs 8,500 crore with sovereign guarantee.[22]

Government's stake in the telecom sector

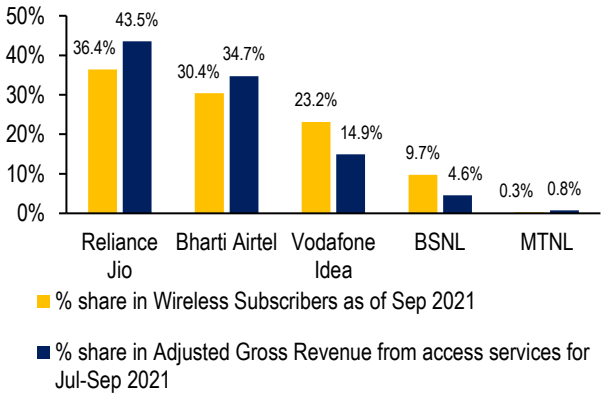
Until the mid-1980s, telecommunications services were operated by the Department of Telecommunications (DoT) of the central government.[24] In 1986, MTNL was established to provide telecom services in Delhi and Mumbai. For other parts of the country, DoT continued to provide telecom services. National Telecom Policy, 1994 opened up the telecom sector for the private sector. In October 2000, a corporate entity BSNL was established to take over the services activities of DoT. Over the years, the telecom sector in India has evolved from a public-sector led industry to a private-sector led industry. While the government-owned BSNL and MTNL have remained in business, they are distant competitors to private operators in the sector. As discussed earlier, these two companies have been making losses for about a decade now. As of September 2021, public sector operators had about a 10% share in the overall subscriber base.

Government might become one of the largest shareholders in Vodafone Idea Limited

As discussed earlier, as part of reform measures for the telecom sector, the government has provided an option of paying interest dues by way of equity. The detailed guidelines about the modalities of such conversion are yet to be released.
In January 2022, the Board of Vodafone Idea Limited approved the exercise of the option to convert outstanding interest dues into equity.[25,26] The Net present value of the outstanding interest dues is estimated to be Rs 16,000 crore. If the government were to approve the conversion of dues of Vodafone Idea into equity, it is estimated to own 35.8% stake in the company, while the promoters will jointly hold 46.3%. The equity shares will be offered to the government on a preferential basis. Note that the shares of Vodafone Idea Limited have fallen by 15.2% in past one month.[27] Two more companies Tata Teleservices and Tata Teleservices Maharashtra limited have also decided to offer pay interest dues by way of equity.[28] Their interest dues are estimated to be about Rs 4,139 crore and Rs 850 crore. Upon conversion into equity, the government is estimated to have 9.5% shares each in the two companies.

In January 2022, the Department of Telecommunications stated that: (i) these companies will continue to be managed as professionally-run private companies, (ii) conversion of liabilities will help companies regain the ability to invest and provide better services, and (iii) government can sell these shares at the appropriate time and thereby recover the due amount.[29] It noted that this measure will prevent a scenario where there are very few players in the market. Such a potential lack of competition might have led to higher prices and poor services. However, such conversion will make the government an important stakeholder in the third-largest company in the sector in terms of market share. It also owns the fourth and fifth largest companies in the sector. This raises the question whether the government's role in the telecom business is set to increase in future and if so, its implications for the competition in the sector.

Figure 8: Market share of key service providers by subscriber base and revenue



Source: TRAI; PRS.

India's preparedness for 5G

5G is the next technology frontier in the telecom sector. According to the High-Level Forum of the Department on 5G, 5G is predicted to create a cumulative economic impact of USD one trillion in India by 2035.[30] As of January 2021, 118 operators in 59 countries have deployed 5G network.[31]Mostly, 5G has been launched partially in these countries. In India, the commercial rollout of 5G is yet to happen. The Standing Committee on Information Technology (2021) examined India's preparedness for 5G.[31] The Committee noted that sufficient preparatory work has not been undertaken for the launch of 5G services in India. It highlighted: (i) inadequate availability of spectrum, (ii) high spectrum prices, (iii) poor development of use cases for 5G, (iv) low status of fiberisation, and (v) deficient backhaul capacity (links between the core network and sub-networks), as some of the key concerns.[31] It noted that as of January 2021, 5G trials were not permitted by the department.[31] In May 2021, the department permitted telecom service providers to start 5G trials in India.

Table 8: Deployment of telecom technology- India vis-a-vis World

Technology	World	India
2G	1991	1995
3G	1998	2008
4G	2008	2015
5G	2019	-

Source: "21st Report: India's preparedness for 5G", February 2021, Standing Committee on Information Technology; PRS.

Allocation of 5G spectrum

Allocation of new bands of the spectrum is crucial for the rollout of 5G. However, the auction of the 5G spectrum is still pending. The Committee noted the concerns of the telecom companies that the reserve price set by TRAI (Rs 492 crore per MHz) for the 5G spectrum is exorbitantly high.[31] It observed that considering the financial stress in the sector and that the 5G ecosystem is yet to be developed, high reserve price may have an adverse impact on the abilities of service providers to roll out 5G.[31] The Committee further noted that based on the current availability of spectrum, approximately 50 MHz spectrum per operator can be ensured. This is substantially lower than the global average (about 100 MHz).[31] It noted that in case of 4G too, the average spectrum per operator in India is around one-fourth of the global average.[31] The Committee observed that there is an urgent need for an audit of all allocated spectrum for detecting under-utilisation and subsequently rationalising the allocation of spectrum.[31] In November 2021, TRAI released a consultation paper inviting suggestions on various issues related to the auction of frequency bands identified for 5G including reserve prices, charges and fees.[32]

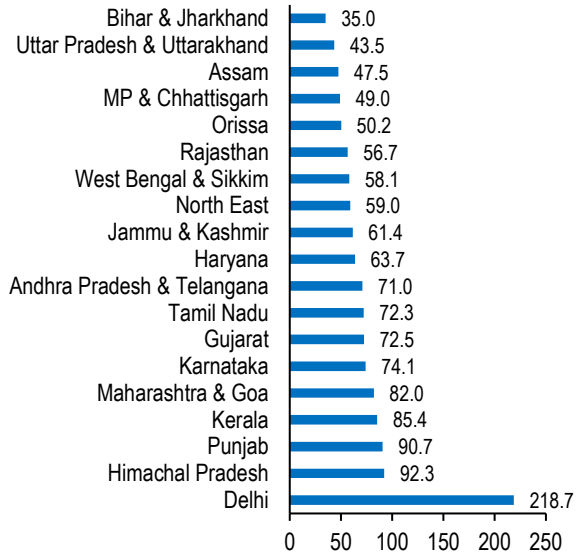
Digital Divide

COVID-19 has brought focus on access to communication services. During the nationwide lockdown, internet access became crucial for adults to work from home and children to access education. However, notable gaps exist in India with regard to access to telecom services and the use of internet. International Telecommunications Union (ITU, 2019) notes that barriers are often related to age, gender, socioeconomic status, and geography.[33] The Department of Telecommunications (2020) had noted that India has become the global leader in monthly data consumption.[34] The Department also noted that the cost of data has reduced substantially thereby enabling affordable internet access.[34]

Regional Divide: The number of internet subscribers per 100 inhabitants for the country on aggregate was 61.1 as of June 2021. This was lower than the global average for developing countries in 2020 as per ITU (65.1).[35] A substantial inter-state variation is seen on this parameter (Figure 9). Number of internet subscribers per 100 inhabitants in states such as Punjab, Himachal

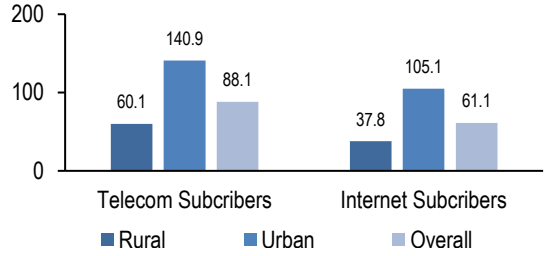
Pradesh, and Kerala circles were more than double of that in Bihar and Jharkhand, and Uttar Pradesh and Uttarakhand circles.

Figure 9: Service-area wise internet subscribers per 100 inhabitants (as of June 2021)



Note: Maharashtra & Goa includes Mumbai circle. Tamil Nadu includes Chennai circle. West Bengal & Sikkim includes Kolkata circle. Uttar Pradesh & Uttarakhand comprises UP East and UP West circles. North-East comprises Arunachal Pradesh, Manipur, Meghalaya, Mizoram, Nagaland, and Tripura. Service area also includes adjoining union territories.
Sources: Performance Indicator Reports-June 2021, TRAI; PRS.

Figure 10: Subscribers per 100 inhabitants in India (as of June 2021)



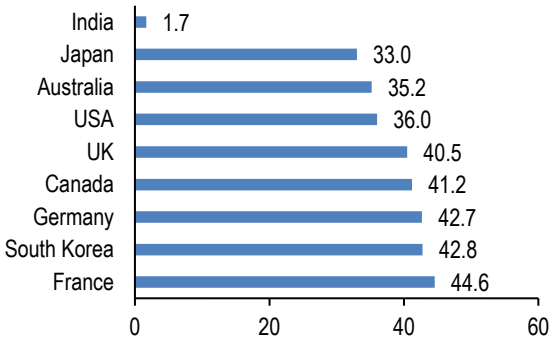
Source: Performance Indicator Reports-June 2021, TRAI; PRS.

Rural-Urban Divide: As of June 2021, while the number of internet subscribers per 100 inhabitants in urban areas was 105.1, the corresponding number for rural areas was 37.8, almost two-thirds less (Figure 10).

Access to broadband

Communication can be classified among broadband and narrowband based on the bandwidth required for communication. Broadband communication uses a higher bandwidth and provides better speed. Telecom Regulatory Authority of India (2020) had observed that in the post-COVID-19 pandemic era, there will be an increasing reliance on broadband connectivity and demand for these services is likely to grow much faster.[36] TRAI observed that India needs to improve in terms of access to fixed broadband as well as the speed of broadband. As of December 2020, only 9.1 out of 100 households had access to fixed broadband.[36,37]

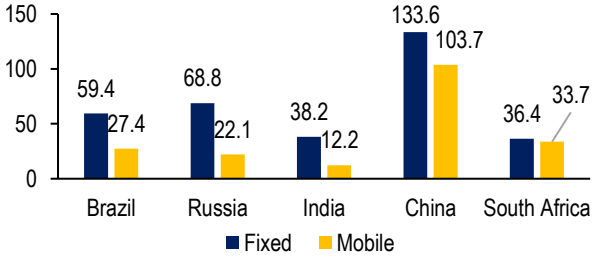
Figure 11: Fixed Broadband Penetration per 100 inhabitants as of June 2020



Source: TRAI; PRS.

TRAI noted that as per a March 2021 report by a private firm (Ookla), India experiences download speeds of 12.2 Mbps in case of mobile broadband and around 56.1 Mbps in case of fixed broadband.[36] The corresponding global average was 48.4 Mbps and 98.7 Mbps, respectively.[36] India ranked 131st among 140 nations in mobile broadband speed and 66th among 177 countries in fixed broadband speed according to the report by Ookla.[36] It observed that India's broadband speed is the lowest among the BRICS countries (Figure 12). Note that the National Digital Communications Policy 2018 seeks to provide broadband connectivity at 50 Mbps to every citizen by 2022.[36]

Figure 12: Broadband speed in BRICS countries (as of June 2020)



Source: TRAI; PRS.

In India, as of December 2020, 94% of internet subscribers in India use a broadband connection.[36] However, a broadband connection in India is defined to have a minimum download speed of 512 kbps (kilo bits per second) to an individual subscriber. In other countries, this threshold is defined at a higher level. In USA, UK, and China, it is defined to be 25 Mbps (mega bits per second), 24 Mbps, and 20 Mbps, respectively.[36] In August 2021, TRAI recommended re-defining broadband in India as: (i) basic broadband (download speed between two Mbps and 50 Mbps), (ii) fast broadband (download speed between 50 Mbps and 300 Mbps), and (iii) super-fast broadband (download speed of more than 300 Mbps.[36] It also recommended a direct benefit transfer scheme in those rural areas where adequate fixed-broadband capacity is available but there is a lack of demand.

It recommended overhauling right of way provisions and formulating a centrally sponsored scheme for incentivising states to undertake right of way related reforms. It recommended encouraging provisioning of common ducts by land-owning agencies for laying of telegraph wires. These will help in a quicker laying of optical fibres for broadband purposes.

Promotion of domestic manufacturing of telecom equipment

The Standing Committee on Information Technology (2019) had observed that India is highly dependent on the import of telecom equipment.[38] During 2017-18 and 2018-19, India imported telecom equipment worth Rs 1.4 lakh crore and 1.2 lakh crore, respectively.[38] The Committee observed that this indicates a lack of requisite ecosystem for the promotion of domestic manufacturing.[38] Some of the reasons for the dependence on import are: (i) import of telecom equipment at zero duty as per existing tariff obligations under international treaties, (ii) low investment in research and development and creation of intellectual property rights, and (iii) lack of market access for indigenous manufacturers.[38] The Committee noted that imports are likely to increase substantially with the introduction of newer technology such as 5G.[38]

The Standing Committee on Information Technology (2021) also stressed on the importance of enhancing domestic manufacturing capabilities in view of the adoption of 5G. It observed that the ecosystem should be developed for complete manufacturing rather than just assembly, as manufacturing gives higher value addition. The Committee also highlighted the importance of the promotion of research and development for the success of telecom manufacturing.[31] The Committee noted that in 2018, TRAI had proposed the creation of a Telecom Research and Development Fund with an initial corpus of Rs 1,000 crore for promoting research, innovation, and manufacturing of indigenous telecommunications equipment. It recommended that this fund should be created at the earliest.[31] In February 2021, the government notified a production-linked incentive scheme to promote manufacturing of telecom and network products in India.[4]

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Demand for Grants 2022-23 Analysis
Education

The Ministry of Education consists of two departments: (i) school education and literacy, and (ii) higher education.

The **Department of School Education and Literacy** is broadly responsible for education imparted between the ages of six to 18 years, i.e., school education. Under the Right to Education (RTE) Act, 2009 the government is mandated to provide elementary education to all children between 6-14 years of age. Secondary education is imparted between Class 9-12 for children between 14-18 years of age.

The **Department of Higher Education** is responsible for higher education, and training for students above 18 years of age. Higher education includes undergraduate and postgraduate courses, doctoral degrees, and certificates following the completion of 12 years of schooling or equivalent.

This note looks at the proposed expenditure of the Ministry for 2022-23, trends in this expenditure and discusses some of the issues related to the education sector.

Budget speech 2022-23 highlights[1]

- To enable all states to provide supplementary education in regional languages for classes 1-12, 'one class-one TV channel' programme of PM eVIDYA will be expanded from 12 to 200 TV channels.
- To promote critical thinking skills and creativity in vocational courses, 750 virtual labs (in science and mathematics), and 75 skilling e-labs (for simulated learning environment) will be established in 2022-23.
- High-quality e-content in all spoken languages will be developed for delivery via internet, mobile phones, TV and radio through Digital Teachers.
- A Digital University will be established to provide access to students across the country for world-class quality universal education with personalised learning experience at their doorsteps. This will be made available in different Indian languages and ICT formats. The best public universities and institutions in the country will collaborate as a network of hub-spokes.

Allocation in Union Budget 2022-23

In 2022-23, the Ministry has been allocated Rs 1,04,277 crore. This is an 18.5% increase over the revised expenditure in 2021-22. The allocation constitutes 3% of the central government's estimated expenditure for 2022-23.

In 2022-23, the **Department of School Education and Literacy** has been allocated Rs 63,449 crore, accounting for 61% of the Ministry's total allocation. The **Department of Higher Education** has been allocated Rs 40,828 crore, accounting for 39% of the Ministry's total allocation.

Overview of finances

As per the Economic Survey (2021-22), India's total public investment (centre and states combined) in education has nearly doubled from Rs 3.5 lakh crore in 2014-15 to Rs 6.9 lakh crore in 2021-22.[2] However, the share of public investment in education has largely remained constant, at 10% of total government expenditure (centre and states combined) or 3% of GDP.[2] This is much lesser than countries like Germany, USA, UK, and South Africa, which have a public investment of about 5-6% of their GDP in education. The National Policy on Education 1968 recommended the spending on education to be 6% of GDP. The National Education Policy, 2020 (NEP) reaffirms the recommendation of increasing public investment on education to 6% of GDP.[3]

Table 1: Budget allocations for the Education (2022-23) (in Rs crore)

Department	2020-21 Actuals	2021-22 RE	2022-23 BE	% change (RE to BE)
School Education & Literacy	51,842	51,970	63,449	22.1%
Higher Education	32,378	36,032	40,828	13.3%
Total	**84,219**	**88,002**	**1,04,277**	18.5%

Note: BE – Budget Estimate; RE – Revised Estimates.
Sources: Expenditure Budget - Ministry of Education, 2022-23; PRS.

Table 2 shows the key heads under which the Ministry spends its funds.

Table 2: Major heads of expenditure under the Ministry of Education (2022-23 Budget Estimates)

Expenditure head	Amount (in Rs crore)	% of total
Samagra Shiksha	37,383	36%
Autonomous Bodies	12,359	12%
PM POSHAN	10,234	10%
Universities	9,914	10%
IITs	8,495	8%
UGC and AICTE	5,321	5%
NITs and IIEST	4,364	4%
Student Financial Aid	2,078	2%
RUSA	2,043	2%
Others	12,086	11%
Total	**1,04,277**	**100%**

Note: Autonomous Bodies include NCERT and Navodaya Vidyalaya Samiti (NVS); Universities include grants to central universities, and Deemed Universities promoted by central government.
Sources: Expenditure Budget - Ministry of Education, 2022-23; PRS.

In 2022-23, the highest expenditure (36%) is allocated towards Samagra Shiksha (Rs 37,383 crore), followed by: (i) autonomous bodies (12%) such as NCERT, (ii) PM POSHAN (10%), (iii) universities (10%), (iv) Indian Institutes of Technology (8%), and (v) statutory and regulatory bodies in higher education (University Grants Commission (UGC) and All India Council for Technical Education (AICTE)) (5%), among others.

The Standing Committee on Human Resource Development/Education (2018, 2020, 2021) has repeatedly noted that the Department of School Education and Literacy is allocated funds much below its proposals.[4,5,6] In 2018-19, 2020-21, 2021-22, the shortfall was Rs 15,500 crore, Rs 22,700 crore, and Rs 43,000 crore respectively. In other words, the Department only received 76%, 72% and 56% of the sought funding in these years, respectively.

The Committee recommended additional funds for centrally sponsored schemes and central sector schemes under the department at the revised estimates stage. Note that in the years stated above (2018-19, 2020-21, and 2021-22), the Department could utilise 97%, 87%, and 95% of the allocated funds respectively.

Similarly, for 2020-21, the Department of Higher Education received an allocation of Rs 39,466 crore, against a demand of Rs 58,251 crore.[7] The Standing Committee on Human Resource Development (2020) noted that the allocation for Central Universities is inadequate as compared to their infrastructure, faculty and number of students enrolled.[5] This affects the implementation of schemes. The Committee recommends increasing the budgetary allocations of the department of higher education.

Department of School Education and Literacy

School education generally refers to the education imparted to an individual in the 6-18 year old age group. The school education system in India comprises of more than 25 crore students, 96 lakh teachers, and 15 lakh schools (Table).

Table 3: School system dimensions

	Public	% share	Private	% share
Students	15.5 crore	62%	9.5 crore	38%
Teachers	57.5 lakh	60%	38.5 lakh	40%
Schools	11 lakh	73%	4 lakh	27%

Sources: UDISE Flash Statistics 2019-20; PRS.

For 2022-23, most of the allocation to the Department of School Education and Literacy is for Samagra Shiksha (59%), autonomous bodies (19%), and the PM POSHAN scheme (16%). Autonomous bodies refers to the Kendriya Vidyalaya Sangathan, Navodaya Vidyalaya Samiti, National Council of Educational Research and Training (NCERT), Central Tibetan School Administration, and National Bal Bhawan. Table 4 shows the key expenditure heads of the department.

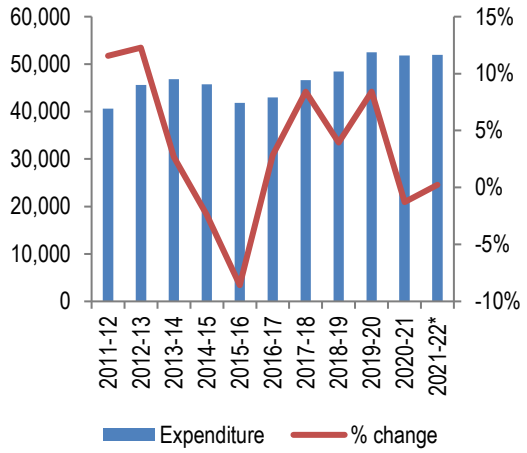
Table 4: Major heads of expenditure under the Department of School Education and Literacy in 2022-23 (in Rs crore)

Major Head	2020-21 Actuals	2021-22 RE	2022-23 BE	% change (RE to BE)
National Education Mission	27,923	30,003	37,510	25%
-Samagra Shiksha	27,835	30,000	37,383	25%
-Teachers Training and Adult Education	89	3	127	4,518%
Autonomous bodies	10,388	11,073	12,359	12%
PM POSHAN#	12,878	10,234	10,234	0%
Exemplar	-	-	1,800	-
ASPIRE*	-	-	600	-
Scholarship Scheme**	321	284	350	23%
Others	331	376	596	58%
Total	**51,842**	**51,970**	**63,449**	**22%**

Note: # Earlier known as National Programme of Mid-Day Meal in Schools; * Refers to Accelerating State Education Program to Improve Results, ** Refers to National Means-cum-Merit Scholarship Scheme.
Sources: Expenditure Budget, 2021-22; PRS.

Between 2011-12 and 2021-22, the Department's expenditure has seen a compounded annual growth of 2%. This is lesser than the CAGR of the Ministry's actual expenditure (3.8%), during the same time period (2011-12 to 2021-22).

Figure 1: Trend of actual expenditure incurred by Department of School Education and Literacy (2010-22) (in Rs crore, year-on-year change in %)



Note: *Figures for 2021-22 are revised estimates.
Sources: Expenditure Budget, 2011-22; PRS.

Table 5shows a trend of utilisation of funds allocated to the department between 2010-11 and 2020-21.

Table 5: Comparison of budget estimates and the actual expenditure (2010-21) (in Rs crore)

Year	Budget Estimate	Actuals	Utilisation % (Actuals/BE)
2011-12	41,451	40,641	98%
2012-13	48,781	45,631	94%
2013-14	52,701	46,856	89%
2014-15	55,115	45,722	83%
2015-16	42,220	41,800	99%
2016-17	43,554	42,989	99%
2017-18	46,356	46,600	101%
2018-19	50,000	48,441	97%
2019-20	56,537	52,520	93%
2020-21	59,845	51,842	87%
2021-22*	54,874	51,970	95%

Note: BE – Budget Estimate. *Revised Estimate
Sources: Union Budgets, 2012-22; PRS.

National Education Mission (NEM): The NEM consists of two expenditure heads: (i) Samagra Shiksha, and (ii) Teachers Training and Adult Education. Allocation to the NEM accounts for 36% of the total budget of the Ministry of Education. In 2022-23, the NEM has been allocated Rs 37,510 crore, which is a 25% increase as compared to 2021-22.

Samagra Shiksha was launched in July 2018. It aims to ensure inclusive and equitable quality education at all levels of school education. It subsumed three erstwhile centrally sponsored schemes: (i) Sarva Shiksha Abhiyan (SSA), (ii) Rashtriya Madhyamik Shiksha Abhiyan (RMSA), and (iii) Teacher Education (TE).

In 2022-23, Samagra Shiksha has been allocated Rs 37,383 crore (25% increase over 2021-22). The allocation for Samagra Shiksha accounts for 59% of the total departmental allocation and 99% of the allocation for the National Education Mission. In 2021-22, Samagra Shiksha was allocated Rs 31,050 crore which was reduced to Rs 30,000 crore at the revised stage.

In 2021-22, the Samagra Shiksha scheme received an allocation of Rs 31,050 crore, against a demand of Rs 57,914 crore. In March 2021, the Department stated that it needs Rs 19,164 crore for implementation of NEP interventions under the Samagra Shiksha scheme.[6]

Teacher Training and Adult Education has been allocated Rs 127 crore in 2022-23, which is 0.2% of the total departmental allocation. In 2020-21, teacher training and adult education had an allocation of Rs 250 crore at the budget stage, which was decreased to Rs 2.7 crore at the revised stage. (a decrease of 98%).

PM POSHAN: In September 2021, the central government renamed the National Scheme for Mid-Day Meal in Schools to PM POSHAN.[8] The Mid-Day Meal programme targeted enhancement of enrolment, retention, attendance, and nutritional levels among children studying in Class 1 to 8 across India. The erstwhile Mid-Day meal programme has been modified by: (i) extending the scheme to pre-primary students studying in government and government aided primary schools, (ii) providing supplementary nutrition items to children in aspirational districts and districts with high prevalence of anaemia, (iii) involvement of women self-help groups and farmer producer organisations to use locally grown food items, and (iv) mandatory social audits in all districts.

In 2022-23, PM POSHAN has been allocated Rs 10,234 crore, which is the same as the revised estimates of 2021-22.

Autonomous bodies: These include: (i) Kendriya Vidyalaya Sangathan (KVS), (ii) Navodaya Vidyalaya Samiti (NVS), (iii) National Council of Educational Research and Training (NCERT), (iv) Central Tibetan School Administration (CTSA), and (v) National Bal Bhawan. In 2022-23, the allocation for autonomous bodies is Rs 12,359 crore (12% increase from 2021-22).

Exemplar: This is a new scheme launched by the Department of School Education and Literacy. In 2022-23, this scheme has been allocated Rs 1,800 crore. The scheme aims to qualitatively strengthen more than 15,000 schools, by incorporating all aspects of the National Education Policy 2020.[9] The selected schools will include: (i) one primary and one elementary school in each block, (ii) one secondary and one senior secondary school in each district, and (iii) a few Kendriya Vidyalayas and Navodaya Vidyalayas. Over a period of time, these schools will become schools of excellence, and provide handholding and mentoring to other schools in their regions.

ASPIRE (Accelerating State Education Program to Improve Results): This is a new scheme launched by the Department of School Education and Literacy. ASPIRE will assist the central government in implementing Samagra Shiksha, to improve education outcomes in Assam, Gujarat, Jharkhand, Tamil Nadu, and Uttarakhand.[10] The key outcomes include: (i) foundational learning at the primary level, and (ii) reduced dropout rates at the secondary level. The scheme is supported by the Asian Development Bank, with a total support of about Rs 3,700 crore over a period of six years.

National Means-cum-Merit Scholarship Scheme: The scheme provides one lakh scholarships of Rs 6,000 per annum each to eligible meritorious students in Class 9. The scholarship is provided up to Class 12 to prevent students from dropping out due to financial constraints.

In 2022-23, Rs 350 crore has been allocated for the scheme. This is the same as the allocation for 2021-22 at the budget estimates stage. In 2021-22, the revised expenditure for the scheme is Rs 284 crore. This is 19% less than the 2021-22 budget estimates (Rs 350 crore).

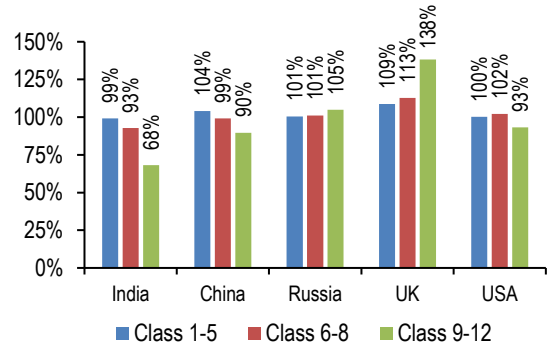
Key issues in school education

Issues related to access, dropout, and quality of learning

Enrolment: Gross Enrolment Ratio (GER) is the student enrolment as a proportion of the corresponding eligible age group in a given year.[11] For the year 2020-21, the GER of students at elementary, secondary, and senior secondary levels was 96%, 76%, and 50% respectively.[6] The Standing Committee (2021) took note of the sharp decline in GER at senior secondary level (50%). This implies that curtailing dropouts at the senior secondary level remains a challenge. As per the NEP, more than three crore out of school children need to be enrolled in school to achieve 100% GER at all levels of school education, by 2030.[3]

Figure 2, compares GER in India with other countries as in 2015-16.[3]

Figure 2: International comparison of GER (2015-16)



Sources: Educational statistics at a Glance 2018; PRS.

India's enrolment rate in Class 1-5 and Class 6-8 is comparable to that of developed countries. However, it is significantly less (68%) than these countries for Class 9-12 (see Figure 2).

The NEP notes that the GER is lower for certain socio-economically disadvantaged groups, based on: (i) gender identities (female, transgender persons), (ii) socio-cultural identities (scheduled castes, scheduled tribes), (iii) geographical identities (students from small villages and small towns), (iv) socio-economic identities (migrant communities and low-income households), and (v) disabilities.[3]

Impact of Covid on enrolment

As official data is only available up to 2019-20, the Economic Survey (2021-22) uses data from the Annual Status of Education Report (ASER) 2021, to assess the impact of the Covid pandemic on education in rural areas. As per ASER Rural (2021), the share of children (in the 6-14 years age group) not enrolled in schools increased from 2.5% in 2018 to 4.6% in 2021 (Table 6). Among all groups, the decline in enrolment was the most among the 7-10 year age group. In the 7-10 year age group, the decline of enrolment for boys was higher than that of girls.

Table 6: Enrolment in schools by age group and school type in rural areas (in percent)

	6 to 14 age group		15 to 16 age group	
Category	**2018**	**2021**	**2018**	**2021**
Government	64.3%	70.3%	57.4%	67.4%
Private	32.5%	24.4%	29.9%	25.2%
Others	0.7%	0.7%	0.6%	0.9%
Not Enrolled	2.5%	4.6%	12.1%	6.6%
Total	**100%**	**100%**	**100%**	**100%**

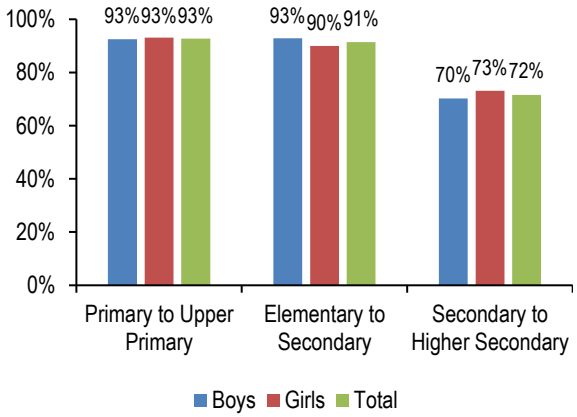
Sources: Economic Survey (2021-22); PRS.

Further, despite the pandemic, the share of children (in the 15-16 years age group) not enrolled in schools decreased from 12.6% in 2018 to 7.1% in 2021.

The ASER report also found an increase in the share of enrolment in government schools, and a simultaneous decrease in enrolment in private schools, in both age groups (Table 6). This may have been caused by: (i) shut down of low-cost private schools, (ii) financial distress of parents, (iii) disproportionately high fee in private schools, and (iv) return of families to villages. To deal with the increased enrolment in public schools, the Economic Survey (2021-22) recommends equipping them with additional teachers, classrooms, and teaching/ learning materials.

Transition and dropouts: Transition rates reflect the dropout levels in the school education system. It is the percentage of pupils enrolled in the final grade of the current stage who proceed to the first grade of the next stage. Higher the transition rate, lower the dropout level. As of 2019-20, the transition rate from primary to upper primary and from elementary to secondary was more than 90%. However, the transition rate from secondary to higher secondary was only 72%. The transition rate for both genders is low for the transition from secondary to senior secondary (Class 10 to Class 11).[12]

Figure 3: Transition rate across different levels of education



Sources: UDISE Flash Statistics 2019-20, PRS.

According to the Ministry, the most prominent reason for dropping out in 2015-16 was due to engagement in domestic activities (for girls), and engagement in economic activities (for boys).[13] Other reasons for dropping out include loss of interest in studies, and financial constraints.

Table 7: Major reasons for dropping out (Class 1-12) for 2015-16

Reason for dropping out	Male	Female
Child not interested in studies	23.8%	15.6%
Financial Constraints	23.7%	15.2%
Engage in Domestic Activities	4.8%	29.7%
Engage in Economic Activities	31.0%	4.9%
School is far off	0.5%	3.4%
Unable to cope up with studies	5.4%	4.6%
Completed desired level/ Grade	5.7%	6.5%
Marriage		13.9%
Other reasons	5.1%	6.2%

Note: Other reasons include: (i) timings of educational Institution not suitable, (ii) language/medium of Instruction used unfamiliar, (iii) inadequate number of teachers, (iv) quality of teachers not satisfactory, (v) unfriendly atmosphere at school. For girl students, other reasons also include: (i) non-availability of female teachers, (ii) non-availability of girl's toilet.
Sources: Educational Statistics at Glance 2018, MHRD; PRS.

The Standing Committee (2021) also noted that high drop out among girls at the secondary stage has a correlation with high incidence of child marriage.[6] The Committee recommended conducting a survey to identify districts where dropout rates of Scheduled Caste (SC), Scheduled Tribe (ST) and girls were higher than the national average.[14]

For 2021-22, the allocation (budget estimates) for the North East Region was Rs 4,382 crore. The Standing Committee (2021) noted that this was lesser than the allocation in 2020-21. The Committee noted that the dropout rates in states like Arunachal Pradesh, Assam, Meghalaya are higher than the national average, and hence, need special interventions.[6]

In July 2020, the central government has issued guidelines for main streaming of children of migrant labourers. The guidelines allow for the smooth admission of these children into schools, without asking for any documents other than identity.[15,16]

To improve the retention of children in schools, the NEP recommends strengthening existing schemes and policies which are targeted at socio-economically disadvantaged groups. For instance, schemes for free bicycles for girls from socio-economically disadvantaged groups or scholarships to tackle dropouts. Further, it recommends setting up special education zones in areas with a significant proportion of such disadvantaged groups. A gender inclusion fund should also be set up to assist female and transgender students in getting access to education.

The Standing Committee on Human Resource Development (2020) suggested that vocational training be provided to students dropping out at the secondary level. This will help them get job opportunities at the earliest and continue their studies.[5]

Response to Covid

In January 2021, to prevent dropouts and ensure continuity in learning, the central government released guidelines to identify out of school children, and ensure continuity of learning.[17,18] The guidelines provide that states must carry out identification of out of school children in the six to 18 years age group through a door-to-door survey, and prepare an action plan for their enrolment. When schools reopen, they must: (i) prepare and run school readiness modules/bridge course to allow students adjust to the school environment, (ii) relax detention norms to prevent drop out this year, and (iii) identify students across different grades based on their learning levels.

Infrastructure in schools

As per the Economic Survey (2021-22), access to basic facilities (such as electricity and sanitation) in schools has improved. As of 2019-20, more than 90% schools had access to a hand wash facility. More than 95% schools had functional toilets, for both boys and girls. However, only 38% of all schools had access to computers, while only 22% of schools had access to a functional internet connection.

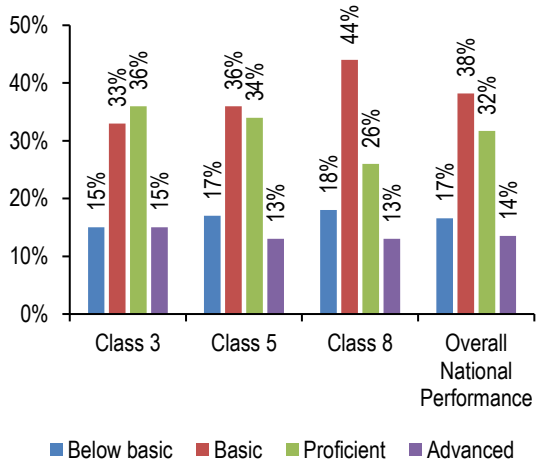
The Department provides for the establishment of Kasturba Gandhi Balika Vidyalayas (KGBVs) in Educationally Backward Blocks (EBBs) of a State/UT, where the female rural literacy rate is below the national average.[6] As of March 2021, 5,726 KGBVs have been sanctioned.[6] Of these, 1,339 have been sanctioned in Aspirational Districts. Out of the 1,339 schools, only 1,016 are operational.[6]

The Standing Committee (2020) highlighted that delay in completion of infrastructure leads to cost overruns and students' dropouts in government schools.[5]

Quality of learning

The National Achievement Survey (2017) observed that nearly 53% of class 3 students have achieved grade proficiency levels.[19] This means that they can solve problems using simple logic, apply simple rules, follow simple instructions, and are able to use simple language to express themselves. This proportion of students who are grade proficient drops to 47% in class 5 and to a further 39% in class 8. Note that NAS is conducted for class 3, 5, and 8 and it measures learning level outcomes in language, mathematics, and environmental studies (for class 3 and 5), and language, mathematics, sciences, and social sciences (for class 8).[19]

Figure 4: Proficiency of learning at different levels



Note: Below basic means learners at this level have not achieved the required learning for this grade.
Sources: National Achievement Survey 2017, MHRD; PRS.

The Central Advisory Board on Education (CABE, 2014), National Achievement Survey (2012 and 2017), and the Economic Survey (2016-17) also observed declining learning levels in elementary education even after the implementation of the Right to Education Act (RTE), 2009.[20,21,22,23]

Under the RTE Act, children are enrolled in the class that corresponds to their age, irrespective of their learning levels. This results in a situation where children may have different learning levels within the same class, depending on when they are enrolled in the schooling system. To close the gap in learning levels, the NEP has made several recommendations such as reforms in: (i) curriculum and nature of assessments, and (ii) improving foundational literacy and numeracy through incorporating early childhood care and education in the education system.[3]

Impact of Covid on quality of learning

Due to the pandemic, schools were shut down during the resulting lockdowns. As a result, online learning became the dominant mode of learning.[2]

As of December 2020, while the number of internet subscribers per 100 inhabitants in urban areas was 103, the corresponding number for rural areas was 35, almost two-thirds less.[24] According to the 75th round of National Sample Survey (2017-18), only 15% of the rural households had internet. In comparison, 42% of the urban households had internet facility. As per the survey, only 4.4% of the rural households had a computer (does not include a smartphone), the corresponding number for urban households was 23%. These figures are indicative of comparatively lesser access to internet and computers in rural areas.

The Economic Survey (2021-22) observed that in spite of an increase in availability of smartphones, issues related to availability of devices, and internet access remained.[2] This has negatively impacted the access to education in rural areas.[2] Further, students in lower grade found it difficult to do online activities compared to higher-grade students.[2]

In the 2022-23 Union Budget speech, the Finance Minister noted that the closure of schools has negatively impacted children in rural areas, especially from the Scheduled Castes and Scheduled Tribes.[1] To enable imparting supplementary teaching in regional languages, the 'One Class-One TV channel' programme of PM eVIDYA will be expanded from 12 to 200 TV channels.[1] In an NCERT survey about the use of different digital tools, only 3% of the surveyed students reported using TV.[25] The most preferred modes for students were smartphones (80%), and laptops (20%).[25] A similar preference pattern was noted in teachers.[25]

The PM eVidya initiative was launched in May 2020 under the Aatma Nirbhar Bharat Abhiyaan. Under this initiative all states were provided access to various e-content through the web portal - DIKSHA. The e-content included courses for teachers, and quizzes. In addition, the initiative provided for Swayam Prabha channels, which helped in telecasting educational programmes for students who did not have internet access. The initiative also included a channel for differently abled children.[26]

Foundational literacy and numeracy

The NEP also notes lack of foundational literacy and numeracy as a reason behind poor learning levels at subsequent stages of education. It observed that more than five crore students currently enrolled in elementary school (26% of students) have not attained foundational literacy and numeracy (the ability to read and understand basic text and carry out basic addition and subtraction).

The NEP aims to achieve universal foundational literacy and numeracy in primary school by 2025.[3] This implies that every child, by grade 3, must be able to read with comprehension, write, perform basic mathematical operations, and learn basic life skills. To achieve this by 2026-27, a national mission named National Initiative for Proficiency in Reading with Understanding and Numeracy (NIPUN Bharat) has been launched.[27]

The Mission specifies yearly targets for achieving learning outcome at various grade levels. To track the progress of students, school based assessment and large-scale standardised assessment will be conducted.[28] Training for teachers will focus on bridging the language barrier, and encouraging peer learning.[83] A five tier structure will be in place for implementing the scheme (at the national, state, district, block, and school levels).

To achieve universal foundational literacy and numeracy, the NEP also recommends Early Childhood Care and Education (ECCE) for making children school ready before starting instruction-based learning.

Early Childhood Care and Education

The NEP observes that over 85% of a child's cumulative brain development happens before the age of six. To ensure healthy brain development

and growth, it recommends universalising access to quality Early Childhood Care and Education (ECCE). This will ensure that students entering Grade 1 are school ready.

ECCE consists of play-based and activity-based learning comprising of alphabets, language, puzzles, painting, and music for children in early years of their life. The NEP recommended that ECCE for children in the age group of 3-6 should be incorporated in the school structure by restructuring the school curriculum

As of June 2018, the enrolment rate across the country for age-group 3-5 stands at 33%.[29] This implies that nearly only one in every three students in the 3-5 age-group is receiving early education. There are wide variations amongst states in this regard. In states like Punjab, Kerala, Himachal Pradesh, Telangana and Tamil Nadu, the age-specific attendance ratio (for 3-5 years) is more than 50% while in Karnataka and Bihar, it is around 20% only.

In contrast, the enrolment rate in early childhood education for OECD countries (generally developed countries) is 87%.[30] In the United Kingdom, since September 2010, all families who have a three to four year old child are eligible for 570 hours a year (over 38 weeks) of government funded early education.[31] As of 2018, 94% of the three and four year old children benefitted from universal funded early education.[32] While early child care is not mandatory in New Zealand, the New Zealand Government subsidises all children who attend early learning services for up to six hours a day (a total of 30 hours per week), up until children go to school or turn six.[33]

Other measures to be taken in this regard include: (i) filling teacher vacancies at the earliest, (ii) ensuring a pupil to teacher ratio of 30:1 for effective teaching, and (iii) training teachers to impart foundational literacy and numeracy.

Curriculum

The NEP noted that the current curriculum system is based on rote learning. The Policy specifies reduction in the content of subjects to core essentials to enhance critical thinking, and inquiry-based, discussion-based, discovery-based, and analysis-based learning.[3]

The Policy recommends various reforms in the curriculum system to shift the system towards a character and skill-building system. The reforms include: (i) introduction of experiential learning (such as hands-on learning, arts/sports-integrated learning), (ii) eliminating significant separation among curricular, extracurricular, or co-curricular in certain streams, and (iv) promoting mother tongue as medium of instruction, preferably till Class 8 and beyond.[3]

Further, it recommended that the existing system of exams be reformed. Board examinations should test only core concepts and cover a range of subjects. Students should be able to choose their subjects and have the option to take the exams on up to two occasions during a given year. To track students' progress throughout their school experience, examinations will be conducted in Class 3, 5, and 8. The examination in Class 3 will test basic foundational literacy and numeracy, and its results will only be used for the improvement of the school education system. Further, a National Assessment Centre will be set up under the MHRD as a standard-setting body for student assessment and evaluation.[3]

Note that under the RTE Act, the Continuous and Comprehensive Evaluation (CCE) is the evaluation mechanism for elementary education. CCE (e.g., paper-pencil test, drawing and reading pictures, and expressing orally) does not mean an absence of an evaluation, but it means an evaluation of a different kind from the traditional system of examinations. It has been recommended that proper design of assessment and using this information can help improve the quality and innovation in terms of teaching and learning.[34] However, the CABE (2014) noted that CCE has not been adequately implemented or monitored. It recommended that there is a need to proactively communicate the intent of CCE among teachers for its effective implementation.[35]

Issues related to teachers, and training

Experts have identified various issues concerning the role of teachers to address the challenges confronting elementary education.[36] These include: (i) low teacher accountability and appraisal, (ii) poor quality of the content of teacher-education and changes required in the curriculum of B. Ed and D. Ed courses, (iii) need for continuous in-service teacher training and upgradation of skill set, (iv) inadequate pupil-teacher ratio and deployment of teachers for non-educational purposes, (v) teacher vacancies, and (vi) excessive recruitment of contract/para teachers.

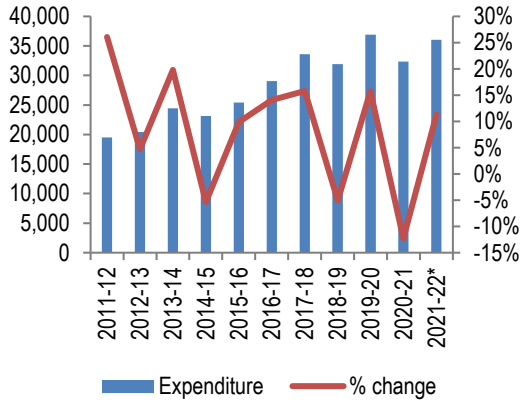
Over the last few years, the number of teachers in the schooling system has increased (from nearly 82 lakh in 2013-14 to nearly 89 lakh in 2016-17).[11] This has led to a decline in the Pupil-Teacher Ratio (PTR) across school education (from 31.3 in 2013-14 to 28.4 in 2016-17). PTR is defined as the number of students per teacher. According to the RTE Act, 2009, the PTR should ideally be lower than 30:1 at the primary level, and 35:1 at the upper primary level. Amongst the states, only Uttar Pradesh and Bihar do not meet the RTE prescribed PTR at the primary level, with a PTR of 39 and 36, respectively.

The NEP also observes that the quality of teacher education, recruitment, deployment, and service conditions are not up to desired standards. Further, it noted the significant teacher vacancies across India. It also adds that poor service conditions and culture, and lack of career progression amongst teachers affects their motivation and teaching quality.

Department of Higher Education

Higher education includes under graduate and post graduate courses, doctoral degrees, and certificates following the completion of 12 years of schooling or equivalent. The higher education system in India comprises of more than 1,000 universities, 42,000 colleges, and 3.8 crore students.[37] Most of the colleges in India are private unaided colleges (65%), followed by government colleges (21%), and private aided colleges (14%).[38]

Figure 5: Trend of actual expenditure of the Department of Higher Education (in Rs crore, year-on-year change in %)



Note: Figures for 2021-22 are revised estimates.
Sources: Expenditure Budget, 2011-22; PRS.

In 2022-23, the Department of Higher Education has been allocated Rs 40,828 crore (13% increase over revised estimates of 2021-22). This is 39% of the total budget allocation to the Ministry of Education. In 2021-22, the allocation for the department was Rs 38,351 crore, which was reduced to Rs 36,032 crore at the revised stage (6% decrease).

Between 2011-12 and 2021-22, the Department's expenditure has seen a compounded annual growth of 6%. Figure 5 depicts the allocation to the Department of Higher Education from 2010-11 to 2021-22.

Table 8 indicates utilisation of funds to the department between 2010-11 and 2020-21.

Table 8: Comparison of budget estimates and the actual expenditure (2010-21) (in Rs crore)

Year	Budget Estimate	Actuals	Utilisation % (Actuals/BE%)
2011-12	21,912	19,505	89%
2012-13	25,275	20,423	81%
2013-14	26,750	24,465	91%
2014-15	27,656	23,152	84%
2015-16	26,855	25,439	95%
2016-17	28,840	29,026	101%
2017-18	33,330	33,614	101%
2018-19	35,010	31,904	91%
2019-20	38,317	36,916	96%
2020-21	39,467	32,900	83%
2021-22	54,874	51,970	95%

Note: Figures for 2021-22 are revised estimates.
Sources: Union Budgets 2011-22; PRS.

The utilisation has generally been below the budgeted amount. In 2016-17 and 2017-18, the Department's expenditure exceeded the budget estimates. Table 9 provides the major heads of financial allocation under the Department for 2021-22.

Table 9: Major expenditure heads for Department of Higher Education, 2022-23 (in Rs crore)

Major Head	2020-21 Actuals	2021-22 RE	2022-23 BE	% change (RE to BE)
Universities	8,807	9,288	9,914	7%
IITs	6,681	8,345	8,495	2%
Statutory and regulatory bodies	4,194	5,139	5,321	4%
NITs and IIEST	3,252	3,699	4,364	18%
Student Financial Aid	1,834	2,089	2,078	-1%
RUSA	165	793	2,043	158%
World Class Institutions	1,016	1,200	1,700	42%
IISERs	993	1,121	1,380	23%
IISc	604	622	727	17%
IIMs	465	651	654	0%
Digital India e-learning	280	368	421	15%
IIITs	339	407	543	33%
Research	214	144	219	51%
Others	3,533	2,164	2,971	37%
Total	**32,378**	**36,032**	**40,828**	**13%**

Note: Universities include grants to central universities, and Deemed Universities promoted by central government.
Sources: Expenditure Budget 2021-22; PRS.

In 2022-23, the highest share of the departmental allocation is for universities (24%), IITs (21%), statutory and regulatory bodies (13%), and NITs and the Indian Institute of Engineering Science and Technology (11%).

In December 2021, the Comptroller and Auditor General (CAG) had released its performance audit of the eight new IITs (in Bhubaneswar, Gandhinagar, Hyderabad, Indore, Jodhpur, Mandi, Patna, and Ropar), which were established during 2008-09.[39] The report covers the activities of these IITs during 2014-19. The Ministry envisaged an overall intake of 18,880 students across the eight IITs between 2008-14. The audit found that only 6,224 students (out of the planned intake of 18,800 students) were admitted during this period. Further, although the Ministry of Education had permitted an increase in sanction of faculty positions, the seven IITs had vacancies in faculty positions ranging from 5% to 36%. As of February 2022, there were 4,370 vacant faculty positions across the 23 IITs.[40] The CAG also noted that the pace of infrastructure creation did not correspond with the pace of envisaged increase of student/faculty. The CAG recommended: (i) increasing the pace of establishing infrastructure, and (ii) attracting research from non-funding resources.

In 2021-22, the allocation for Rashtriya Uchchtar Shiksha Abhiyan (RUSA) reduce from Rs 3,000 crore at the budget estimates stage, to Rs 793 crore at the revised estimates stage (Table). RUSA aims to improve the overall quality of existing state higher educational institutions.[41] As of December 2021, more than 2,900 projects worth Rs 14,600 crore have been approved in all states (and UTs) under RUSA.[42] Under RUSA, states were required to establish State Higher Education Councils for: (i) synergising resources from the centre and state, (ii) channelling resources to institutions from the state budgets, and (iii) planning, monitoring, quality control and co-ordination of higher education at state level.[41]

The allocation to World Class Institutions in 2022-23 is Rs 1,700 crore. This is 42% more than the allocation in 2021-22 at the revised estimates stage. The government has granted the status of Institution of Eminence (IoE) to ten private institutions and eight public institutions.[43] These institutions have greater autonomy in admitting foreign students, fixing fees, and recruiting foreign faculty. Further, each public institution declared as an Institute of Eminence gets financial assistance of up to Rs 1,000 crore over five years.[44]

Issues in the higher education sector

Enrolment

The overall Gross Enrolment Ratio in higher education in India has increased from 19.4% in 2010-11 to 27.1% in 2019-20.[45] Gross Enrolment Ratio (GER) is the percentage of students enrolled in a higher education course from the age group of 18-23 years. In 2019-20, the GER for female students (27.3%) was higher than the GER for male students (26.9%).[47] India's GER in higher education (27.1%) is much lesser than countries like USA (86%), Germany (68%), UK (57%) and China (43%).[46] States where GER is below the national level include Bihar (14.5%), Assam (17.3%), and Chhattisgarh (18.5%).[47]

The Standing Committee (2016) had noted that the Gross Enrolment Ratio (GER) in higher education in the country has increased due to the government of India's efforts of setting up new Central Universities in the country, including Indian Institutes of Information Technology (IIITs).[48]

As of 2019-20, the highest enrolment is at the under graduate level (80%), followed by post graduate level (11%).[47] Enrolment at the Ph.D level is just 1% of the total enrolment in higher education. Most students at the under graduate level are enrolled in the arts stream (30%), followed by science (16%), commerce (14%), and engineering (12%).[47] The preferred subject at the post graduate level is social science, followed by science and management.[47] At the Ph.D. level, majority of the students chose science. [47]

The NEP aims to increase the GER in higher education to 50% by 2035. This will be achieved by improvement in the capacity of existing higher education institutes by restructuring and expanding existing institutes.[3] Note that in countries like USA, where the GER in higher education is 86%, the average amount of student debt for federal loans is USD 27,000 (Rs 20 lakh).[49]

Further, NEP recommends that all institutes should aim to be large multidisciplinary institutes (with enrolments in thousands), and there should be one such institution in or near every district by 2030. Further, institutions should have the option to run open distance learning and online programmes to enhance the reach of higher education.[3]

Regulation of higher education

The NEP observes that higher education in India has been overly regulated with too little effect. It noted problems of concentration of power, conflict of interest, and a resulting lack of accountability in higher education regulation.

In India, higher education is regulated by multiple authorities. The University Grants Commission (UGC) regulates universities and colleges teaching general subjects. It is empowered with disbursing grants to universities for their maintenance and development, and with regulating fees charged by them. It also has powers regarding the recognition, functioning, and de-recognition of deemed universities. Failure to comply with UGC standards may result in withdrawal of grants or termination of affiliation of a college to a university if the college does not comply with fee structure and other regulations.[50]

Universities in India (public or private) are established by an Act of Parliament or state legislatures. The central government can also declare an institution to be a deemed university based on recommendations of the UGC. Such universities are allowed to set their own syllabus, admission criteria, and fees. Some prominent higher educational institutions are also classified as institutions of national importance (INI). Universities awarding their own degrees can be classified into five categories based on their management: (i) Central Universities; (ii) State Universities; (iii) Private Universities; (iv) Institutions-deemed-to-be-a-University; and (v) Institutions of National Importance.

Out of the 3.5 crore students enrolled in higher education, most attend state universities (85%), followed by central universities (7.7%), private universities (3.4%), deemed universities (2.5%), and institutes of national importance (0.8%).[47] IITs, IIITs, NITs, IIEST, IISERs, and IIMs, among others, are recognised as institutes of national importance.[51] In terms of type of universities, the highest budget allocation for 2022-23 went to institutes of national importance (38%), followed by central universities (24%) and state universities (5%).

The All-India Council for Technical Education (AICTE) regulates universities or colleges offering

technical courses such as engineering and management. These institutions are required to comply with the academic standards and regulations set by AICTE.[52] Additionally, institutions offering courses related to medical, legal, nursing, or architectural education are regulated by 15 professional councils such as the Medical Council and the Bar Council. These councils also conduct qualifying examinations for entering the profession.

For setting quality standards and accreditation, there are, currently, two accrediting institutions: (i) the National Board of Accreditation (NBA) established by AICTE, and (ii) the National Assessment and Accreditation Council (NAAC) established by UGC.

The NBA only accredits programs in engineering, computer application, pharmacy, architecture, management, hotel management and catering technology.[53]

The NAAC undertakes quality assessment of higher educational institutes, and provides a final institutional grade on a four-point scale.[54] The grades range from D (not accredited) to A++. The assessment is based on seven criteria, which include: (i) curricular aspects, (ii) teaching, learning and evaluation, and (iii) infrastructure and learning resources.[55] As of December 2020, only 318 universities (30%) and 5,542 colleges (13%) were accredited by NAAC.[38] Out of these, only 182 universities and 1,410 colleges had a rating of A and above.

The Standing Committee on Human Resource Development (2016) noted that accreditation of higher educational institutions needs to be at the core of the regulatory arrangement in higher education. Further, the Committee recommends that credit rating agencies, reputed industry associations, and professional bodies should be encouraged to rate Indian universities and institutions.

The Standing Committee on Human Resource Development (2020) noted higher education to be of global importance.[7] The Committee recommended alignment of the higher education system in India with global standards by developing graduates with new skills, a broad knowledge base, and competencies. The Committee noted that this could be achieved by: (i) upgrading existing institutions, (ii) allocating more funds towards university-based research, and (iii) promoting collaborations among institutions.

Earlier, the draft Higher Education Commission of India Bill (HECI) was placed in public domain for comments. The HECI will act as an umbrella body with four separate arms for: (i) standard-setting, (ii) accreditation, (iii) regulation, and (iv) funding. As of February 2022, stakeholder consultations for the bill are in progress.[56]

Issues related to teachers and training

As of September 2020, 6,210 teaching posts are vacant across 42 central universities which come within the purview of the Ministry of Education.[57] As of December 2021, more than 14,400 teaching posts are vacant across all centrally funded higher education institutes.[58,59]

The Standing Committee on Human Resource Development (2016) noted that this could be due to two reasons: (i) young students don't find the teaching profession attractive, or (ii) the recruitment process is long and involves too many procedural formalities.[48]

The Standing Committee on Education, Women, Children, Youth, and Sports (2021) noted that the current evaluation system of faculty recruitment is ineffective.[60] The Committee recommends transforming the National Eligibility Test to align with the latest modes of teaching and research. Further, the Committee observed a need for a mechanism to monitor faculty induction and development. The Committee recommended creating an independent cadre of faculty for all centrally funded institutes, through a common exam conducted by the National Testing Agency or Union Public Service Commission

The NEP states that National Professional Standards for Teachers will be developed by 2022. The standards will specify expectations from a teacher at different levels of expertise. These standards will be revised in 2030 and thereafter every ten years to ensure the efficacy of the system.

Infrastructure in higher education institutes

As of 2019-20, more than 80% universities had playgrounds, auditoriums, libraries, laboratories, conference halls, common roofs, cafeteria, computer centres, and first aid rooms.[47] About half of all universities had theatres, indoor stadiums, and connectivity to the National Knowledge Network (NKN).[47] The NKN is a high-speed internet backbone, connecting higher education institutes, research labs, and data centres for seamless sharing of research and knowledge.[61]

The Higher Education Financing Agency (HEFA) is tasked with the creation of high-quality infrastructure in premier educational institutions. It is jointly promoted by Canara Bank and the Ministry of Education with an authorised capital of Rs 10,000 crore. All the centrally funded higher educational institutions are eligible for joining as members of the HEFA.[62] HEFA has been tasked to mobilise one lakh crore rupees to meet the infrastructure needs of higher educational institutions by 2022.[63] In 2019-20, HEFA has sanctioned nearly Rs 8,600 crore for 48 projects, and disbursed nearly Rs 1,200 crore.[64]

Issues related to research funding and output

India's investment in research and development (as a percentage of GDP) has reduced from 0.8% in 2008 to 0.7% in 2018.[65] This is much lower than the United States (2.8%), China (2.1%), Israel (4.3%), and South Korea (4.2%).[65] As a result, India's research output is lesser compared to some other countries.

For example, in 2017, India's number of patent applications (46,000) were 7% of those filed by the United States (6 lakh), and just 3% of those filed by

China (13.8 lakh).[66] Further, the share of Indian residents in total applications has increased from 20% in 2010-11 to 40% in 2020-21.[66]

The Economic Survey (2021-22) notes that the number of patents granted in India has increased from 7,509 in 2010-11 to 28,391 in 2020-21.[66] As of 2020, this was much lesser compared to China (5.3 lakh), USA (3.5 lakh), Japan (1.8 lakh), and Korea (1.3 lakh).[66]

In terms of publications, India's share of scientific publications increased from 3.1% in 2009 to 4.8% in 2016. As of 2016, both USA (18%) and China (19%) published approximately four times as many articles.

In the 2021-22 Union Budget Speech, the Finance Minister announced the establishment of the National Research Foundation (NRF).[67] The NRF was given an outlay of Rs 50,000 crore over five years. As per the detailed project report, the NRF's key objectives will include: (i) funding competitive peer-reviewed grant proposals of all types, submitted in any of our official languages to individuals or groups of individuals, across all disciplines, and (ii) funding research infrastructure at individual institutions and other research equipment that can be shared across multiple institutions.[65]

The Standing Committee on Education (2021) recommended that funding from National Research Foundation (NRF) should focus on themes having national importance as identified after due consultations with different Ministries/organisations.[58]

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Annexure

Table 10: Allocations to the Ministry of Education for 2022-23 (in Rs crore)

Major Heads	2020-21 Actuals	2021-22 RE	2022-23 BE	% change (RE to BE)
Department of School Education and Literacy	**51,842**	**51,970**	**63,449**	**22.1%**
National Education Mission	27,923	30,003	37,510	25%
-*Samagra Shiksha*	27,835	30,000	37,383	25%
-*Teachers Training and Adult Education*	89	3	127	4,518%
Autonomous bodies	10,388	11,073	12,359	12%
PM POSHAN	12,878	10,234	10,234	-
Exemplar	-	-	1,800	-
ASPIRE*	-	-	600	-
National Means Cum Merit Scholarship Scheme	321	284	350	23%
Others	331	376	596	58%
Department of Higher Education	**32,378**	**36,032**	**40,828**	**13%**
Statutory and regulatory bodies (UGC and AICTE)	4,194	5,139	5,321	4%
NITs and IIEST	3,252	3,699	4,364	18%
Student Financial Aid	1,834	2,089	2,078	-1%
Rashtriya Uchhatar Shiksha Abhiyan (RUSA)	165	793	2,043	158%
World Class Institutions	1,016	1,200	1,700	42%
IISERs	993	1,121	1,380	23%
IISc Bangalore	604	622	727	17%
IIMs	465	651	654	0%
Digital India e-learning	280	368	421	15%
IIITs	339	407	543	33%
Research and Innovation	214	144	219	51%
Others	12,340	11,453	12,885	13%
Total	**32,378**	**36,032**	**40,828**	**13%**

Sources: Expenditure Budget 2022-23; PRS.

Demand for Grants 2022-23 Analysis
Health and Family Welfare

In the last two years, the COVID-19 pandemic and its aftermath has highlighted the importance of a robust public health system. In India, states have the primary responsibility of managing the public health system. The Ministry of Health and Family Welfare sets the overall policy and regulatory framework of the health sector. It also implements the National Health Mission and various other schemes which deal with all levels of healthcare systems in the country.

Last year, one of the focus areas in the union budget was health and well-being. This translated into announcement of the PM AtmaNirbhar Swasth Bharat Yojana which seeks to improve healthcare systems at the primary, secondary and tertiary levels; allocating Rs 35,000 crore towards the COVID-19 vaccination programme; and allocating additional grants to states for health, water and sanitation.

While these programmes and schemes have helped in improving the status of the public health system in the country, there is still a long way to go. India's overall investment in its public health system is one of the lowest in the world. The physical infrastructure of health systems is still fairly poor, especially in rural areas. There is shortage of human resources (both doctors and support staff). People continue paying high amounts out of their own pocket implying that access to public health care, quality of public health care and overall insurance coverage needs to improve. The National Health Profile (2020) recognises that health financing is one the key ways to achieve universal health coverage, which is one of the goals under the National Health Policy, 2017.[1] Appropriate health financing will also help ensure adequate funds for health care, provide equitable access to all population groups and reduce barriers to utilise health services.

In this note we examine the trends in the financial allocation towards the Ministry of Health and Family Welfare, issues with health financing and key issues with the health sector.

Overview of finances

In 2022-23, the Ministry of Health and Family Welfare has been allocated Rs 86,201 crore.[2] This is a marginal 0.2% increase over the revised estimates of 2021-22. The **Department of Health and Family Welfare** accounts for 96% of the Ministry's allocation at Rs 83,000 crore, while the **Department of Health Research** has been allocated Rs 3,201 crore (4% of the allocation).

Highlights of the Budget speech 2022-23

An open platform will be rolled out for the National Digital Health Ecosystem. It will consist of digital registries of health providers and health facilities, unique health identity, consent framework, and universal access to health facilities.

To improve access to quality mental health counselling and care services, a 'National Tele Mental Health Programme' will be launched. This will include a network of 23 tele-mental health centres of excellence, with NIMHANS as the nodal centre and International Institute of Information Technology, Bangalore providing technology support.

The Department of Health and Family Welfare is broadly responsible for: (i) implementing health schemes, and (ii) regulating medical education and training. The Department of Health Research is broadly responsible for conducting medical research.

Table 1: Budget allocation for the Ministry of Health and Family Welfare (in Rs crore)

Item	2020-21 Actuals	2021-22 RE	2022-23 BE	% Change (RE 2021-22 to BE 2022-23)
Health & Family Welfare	77,569	82,921	83,000	0.1%
Health Research	3,125	3,080	3,201	3.9%
Total	**80,694**	**86,001**	**86,201**	**0.2%**

Note: BE – Budget Estimate; RE – Revised Estimates.
Sources: Demand Number 46 and 47, Expenditure Budget 2022-23; PRS.

COVID-19 related expenditure: In 2022-23, the only COVID-19 specific allocation under this Ministry is Rs 226 crore allocated towards the Insurance Scheme for Health Care Workers fighting COVID-19. In addition, the Ministry of Finance has allocated Rs 5,000 crore towards COVID-19 vaccination.

As per the revised estimates of 2021-22, the Ministry of Health and Family Welfare has allocated Rs 16,545 crore towards COVID-19 related expenditure. This includes Rs 14,567 crore allocated towards the second phase of the COVID-19 Emergency Response and Health System Preparedness Package, and Rs 1,165 crore towards phase I (includes Rs 526 crore allocated to the Indian Council of Medical Research (ICMR) for procurement of testing kits, equipment). In 2021-22, the Ministry of Finance had estimated expenditure of Rs 35,000 crore towards COVID-19 vaccination. As per the revised estimates of 2021-22, this amount is estimated to increase to Rs 39,000 crore.

In 2020-21 (actuals), the Ministry spent Rs 11,941 crore on COVID-19 which includes expenditure towards the Emergency Response and Health System Preparedness Package (Rs 10,529 crore), allocation to

ICMR (Rs 1,275 crore), and vaccination for healthcare workers and frontline workers (Rs 137 crore). Table 2 details the main heads of expenditure under the Ministry allocated for the year 2022-23.

Table 2: Main heads of expenditure (in Rs crore)

Major Heads	2020-21 Actuals	2021-22 RE	2022-23 BE	% Change (RE 2021-22 to BE 2022-23)
National Health Mission (total)	37,080	34,447	37,000	7.4%
AIIMS, ICMR, CGHS and other autonomous and statutory bodies	12,197	13,979	15,200	9%
PMSSY	6,840	7,400	10,000	35.1%
PMJAY	2,681	3,199	6,412	100.4%
PM ABHIM		1,040	5,846	462.0%
National AIDS & STD Control Programme	2,815	2,350	2,623	11.6%
Family Welfare Schemes	462	306	484	58.2%
COVID-19	11,941	16,545	226	-98.6%
Others	6,679	6,735	8,409	25%
Total	**80,694**	**86,001**	**86,201**	**0.2%**

Note: Expenditure on COVID includes allocation towards both phases of COVID-19 emergency response, vaccination of healthcare and frontline workers, insurance for healthcare workers, and procurement of COVID-19 testing kits; BE - Budget Estimate; RE - Revised Estimates; AIIMS – All India Institute of Medical Sciences (New Delhi); ICMR – Indian Council of Medical Research; CGHS - Medical Treatment of CGHS Pensioners; PMJAY - Pradhan Mantri Jan Arogya Yojana; PMSSY - Pradhan Mantri Swasthya Suraksha Yojana; PM ABHIM - Pradhan Mantri Ayushman Bharat Health Infrastructure Mission.
Sources: Expenditure Budget 2022-23; PRS.

Issues to consider

Investment in public health has been low

India's public health expenditure (centre and states) was 1.8% of the GDP in 2020-21.[3] This is higher than the trend in the last decade when public health expenditure as percentage of GDP was between 1.1% - 1.5%.[4,5] However, this allocation is much lower as compared to other countries.[4,6,7,8] The Economic Survey 2020-21 observed that India ranks 179th among 189 countries in prioritising healthcare in the government budget.[4] The National Health Policy, 2017 aims to increase public health expenditure to 2.5% of the GDP by 2025.[1]

The National Health Policy, 2017 noted that while general taxation would remain the largest means for financing health care, the government could consider imposing taxes on specific commodities such as tobacco, alcohol and foods having negative impact on health, and also levy taxes on extractive industries and pollution cess.[1] In 2018-19, the central government announced a 4% Health and Education Cess in place of the 3% Education Cess on Income Tax and Corporation Tax, to cater to the education and health needs of the poor and rural families.[9] In 2022-23, Rs 53,846 crore is estimated to be collected through the health and education cess, which is an 14% increase over the amount collected in 2021-22 (RE).[10]

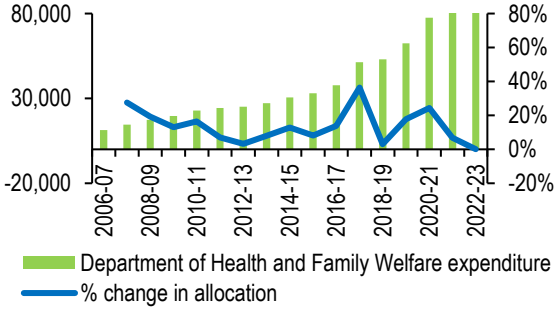
In 2020-21, the central government introduced a 5% health cess which is imposed as customs duty on certain medical equipment.[11] This was to be utilised for financing health infrastructure and services in aspirational districts. In 2022-23, Rs 870 crore is estimated to be collected under this health cess (customs), which is a 12% increase over the amount collected in 2021-22 (RE).[10]

The 15th Finance Commission noted that the health sector faces multiple challenges such as low investment, inter-regional disparities especially in nutrition levels and hunger, shortage of doctors, paramedics, hospitals, and inadequate numbers of primary healthcare centres.[12] It recommended unconditional grants amounting to one lakh crore rupees for the health sector (for the time period 2021-26). In addition, it suggested that by 2022, states should spend more than 8% of their budget on health. In 2021-22, as per budget estimates, states have allocated only 6% of their budget towards health.

Allocation towards the Department of Health and Family Welfare has been low despite high utilisation

Between 2006 and 2022, the allocation to the Department of Health and Family Welfare has increased at a CAGR of 13%. (Compound Annual Growth Rate (CAGR) is the annual growth rate over a certain period of time.) Over the past few years, the Standing Committee on Health and Family Welfare has noted that the allocation towards the Department has been lower than the amount sought by the Department. This is despite budget utilisation being 100% or higher (post 2015-16). In 2020-21, the Department spent Rs 77,569 crore which was 19% more than what was estimated at the budget stage. In 2021-22 also, the Department is expected to exceed the budget estimate by 16%.

Figure 1: Allocation to the Department of Health and Family Welfare (2006-22) (in Rs crore)



Note: For 2021-22, % change in allocation is 2021-22 RE over 2021-22 BE; BE – Budget Estimate; RE – Revised Estimate.
Sources: Expenditure Budgets, 2006-07 to 2022-23; PRS.

Primary healthcare is lacking and requires more investment

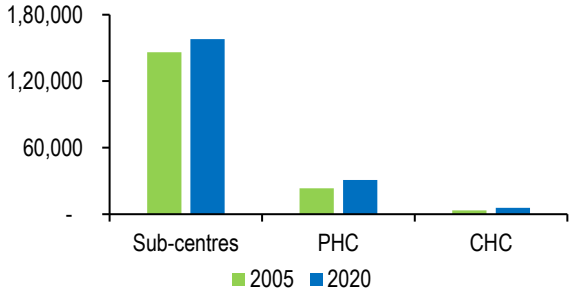
Depending on the level of care required, healthcare in India is broadly classified into three types: primary

care (provided at primary health centres), secondary care (provided at district hospitals), and tertiary care institutions (provided at specialised hospitals like AIIMS). Primary health care infrastructure provides the first level of contact between health professionals and the population.[13]

Based on the population served and the type of services provided, primary health infrastructure in rural areas consists of a three-tier system. This includes Sub-Centres (SCs), Primary Health Centres (PHCs), and Community Health Centres (CHCs).[14] Primary healthcare systems are managed and administered by states (since public health is a state subject). The Ministry provides states with technical and financial assistance to help improve their public healthcare delivery systems. In the union budget 2017-18, it was announced that 1.5 lakh SCs and PHCs will be transformed into Health and Wellness Centres (HWCs) by December, 2022.[15]

Primary healthcare system: As on March 31, 2020, 1,55,404 SCs, 24,918 PHCs and 5,183 CHCs were functioning in rural areas.[16] In urban areas, there were 2,517 SCs, 5,895 PHCs, and 466 CHCs.[16]

Figure 2: Number of Sub Centres, PHCs, and CHCs (2005 and 2020)



Note: PHC – Primary Health Centre; CHC: Community Health Centre.
Sources: Rural Health Statistics 2017-19; PRS.

Ayushman Bharat- Health and Wellness Centres Scheme (AB-HWC): HWCs provide a range of services beyond maternal and child healthcare services. These include: (i) care for non - communicable diseases, (ii) rehabilitative care, (iii) mental health services, (iv) first level care for emergencies and trauma, and (v) free essential drugs and diagnostic services.[17] As on February 6, 2022, 90,030 HWCs were operational across the country.[18] Note that the target is to create 1.5 lakh HWCs by December 2022.

The number and distribution of SCs, PHCs and CHCs in rural areas is based on population norms. However, the Standing Committee on Health (2021) had noted that there are shortfalls of 23% in SCs, 28% in PHCs, and 37% in CHCs.[19] The 15th Finance Commission also noted that there are critical gaps with respect to sub centres, PHCs, CHCs and wellness centres in some states.[20] It noted that as of March 31, 2020, 885 PHCs and 33,886 SCs did not have the necessary infrastructure to meet the targets of the National Health Policy, 2017.[12]

As per the Rural Health Statistics 2019, SCs, PHCs, and CHCs still do not meet the required coverage targets (see Table 3).

Table 3:Average rural population covered by health facility (based on the mid-year population as on July 1, 2020)

Health Facility	Norm	Average rural population covered
SC	300 – 5,000	5,729
PHC	20,000 – 30,000	35,730
CHC	80,000 – 1,20,000	1,71,779

Source: Rural Health Statistics 2019; PRS.

The Standing Committee on Health (2021) also noted that inadequate primary health infrastructure in several areas and absence of an organised primary healthcare system in urban areas were some of the issues that led to poor management of the COVID-19 outbreak.[21] The 15th Finance Commission observed that prevention and early management of health problems can reduce the need for complicated specialist care provided at the tertiary level.[12] It recommended that the focus of healthcare provision in the country should be towards providing primary healthcare.

The 15th Finance Commission noted that India is estimated to have 1.4 hospital beds per 1,000 people, which is half the global average of 2.9 beds (World Bank estimate in 2017).[22] Over 60% of these beds are in the private sector.[12] In comparison, China has over four beds per 1,000 people, Sri Lanka, the United Kingdom and the United States all have around three beds per 1,000 people, while Thailand and Brazil have more than two beds per 1,000 persons.[12] The National Health Policy, 2017 aims to increase the availability to two beds per 1,000 people. This could be achieved by creating 3,000 to 5,000 hospitals with 200 beds each by 2025.[12]

National Health Mission: The National Health Mission (NHM) provides states with financial assistance towards interventions focused on strengthening primary and secondary healthcare. It comprises of a rural sub mission, the National Rural Health Mission (NRHM) and an urban sub-mission, National Urban Health Mission (NUHM). Key program components of the NHM include health system strengthening in rural and urban areas, Reproductive-Maternal- Neonatal-Child and Adolescent Health (RMNCH+A), and Communicable and Non-Communicable Diseases. States have the flexibility to plan and implement state specific action plans within these broad national parameters and priorities. They are provided with technical and financial assistance based on these plans, subject to availability of resources.

In 2022-23, NHM has been allocated Rs 37,000 crore. Of this, Rs 22,317 crore has been allocated towards the Flexible Pool for RCH and Health System

Strengthening, National Health programme and NUHM. Rs 6,343 crore has been allocated towards infrastructure maintenance. The allocation for NHM in 2022-23 is 7.4% higher than the revised estimates of 2021-22.

Pradhan Mantri Ayushman Bharat Health Infrastructure Mission (PM ABHIM): PM ABHIM was launched in October 2021 (renaming the Prime Minister Atmanirbhar Swasth Bharat Yojana that was announced in Budget 2021).[23] It is a Centrally Sponsored Scheme (with some Central Sector component) spread over five years from 2021-22 to 2025-26. The Mission focuses on developing capacities of health systems and institutions across primary, secondary and tertiary healthcare levels, to prepare health systems in responding effectively to the current and future pandemics.

One of the components seeks to enable early detection of diseases through HWCs. These HWCs will also provide medical consultation, test facilities and medicine free of cost. Further, 35,000 new critical care beds will be added in 600 districts, and referral facilities (transferring patients from one health care facility to other) will be provided in 125 districts.

Under the second component, integrated public health laboratories will be created in 730 districts. Block level public health units will be created in 3,000 blocks. The network for diagnostic facilities will be strengthened by using five regional national centres for disease control, 20 metropolitan units, and 15 bio-safety level labs.

The Mission has been allocated Rs 5,846 crore in 2022-23. In 2021-22 (RE), the Mission was allocated Rs 1,040 crore.

Poor investment in primary health care

Allocation towards NHM and PM ABHIM form just about half of the Ministry's budget. The National Health Policy, 2017 suggests allocating up to two-thirds or more of the budget to primary care, followed by secondary and tertiary care. The 15th Finance Commission also recommended that by 2022, two-thirds of the total health expenditure should be on primary healthcare.

Low investment in public health impacts the ability of the government to invest in primary health infrastructure, in increasing the human resources available, and ensuring that all citizens have access to basic health care. It has also resulted in citizens preferring to use private health facilities over government ones, and spending more from their pocket on basic health care.

As per the 75th NSS survey (July 2017 and June 2018), about 33% ailments in rural areas and 26% in urban areas were treated in government hospitals.[24] The remaining were treated in private hospitals (21% in rural, 27% in urban), or by private doctors/clinics (41% in rural, 44% in urban), and the rest with informal health care providers and charitable hospitals.[24] This is despite higher average expense for treatment (without hospitalisation) in private hospitals (Rs 1,062) as compared to government hospitals (Rs 331).[25] The 15th Finance Commission noted that private health care in India is expensive, and also lacks trained and skilled manpower.

The 15th Finance Commission has recommended grants of Rs 70,051 crore, over the period of five years (2021-2026) through local governments, for strengthening the primary healthcare system. These grants will provide for: (i) conversion of rural SCs and PHCs to HWCs, (ii) support for diagnostic infrastructure for primary healthcare activities, and (iii) support for urban HWCs, SCs, PHCs, and public health units at the block level. The Commission also recommended that centrally sponsored schemes (CSS) in health should be flexible enough to allow states to adapt and innovate, and the focus of these schemes should shift from inputs to outcome. It also recommended strengthening local governments in terms of resources, health infrastructure and capacity building which would enable them to play an enhanced role in health care delivery, including in crisis times.

Out-of-pocket spending by individuals is high

Poor public spending, and poor public health infrastructure has led to individuals spending higher amounts on healthcare services. Out-of-pocket expenditure is the payment made directly by individuals at the point of service where the entire cost of the health service is not covered under any financial protection scheme. The Economic Survey 2020-21 noted that in India out-of-pocket expenditure by households is one of the highest in the world.[4]

According to the National Health Accounts estimates, in 2017-18, out-of-pocket expenditure on health as a percentage of total health expenditure in the country was 48.8%.[26] This has reduced from 69.4% in 2004-05.[26] In several cases, this expenditure is paid out through borrowings. As per the NSS Survey on Health in India (2018), in rural areas, 13.4% of the hospitalisation cases were financed by individuals through borrowings. In urban areas, this share was at 8.5%.[27] Between 3-4% people in both rural and urban areas required support from friends and relatives.[27] In 2017-18, private sector health expenditure was 5.8% of the total health expenditure. Government health expenditure (both centre and states) including capital expenditure was 40.8 % of the total health expenditure.

The Ministry introduced the Ayushman Bharat - Pradhan Mantri Jan Arogya Yojana (PMJAY) to provide health insurance coverage to poor and vulnerable families, for accessing secondary and tertiary healthcare services through empanelled public and private healthcare facilities.[28] While PMJAY provides coverage for secondary and tertiary levels of healthcare. Of the health expenditure in 2017-18,

47% was towards primary care, 34% towards secondary care, and 14% towards tertiary care (the remaining is towards governance and supervision).[26]

The 15th Finance Commission noted that about 60 million Indians are pushed into poverty each year due to out-of-pocket payments for health. This implies that health insurance or any kind of financial protection measures must cover expenses at all levels of healthcare. The Economic Survey 2020-21 noted that increasing government spending on public health from 1% of the GDP to 2.5-3% of GDP will help in reducing out-of-pocket expenditure from 60% to 30%.[3,4] It also noted that Indian states that have higher per capita spending on health have lower out-of-pocket expenditure, which is also true at global level.

Insurance schemes to help reduce out of pocket spending

Under PMJAY, insurance cover up to five lakh rupees per family per annum is provided to around 10.74 crore poor and vulnerable families, whose eligibility is determined as per the Socio-Economic Caste Census (2011).[28] The insured families can access secondary and tertiary healthcare services through empanelled public and private facilities. The scheme subsumed two centrally sponsored schemes, namely, Rashtriya Swasthya Bima Yojana (RSBY) and the Senior Citizen Health Insurance Scheme. The scheme provides coverage for 1,573 procedures, and pre and post-hospitalisation expenses as well.

Allocation: In 2022-23, PMJAY has been allocated Rs 6,412 crore, which is double the revised estimates of 2021-22 (Rs 3,199 crore). Experts have noted that this amount may be low considering the expenditure required on PMJAY.

A study by the 15th Finance Commission on Ayushman Bharat (2019) estimated the demand and expenditure on PMJAY for the next five years.[20] It stated that the total costs (centre and states) of PMJAY for 2019 could range from Rs 28,000 crore to Rs 74,000 crore. This estimate considers: (i) the assumption that all targeted beneficiaries will be covered (approximately 50 crore people), (ii) hospitalisation rates over time, and (iii) average expenditure on hospitalisation. These costs could go up to between Rs 66,000 crore and Rs 1,60,089 crore in 2023 (accounting for inflation).

Implementation: The Economic Survey 2020-21 noted that PMJAY enhanced health insurance coverage. The proportion of health insured households increased by 54% in states that implemented PMJAY and decreased by 10% for states which did not implement it.[4]

However, utilisation of the amount allocated to the scheme has also been poor. While 83% of budget allocation was utilised in 2018-19, the utilisation decreased to 50% in 2019-20, and to 42% in 2020-21. In 2021-22, the allocation towards the scheme has been halved at the revised stage. This could imply gaps in implementation of the scheme.

Table 4 shows details regarding the implementation of the Ayushman Bharat programme which includes PMJAY and Health and Wellness Centres.

Table 4: Status of implementation of PMJAY (April 1, 2021 to November 28, 2021)

Indicators	All India
Total footfalls	82.6 crore*
Ayushman cards issued	17.2 crore
Funds disbursed to states/UTs for implementation	Rs 2,544 crore
Total hospital admissions authorised	74.7 lakh
Claims paid towards authorised hospital admissions (COVID-19 and Non-COVID-19 treatment)	Rs 2,450 crore*
Claims paid for authorised hospital admissions for COVID-19 treatment	Rs 1,056 crore*
Health and Wellness Centres	90,030*

Note: *As on February 6, 2022.
Sources: Lok Sabha Starred Question No. 95, Ministry of Health and Family Welfare, answered on December 3, 2021; HWC Portal, Ayushman Bharat; PRS.

The Standing Committee on Health and Family Welfare (2020) noted that PMJAY faces various implementation challenges.[29] One of the key issues is identification of beneficiaries. The scheme allows only those persons to avail insurance who have been included in the SECC 2011. This database is more than a decade old and hence may not capture the entire population in need of such insurance. The Standing Committee on Health (2021) had recommended that the Ministry should expand the list of beneficiaries under PMJAY.[19] The Committee (2021) also noted that the utilisation of PMJAY was also adversely impacted due to COVID-19.

Note that, the Standing Committee on Health (2018) and a study report of the 15th Finance Commission (2019) had noted that PMJAY is just an extension of RSBY which provided for coverage of up to Rs 30,000 per family per annum.[20,30] Hence, to ensure proper implementation of the scheme, an analysis of the failures and inadequacies of RSBY should be done. This would look at whether: (i) RSBY covered all potential beneficiaries, (ii) hospitalisation rates increased under the scheme, and (iii) insurance companies were profitable under the scheme. The key challenges identified in the implementation of RSBY include: (i) low rate of enrolment of beneficiaries, (ii) increase in out-of-pocket expenditure, and (iii) issues in empanelment of healthcare service providers.[31]

Shortfall in human resources

The Economic Survey 2020-21 observed that the aggregate density of health workers is closer to 23 per 10,000 population, which is the lower threshold recommended by the World Health Organisation (WHO).[4] This is significantly lower than the adequate density of 44.5 health workers per 10,000 population, recommended by WHO to achieve the Sustainable Development Goals (SDG) targets by 2030. As of

2019, there is one doctor per 1,511 people, which is lower than the WHO standard of one doctor per 1,000 people.[12] There is one nurse per 670 people, which is lower than the WHO standard of one nurse per 300 people.[12] In December 2021, in response to a question on shortage of doctors, the Minister had replied that as of November 2021, the doctor-population ratio in the country is 1:834.[32] This is assuming 80% availability of registered allopathic doctors and 5.65 lakh AYUSH doctors.

As on March 31, 2020, there was a 2% shortage (based on the minimum requirement as per the norms) in the sanctioned posts of female health workers/ ANMs, and a 65.5% shortage of male health workers/ ANMs (at SCs and PHCs).[16] With regard to allopathic doctors at PHCs, there was a shortfall of 6.8% of the total requirement for existing infrastructure.[16] Further, there were vacancies even in these sanctioned posts. Vacancies for female health workers/ ANMs were at 14.1%, for of male health workers/ ANMs at 37% (at SCs and PHCs), and for doctors at PHCs at 24.1%.[16]

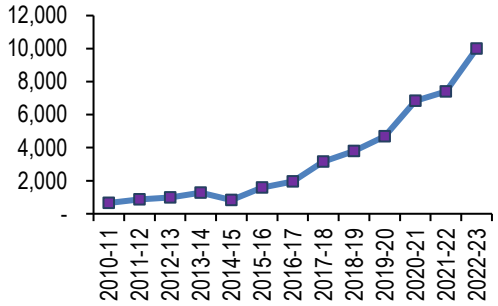
The 15th Finance Commission noted that there is regional and state-wide disparity in the availability of doctors. It recommended that an All India Medical and Health Service must be constituted under the All-India Services Act, 1951.

Medical and Allied Healthcare education: In the last three years Parliament has passed various laws which seek to improve the regulation of medical education and profession in India. The National Medical Commission Act, 2019 sets up the NMC and replaces the Medical Council of India (MCI).[33] The NMC will oversee medical education and practice in India. The National Commission for Allied and Healthcare Professions Act, 2021 seeks to regulate and standardise the education and practice of allied and healthcare professionals.[34]

Pradhan Mantri Swasthya Suraksha Yojana (PMSSY): PMSSY was introduced in 2003 with the objective of: (i) correcting regional imbalances in the availability of affordable and reliable tertiary healthcare services, and (ii) augmenting facilities for quality medical education in the country.[35] This included establishing institutions like AIIMS and upgrading certain state government hospitals. The scheme covers 20 new AIIMS and 71 state government hospitals.[35]

In 2018, the Comptroller and Auditor General (CAG) noted that all new AIIMs overshot their completion time by almost five years.[36] There were similar delays observed in the upgradation of state government hospitals. Further, it was found that the Ministry had estimated the capital cost for setting up six new AIIMS in Phase 1 to be Rs 332 crore per institute. After four years, this cost was revised to Rs 820 crore per institute, on account of shortcomings in planning and assessment of requirements. The Standing Committee on Health and Family Welfare (2017 and 2018) noted that this indicates poor assessment of time and cost which have left the allocated funds unused.[30,37]

Figure 3: Yearly allocation to PMSSY (2010-22) (in Rs crore)



Notes: Values for 2021-22 and 2022-23 are revised estimate and budget estimate respectively
Sources: Union Budget 2010-11 to 2022-23; PRS.

In 2022-23, PMSSY has been allocated Rs 10,000 crore. This is an increase of 35% over the revised estimates of 2021-22 (Rs 7,400 crore). The central government also provides grants to autonomous bodies such as AIIMS, New Delhi, Post Graduate Institute of Medical Education and Research, Chandigarh, and Jawaharlal Institute of Post Graduate Medical Education and Research, Puducherry. In 2022-23, these autonomous bodies have been allocated Rs 10,022 crore, which is an increase of 14% over the revised estimates of 2021-22.

Key health indicators have improved but still far from ensuring overall better health of citizens

While health financing as a percentage of GDP is a good metric to understand how much is a country investing in its health infrastructure, performance across certain key indicators is a reflection of how healthy the overall population is, and whether health services are accessible to all citizens.

The results of National Family Health Survey-5 (NFHS-5) (2019-20) indicate several improvements in health indicators as compared to NHFS-4 (2015-16).[38] These include: (i) reduction in infant mortality rate, (ii) improvement in immunisation coverage, (iii) increase in households with improved sanitation facility and clean cooking fuel, and (iv) increase in institutional births.[39]

Table 5 shows the status of some key targets under the NHM framework.

Table 5: Status of some key targets of NHM

Indicator	Target (2012-20)	Latest Status
IMR	25	35 (2019-21)
MMR	100 per 1,00,000 live births	113 (2016-18)
TFR	2.1	2.0 (2019-21)
Annual Malaria incidence	< .001	0.02 (2019)
Annual prevalence and mortality from Tuberculosis	Reduce by half	Incidence reduced from 300 per lakh in 1990 to 204 per lakh in 2017.

Note: IMR-Infant Mortality Rate; MMR-Maternal Mortality Rate; TFR-Total Fertility Rate.
Sources: Health and Family Welfare Statistics 2019-20; Special Bulletin on maternal Mortality in India 2016-18; National Family Health Survey-5 (2019-21); Unstarred Question No.711, Ministry of Health and Family Welfare, Lok Sabha, July 23, 2021; PRS.

The Economic Survey 2020-21 noted that information asymmetry is one of the key reasons which exposes the healthcare sector to market failures. It noted that patients in India rarely know the value of information they receive in the healthcare sector. For example, in case of certain medical services such as preventive care or mental health, patients may never know about the quality of the services they received. The Survey recommended setting up a sectoral regulator (in private healthcare): (i) for supervision and regulation of the healthcare sector, and (ii) to prevent information asymmetry in the sector. Further, the Survey noted that mitigating information asymmetry in the healthcare sector will help achieve lower insurance premiums and better welfare of people.

Health research is still lagging

In 2021-22, the Department of Health Research has been allocated Rs 3,201 crore, which is a 4% increase over the revised estimates of 2021-22, and a 2% increase over the actual expenditure in 2020-21.

The Standing Committee on Health and Family Welfare (2020) noted that the allocation to Department of Health Research is low compared to the requirement of funds needed for health research.[39] It recommended that at least 10% of the budget for the Ministry of Health and Family Welfare should be earmarked towards health research. However, in 2021, the Committee recommended that the allocation towards the health research should be 5% of the total expenditure of the Ministry.[40] As per the budget estimates of 2022-23, allocation towards the Department of Health Research is 4% of the total allocation of the Ministry.

The Standing Committee on Health and Family Welfare (November 2020) noted that the allocation to Department of Health Research was one of the lowest in 2019-20 (Rs 1,861 crore) as compared to the allocation of other departments involved in scientific research.[21] The Committee reiterated its recommendations to increase the budgetary outcomes of the Department of Health Research. The Committee noted that shortfall of funds may adversely impact the establishment of new Viral Research and Diagnostic Laboratories; Multi-Disciplinary Research Units in Medical Colleges, and Model Rural Health Research Units in states.

Further, the Committee noted that there is inadequate investment on public health research, as India invests only 0.65% of GDP on overall research and development activities in the country across various sectors.[21] It recommended that the Ministry of Health and Family Welfare should at least increase its spending on health research to the world average of 1.72% of GDP within two years.

The Standing Committee on Health and Family Welfare (2017, 2018, 2021) had noted the persistent recurring mismatch between the projected demand for funds and actual allocation to the Department of Health Research.[40,41,42] The Committee (2018) also noted that the Department had reported shortfall of funds for implementation of projects and on the other hand, there was underutilisation of funds released.

This mismatch between demand and allocation has led to impact in terms of restrictions in the sanctioning of new labs, providing recurring grants to the ongoing projects, and upgradation of health research infrastructure.[41] This also led to repercussions in the medical research output. For example, in 2019, only 799 research papers have been published by the ICMR and 25 patents have been filed.[40]

Under PM ABHIM, a national institution for One Health, four new National Institutes for Virology, a Regional Research Platform for WHO South East Asia Region, nine Biosafety Level III laboratories, five new Regional National Centre for Disease Control will be set up.[43] Further, Integrated Public Health Labs will be set up in all districts.

Digital health ecosystem

The National Health Policy, 2017 had proposed setting up a National Digital Health Authority (NDHA) to regulate, develop and deploy digital health across the healthcare systems. The Policy suggested using digital tools extensively to improve the efficiency and outcomes of the healthcare system. It proposed an integrated health information system which serves the needs of all stake-holders and improves efficiency, transparency, and citizen experience.

Ayushman Bharat Digital Mission: The Mission was launched in September 2021.[44] It seeks to create a system of personal health records and ensure national portability in provision of health services. Under the Mission, every citizen will be provided with a digital health identity. Health records of citizens will be stored digitally to avoid the loss of any health records. Citizens will have an option to give their

consent for sharing their health records with medical practitioners.

In July 2021, the National Health Authority (NHA) had published a consultation paper to invite comments on the design and functionality of the Unified Health Interface (UHI).[45] UHI is proposed to be a foundational layer of the National Digital Health Mission (NDHM) and is envisioned to expand interoperability of health services in India through open protocols. UHI aims at streamlining the digital health service experience by technology pathways that enable such services.

The National Digital Health Mission has been allocated Rs 200 crore in 2022-23. As per the revised estimates of 2021-22, the Mission had been allocated Rs 75 crore.

COVID-19: Financing the additional expenditure and vaccination

Developing infrastructure to manage COVID-19

In April 2020, the central government announced an investment of Rs 15,000 crore as COVID-19 Emergency Response and Health System Preparedness Package.[46] The funds will be utilised over next four years for strengthening health system in the country. This includes: (i) setting up of diagnostic laboratories, (ii) strengthening existing health facilities (such as hospitals), and (iii) welfare of health workers (such as insurance for health workers).

As on February 3, 2022, 3,249 operational laboratories (1,411 government, and 1,838 private) were reporting to ICMR.[47] This is significantly higher than that in March 2020 (79).[48] ICMR has setup 12 mentor institutes to expedite the approval process for labs applying for COVID-19 testing.[49] The central government has also established an Indian SARS-CoV-2 Genomic Surveillance Consortium (INSACOG) for genomic sequencing and tracking the evolution of variant strains of SARS-CoV-2.[50] As of December 21, 2021, INSACOG has 38 Genome Sequencing Laboratories across the country.[50]

The Standing Committee on Home Affairs (2020) noted that there is huge disparity in the infrastructure and services in public and private hospitals.[51] This includes disproportionate availability of ICU beds in both public and private hospitals. It further noted that during the pandemic the largest share of burden was on government hospitals as private hospitals are either inaccessible or unaffordable for everyone. The Committee recommended that more funds should be allocated to public hospitals to strengthen the public health infrastructure. This will help the public hospitals to prepare appropriately for such pandemics in future.

The Standing Committee on Health and Family Welfare (2020) on the outbreak of pandemic COVID-19 and its management noted that there is shortage of healthcare providers in state run hospitals.[21] Further, it noted that many hospitals and medical colleges across India are functioning below the sanctioned strength of faculty and speciality Departments are non-functional due to lack of required faculty. The Committee recommended the central and state governments to fill up the vacancies at the earliest.

Table 6: Allocation for COVID-19 related expenditure

Major Heads	2020-21 Actuals	2021-22 RE	2022-23 BE
COVID-19 Emergency Response and Health System Preparedness Package	13,079	1,691	
COVID-19 Emergency Response and Health System Preparedness Package (Phase-II)		14,567	
PM Garib Kalyan Package - Insurance Scheme for Health Care Workers fighting COVID-19		814	226
COVID-19 vaccination for healthcare workers and frontline workers	137		
Support for COVID Vaccination *		39,000	5,000

Note: * Allocation under Demand No. 42 (Transfer to states) of Ministry of Finance.
Sources: Demand Numbers 42, 46, 47, Expenditure Budget 2022-23; PRS.

COVID-19 Vaccination

Currently three vaccines are being administered in India – (i) Covishield, developed by the Serum Institute of India, (ii) Covaxin, developed by Bharat Biotech and (iii) Sputnik V, developed by Dr Reddy's Laboratories and Sputnik LLC. Covaxin was given emergency use authorisation (EUA) for children aged between 12-18 years in December 2021 and is being administered in the age group of 15-18 years since January 3, 2022.[52,53,54,55] Further, priority groups who have already received two doses of vaccines will be given another precautionary dose from January 10, 2022. EUA refers to: (i) approving the use of unapproved medical products, or (ii) unapproved uses of approved medical products during public health emergencies (such as the COVID-19 pandemic).[52] As of February 5, 2022, about 95 crore people had received the first dose of a vaccine, of which 73 crore people had been fully vaccinated.[56] 1.47 crore people have received a precautionary dose.

The Drug Controller General of India (DCGI) has approved more vaccines for restricted emergency use in India. These include: (i) Moderna COVID-19 vaccine, (ii) Janssen (developed by Johnson and Johnson), (iii) ZyCov-D (developed by Zydus Cadila), (iv) Corbovax (developed by Biological E) and (v) Covovax developed by Serum Institute of India and ICMR).[57,58,59,60] All these vaccines may be administered to all persons of 18 years of age and above. ZyCov-D may be administered to all persons

of 12 years of age and above.[59] In December 2021, DCGI granted emergency use authorisation to an anti-viral drug, Molnupiravir.

Table 7: Phases of vaccination drive (as on January 2022)[61]

Date	Group
January 16, 2021	Priority group including healthcare and frontline workers
March 1, 2021	(i) People over the age of 60, and (ii) people older than 45 with co-morbidities*
April 1, 2021	People over the age of 45
May 1, 2021	People over the age of 18
January 3, 2022	Children aged 15 to 18 years; precautionary dose for priority groups

Note: *Co-morbidities include heart failures, respiratory ailments, and lymphoma
Sources: Ministry of Health and Family Welfare; PRS.

Administration of vaccines: The central government constituted the National Expert Group on the COVID-19 vaccine (NEGVAC) in August 2020 to advise on strategies to develop and distribute COVID-19 vaccine in India.[62] The group is responsible for advising the government on matters such as: (i) prioritisation of population groups for vaccination, (ii) selection of vaccine candidates, (iii) inventory management and delivery, (iv) vaccine manufacturing, and (v) cold chain storage and associated infrastructure.[62]

For efficient and transparent administration of vaccine, the government: (i) prepared a database of healthcare and frontline workers, (ii) augmented cold chains, and (iii) procured syringes and needles.[63] Further, the central government, in collaboration with state and district level authorities, developed a digital platform, COVID-19 Vaccine Information Network Co-WIN for vaccine administration and distribution.[63]

Production, procurement and pricing of vaccines: In January 2021, the government began procuring vaccines from manufacturers of Covishield and Covaxin (Serum Institute of India and Bharat Biotech).[64] The central government procured 50% of total vaccines to vaccinate: (i) healthcare and frontline workers, and (ii) people over the age of 45 free of cost.[65] . The government allocated vaccines to states from its share, based on certain criteria (such as number of cases and wastage of vaccine). The remaining 50% of doses could be procured by state governments and the open market (25% each). In May 2021, the Ministry of Health and Family Welfare announced that 51 crore vaccine doses will be procured between May-July 2021.[66]

A new policy was operationalised on June 21, 2021, under which centralised procurement of vaccines was established.[67] Under the revised policy, 75% of procurement is conducted by the central government, and the remaining 25% is open for the private sector (with a cap on pricing).[68] Prices for procurement by the government are periodically negotiated with manufacturers. The central government provides vaccines to states free of cost. Private hospitals can charge up to Rs 150 over the price of a vaccine.[67] Note that in the United States and United Kingdom all vaccines are administered free of cost.[69,70]

In 2021-22, the Ministry of Finance had estimated expenditure of Rs 35,000 crore towards COVID-19 vaccination. As per the revised estimates of 2021-22, this amount is estimated to increase to Rs 39,000 crore. In 2022-23, the Ministry has allocated Rs 5,000 crore towards COVID-19 vaccination. The Standing Committee on Chemicals and Fertilisers (March 2021) noted that 276 crore doses of vaccine would be required to vaccinate all adults in India.[71] It estimated that this would cost approximately Rs 68,310 crore.

As on December 9, 2021, the central government had incurred an expenditure of Rs 19,675 crore for procurement of COVID-19 vaccines to supply them free of cost to states/UTs.[72]

The Standing Committee on Health and Family Welfare (2020) noted that India lacks cold-chain storage infrastructure required for such a large vaccination programme. It recommended the Ministry of Health and Family Welfare to upgrade its cold-chain storage system to facilitate easy distribution of vaccine across the country.[73] It further recommended the central government to ensure development of cold storage infrastructure across the country to ensure efficient administration of vaccines.

Table 8: Pricing of vaccines for government procurement and private administration

Name		Covishield	Covaxin	Sputnik V
Price/dose for government procurement*		200	250***	995
Price for private hospitals	Price/dose declared by manufacturer	600	1,200	948
	GST and service charge**	180	210	197
	Maximum price of the vaccine	780	1,410	1,415

Note: *Prices established for government procurement have changed over the months, according to several news reports.[74,75] The price/ dose here is based on guidelines from January 2021.
** This includes a levy of 5% GST and a service charge of up to Rs 150 that private hospitals may charge for administering vaccines.
*** Note that Bharat Biotech, the manufacturer of Covaxin provided 16.5 lakh doses free of cost to the central government in January 2021.
Sources: Letter No. 2079203/2021/Immunisation, Ministry of Health and Family Welfare, June 8, 2021; Press Information Bureau; PRS.

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Annexure

Table 9: Allocations to the Ministry of Health and Family Welfare for 2022-23 (in Rs crore)

Major Heads	2020-21 Actuals	2021-22 BE	2021-22 RE	2022-23 BE	% Change between 2021-22 RE and 2022-23 BE
Department of Health and Family Welfare	**77,569**	**71,269**	**82,921**	**83,000**	**0.1%**
Department of Health Research	**3,125**	**2,663**	**3,080**	**3,201**	**3.9%**
Pradhan Mantri Swasthya Suraksha Yojana (PMSSY)	6,840	7,000	7,400	10,000	35.1%
National AIDS and STD Control Programme	2,815	2,900	2,350	2,623	11.6%
Family Welfare Schemes	462	387	306	484	58.2%
National Health Mission	**37,080**	**36,577**	**34,447**	**37,000**	**7.4%**
National Rural Health Mission	30,329	30,100	27,850		
National Urban Health Mission	950	1,000	500		
Flexible Pool for RCH and Health System Strengthening, National Health programme and National Urban Health Mission				22,317	
Infrastructure Maintenance				6,343	
Strengthening national Programme Management of the NRHM				200	
Tertiary Care Programs	301	501	431	501	16.1%
Strengthening of State Drug Regulatory System	*115*	175	65	100	53.8%
Human Resources for Health and Medical Education	5,386	4,800	5,600	7,500	33.9%
Autonomous Bodies (includes AIIMS, ICMR)	9,177	10,924	10,916	12,220	11.9%
Ayushman Bharat - Pradhan Mantri Jan Arogya Yojana (PMJAY)	3,200	6,400	3,100	6,400	41%
Pradhan Mantri Ayushman Bharat Health Infrastructure Mission (PMABHIM)			1,040	5,846	462.1%
Medical Treatment of CGHS Pensioners (PORB)	2,794	2,300	2,750	2,645	-3.8%
Statutory and Regulatory bodies	226	316	314	335	6.9%
Infrastructure Development for Health Research	148		177	0	9%
Rashtriya Swasthya Bima Yojana (RSBY)	0	1	1	45	4400%
Others	6,011	7,127	6,654	8,377	26%
COVID-19 Emergency Response and Health System Preparedness Package	11,804		1,165		
India COVID-19 Emergency Response and Health System Preparedness Package (Phase-II)			14,567		
PM Garib Kalyan Package - Insurance Scheme for Health Care Workers fighting COVID-19			814	226	-72.2%
COVID-19 vaccination for healthcare workers and frontline workers	137				
Total	**80,694**	**73,932**	**86,001**	**86,201**	**0.2%**

Sources: Demand Numbers 46 and 47, Demand for Grants, Ministry of Health and Family Welfare, Union Budget, 2022-23; PRS.

State-wise numbers on the health sector

Table 10: Comparison of key health indicators across states

State	Population (Million) 2011	Crude Birth Rate 2017	Total Fertility Rate, 2019-21	Under 5 mortality rate, 2010-15	Infant Mortality Rate (per 1000 live Births) 2020	Underweight children (%) 2015-16	Life Expectancy at Birth (Years) 2014-18	Maternal Mortality Ratio 2016-18
		Number of live births per 1,000 in a population.	Number of children born to a woman in her lifetime	Death between 0-5 years, per 1,000 live births	Number of infants who die before reaching one, per 1,000 live births	% Children below 5 years of age who are underweight	How long a new-born can expect to live, on existing death rate	Number of maternal deaths, per 1,00,000 live births
Andhra Pradesh	49	16	1.7	41	30.3	32%	70	65
Assam	31	21	1.9	57	31.9	30%	67	215
Bihar	104	26	3.0	58	46.8	44%	69	149
Chhattisgarh	26	23	1.8	64	44.3	38%	65	159
Gujarat	60	20	1.9	44	31.2	39%	70	75
Haryana	25	21	1.9	41	33.3	29%	70	91
Jharkhand	33	23	2.3	54	37.9	48%	69	71
Karnataka	61	17	1.7	32	25.4	35%	69	92
Kerala	33	14	1.8	7	4.4	16%	75	43
Madhya Pradesh	73	25	2.0	65	41.3	43%	67	173
Maharashtra	112	16	1.7	29	23.2	36%	73	46
Odisha	42	18	1.8	48	36.3	34%	69	150
Punjab	28	15	1.6	33	20	22%	73	129
Rajasthan	69	24	2.0	51	30.3	37%	69	164
Tamil Nadu	72	15	1.8	27	18.6	19%	72	60
Telangana	35	17	1.8	32	26.4	29%	70	63
Uttar Pradesh	200	26	2.4	78	50.4	40%	65	197
West Bengal	91	15	1.6	32	22	32%	72	98
Arunachal Pradesh	1	18	1.8	33	12.9	19%		
Delhi	17	15	1.6	42	24.5	27%	74	
Goa	1	13	1.3	13	5.6	24%		
Himachal Pradesh	7	16	1.7	38	25.6	21%	73	
Jammu & Kashmir	13	15	1.4	38	16.3	17%	74	
Manipur	3	15	2.2	26	25	14%		
Meghalaya	3	23	2.9	40	32.3	29%		
Mizoram	1	15	1.9	46	21.3	12%		
Nagaland	2	14	1.7	37	23.4	17%		
Sikkim	1	16	1.1	32	11.2	14%		
Tripura	4	13	1.7	33	37.6	24%		
Uttarakhand	10	17	1.9	47	39.1	27%	71	99
Andaman & Nicobar Islands	0	11	1.3	13	20.6	22%		
Chandigarh	1	14	1.4	38	NA	25%		
Dadra & Nagar Haveli	0	24	1.8	42	31.8	39%		
Daman & Diu	0	20	1.8	34	31.8	27%		
Lakshadweep	0	15	1.4	30	0	23%		
Puducherry	1	13	1.5	16	2.9	22%		
All India	**1,211**	**20**	**2.0**	**50**	**35.2**	**36%**	**69**	**113**

Sources: Census Data 2011; Sample Registration System 2019; Health and Family Welfare Statistics 2017; Special Bulletin on maternal Mortality in India 2016-18; National Family Health Survey-5 (2019-21); PRS.

Demand for Grants 2022-23 Analysis
Jal Shakti

The Ministry of Jal Shakti is responsible for the development, maintenance, and efficient use of water resources in the country and coordination of drinking water and sanitation programs in rural areas. The Ministry was created in 2019 by integrating the Ministries of: (i) Water Resources, River Development, and Ganga Rejuvenation, and (ii) Drinking Water and Sanitation. The Ministry of Jal Shakti consists of two departments with the same names as those of merged ministries. This note provides an overview of the budget allocation towards the two departments and some broader issues in the sector.

Allocations in Union Budget 2022-23

In 2022-23, the Ministry of Jal Shakti has been allocated Rs 86,189 crore, which is a 24.8% increase over the revised estimates of 2021-22 (at Rs 69,046 crore).[1] This increase is mainly on account of increased allocation towards the Jal Jeevan Mission (Rs 60,000 crore in 2022-23 compared to Rs 45,011 in 2021-22 RE).[2] The Department of Drinking Water and Sanitation implements the Jal Jeevan Mission scheme. The total allocation towards this Department in 2022-23 is Rs 67,221 crore (78% of the total allocation towards the Ministry). The Department of Water Resources, River Development, and Ganga Rejuvenation has been allocated Rs 18,968 crore (Table 1).[3]

Table 1: Budgetary allocation to the Ministry of Jal Shakti (in Rs crore)

Department	2020-21 Actuals	2021-22 RE	2022-23 BE	% Change (RE 21-22 to BE 22-23)
Drinking Water and Sanitation	7,232	18,009	18,968	5%
Water Resources	15,967	51,037	67,221	32%
Total	**23,199**	**69,046**	**86,189**	**25%**

Note: BE is budget estimate. RE is the Revised Estimate.
Sources: Demands for Grants 2022-23, Jal Shakti; PRS.

Policy proposals in Union Budget Speech 2022-23:

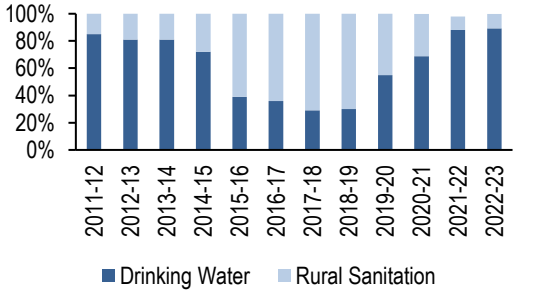
- The coverage of Har Ghar, Nal Se Jal under Jal Jeevan Mission (JJM) will increase by 3.8 crore households in 2022-23. Rs 60,000 crore will be allocated towards this mission for this year.
- Implementation of the Ken-Betwa Link Project, at an estimated cost of Rs 44,605 crore will be taken up. The project will be aimed at providing irrigation benefits to 9.08 lakh hectare of farmers' lands, drinking water supply for 62 lakh people, 103 MW of Hydro, and 27 MW of solar power.

Department of Drinking Water and Sanitation

The Department of Drinking Water and Sanitation administers programs for safe drinking water and sanitation in rural areas. In 2022-23, the Department has been allocated Rs 67,221 crore, accounting for 78% of the Ministry's allocation. This is an increase of 32% over the revised estimates of 2021-22. In 2021-22, the allocation to the Department is estimated to be 15% lower than the budget estimates.

The Department's allocations are towards two major rural welfare programmes: drinking water and sanitation. From 2011-12 to 2014-15, the Department's expenditure was focused on drinking water programmes (see Figure 1). With the introduction of the Swachh Bharat Mission, between 2015-19, the focus of expenditure was on rural sanitation. However, since 2019-20, the expenditure focus has shifted back towards drinking water.

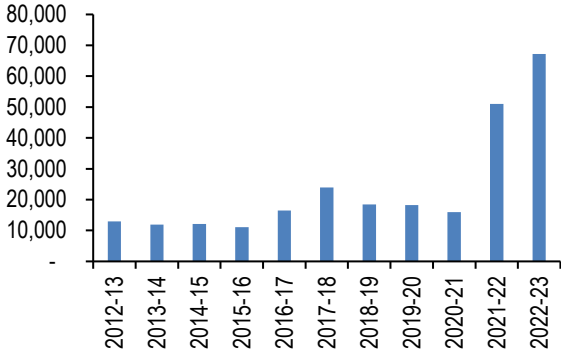
Figure 1: Expenditure on drinking water and sanitation (as a % of Department's expenditure)



Note: Values for 2021-22 are revised estimates and 2022-23 are budget estimates.
Sources: Union Budgets 2011-12 to 2022-23; PRS.

Between 2012-13 and 2020-21, the expenditure by the Department had a marginal increase at a compounded annual growth rate of 3%. In the last two years, the Department has seen a large increase in expenditure, mainly towards Jal Jeevan Mission. Figure below shows the trends in expenditure by the Department in the last decade. Further, with the focus on a scheme to provide for tapped water connection in rural areas, the expenditure of the Department increased by 220% in 2021-22.

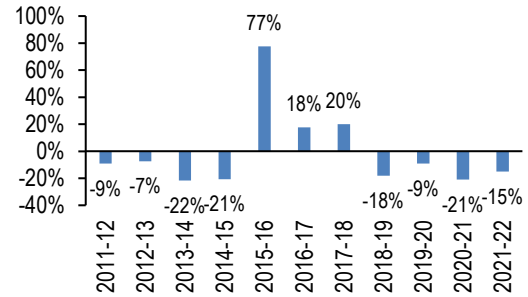
Figure 2: Expenditure by the Department of Drinking Water and Sanitation (in Rs Crore)



Note: Values for 2021-22 are revised estimates and 2022-23 are budget estimates. Allocations before 2019-20 were towards the erstwhile Ministry of Drinking Water and Sanitation.
Sources: Union Budgets 2014-15 to 2022-23; PRS.

Utilisation of Funds: Since 2011-12, the actual expenditure by the Department of Drinking Water and Sanitation has been lower than the budgeted expenditure except during 2015-18 (as shown in Figure 3). Notably, the actual expenditure in 2015-16 was 77% higher than the budgeted expenditure for the year with the launch of Swachh Bharat Mission-Gramin (SBM-(G)). This may be due to a lack of adequate budgeting and efficient implementation of the scheme. The Standing Committee on Water Resources (2021) took note of under-utilisation of funds and recommended the Department to ensure strict monitoring of the release of funds.[5] In response, the Department stated that a Public Financial Management System (PFMS) is being on-boarded to examine central fund expenditure under JJM and phase two of SBM-(G).[4] The Ministry also took note of high variability in fund utilisation among states due to schemes being demand-driven.[5]

Figure 3: Allocation towards the Department Of Drinking Water And Sanitation - % change from budget estimates to actuals



Note: The expenditure figure for 2021-22 is revised estimate.
Sources: Union Budgets 2011-12 to 2022-23; PRS.

Schemes under the Department of Drinking Water and Sanitation

The Department is responsible for implementing two major schemes: (i) the Jal Jeevan Mission (JJM), and (ii) the Swachh Bharat Mission-Gramin (SBM-G). JJM aims to provide a functional household tap connection to every rural household, (an estimated 18.93 crore households).[6] In 2022-23, JJM has been allocated Rs 60,000 crore (33% increase over 2021-22). This is 89% of the department's allocation for 2022-23. SBM-G aims to improve rural sanitation. In 2022-23, SBM-G has been allocated Rs 7,192 crore (20% annual increase over 2021-2022 revised estimates). This is 11% of the department's budget allocation for 2022-23.

Table 2: Allocation towards key schemes under Department of Drinking Water and Sanitation (in Rs crore)

Scheme	2020-21 Actuals	2021-22 Revised	2022-23 Budgeted	% Change (RE 2021-22 to BE 2022-23)
JJM	10,998	45,011	60,000	33%
SBM-G	4,945	6,000	7,192	20%
Others	24	26	29	12%
Total	**15,967**	**51,037**	**67,221**	**32%**

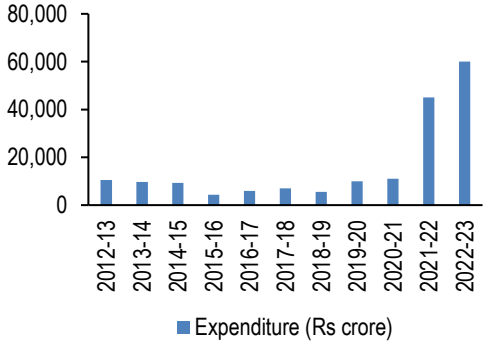
Note: BE is budget estimate. RE is the revised estimate.
Sources: Demands for Grants 2022-23, Department of Drinking Water and Sanitation; PRS.

Jal Jeevan Mission

The Jal Jeevan Mission was launched in 2019 with the aim to provide Functional Household Tap Connection (FHTC) to every rural household by 2024.[2] It subsumed the National Rural Drinking Water Programme launched in 2009. The total estimated cost of JJM is Rs 3.6 lakh crore over five years (2019-24).[2]

In 2022-23, JJM has been allocated Rs 60,000 crore, which is a 33% increase over the revised estimate expenditure in 2021-22. After a reduction in expenditure on schemes related to drinking water coverage from 2015-16 to 2018-19, the expenditure on such schemes increased from 2019-20 onwards. There was a big jump in the last two years due to the launch of Jal Jeevan Mission (Figure 4).

Figure 4: Expenditure on Drinking Water schemes (in Rs crore)



Note: Value for 2021-22 is the revised estimate and 2022-23 is the budget estimate.
Sources: Union Budgets 2012-13 to 2022-23; PRS.

Target versus achievements: Before JJM, the coverage of the National Rural Drinking Water Programme (NRDWP) was monitored in terms of

habitations having provision of minimum 40 Litres Per Capita Per Day (LPCD) of potable drinking water sources at a reasonable distance.

JJM (which subsumed NRDWP in 2019) aims to provide functional household tap connections to every rural household at a minimum service level of 55 LPCD.[2] Table 3details the timeline of physical targets to be achieved under JJM.

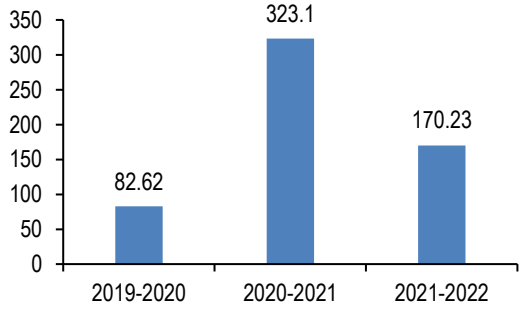
Table 3: Financial and physical targets of JJM

Year	FHTCs planned (in crore)	Estimated funds required (in Rs crore)	Total FHTCs planned (in %)
2019-20	4.03	36,000	21
2020-21	2.49	60,000	34
2021-22	3.83	1,00,000	54
2022-23	3.84	84,000	74
2023-24	3.06	80,000	90
Dec 31, 2024	1.93	-	100
Total	**19.18**	**3,60,000**	

Sources: The Standing Committee on Drinking Water and Sanitation (2020-21); PRS.

Jal Jeevan Mission was announced on August 15, 2019. As of that day, 3.23 crore (17% connections out of 18.93 crore rural households) households were reported to have tap water.[7,8] As of February 2022, 8.99 crore households (47%) households were reported to have tap water connections.[9] Figure 5 provides details on the yearly progress of the scheme.

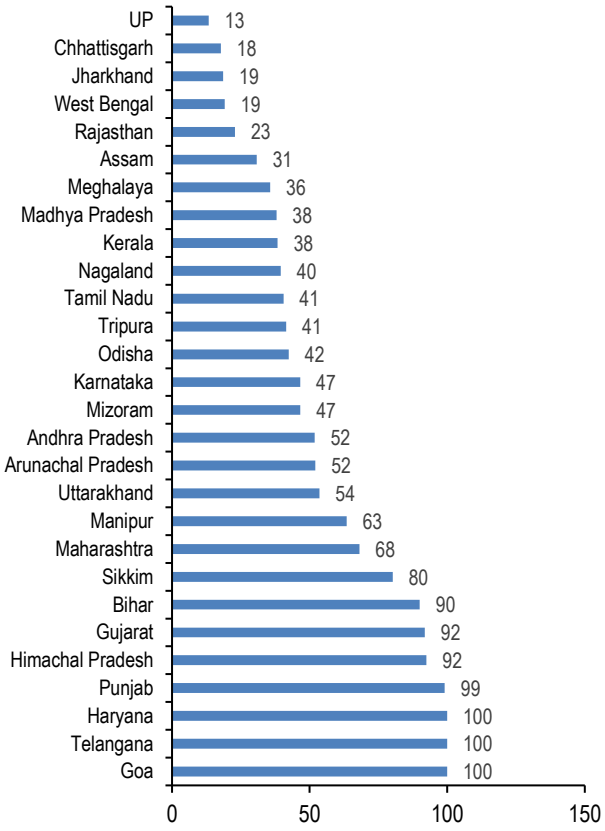
Figure 5: Households provided with tap water supply (in lakhs)



Sources: JJM Dashboard, Ministry of Jal Shakti; PRS

However, there is a wide disparity in tap water coverage across states (Figure). As of February 2022, only seven states have a coverage of 90% and more since the start of the program depicting a wide state wise disparity.

Figure 6: Households with tap water connection since the start of JJM in February 2022 (in %)



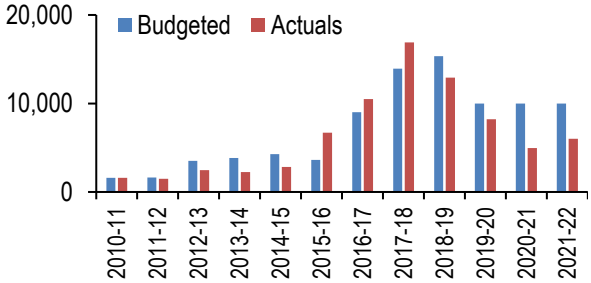
Sources: JJM Dashboard, Ministry of Jal Shakti; PRS

However, the Standing Committee on Drinking Water and Sanitation (2020-21) noted certain weaknesses in the implementation of the scheme including: (i) lack of participatory approach, (ii) inadequate financial resources, (iii) non-availability of technical human resources, and (iv) poor operation and maintenance of completed schemes.[10] It recommended that effective strategies should be developed to monitor accomplished work. In March 2021, the Committee noted that the problem of unspent balances is more prominent under JJM than SBM-(G). The state-wise disparity in unspent balances is also prominent, specifically with states like West Bengal, Uttar Pradesh, and Rajasthan (see Table 17 in the Annexure).[11]

Swachh Bharat Mission - Gramin

In 2014, the Swachh Bharat Mission (Gramin) was launched by restructuring the Nirmal Bharat Abhiyan.[12] The Mission aimed to achieve universal sanitation coverage, eliminate open defecation, and improve cleanliness in rural India by October 2, 2019.[13] Figure shows the trends in budget allocation and actual expenditure on rural sanitation in the past 10 years. The allocation for this year is Rs 7,192 crore.

Figure 7: Budgeted versus actual expenditure on sanitation (in Rs crore)



Note: The 'actuals' figure for 2021-22 is the revised estimate.
Sources: Union Budgets 2010-11 to 2022-23; PRS.

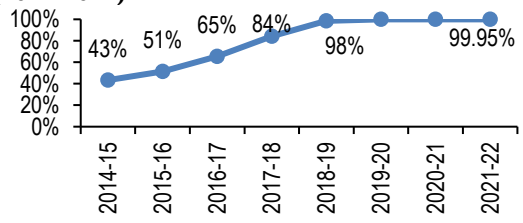
Except during 2015-18, the expenditure of the scheme was lower than the budgeted amount. The increased spending from 2015-16 to 2017-18 accounts for the launch of SBM-G and hence, renewed focus at improving rural sanitation. Note that the allocation towards the scheme has been the same since 2019-20 (Rs 9,994 crore). This year marks a decrease in this allocation (at Rs 7,192 crore). In 2019-20, the unspent balance on SBM-G from all states was cumulatively estimated to be Rs 10,475 crore.[3] Table 5 in the Annexure provides a detailed state-wise analysis on unspent balances for SBM-G. In 2021, the Department stated that the under-utilisation has been due to the pattern of fund usage by the States. The Department also observed that funds available with the states at the end of a financial year are utilised by the states during the subsequent financial year, leading to accumulation of unspent balances.[3]

Key features of SBM-G:

Construction of Individual Household Latrines (IHHLs): The cost provision for constructing a household toilet was increased from Rs 10,000 to Rs 12,000 in September 2014 when the Nirmal Bharat Abhiyan was restructured into SBM-G.[14] This cost for constructing toilets is shared between the centre and the state in the ratio of 60:40. Table 5 gives the number of household toilets constructed since the inception of the scheme.

As per the Department, 100% of the rural households had access to IHHL in 2019-20.[15] Figure illustrates the total coverage of household toilets since the inception of the SBM programme.

Figure 8: Percentage of households with toilets (2014-2021)

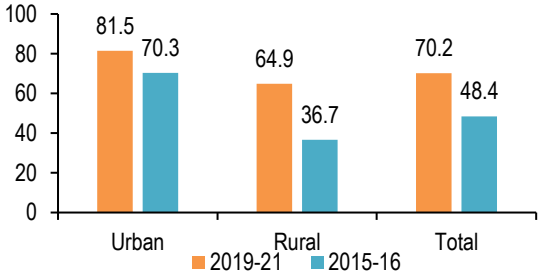


Note: 2021-22 refers to data as of February 2022.
Sources: Management Information System Reports of SBM, Ministry of Jal Shakti; PRS.

The Economic Survey (2020-21) noted that sanitation access improved for all states between 2012 and 2018. However, inter-state differences in access to sanitation are still large, especially in rural areas. For example, access to sanitation is below 75% in states such as Odisha, Jharkhand, Uttar Pradesh, and West Bengal.[3] The Standing Committee on Rural Development (2018-19) raised questions over the construction quality of toilets and observed that the government is including non-functional toilets while measuring access to toilets. This was leading to inflated data.[16]

From the data collected in 2019-21 for the National Family Health Survey, it was found that only 65% of the population in rural Indian households use improved sanitation facilities. This is an increase from 37% in 2015-16 (see Figure 9).[17] Improved sanitation facilities refers to various types of flush/pit latrines toilets that are not shared with other households.

Figure 9: Population with improved sanitation facilities (in %)



Sources: National Family Health Survey 4 and 5; PRS

Open Defecation Free (ODF) villages: Under SBM-G, a village is declared as ODF when: (i) there are no visible faeces in the village, and (ii) every household as well as public institution uses safe technology options for faecal disposal.[18]

After a village declares itself as ODF, state governments are required to verify the ODF status of such a village. Such verification must include indicators such as: (i) access to a toilet facility and its usage, and (ii) safe disposal of faecal matter through septic tanks.

The guidelines for ODF state that since it is not a one-time process, at least two verifications must be carried out.[19] The first verification must be carried out within three months of ODF declaration. The second verification must be carried out around six months after the first verification.

As per the Ministry of Jal Shakti, a total of 6,02,750 villages across 711 districts and 35 states and union territories have been declared as ODF as of February 2022.[20] Of these, 6,02,304 villages (99.5%) have been verified by state governments as ODF under the first level of verification.[20] Close to five lakh villages (83%) have been verified as ODF under the second level of verification.[21] State-wise details on the number of villages declared and verified ODF can be found in the Annexure.

However, questions have been raised on the ODF status of villages. The 15th Finance Commission noted that the practice of open defecation is still prevalent, despite access to toilets. It highlighted that there is a need to sustain behavioural change of people for using toilets.[22] The 15th Finance Commission recommended that an independent survey be instituted to estimate the prevalence of open defecation in the country. The Standing Committee on Rural Development raised a similar concern in 2018, noting that "even a village with 100% household toilets cannot be declared open defecation-free (ODF) till all the inhabitants start using them".

In February 2020, the Department of Drinking Water and Sanitation launched Phase II of SBM-Gramin with focus on ODF Plus. It will be implemented from 2020-21 to 2024-25 with an outlay of Rs 1,40,881 crore. ODF Plus includes sustaining the ODF status, and solid and liquid waste management. Provisions for release of funds have been changed under this phase. The funds will be released in four portions - two portions in each of the two instalments. The second portion of each instalment will be released only after utilisation of 80% of the available funds. This has been done to avoid accumulation of unspent balances.[3]

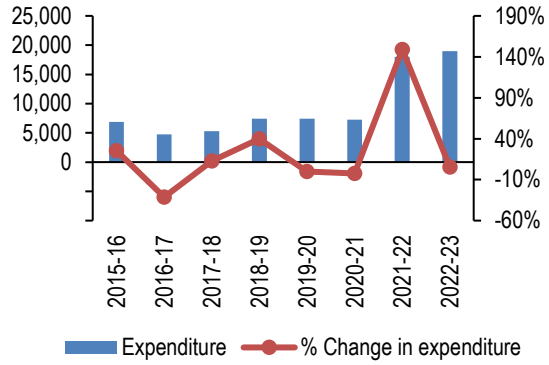
Department of Water Resources, River Development, and Ganga Rejuvenation

The Department of Water Resources, River Development, and Ganga Rejuvenation is responsible for: (i) planning and coordination of water resources in the country, (ii) monitoring of irrigation and flood control projects, (iii) supporting state level activities for ground water development, (iv) specific focus on Ganga rejuvenation related activities, and (iv) reduction of pollution and rejuvenation of rivers.[23]

In 2022-23, the Department has been allocated Rs 18,968 crore, accounting for 22% of the Ministry's allocation. This is a 5% increase over the revised estimate of 2021-22. Note that, in 2021-22, the revised estimate is 100% higher than the budget estimates (from Rs 9,023 crore to Rs 18,009 crore).

The was due to allocations for: (i) Accelerated Irrigation Benefit programme, which was earlier funded through loans from NABARD, and (ii) interlinking Ken-Betwa rivers.

Figure 10: Expenditure by the Department of Water Resources, River Development, and Ganga Rejuvenation over the years (Rs crore)



Note: Values for 2021-22 and 2022-23 are revised estimates and budget estimates respectively.
Sources: Union Budgets 2015-16 to 2022-23; PRS.

Schemes under Department of Water Resources, River Development, And Ganga Rejuvenation

In 2022-23, 58% of the Department's expenditure is estimated to be on the Pradhan Mantri Krishi Sinchai Yojna. This is followed by the Namami Gange (15%), Water Resources Management (9%), and Interlinking of Rivers (7%). Interlinking of Rivers comprises the allocation towards the Ken-Betwa Link Project, which was approved by Union Cabinet in December 2021.[24] The project aims to provide: (i) irrigation benefits to 9.08 lakh hectare of farmers' lands, (ii) drinking water supply for 62 lakh people, and (iii) 103 MW of Hydro and 27 MW of solar power. Total outlay on the project is estimated to be Rs 44,605 crore. It is estimated to be completed in eight years.[25] The project has been allocated Rs 4,300 crore at the revised stage in 2021-22. In 2022-23, the total allocation towards the scheme is Rs 1,400 crore.

Table 4: Allocation to the Department of Water Resources (in Rs crore)

Major Head	Actuals (20-21)	Revised (21-22)	Budgeted (22-23)
PM Krishi Sinchai Yojna	4,376	9,489	10,952
Namami Gange	500	1400	2800
Water Resources Management	345	632	1,790
Interlinking of Rivers	-	4,300	1,400
Namami Gange	500	1400	2800
Central Water Commission	353	376	411
Central Ground Water Board	233	272	282
Others	444	427	528
Total	**7,232**	**18,009**	**18,968**

Note: BE is budget estimate. RE is the revised estimate. Others include central sector projects such as river basin management, and major irrigation projects.
Sources: Demands for Grants 2022-23, Department of Water Resources, River Development, and Ganga Rejuvenation; PRS.

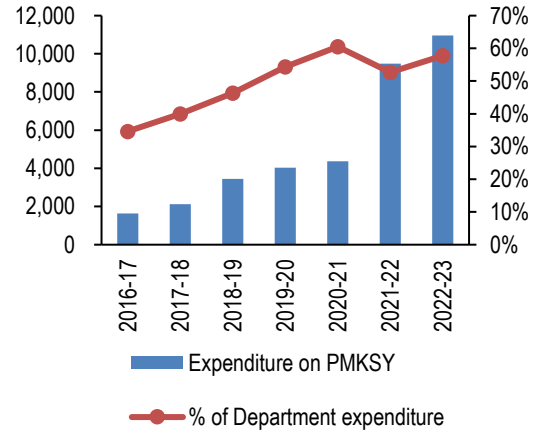
Pradhan Mantri Krishi Sinchai Yojna

The Economic Survey (2016-17) highlighted that 52% of the total net sown area in India is unirrigated and depends on rainfall for cultivation.[26] It noted that when rainfall is significantly less than usual, the unirrigated areas face higher adverse effects than the irrigated areas. Therefore, it recommended that irrigation coverage in the country needs to be increased.[26]

The Pradhan Mantri Krishi Sinchai Yojana (PMKSY) was launched in 2015-16.[27] The scheme seeks to: (i) expand coverage of irrigation, (ii) improve water use efficiency on farms, and (iii) introduce sustainable water conservation practices.[28] The Ministry of Jal Shakti implements the following components of the scheme: (i) PMKSY – Har Khet Ko Pani, (ii) Flood Management, and (iii) Borders Area Programme.[27] The scheme has two other components which are implemented by other ministries: (i) Per Drop More Crop by the Ministry of Agriculture and Farmers' Welfare, and Watershed Management Component under the Ministry of Rural Development.[29] Figure 6 shows the expenditure on the scheme from 2016-17 to 2022-23 under the demands of the Department. Its share in the Department's expenditure is estimated to increase from 35% in 2016-17 to 58% in 2022-23.

The Standing Committee on Water Resources (2021-22) pointed out to the Department that almost 40% of the total allocation of the Department in 2021-22 had been kept for repayment of loans and other liabilities under PMKSY.[30] It noted that this increased committed liability was leaving decreased amounts for various other schemes under the Department.

Figure 11: Expenditure on PMKSY over the years (in Rs crore)



Note: Estimate for 2021-22 are revised estimates and 2022-23 are budget estimates.
Sources: Union Budgets 2016-17 to 2022-23; PRS.

Har Khet ko Pani: This scheme's objectives include: (i) creation of new water sources, (ii) restoration and repair of traditional water bodies, (iii) command area development, and (iv) strengthening of distribution network from irrigation sources to the farm.[31,32] Some components of Har Khet ko Pani are:

- *Accelerated Irrigation Benefit Programme (AIBP):* Under this scheme, financial assistance is being provided for faster completion of irrigation projects. As of February 2022, 46 projects (43%) out of the 106 projects selected under the scheme have been completed.[33] In February 2022, the Ministry noted that no new projects have been included under PMKSY- AIBP since 2018.[21] Further, 23 projects (20%) projects are facing constraints such as land acquisition, legal, and contractual issues.[32]
- *Command Area Development and Water Management Programme:* The objective of the program is to enhance utilisation of irrigation potential created. This is achieved through activities such as construction of field channels, land levelling, and reclamation of waterlogged area.[34] As of March 2021, there are 88 projects under the programme, of which only 18 (21%) have achieved more than 50% physical progress.[35]

Issues to consider

Flood Management

The National Water Policy (2012) noted that climate change has deepened incidences of water related disasters such as floods, increased erosion, and increased frequency of droughts.[36] The central government supports states by providing financial assistance for undertaking flood management works in critical areas through the Flood Management and Border Areas Programme. From 2017-18 to 2019-20, central assistance of Rs 2,022 crore has been released under the scheme.[37]

Under flood management component of PMKSY scheme, as of March 2020, 14 projects of the 83 sanctioned projects had been completed.[38] Major issues faced while implementing the scheme include acquisition of land for the project, legal problems, non-release of state share, and inadequate budget allocation.[39] The Standing Committee on Water Resources (2020-21) noted the delay in completion of projects and recommended that the Department resolve the underlying factors for such delay.[38]

Further, in August 2021, the Standing Committee on Water Resources recommended establishing a National Integrated Flood Management Group under the Ministry of Jal Shakti as an overarching body responsible for flood management.[40] The group may include concerned ministers of state governments and meet at least once a year. It should be responsible for: (i) formulating strategies on prevention and mitigation of flooding, and (ii) supervising management of floods, including

aspects controlled by states or local governments and which are under international linkages. The Committee noted that central government's share in funding of flood management programmes has reduced from 75% to 50% for general states and from 90% to 70% for special category states. The Committee recommended increasing central government's funding share in flood management schemes and providing adequate budgetary support for it.[40]

Conservation and Rejuvenation of rivers

The National Water Policy (2012) highlights that water is a scarce natural resource for food security and sustainable development.[41] In the Union Budget of 2019-20, clean rivers had been recognised as one of the ten vision points for the decade. The Expert committee on restructuring the CWC and CGWB (July 2016) notes that rivers and ground water in India have been polluted by untreated effluents and sewage.[42] Further, over-extraction of groundwater in the immediate vicinity of a river and destruction of catchment areas, have negatively impacted river flows in India.[43]

The Ministry of Jal Shakti implements the Namami Gange Mission with the objective of rejuvenation of river Ganga and its tributaries through municipal sewage and industrial effluents treatment, river surface cleaning, and rural sanitation.[44] As of February 2022, 183 (55%) of the 334 projects sanctioned under the Mission have been completed.[45]

The scheme was launched in 2014 with a proposed budget outlay of Rs 20,000 crore for the period 2015-2020.[46] During the period 2015-16 to 2020-21, only Rs 4,016 crore (20% of the allocation at the budget stage) has been spent under the programme. In 2022-23, the scheme has been allocated Rs 2,800 crore, which is 50% more than the revised estimate of 2021-22. Table 7 shows the trends in budget allocation and actual expenditure on Namami Gange from 2015-16. Note that the utilisation under the scheme has remained less than 65% since the scheme started except in 2021-22.

Table 7: Budgeted versus actual expenditure on Namami Gange (in Rs crore)

Year	Budgeted	Actuals	% of Budgeted
2015-16	-	100	-
2016-17	-	1,675	-
2017-18	2,300	700	30%
2018-19	2,300	688	30%
2019-20	750	353	47%
2020-21	800	500	62%
2021-22	600	1,400	233%

Note: The 'actuals' figure for 2021-22 is the revised estimate.
Sources: Union Budgets 2015-16 to 2022-23; PRS.

As of 2017, National Mission for Clean Ganga had not finalised the long-term action plans even after more than 6.5 years of signing of agreement with the consortium of Indian Institutes of Technology.[47] As a result, National Mission for Clean Ganga does not have a river basin management plan after more than eight years of National Ganga River Basin Authority notification.

The Standing Committee on Water Resources (2020-21) noted that the implementation of the programme does not meet the targets.[38] Some key bottlenecks affecting the implementation of projects include: (i) delay in tendering process, (ii) non-availability of land for sewage treatment plants leading to delay in execution of projects, and (iii) under-utilisation of sewage treatment plants' capacities due to inadequate house sewer connections in cities, among others.[48] Further, in response to the Committee's observations, the Ministry of Jal Shakti responded (in February 2021) that the COVID-19 pandemic and consequent lockdown had slowed the progress of the projects due to unavailability of labour.[49]

Inter-linking of rivers

Inter-linking of rivers through inter-basin transfer of water was first considered in 1980 by the National Perspective Plan (NPP). Inter-linking of rivers is referred to as the development of water resources through the transfer of water from water surplus basins to water-deficit basins.[50]

Under the NPP, the National Water Development Agency (NWDA) identified 30 links for rivers (16 under the peninsula region and 14 under the Himalayan projects). The Inter Linking of Rivers (ILR) programme under NPP has been allocated Rs 4,300 crore at the revised stage in 2021-22 despite no allocation to in the initial budget. For 2022-23, Rs 1,400 crore have been allocated to the project on account of the implementation of the Ken-Betwa Link Project.

The Ken-Betwa Link Project (KBLP) was declared as a National Project in the 2009. It entails 60:40 funding divide from the union government and state Governments (Madhya Pradesh and Uttar Pradesh).[51] The project will be implemented this year at an estimated outlay of Rs 44,605 crore.

In the Union Budget speech 2022-23, it was declared that draft detailed project reports (DPRs) of five river links have also been finalized. These river links are: (i) Damanganga-Pinjal, (ii) Par-Tapi- Narmada, (ii) Godavari-Krishna, (iii) Krishna-Pennar, and (iv) Pennar-Cauvery.[52] At the time of preparation of DPR of the individual river link projects, detailed Environmental Impact Assessment (EIA) studies are carried out.[53] EIA study includes impacts on land environment, water resources, terrestrial ecology, impact on air quality, and impact on local services (such as water supply, community forests, and impact on business opportunities). Once the beneficiary states of the river-linking reach a consensus on the findings from the DPR, the central government will provide

assistance for implementation of the five-river links.

In the environmental assessment for the Ken-Betwa Link Project, it was pointed out that the construction of the dam across the Ken River will submerge 9,000 hectares of land.[54] Out of this, forest land accounts for 5,258 hectare (58% of the land) and the rest belongs to agricultural lands, settlements, scrubs and water bodies. Ten villages are also likely to be submerged. Note that, the area of Panna National Park (tiger reserve) accounts for about 79% of total forest area under submergence.[54]

As per the EIA, during the implementation of the Ken-Betwa project, the air quality in the surrounding area of the dam will also be significantly impacted due to diesel combustion in various equipment, and release of Sulphur pollutants in the air.[54] The project also proposes that construction material (such as sand, gravel and stones) will be excavated from the river bed. This may lead to rise in the turbidity levels of the river, and hence, significantly decrease the river quality.[54] Further, a total of 3,800 workers will be emigrated for the project. The scarcity of water in the houses and the absence of sanitary facilities in labour camps could be responsible for increased prevalence of gastero-enteritis and other water-borne diseases.[54]

Ground water depletion

Currently, ground water resources accounts for over 60 percent of the total area irrigated in the country. About 85% of the rural drinking water supply is also met from ground water sources.[55]

As of 2021, while the national level usage of ground water resources was at 63%, there were eight States/UTs where this value was higher than the target of 70%.[56] However, of 534 districts in 22 States/UTs, 202 districts had stage of extraction ranging from 71% to 385%.

However, note that ground water development is not uniform across states in India. It has exceeded 100% in some states such as Delhi (120%), Haryana (137%), Rajasthan (140%), and Punjab (166%).[57] This implies that the annual ground water utilisation in these states is higher than the net annual ground water availability. The status of ground water development ratio across states is provided in the Annexure. The Planning Commission in its 12th Five-Year Plan had noted that India is fast moving towards a ground water crisis and nearly 60% of all districts in the country have issues related to either availability of ground water, or quality of ground water, or both.[58]

The ground water management and regulation scheme was launched in 2008 with the aim to regulate and control the development of ground water resources of the country.[59] Further, the Atal Bhujal Yojana was launched in April 2020 for sustainable management of ground water resources through a strong ground water database and community participation in the sector.[60] In April 2021, the Central Ground Water Board (CGWB) under the Ministry also released the Master Plan For Artificial Recharge To Groundwater In India – 2020.[61] The plan identifies state-wise areas for artificial recharge, structures available and their estimated cost. It recommends alternatives to harness the run off from rain.

Over the years, ground water usage has increased in areas where the resource was readily available due to its near universal availability, dependability, and low capital cost. Agriculture sector is the major consumer of ground water resources with about 89% of the total annual ground water extraction being used for irrigation (remaining 11% for domestic and industrial use).[62] Government incentives such as credit for irrigation and subsidies for electricity supply have further increased the dependency of agriculture on ground water.[63]

The NITI Aayog (2019) highlighted that in regions with declining water tables, policies that limit MSPs and subsidies for water-intensive crops (such as sugarcane, wheat, and rice), can significantly reduce water demand from the agriculture sector.[64] Further, providing better price support for crops such as pulses and oilseeds (which require less water) would incentivise the production of these crops.[65]

The 15th Finance Commission noted that under the Jal Jeevan Mission, 63% of rural habitations are being provided piped water supply from ground water sources.[66] It highlighted that this will become unsustainable, given the highly depleted water table in the country. The Commission recommended the following to reduce the dependence on ground water: (i) fixing price on water on graded basis, where higher consumption entails higher charges, (ii) greater reliance on surface water for schemes such as Jal Jeevan Mission, (iii) incentivising creation of rainwater harvesting structures (including stricter implementation of laws), and (iv) reuse of greywater (that is, clean waste water from households' appliances).[66]

Ground water contamination

Ground water contamination is the presence of certain pollutants in ground water that are in excess of the limits prescribed for drinking water.[67] The Central Ground Water Board (CGWB) in 2018 noted that concentration of contaminants such as fluoride, arsenic, nitrate, and iron in ground water beyond the permissible limits can lead to environmental issues and health problems. In December 2021, the Minisitry of Jal-Shakti also noted that CGWB is conducting regular studies on the occurrence of arsenic in ground water beyond permissible limits for human consumption in isolated pockets in various states/UTs including

West Bengal, Bihar, Uttar Pradesh, and Chhattisgarh.[68] Table 8 shows the number of states and districts affected by select geogenic contaminants as of 2020.

Table 8: States and districts affected by geogenic contamination in ground water (2020)

Geogenic contaminants	Number of affected states/UTs	Number of affected districts
Arsenic (> 0.01 mg/l)	21	152
Fluoride (> 1.5 mg/l)	23	370
Nitrate (> 45 mg/l)	23	423
Iron (> 1mg/l)	27	341

Source: Unstarred Question 1944, Lok Sabha, Ministry of Jal Shakti, September 22, 2020; PRS.

As of February 2020, 3% (51,952) of the total habitations (17,24,423) in India were affected by contamination of ground water.[66]

The 15th Finance Commission noted that the number of water quality-affected habitations (due to contamination such as Fluoride, Arsenic, Iron, Salinity, and Nitrate) may rise as deeper drilling for drinking water sources may lead to chemical contamination of ground water.[66]

The National Water Quality Sub-Mission was launched in March 2017 to provide safe drinking water to 27,544 arsenic/fluoride affected rural habitations in the country, over a span of four years.[39] The Standing Committee on Water Resources (2019-20) observed that out of these habitations, 11,884 habitations (43%) have been covered under the scheme. 4,100 habitations (15%) have seen an improvement in quality on retesting or have been covered under a state plan.[39] In December 2021, the Ministry noted that water is a state subject and hence, initiatives on water quality is primarily states' responsibility.[69] They also listed various steps that have been taken by the central government for providing contamination free water, such as, giving 10% weightage to the population residing in habitations affected by chemical contaminants including arsenic and fluoride while allocating the funds to states/ UTs in a financial year for JJM.[69] Further, CGWB has constructed arsenic safe exploratory wells in West Bengal, Bihar and Uttar Pradesh by using cement sealing technique. 510 such wells were constructed as of December 2021, including 40 in Bihar, 185 in West Bengal and 285 in Uttar Pradesh and handed over to the states for use.[69]

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Annexure

Table 17: State-wise unspent balances on SBM and JJM (in Rs crore)

State/UT	Unspent Balances under SBM-G		Unspent Balances under JJM	
	2018-19	2019-20	2018-19	2019-20
Andhra Pradesh	987	1,035	26	277
Arunachal Pradesh	15	40	6	58
Assam	639	542	359	452
Bihar	1,105	1,202	313	257
Chhattisgarh	406	377	32	58
Goa	2	2	-	-
Gujarat	399	476	-	6
Haryana	127	161	10	91
Himachal Pradesh	87	72	-	8
Jharkhand	506	551	76	268
Karnataka	601	561	27	80
Kerala	53	183	3	41
Madhya Pradesh	508	310	1	246
Maharashtra	906	574	248	285
Manipur	40	19	-	63
Meghalaya	72	36	1	17
Mizoram	21	8	0	31
Nagaland	1	17	-	35
Odisha	505	1,253	1	91
Punjab	164	243	103	257
Rajasthan	841	714	314	995
Sikkim	7	3	1	12
Tamil Nadu	465	231	1	264
Telangana	278	243	4	31
Tripura	62	63	49	136
Uttar Pradesh	1,187	758	58	932
Uttarakhand	100	132	6	67
West Bengal	530	544	761	1,147
Total	**10,684**	**10,475**	**2,436**	**6,432**

Sources: Standing Committee on Demand for Grants (2020-21), Department of Drinking Water and Sanitation, Ministry of Jal Shakti; PRS.

Table 18: State-wise ODF declared and verified villages (as of 2019-2020)

State	Total Villages	Total declared ODF	Total Verified (1st level)	Total Verified (2nd level)	% Verified 2nd level
Andaman and Nicobar Islands	192	192	192	192	100%
Andhra Pradesh	18,841	18,841	18,841	18,819	100%
Arunachal Pradesh	5,389	5,389	5,389	5,389	100%
Assam	25,503	25,503	25,503	15,245	60%
Bihar	38,691	38,691	37,317	-	-
Chandigarh	13	13	13	-	-
Chhattisgarh	18,769	18,769	18,769	18,769	100%
Dadar and Nagar Haveli and Daman and Diu	95	95	95	95	100%
Goa	365	365	18	-	-
Gujarat	18,261	18,261	18,261	18,261	100%
Haryana	6,908	6,908	6,908	6,908	100%

Himachal Pradesh	15,921	15,921	15,921	10,326	65%
Jammu and Kashmir	7,263	7,263	7,195	-	-
Jharkhand	29,564	29,564	29,333	164	1%
Karnataka	27,044	27,044	26,900	-	-
Kerala	2,027	2,027	2,027	2,027	100%
Ladakh	302	302	302	5	2%
Lakshadweep	9	9	9	-	-
Madhya Pradesh	50,228	50,228	50,228	3	0%
Maharashtra	40,533	40,511	40,505	-	-
Manipur	2,556	2,556	2,556	-	-
Meghalaya	6,028	6,028	6,028	2,101	35%
Mizoram	696	696	696	537	77%
Nagaland	1,451	1,451	1,142	-	-
Odisha	46,785	46,785	46,785	-	-
Puducherry	265	265	265	265	100%
Punjab	13,726	13,726	13,700	13,700	100%
Rajasthan	42,860	42,860	42,860	-	-
Sikkim	403	403	403	382	95%
Tamil Nadu	12,525	12,524	12,524	-	-
Telangana	14,200	14,200	14,149	6,822	48%
Tripura	1,178	1,178	646	142	12%
Uttar Pradesh	97,640	97,640	97,623	23,213	24%
Uttarakhand	15,473	15,473	15,473	14,340	93%
West Bengal	41,461	41,461	41,377	22,362	54%
Total	**6,03,165**	**6,03,142**	**5,99,953**	**1,79,945**	**30%**

Sources: Management Information System Reports of SBM; PRS.

Table 19: Status of level of ground water development across states (2017)

State	Ground water development resources (%)
Andhra Pradesh	44
Arunachal Pradesh	0
Assam	11
Bihar	46
Chhattisgarh	44
Delhi	120
Goa	34
Gujarat	64
Haryana	137
Himachal Pradesh	86
Jammu & Kashmir	29
Jharkhand	28
Karnataka	70
Kerala	51
Madhya Pradesh	55
Maharashtra	55
Manipur	1
Meghalaya	2
Mizoram	4
Nagaland	1
Odisha	42
Puducherry	74
Punjab	166
Rajasthan	140
Sikkim	0
Tamil Nadu	81
Telangana	65
Tripura	8
Uttar Pradesh	70
Uttarakhand	57
West Bengal	45
Total	**63**

Note: Total includes union territories; data as of 2017.
Sources: Dynamic Ground Water Resources of India, 2017, Central Ground Water Board; PRS.

Demand for Grants 2022-23 Analysis
Housing and Urban Affairs

The Ministry of Housing and Urban Affairs formulates policies, coordinates activities of various agencies (at the state and municipal level), and monitors programmes in the area of urban development. It also provides states and urban local bodies (ULBs) with financial assistance through various centrally supported schemes. In 2017, the Ministry of Housing and Poverty Alleviation, and the Ministry of Urban Development were combined to form the Ministry of Housing and Urban Affairs.

Over the past few years, while the allocation towards the Ministry has increased and several new schemes and programmes have been implemented, urban areas continue to face issues with lack of adequate housing, poor infrastructure, and poor service delivery. Some of the key reasons behind such problems are the inadequate financial and technical capacity of cities to meet the challenges of urbanisation which result in poor service delivery and poor implementation of schemes. This note looks at the expenditure incurred by the Ministry, the status of the various schemes implemented by it, and the issues faced with investment required for urban planning.

Budget speech highlights 2022-23 [1]

- A High-Level Committee of urban planners, urban economists, and institutions will be formed to make recommendations on urban sector policies, capacity building, planning, implementation, and governance.
- For developing India specific knowledge in urban planning and design, and to deliver certified training in these areas, up to five existing academic institutions in different regions will be designated as centres of excellence. Each of these centres will be provided with endowment funds of Rs 250 crore.
- States will be provided with support for urban capacity building. Modernisation of byelaws, town planning schemes, and Transit Oriented Development will be implemented.
- Innovative ways of financing and faster implementation of metro systems of appropriate type at scale will be encouraged. Design of metro systems will be re-oriented and standardised for Indian conditions and needs. Multimodal connectivity between mass urban transport and railway stations will be facilitated on a priority basis.
- Use of public transport will be promoted in urban areas, complemented by clean technology and governance solutions, special mobility zones with zero fossil-fuel policy, and electric vehicles.

Overview of Finances [2]

The total expenditure on the Ministry of Housing and Urban Affairs for 2022-23 is estimated at Rs 76,549 crore. This is an increase of 4% over the revised estimates for 2021-22. In 2022-23, the revenue expenditure of the Ministry is estimated at Rs 49,208 crore (64% of the total expenditure) and the capital expenditure is estimated at Rs 27,341 crore (36% of the total budget). Note that since 2014-15, the Ministry's revenue expenditure has been higher than the capital expenditure.

Table 1: Budget allocations for the Ministry of Housing and Urban Affairs (in Rs crore)

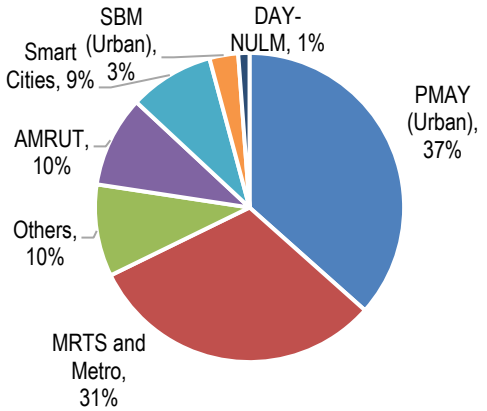
	2020-21 Actuals	2021-22 RE	2022-23 BE	% Change (RE 21-22 to BE 22-23)
Revenue	36,397	47,894	49,208	3%
Capital	10,304	25,957	27,341	5%
Total	**46,701**	**73,851**	**76,549**	**4%**

Note: BE – Budget Estimate; RE – Revised Estimate.
Source: Demand No. 60, Ministry of Housing and Urban Affairs, Union Budget 2022-23; PRS.

Expenditure across schemes

The Ministry implements several centrally sponsored schemes, and a few central sector schemes. These include: (i) Pradhan Mantri Awas Yojana – Urban (PMAY-U), (ii) Atal Mission for Rejuvenation and Urban Transformation (AMRUT), (iii) 100 Smart Cities Mission, (iv) Swachh Bharat Mission – Urban (SBM-U), and (v) Deendayal Antyodaya Yojana-National Urban Livelihood Mission (DAY-NULM). The Ministry also develops and manages metro rail projects across the country.

Figure 1: Highest allocation to PMAY-U in 2022-23 Budget



Note: MRTS– Mass Rapid Transit System.
Source: Demand No. 60, Ministry of Housing and Urban Affairs, Union Budget 2022-23; PRS.

Of the expenditure allocated to the Ministry in 2022-23, the highest allocation is towards PMAY-U at 37 % of the total Ministry's budget followed by allocation to Metro projects.

Table 2: Key allocations in the Ministry

	2020-21 Actuals	2021-22 RE	2022-23 BE	% Change (RE 2021-22 to BE 2022-23)
PMAY – Urban	20,991	27,000	28,000	4%
MRTS and Metro	8,998	23,480	23,875	2%
AMRUT	6,448	7,300	7,300	0%
Smart Cities	3,305	6,600	6,800	3%
SBM – Urban	995	2,000	2,300	15%
DAY-NULM	817	795	900	13%
SVANIDHI	114	300	150	-50%
Others	4,908	6,291	7,224	15%
Total	**46,701**	**73,851**	**76,549**	**4%**

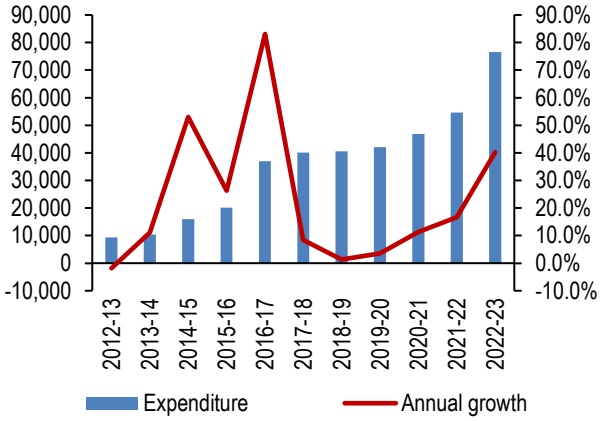
Note: BE – Budget Estimate, RE – Revised Estimate, PMAY-Pradhan Mantri Awas Yojana, MRTS- Mass Rapid Transit System, AMRUT- Atal Mission for Rejuvenation and Urban Transformation, SBM- Swachh Bharat Mission, DAY NLUM- Deendayal Antyodaya Yojana-National Urban Livelihoods Mission, SVAnidhi- PM Street Vendor's AtmaNirbhar Nidhi.
Source: Demand No. 60, Ministry of Housing and Urban Affairs, Union Budget 2022-23; PRS.

Issues to consider

Cities need significant additional investment

The pace of urbanisation is increasing in the country. As per the 2011 census, around 31% of the country's population resided in urban areas.[3] By 2031, around 600 million (43%) people are expected to live in urban areas, an increase of over 200 million in 20 years.[3] Urbanisation is the process of growth of cities (either through a natural increase in population, or migration, or physical expansion). Benefits of urbanisation include: (i) production of goods at a larger scale at lower input costs, (ii) knowledge spill-over between firms and individuals, and (iii) access to a large labour pool.[4] However, urbanisation also has adverse consequences such as: (i) traffic congestion, (ii) environmental degradation, (iii) deterioration in civic services, and (iv) air and water pollution. Urbanisation puts incremental pressure on the existing infrastructure in urban areas.[4] Therefore, policy responses to address urbanisation require comprehensive development of the socio-economic environment, effective delivery of public services, and provision of affordable housing and transport services for the poor.[4] These entail large capital investment for such infrastructure projects which would require additional support from central and state governments in the form of capital grants. With the current rate of urbanisation, the High-Powered Expert Committee (HPEC) for Estimating the Investment Requirements for Urban Infrastructure Services (2011) had estimated a requirement of Rs 39 lakh crore (at 2009-10) prices for the period 2012-2031. As per their framework, the investment in urban infrastructure should increase from 0.7% of GDP in 2011-12 to 1.1% of GDP by 2031-32. In 2021-22, total expenditure on urban development by states and centre is estimated to be 0.7% of GDP.[5,6]
During 2012-13 and 2022-23, the expenditure of the Ministry has increased at an average annual rate of 23%.

Figure 2: Trend in expenditure (2011-22)



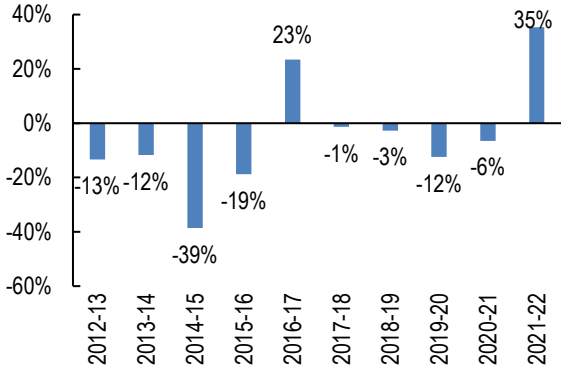
Note: For the years 2012-13 till 2015-16, the figures are a combination of the erstwhile Ministry of Housing and Urban Poverty Alleviation, and the Ministry of Urban Development. Values for 2021-22 and 2022-23 are revised and budget estimates respectively. All other figures are actuals.
Source: Ministry of Housing and Urban Poverty Alleviation, and the Ministry of Urban Development budgets 2011-12 to 2015-16. Ministry of Housing and Urban Affairs budget documents 2015-16 to 2022-23; PRS.

The Standing Committee on Urban Development, (2021) noted that the budgetary allocations to the Ministry were lower than the Ministry's demand during 2018-21.[7] This has been observed in earlier budget allocations also. For instance, in 2017-18, while the erstwhile Ministry of Urban Development projected an expenditure of Rs 68,410 crore, it was allocated Rs 34,212 crore in that year's budget.[8] The Committee recommended that with implementation of schemes picking momentum, the budgetary allocation should be increased for better implementation.[7] This would also supplement efforts of state governments to develop and maintain urban infrastructure.

The Ministry of Finance (2017) noted that only budgetary outlays will not be enough to cater the growing demands on local governments for improving their infrastructure.[9] Urban infrastructure projects tend to be capital intensive and not only require upfront capital investment but also annually recurring operations and maintenance expenditures. Alternate sources of financing are required to meet the funding gap. The flagship schemes of the Ministry (such as Smart Cities Mission, Swachh Bharat Mission) seek to meet

their financing requirements through a mix of sources such as borrowings, municipal bond financing, and public-private partnerships. The Standing Committee on Urban Development (2020) noted that as of March 2020, municipal bonds worth Rs 3,390 crore had been issued in eight cities including Ahmedabad and Pune for the implementation of AMRUT scheme.[10]
The Standing Committee on Urban Development (2021) observed that there has been underutilisation of funds by the Ministry.[11] From 2012-13 to 2020-21, barring 2016-17, there has been an underutilisation of funds (see Figure 3). In 2016-17, the actual expenditure on metro projects, AMRUT, and Smart Cities Mission were higher than the budget estimates. The Committee recommended the Ministry to avoid such underutilisation of funds.[11]

Figure 3: Deviation in actual expenditure from budgeted expenditure (2012-22)



Note: For the years 2012-13 till 2015-16, the figures are a combination of the erstwhile Ministry of Housing and Urban Poverty Alleviation, and the Ministry of Urban Development. Values for 2021-22 are revised estimates. All other figures are actuals.
Source: Union Budget 2012-13 to 2022-23; PRS.

Service delivery in urban areas continues to be poor

The HPEC (2011) had noted that the state of service delivery in Indian cities and towns is inadequate compared to desirable levels.[4] Irregular water supply, poor sanitation, inadequate waste management, and degraded transport infrastructure are some of the issues persistent in urban India. Factors contributing to poor service delivery include: (i) fragmented and overlapping institutional responsibility, (ii) lack of autonomy of urban local bodies, (iii) poor maintenance of public infrastructure, and (iv) inadequate investment in urban infrastructure.[4] The HPEC recommended that in order to achieve an inclusive economic growth there is a need to shift focus of policy from creating physical infrastructure to delivering services.[4] Without this, additional capital investments in urban infrastructure will not result in improvements in service delivery. India fares poorly in comparison to other countries on its parameters of service delivery. See Table for a comparison of India (rural and urban) on service delivery parameters with other countries

According to the 76th National Sample Survey (July-December 2018) about 14% households in urban areas did not have both bathroom and latrine within household premises and 2% of the household members in urban areas never used latrine.[12] 19% households in urban areas did not have drinking water facilities within household premises. The Jal Jeevan Mission (Urban) was announced in the 2021-22 budget speech.[13] The Mission aimed to provide functional taps in 4,378 statutory towns. However, no financial allocation has been made towards the Mission in either 2021-22 or 2022-23 budget.

Table 3: Ranking of India and other countries on parameters of service delivery (2018)

	India	Brazil	Russia	China	USA
Quality of roads	51	112	104	42	11
Electrification rate	105	73	1	1	1
Exposure to unsafe drinking water	106	57	54	75	1
Reliability of water supply	74	78	53	68	27
Infrastructure	63	81	51	29	9

Source: Global Competitiveness Report (2018), World Economic Forum; PRS.

In December 2021 the central government and the Asian Development Bank (ADB) signed a 350 million dollar policy-based loan to improve access to urban services and promote performance based central fiscal transfers to urban local bodies.[14]

Indian cities may not be suitable for metro but metro projects continue receiving high allocation

Investment in metro rail projects in cities forms one of the biggest expenditures made by the Ministry on urban transport. Some of the major metro projects include Chennai, Delhi, Bangalore, and Mumbai metros. Investments in these projects are made in various forms including grants, equity investments, debt, and pass-through assistance (grants given to the government which can be awarded to other organisations) for externally aided projects. Allocation towards metro projects includes the National Capital Region Transport Corporation of Delhi (the implementing agency for the Regional Rapid Transit System in the National Capital Region i.e., Delhi Metro) has been allocated Rs 4,710 crore (20% of the total expenditure of metro projects) in 2022-23 budgetary allocation to build three corridors. This plans to connect three nearby towns, Meerut, Alwar, and Panipat to Delhi through fast trains (average time taken to travel 100km is one hour).

Table 4: Allocation towards metro projects (in Rs crore)

Year	Budgeted	Actuals	% Utilised
2014-15	8,026	5,998	75%
2015-16	8,260	9,300	113%
2016-17	10,000	15,327	153%
2017-18	18,000	13,978	78%
2018-19	15,000	14,470	96%
2019-20	19,152	18,908	99%
2020-21	20,000	8,997	45%
2021-22	23,500	23,480	100%
2022-23	23,875	-	-

Note: Actuals for 2021-22 indicate Revised Estimates.
Source: Ministry of Housing and Urban Affairs Budget documents 2014-15 to 2022-23; PRS.

Short travel distance in Indian cities; metro may not be the ideal option for commute: Indian cities have developed in a way that allow neighborhoods to provide for residences, workplaces, and social and educational facilities.[15] This results in minimising trip lengths leading to less dependency on motorised urban transport. The average trip length in medium and small Indian cities is less than 5 km making non-motorised transport the preferred mode of commute.[15] Metro rail systems are efficient when the average trip distance is greater than 12 km.[15]

The National Transport Development Policy Committee (NTDPC) (2014) report observed that high speed mass transit systems such as metro rail do not always reduce door-to-door travel time. Door-to-door travel time is seen as the most relevant indicator for users.[15] Underground or elevated transport systems do not save time as compared to cars or two-wheelers, when trip distances are short, because time is lost in walking from ground level to the platform level. The NTDPC recommended that the decision to implement metro rail projects should also consider the high-cost factor. Rail-based metro systems should be considered after examining the opportunity cost of investing in expensive fixed infrastructure. NTDPC recommended that metro rail projects should initially be limited to cities with population more than five million. These cities should be able to cover all costs through user charges or fiscal costs. Further it recommended that Indian cities should focus on improving their existing bus systems, adding bus rapid transit systems, and improving non-motorised transport.

However, over the past few years, metro projects have expanded from the larger metropolises such as Delhi and Mumbai to other relatively smaller cities such as Kochi, Lucknow, Bhopal, Jaipur and Indore. As of March 2021, 708 km of metro lines are operational in 18 cities and 1,016 km of metro line and regional rapid transport is under construction in 27 cities.[11] Note that currently the Delhi Metro network is 391 km.[16] The Ministry also continues to allocate a significant portion of its budget towards metro projects. In 2022-23, the second highest (31%) allocation of the Ministry's budget has been towards metro rail projects.

Low ridership and inefficient operational performance of DMRC

The Report of the CAG on "Implementation of Phase-III Delhi Mass Rapid Transit System by DMRC" (2021) noted that the total ridership DMRC network in 2019-20 was projected to be 53 lakh.[17] However, the actual ridership in 2019-20 was 28 lakh (52% of the projection). For phase III (from initially sanctioned four corridors) the ridership was projected to be 21 lakh in 2019-20. However, the actual ridership was 4 lakh (19% of the projection). The Report noted a consistent increase in the operating cost ratio from 49% in 2011-12 to 81% in 2019-20, indicating inefficient operational performance of DMRC.

High allocation towards metro results in lack of funds for other schemes: In 2022-23, the capital expenditure on metro projects is estimated to be 87% of the Ministry's total capital expenditure. The Standing Committee on Urban Development (2019) had noted that high allocation towards metro projects leads to inadequate funds for other schemes such as PMAY-U and AMRUT.[18] It recommended that state/UT governments must be consulted to find ways to reduce the huge outlay on metro works to ensure adequate funding is available for other schemes.

The Standing Committee (2019) observed that standardisation of certain services such as civil works, and electric systems has helped reduce the cost of metro by 20-30%.[18] The Standing Committee (2020) recommended to reduce the cost by: (i) using newer technologies like Metrolite system (suitable for cities with less ridership), and (ii) encouraging the manufacturing of metro components under the Make in India initiative.[10]

Housing targets not met; scheme has focused on middle income groups instead of low-income groups

In 2012, the urban housing shortage was estimated at 1.9 crore units.[19] In 2015-16 the Ministry estimated that this shortage is expected to increase to two crore by 2022.[20] PMAY-U is an affordable housing scheme which seeks to achieve the 'housing for all' target by 2022.[21]

The scheme comprises four components: (i) in-situ rehabilitation of existing slum dwellers (using the existing land under slums to provide houses to slum dwellers) through private participation, (ii) credit linked subsidy scheme (CLSS) for Economically Weaker Sections (EWS), Lower Income Groups (LIG), and middle-income group (MIG), (iii) affordable housing in partnership, and (iv) subsidy for beneficiary-led individual house construction.

Allocation: In 2022-23 the scheme has been allocated Rs 28,000 crore. This is an 4% increase over the revised estimates in 2021-22. In 2020-21, revised estimates increased by 163% in comparison to budgeted allocation for the year. This can be attributed to the Affordable Rental Housing Complexes (ARHC) scheme implemented under the Aatmanirbhar Bharat Scheme. The ARHC scheme seeks to convert government-owned projects and housing stock (projects available with the central government) to affordable housing through public-private partnerships and encourage development on private land by giving special incentives including streamlining of permits and credit. Funding towards the scheme comes from the Central Road and Infrastructure Fund (comprises a cess imposed along with excise duty on petrol and diesel).

In 2022-23, from the total allocation for PMAY-U, 82% is allocated for central assistance to states/UTs and 16% for interest payments against loan raised through extra budgetary resources. In 2022-23, allocation to central assistance has increased by 128% over the revised stage of 2021-22. CLSS for economically weaker sections/low-income groups has been decreased by 100% in 2022-23 allocation in comparison to revised estimate for 2021-22.

Table 5: Components under PMAY-U (in Rs crore)

	2020-21 Actuals	2021-22 RE	2022-23 BE	% Change (RE 2021-22 to BE 2022-23)
Interest Payment for EBR loans	4,148	4,459	4,460	0.02%
Central assistanc to states/ UTs	10,002	10098	23,038	128%
CLSS-I for EWS/LIG	3,750	12000	0.01	-100%
CLSS-II for MIG	3,000	0.01	0	-100%
Others	91	443	502	13%
Total	**20,991**	**27,000**	**28,000**	**4%**

Note: BE – Budget Estimate, RE – Revised Estimate, EBR- Extra budgetary resources, CLSS- Credit linked subsidy scheme, EWS- Economically Weaker Section, LIG- Low-income groups, MIG- Middle-income groups.
Source: Expenditure Budget 2022-23; PRS.

Targets not completed: PMAY-U seeks to achieve housing for all by 2022. The Standing Committee on Urban Development (2021) noted that after five years of the scheme, only 38% of sanctioned houses have been completed.[11] The Committee observed that with this pace of the project, the government may not be able to complete the target by 2022. Further, it noted that only eight states have taken up projects under the in-situ slum redevelopment (ISSR) component. The Committee recommended: (i) formulating a specific time frame for completion of targets and to make up for the time lost due to COVID-19, (ii) encouraging states to take up projects under the ISSR component.[11] Note that as of February, 2022, out of the 54 lakh (47% of sanctioned) houses constructed under PMAY-U, about 6 lakh houses are yet to occupied by residents.[22,23]

Table 6: Status of houses under components of PMAY-U (January 3, 2022]

Component	Sanctioned	Completed
BLC	71	26
AHP	21	6
ISSR	5	5
CLSS	17*	17*

Note: *Beneficiaries, BLC- Beneficiary-led Individual House Construction, AHP- Affordable Rental Housing Complexes, ISSR- In-situ Slum Redevelopment, CLSS- Credit Linked Subsidy Scheme.
Source: PMAY (U) Dashboard; PRS, last accessed on February 10, 2022; PRS.

Beneficiaries under CLSS: Under CLSS, interest subsidy up to Rs 2.6 lakh is given to beneficiaries from EWS, LIG, and MIG on home loans from housing finance companies (HFCs), and banks. Nearly 95% of housing shortage occurs for households in the EWS and LIG sections.[24] However, the Standing Committee on Urban Development (2021) observed that in several states including Uttar Pradesh, Andhra Pradesh, and Jharkhand, most of the beneficiaries belong to middle income groups.[11] It was estimated that about 56% of housing shortage falls in the EWS, 40% in the LIG category, and the rest 4% in the middle- and higher-income groups.[25] However, the Ministry stated that EWS beneficiaries are not being neglected as they are also included under other components (AHP, BLC, and ISSR) of PMAY-U. The Committee noted that the scheme should not overshadow the core target group of EWS/LIG category.[11] It recommended: (i) identifying reasons for low number of beneficiaries from EWS/LIG and addressing the issues, (ii) central nodal agency to work with banks and HFCs for faster sanction of loans to people from EWS/LIG category.[11] The Economic Survey (2021-22) noted that the scheme for MIG was originally up to March, 2019 but was extended till March, 2021.[26] It was expected that this would stimulate demand for steel, cement, transport, and other construction materials.

Lending by housing finance companies (HFCs): Both HFCs, and public sector banks offer low-cost funding for housing. Further, HFCs also provide interest subsidies to beneficiaries under the CLSS component of PMAY-U. However, banks and financing companies face constraints such as inability to access long term funds.[30] The Union Cabinet had approved the creation of a National Urban Housing Fund (NUHF) worth Rs 60,000 crore in February 2018.[27] The NUHF aims to raise funds till 2022 to ensure a sustained flow of central release under PMAY-U to enable construction of houses. In 2020, Housing and Urban Development

Corporation (HUDCO) received Rs 60,000 crore as central assistance under PMAY-U from NUHF.[28] HUDCO is one of the central nodal agencies under PMAY-U, responsible for transferring subsidies through lending institutions to CLSS beneficiaries.[29]

Rental housing: Rental housing helps in plugging the gaps in the housing market by addressing some of the housing demand across income groups. As per the 2011 census, 27.5% of urban residents lived in rented houses. According to the Report of the Group of Secretaries (2017), a rental housing scheme could further complement PMAY-U in achieving the housing target.[30] The Ministry proposed a Draft National Urban Housing Policy in October 2015.[31] It seeks to promote the sustainable development of house ownership with a view to ensuring an equitable supply of rental housing at affordable prices. The Policy noted that the housing shortage in urban areas will not be solved by home ownership and suggested promoting rental housing. The Ministry also released the Model Tenancy Acts in 2020 which provides for the regulation and speedy adjudication of matters related to rental housing, and seeks to repeal the existing state rent control laws.[32,33] Note that the Model Tenancy Act, 2021 was approved by the Union Cabinet in June, 2021.[34]

Construction of toilets improved but access to proper sanitation remains an issue

The Swachh Bharat Mission – Urban (SBM-U) seeks to: (i) make all urban areas open defecation free (ODF), and (ii) achieve 100% scientific management of municipal solid waste (MSW). The Standing Committee on Urban Development (2021) noted that the progress for achieving 100% waste management has been inadequate. In 2020-21, progress for source segregation (wards) and waste processing was 78% and 68% of the target against 75% and 65% achieved in 2019-20.[11] Further, processing of municipal solid waste has increased from 18 % in 2014 to 70 % in 2021.[35] Note that the target of constructing 59 lakh individual household latrines and 5 lakh community and public toilets has been achieved under SBM-U.[36]

SBM-U aims to ensure that: (i) all statutory towns be certified as ODF+, and (ii) statutory towns with less than one lakh residents be certified as ODF++. A town is certified as ODF+ when no cases of open defecation are recorded and all public toilets are maintained and function. A town certified as ODF++ is one where all sewage is safely managed and treated with no dumping of untreated sewage in water bodies or open areas. Under SBM-U, 95 % of cities have been declared ODF. However, according to National Family Health Survey - 5 (2019-21) 81.5% urban households use an improved sanitation facility (includes flush to piped water system, pit latrine with slab).[37]

Note that SBM-U 2.0 was launched in October, 2021.[38] It seeks to focus on source segregation of solid waste at source, scientific processing of waste, and improving dumpsites for solid waste management.

Table 7: Status of ODF cities (as of January 26, 2022)

	Number of Cities	% Achieved
Total Cities	4,586	-
ODF declared cities	4,371	95
ODF verified cities	4,316	94
Certified ODF +	3,339	73
Certified ODF ++	961	21

Source: Swachh Bharat Mission- Urban Dashboard; PRS

Atal Mission for Rejuvenation and Urban Transformation (AMRUT)

AMRUT is a Centrally Sponsored Scheme which seeks to provide basic services (water supply, sewerage, urban transport, etc.) in cities, especially to the poorer households.[39] Components of the Mission include: (i) improving water supply systems, (ii) augmentation of existing sewerage systems, (iii) construction and improvement of drainage systems, (iv) improving urban transport through pedestrian facilities and public transport systems, and (v) capacity building of ULBs. The scheme had a financial outlay of Rs 50,000 crore for five years (2015-20), which was later extended till 2022. In 2022-23, the AMRUT Mission has been allocated Rs 7,300 crore.

The government had proposed that the outlay of Rs 50,000 crore be spent by 2020. However, from 2015-16 to 2021-22, the Ministry has allocated Rs 48,199 crore (96% of the proposed amount), and spent Rs 38,824 crore (78% of the proposed amount).

Table 8: Allocation compared to actual expenditure (Rs crore)

Year	Budget	Actuals	Utilised
2015-16	3,919	2,702	69%
2016-17	4,080	4,864	119%
2017-18	5,000	4,936	99%
2018-19	6,000	6,183	103%
2019-20	7,300	6,391	88%
2020-21	7,300	6,448	88%
2021-22	7,300	7,300	100%
2022-23	7,300	-	-
Total	**48,199**	**38,824**	**81%**

Note: Figures for 2021-22 Actuals are Revised Estimate.
Source: Ministry of Housing and Urban Affairs Demand for Grants for the years 2015-16 to 2022-23; PRS.

Poor implementation: AMRUT focuses on development of basic infrastructure such as water supply, and sewerage and septage management in

selected cities. The Standing Committee on Urban Development (2020) noted that implementation and performance under the scheme has been below target.[40] For instance, 92% of funds under AMRUT were allocated for water supply and sewerage. However, as of July 2021, against the target of 139 lakh, only 107 lakh connections (77% of the target) have been installed. Of the target of 145 lakh sewerage connections, only 79 lakh (54% of the target) had been provided.[41] The Standing Committee on Urban Development (2021) recommended that the new tap connections should be installed with a meter to ensure accountability and curtail wastage of water.[11]

Inadequate capacity of ULBs affecting progress of AMRUT: The Standing Committee on Urban Development (2021) observed that most ULBs are not able to meet the expectations of the Mission by generating their share of contribution.[11] In some cases, state governments have raised funds from external sources on behalf of ULBs. Therefore, the Committee recommended that ULBs may impose charges for services provided to citizens.[11] Note that AMRUT 2.0 was launched in October, 2021.[38] It seeks to provide (i) 100% coverage of water supply to all households in 4,700 ULBs, and (ii) 100% sewerage connections in 500 AMRUT cities.

Smart Cities Mission

The Smart Cities Mission seeks to promote 100 smart cities that provide core infrastructure (such as water and electricity supply, sanitation, and public transport). In 2022-23, the Mission has been allocated Rs 6,800 crore, which is a 3% increase over the revised estimates of 2021-22. The Standing Committee on Urban Development (2021) noted that the amount allocated to the Smart Cities Mission has been less than the proposed amount (See Table 9).[11] The Committee recommended that the Mission should be allocated more funds at the revised stage in 2021-22 and at budget estimates in the upcoming years. Note that there has been an increase of 102% in allocation at the 2021-22 revised stage over the budget stage. However, on the other hand, the Ministry has not been able to spend the entire amount allocated at the budget stage. In 2019-20 and 2020-21, the Ministry was able to spend about half of the amount allocated at the budget stage, possibly indicating lack of implementation capacity.

Table 9: Budgeted allocation less than proposed amount

Year	Proposed	Budgeted
2017-18	13,648	4,000
2018-19	9,810	6,169
2019-20	13,971	6,450
2020-21	13,543	6,450
2021-22	10,000	6,450

Source: The Standing Committee on Urban Development (2021); PRS.

Table 10: Allocation towards Smart Cities Mission (in Rs crore)

Year	Budget	Actuals	Utilised
2015-16	2,020	1,484	73%
2016-17	3,215	4,412	137%
2017-18	4,000	4,526	113%
2018-19	6,169	5,902	96%
2019-20	6,450	3,135	49%
2020-21	6,450	3,305	51%
2021-22	6,450	6,600*	102%
2022-23	6,800	-	-
Total	**41,554**	**29,364**	**71%**

*Revised estimates.
Source: Budget documents 2015-16 to 2022-23; PRS.

Timely completion of projects: The Standing Committee on Urban Development (2021) noted the slow pace of project completion.[11] It observed that most of the projects are under construction stage. The Committee recommended the Ministry to ensure the timely completion of projects to avoid cost overruns.[11]

Table 11: Progress under Smart Cities Mission (as of January 23, 2022)

Project status	No. of projects	% of projects	Cost (in Rs crore)	% of cost
Total Proposed	5,151	-	2,05,018	-
Tendered	6,656	127%	1,88,048	91%
Work orders issued	6,074	117%	1,62,074	79%
Completed	3,371	65%	58,248	28%

Source: Smart Cities Dashboard, Ministry of Housing and Urban Affairs, last accessed February 5, 2022; PRS.

Irregularities in implementation and poor monitoring of projects: The Standing Committee on Urban Development (2021) observed several irregularities in implementation of Smart Cities works which include: (i) frequent dropping of projects after finalising proposals, (ii) redoing of the same work again, and (iii) project costs being higher than market rate.[11] Further, the Committee observed that the Geospatial Management Information System (real time monitoring system) has not been able to adequately monitor projects. The Committee recommended the Ministry to conduct on ground verification of projects by teams consisting of: (i) mission director, (ii) state representative, (iii) member of parliament, and (iv) member of legislative assembly.[11]

Financially backward states lagging behind: Each smart city has a Special Purpose Vehicle (SPV), responsible for the implementation of the Mission at the city level. The central government and state government provide funds to SPV. The Standing Committee on Urban Development (2021) observed that certain financially backward states are not able to provide their share of funds to the SPV which is affecting the progress of the Mission. For instance, in 2020-21, states were able to release only 70% of their share to SPV.

Therefore, the Committee recommended the Ministry to explore the possibility of reducing the amount of contribution by certain backward states to ensure that project implementation is not affected.[11]

PM Street Vendor's Atmanirbhar Nidhi (PM SVANidhi

PM SVANidhi was launched in June 2020 to provide collateral free working capital loans of up to Rs 10,000 to street vendors.[42] Vendors availing loan under the scheme are eligible for an interest subsidy of 7%. Further, the scheme also promotes digital transactions by vendors through a cash back facility. The subsidy is available till March 2022. The Standing Committee on Labour (2021) took note of the impact of COVID-19 on the livelihoods of street vendors.[43] It recommended to explore the feasibility of converting the loan credit amount into a direct cash grant as livelihood support.

The scheme has been allocated Rs 150 crore in 2022-23. There has been a decline of 50% in the allocation for PM SVANidhi over the revised stage of 2021-22. The Standing Committee on Housing and Urban Affairs (2021) observed that many street vendors have not been covered under the scheme, and many are still recovering from the effects of COVID-19 on their businesses.[44] It recommended extending the scheme by at least another year.

Low rate of sanction and disbursal of loans: The Standing Committee on Housing and Urban Affairs (2021) noted that ten states have sanction rates and disbursal rates (out of total loan applications received) less than 50%. Certain banks also have sanction rates less than 50%.[44] Further, while the scheme guidelines require loans to be disbursed within 30 days, 31 states/UTs take longer to disburse loans. The Committee also noted that some lending institutions seek a CIBIL score (a three-digit numeric summary of credit history, rating, and report) before granting loans to vendors, which typically vendors may not have. It recommended: (i) providing timelines to states/UTs to improve their sanction and disbursal rate, (ii) investigating bank-specific reasons for low sanction rates, (iii) addressing delays in the loan disbursement process, and (iv) removing the requirement of seeking minimum CIBIL score for sanctioning loans under the scheme.[44]

Lack of private bank participation: The Standing Committee on Housing and Urban Affairs (2021) noted that there is a gap between the participation of private and public sector banks.[44] As of February 2021, the share of private banks in the total loan applications was 4%. The Committee recommended increasing the participation of private banks under PM SVANidhi.

Vendors not digitally active: The interest subsidy and cashback on digital transactions (credited to the vendor's account) are two primary components of the scheme. Under the Scheme, vendors who carry out their transactions digitally, will be given monthly cash backs as an incentive for adopting digital transactions. The Standing Committee on Housing and Urban Affairs (2021) noted that as of September 24, 2021, out of the total sanctioned applications (27 lakh), 21 lakh street vendors have been digitally on-boarded (given a QR code and debit card for facilitating digital transactions) under the Scheme. Of these, only 7.2 lakh street vendors are actively carrying out their business through digital transactions.[44] The Committee recommended roping in ULBs to collaborate with third party digital payment aggregators to help on-board more street vendors and keep them digitally active.[44]

ULBs lack technical capacity; affecting progress of major schemes

While ULBs have been implementing various schemes, their performance in implementing Smart Cities Mission and AMRUT has been inadequate. One of the key reasons which affects the completion of urban infrastructure projects is lack of trained and competent manpower.[11] Due to inadequate financial and technical capacity, ULBs are not able to implement major schemes like Smart City Mission and AMRUT.[11] Therefore, the Committee recommended that suitable changes should be made to address this concern. The HPEC (2011) had observed that municipal administration has suffered due to (i) presence of untrained and unskilled manpower, and (ii) shortage of qualified technical staff and managerial supervisors.[4] It recommended improving the technical capacity of ULBs. This can be achieved by providing technical assistance to state governments, and ULBs in planning, financing, monitoring, and operation of urban programs.[11]

Financial capacity of cities is poor

The schemes being implemented by the Ministry seek to decentralise the planning process to the city and state level, by giving them more decision-making powers. However, ULBs in India are amongst the weakest in the world both in terms of capacity to raise resources and financial autonomy.[4] Municipal revenue in India accounts for only one percent of the GDP (2017-18).[45] ULB's own revenue as per cent of GDP rose between 2010-11 (0.49%) and 2012-13 (0.53) but has declined thereafter. In 2017-18, own revenue stood at 0.43 per cent of GDP, the lowest in the last eight years. Municipal tax revenue forms a major yet declining share of own revenue.[46] The Constitution (74th Amendment) Act, 1992 had devolved certain functions relating to urban development to ULBs, including the power to collect certain taxes. These functions include urban planning, planning for economic and social development, and urban

poverty alleviation. However, most states have not devolved enough taxation powers to local bodies. Note that many local taxes that were levied by ULBs have now been subsumed under GST.[46] These local taxes include octroi tax, local body tax, entry tax, and advertisement tax. Further, local governments collect only a small fraction of their potential tax revenue.[4] While the central and state governments provide the ULBs with funds, these devolved funds are largely tied in nature, to either specific sectors or schemes. This constrains the spending flexibility of ULBs. PPPs have been an important instrument to finance and develop infrastructure projects. However, projects in many sectors such as water-supply and urban transportation require support from ULBs in the form of additional financial resources. The Ministry of Finance observed that an inability to service such funding requirements constrains project implementation.[47] In such cases where ULBs require financial resources, they can access capital markets through issuance of municipal bonds. Municipal bonds are marketable debt instruments issued by ULBs, the funds raised may be used for capital projects, refinancing of existing loans, and meeting working capital requirements. The Securities and Exchange Board of India regulations (2015) regarding municipal bonds provide that, to issue such bonds, municipalities must: (i) not have negative net worth in any of the three preceding financial years, and (ii) not have defaulted in any loan repayments in the last one year.[48] Therefore, a city's performance in the bond market depends on its fiscal performance.

To improve the finances of the ULBs, the HPEC recommended that state governments share a pre-specified percentage of their revenues from all taxes on goods and services with ULBs.[4] It had recommended mandating this constitutionally. Further, ULBs should be provided with formula-based transfers, and grants-in-aid.[4] The ULBs could raise their own revenue by tapping into land-based financing sources, and improving non-tax revenues (such as water and sewerage charges, and parking fee).[4] The 15th Finance Commission (2021) recommended that Rs 1.2 lakh crore be allocated to urban local bodies as grants for the period 2021-26.[49]

Larger aspects of cities ignored by Master Plans for cities

Master plans are statutory instruments to guide and regulate the development of cities and are critical for managing urbanization as well as spatial sustainability. NITI Aayog (2021) noted that 65% of the 7,933 urban settlements do not have any master plan.[50] This leads to piecemeal interventions, haphazard constructions, urban sprawl, and environmental pollution, which can further aggravate issues such as traffic congestion, and flooding. It also noted that various shortcomings in the approaches of city planning and bottlenecks in plan implementation also need to be resolved.

The HPEC (2011) had observed that larger aspects of planning at the metropolitan, regional, and national levels have received very little attention.[4] Master Plans typically view cities in isolation from the larger region in which they are located.[4] for instance, Master Plans tend to ignore the needs of low-income groups by not focusing on spatial planning (such as housing and transportation for the poor) for the urban poor.[4] Further, Master Plans tend to treat transportation as a secondary issue. The procedures for the preparation and implementation of the Master Plans have tended to be rigid, time-consuming, and weak on the costing and financing of the future requirements of infrastructure.[4] While cities are fast growing and dynamic entities, Master Plans have remained largely static.[4] Despite investments and introduction of new schemes, lack of proper Master Plans in cities can lead to inadequate performance with respect to achieving the set targets.
The Standing Committee on Urban Development (2021) inquired about the status of a master plan for holistic urban development.[11] The Committee noted that formulation of a master plan is a state subject and the Ministry's role is defining the framework and broad guidelines. There should be master plans at three levels: (i) state, (ii) zonal, and (iii) city. The Committee recommended a plan of 30 years should be set involving convergence of schemes like Smart City Mission. AMRUT, and Swachh Bharat Mission.[11] Further, it recommended that as the land in metro cities (Delhi, Mumbai) is owned by multiple authorities, extensive stakeholder consultation should be conducted while formulating the plan. The National Urban Policy (2020) outlines an integrated and coherent approach for managing Indian cities. It seeks to formulate localised solutions for various states/UTs.[24] The Policy recognises state governments as the primary stakeholder responsible for urban development and offers assistance to states to prepare their own state urban policies.[24]

Table 12: State/UT-wise number of existing Master Plans status – 2021

Town category	Total towns in category	Approved Master Plans	Under preparation
Statutory Towns	4041	1566	359
Census Towns	3892	650	268
Total cities and towns	**7933**	**2216**	**627**

Source: Reforms in Urban Planning Capacity India, NITI Aayog, 2020; PRS.

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Demand for Grants 2022-23 Analysis
Science and Technology

The Ministry of Science and Technology has three departments: (i) Department of Science and Technology (DST), (ii) Department of Scientific and Industrial Research (DSIR), and (iii) Department of Biotechnology (DBT). DST is responsible for promoting new areas of science and technology, coordinating, and integrating areas of science and technology having cross-sectoral linkages. It formulates and implements policies for the promotion of science, technology, research, and innovation in the country. DSIR is responsible for promotion, development, and transfer of indigenous technology. The Council for Scientific and Industrial Research (CSIR) is an autonomous body under DSIR which undertakes research and development in diverse areas. DBT is entrusted with the promotion and development of biotechnology.

India's expenditure on Research and Development (R&D) activities remains low in comparison to developed countries. Further, R&D sector in India faces other issues such as: (i) lack of researchers, (ii) inadequate private investment, (iii) delays in approval of patents, and (iv) absence of an integrated approach towards R&D. In this note we examine the expenditure by the three Departments and discuss the key issues in the sector.

Overview of Finances[1,2,3]

Expenditure

In 2022-23, the Ministry of Science and Technology has been allocated Rs 14,217 crore. This comprises: (i) Rs 6,000 crore to DST (42% of the total), (ii) Rs 5,636 crore to DSIR (40%), and (iii) Rs 2,581 crore to DBT (18%). This is an increase of 5% over the revised estimate of 2021-22. Allocation to DST and DSIR in 2022-23 has increased by 15% and 6% over the previous year, respectively. Allocation to DBT has decreased by 13%. Almost all the expenditure under the Ministry is revenue expenditure (99.3% on average).

In 2021-22, expenditure by DST and DBT is estimated to be 14% and 15% lower than the budget estimates, respectively. In 2022-23, DSIR has been allocated 5,636 crore, out of which 99% of the allocation is towards the Council of Scientific and Industrial Research (CSIR). In 2022-23, DBT has been allocated Rs 2,581 crore. Out of which 51% is towards Biotechnology Research and Development, and 32% towards Assistance to Autonomous Institutions. See Tables 4, 5 and 6 in the annexure for major allocation heads under DST, DSIR, and DBT respectively.

Table 1: Overview of Allocation (in Rs crore)

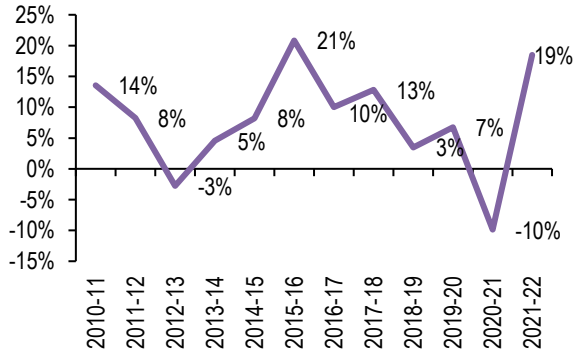
Dept	2020-21 Actuals	2021-22 RE	2022-23 BE	% Change (21-22 RE to 22-23 BE)
DST	**4,894**	**5,240**	**6,000**	**15%**
-Autonomous Bodies	1,375	1,488	1,500	1%
-Institutional and Human Capacity Building	893	984	1,128	15%
DSIR	**4,199**	**5,298**	**5,636**	**6%**
-CSIR	4,202	5,234	5,563	6%
DBT	**2,259**	**2,961**	**2,581**	**-13%**
-Biotechnology Research and Development	1,287	1,494	1,315	-12%
Total	**11,351**	**13,499**	**14,217**	**5%**

Note: BE: Budget Estimates; RE: Revised Estimates. 2020-21 Actuals of CSIR was more than DSIR due to recoveries in other heads being netted off for DSIR expenditure.
Source: Union Budget 2022-23; PRS.

Growth in Expenditure

The growth in the expenditure of the Ministry has been variable during the last decade (Figure 1 and 2). The year-on-year growth in expenditure was relatively higher during the 2015-18 period. During the 2018-21 period, the growth has slowed down. In 2018-19, the expenditure by the Ministry was only 3% higher than the previous year. In 2018-19, actual expenditure by DSIR registered a negative growth as compared to the previous year (-2%). In 2020-21, all three departments witnessed a decline in expenditure as compared to the previous year: (i) -9% for DST, (ii) -14% for DSIR, and (iii) -4% for DBT. During the 2018-23 period, the compounded annual growth rate in expenditure is: (i) 5% for DST, (ii) 6% for DSIR, and (iii) 2% for DBT. The expenditure in 2021-22 is estimated to be 19% higher over the low base of 2020-21 (COVID year).

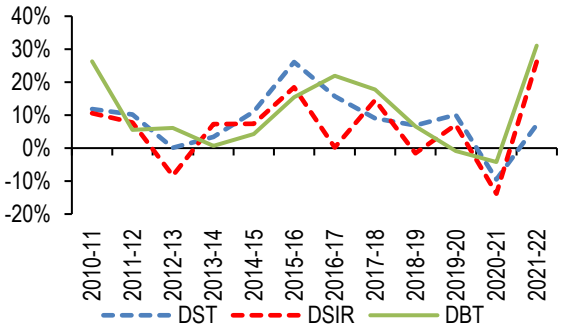
Figure 1: Year-on-year growth in expenditure- Ministry of Science and Technology



Note: Expenditure for 2021-22 is as per revised estimates.
Source: Union Budget of various years; PRS.

Regarding the expenditure of DST, the Standing Committee on Science and Technology (2020) had observed that there is a need for enhancement in the medium-term expenditure framework (MTEF) allocation to the DST.[4] MTEF provides a three-year rolling target for the expenditure of a department.[5] The Committee recommended that DST should pursue the Ministry of Finance for revision of the MTEF to a higher base level. This will help DST in carrying out its new initiatives and future plans.[4]

Figure 2: Department-wise year-on-year growth in expenditure

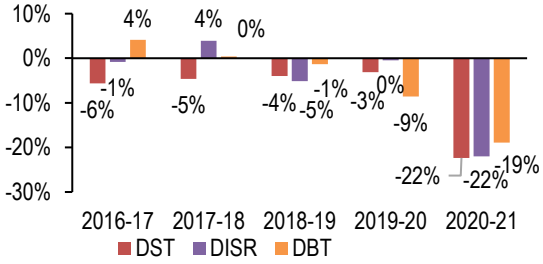


Note: Expenditure for 2021-22 is as per revised estimates.
Source: Union Budget of various years; PRS.

Underutilisation of funds

During the 2016-20 period (four years), on average, DST spent 4% less than the budget estimates (Figure 3). The corresponding figures for DSIR and DBT are 1% and 2% respectively. In 2020-21 actual expenditure is lower than the budget estimates for all three departments: (i) -22% for DST and DISR each, and (ii) -19% for DBT. The Standing Committee on Science and Technology (2021) observed that budget allocation for DST and DISR was reduced at the 2020-21 revised stage due to COVID-19.[6,7]

Figure 3: Underutilisation (Change from Budget Estimates to Actuals)

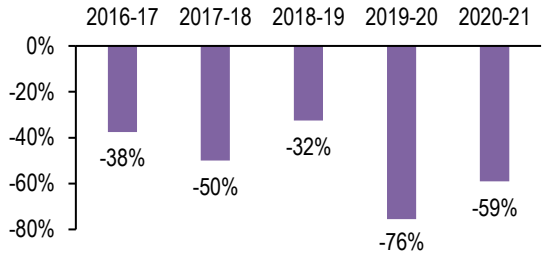


Source: Union Budget of various years; PRS.

Underutilisation of funds for Industrial Research and Development

DSIR utilises funds under Industrial Research and Development head towards: (i) Promoting Innovations in Individuals, Startups & MSMEs (PRISM), (ii) Patent Acquisition and Collaborative Research & Technology Development (PACE), (iii) Building Industrial R&D and Common Research Facilities (BIRD) and (iv) Access to Knowledge for Technology Development & Dissemination (A2K plus) programmes of the Department. The actual expenditure under this head has been lower than the budget estimates in all years between 2016-17 and 2019-20 (50% on average).

Figure 4: Underutilisation - Industrial Research and Development head under DSIR



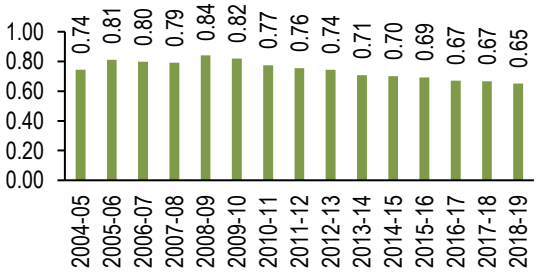
Source: Union Budget of various years; PRS.

Issues for consideration

India's expenditure on research and development on a decline

Investment in science is measured in terms of gross expenditure in research and development (GERD).[8] It includes expenditure on research and development by business enterprises, higher education institutions, governments, and private non-profit organisations. GERD as a percentage of GDP has been declining since 2009-10 (Figure 5). GERD in 2018-19 was estimated to be 0.65% of GDP (latest year till which estimates are available).[9]

Figure 5: GERD falling since 2009-10 (Figures in % of GDP)

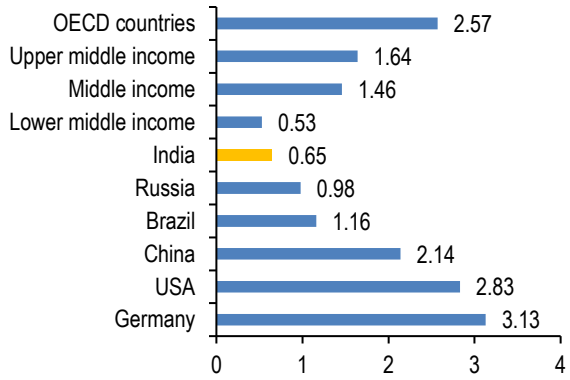


Source: Research and Development Statistics 2019-20; Ministry of Science and Technology; PRS.

India's GERD (2018) was substantially lower than countries such as Germany, USA, China, and Brazil (Figure 6). However, India's GERD is higher than the average for lower-middle-income group countries. The Science, Technology, and Innovation Policy, 2013 (administered by the Ministry of Science and Technology) had observed that increasing GERD to 2% of GDP has been a national goal for quite some time.[10] The Policy had observed that the target for GERD could be achieved by 2018-19 if the private sector at least matches the expenditure level of the public sector.[10] The Standing Committee on Science and Technology (2021) recommended the DST to enhance the GERD

as a % of GDP by promoting private sector investment in R&D.[6]

Figure 6: India's GERD as a % of GDP among the lowest (2018)

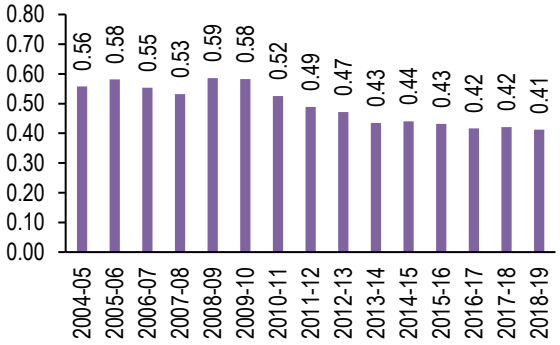


Note: Data for lower middle-income countries is from 2017.
Source: World Bank; PRS.

Public sector investment on R&D on a decline; lowest since 2004-05

The Science, Technology, and Innovation Policy, 2013 had observed that the public sector has led the expenditure on R&D in the country.[10] This includes expenditure by: (i) all central government ministries, (ii) public sector units, (iii) state governments, and (iv) higher education institutes. Expenditure by the public sector has also been declining since 2008-09 (Figure 7). Expenditure by the public sector towards R&D is estimated to be 0.41% of GDP in 2018-19, the lowest since 2004-05.

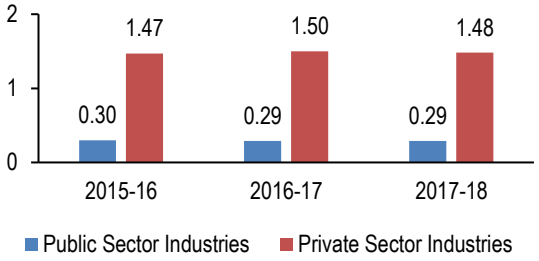
Figure 7: Declining expenditure by the public sector on R&D (Figures in % of GDP)



Source: Research and Development Statistics 2019-20; Ministry of Science and Technology; PRS.

Public sector corporations spend a lesser portion of their sales turnover on R&D as compared to private sector companies (Figure 8). In 2017-18, private sector companies spent 1.48% of their sales turnover on R&D. The corresponding percentage for the public sector industries was 0.29%.

Figure 8: Percentage of sales turnover spent on R&D (Figures in %)

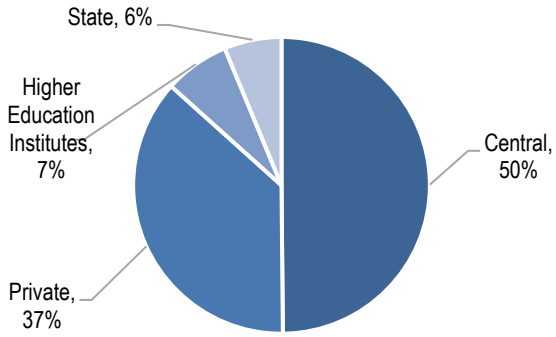


Note: Data for public sector refers to 103 industrial R&D units. Data for private sector refers to 2,007 industrial R&D units excluding scientific and industrial research organisations. The public sector contributed 48% of the total sales turnover of the considered units in 2017-18.
Source: Research and Development Statistics 2019-20; Ministry of Science and Technology; PRS.

Need to increase investment in R&D by state governments

The Economic Survey (2017-18) observed that the government expenditure on R&D is undertaken almost entirely by the central government. There is a need for greater state government spending (Figure 9Figure).[8]

Figure 9: Sector-wise source of funds for R&D in 2018-19



Note: Central sector includes expenditure by central ministries and central public sector units. State sector includes spending by the state ministries/organisations and state agricultural universities. Examples of Higher Education Institutes are IITs and Indian Institute of Science, Bangalore.
Source: Research and Development Statistics 2019-20; Ministry of Science and Technology; PRS.

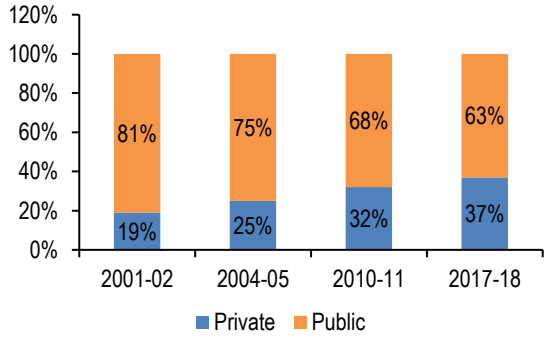
The annual growth rate of R&D expenditure of states in 2017-18 over 2009-10 was 8.2%.[11] In 2017-18, the share of state sector in national R&D expenditure was 6%. A few states accounted for a major share of the total state-sector R&D expenditure. More than 55% of the total R&D expenditure of the states was accounted by seven states- Gujarat, Tamil Nadu, Punjab, Andhra Pradesh, Madhya Pradesh, Uttar Pradesh, and Assam (Table 9 in annexure shows state-wise share of R&D expenditure).[11] Further, state-wise distribution of number of patent applications filed by Indians during 2017-18 shows that more than 75% applications were from seven states- Maharashtra, Tamil Nadu, Karnataka, Delhi,

Telangana, Uttar Pradesh, and Gujarat.[11]

Share of private sector investment low in national expenditure on R&D

It is observed that in countries where R&D investment is about 2% or more of their GDP, major contribution (>50%) comes from the private sector.[8] The Economic Survey (2017-18) had observed that in countries such as the USA, China, Germany, and Japan, the share of the private sector in the overall spending in research and development is significantly higher.[8] In India, the contribution of private sector is 37% and the rest 63% of national R&D expenditure comes from the government (Figure 10). The Economic Survey (2017-18) Survey took note of an analysis by a private organisation (Forbes, 2017).[8] According to this analysis, India had 26 firms in the list of top 2,500 global R&D spenders as compared to 301 Chinese companies. 19 of these 26 firms were in three sectors: (i) pharmaceuticals, (ii) automobiles, and (iii) software. India had no firms in five of the top ten R&D sectors as opposed to China, which has a presence in each one of the top five sectors.

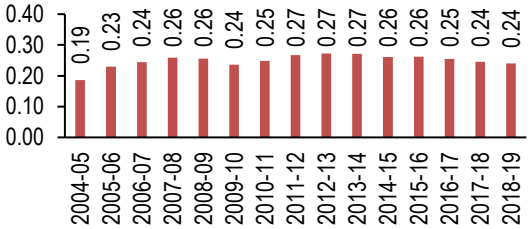
Figure 10: % share of public investment in R&D more than private investment



Source: Research and Development Statistics 2019-20; Ministry of Science and Technology; PRS.

The Science, Technology, and Innovation Policy, 2013 Policy had stressed that the expenditure on R&D by the private sector needs to go up.[10] It had observed that an increase in private investment is necessary for translating R&D outputs into commercial outcomes. However, the expenditure on R&D by the private sector has decreased from 0.27% of GDP in 2012-13 to 0.24% of GDP in 2018-19 (Figure 11). NITI Aayog (2018) noted that low investment by the private sector in R&D is a key challenge in the development of the innovation ecosystem in the country.[12] Note that the Draft Science, Technology, and Innovation Policy, 2020 seeks to double the GERD and the private sector contribution to GERD in five years.[13] Since October 2019, companies have been allowed to use corporate social responsibility funds (CSR) for contributions towards research.[14] They can spend CSR funds as contributions to public-funded incubators, research organisations and universities engaged in research in science, technology, engineering, and medicine.

Figure 11: Low expenditure by private sector on R&D (Figures in % of GDP)

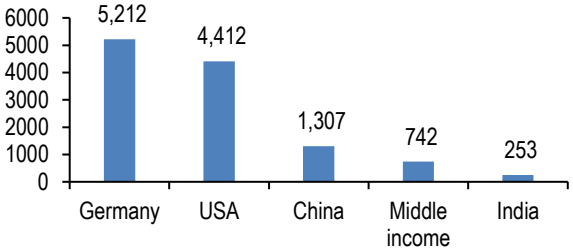


Source: Research and Development Statistics 2019-20; Ministry of Science and Technology; PRS.

Low number of researchers per million people

India's researchers per million people have increased from 157 in 2011 to 253 in 2018.[15] However, it remains significantly low when compared to other countries (See Figure 12).

Figure 12: Researchers per million people (2018)



Note: Data for USA and Middle-income countries is from 2017 and 2015 respectively.
Source: World Bank; PRS.

Note that India's gross enrolment ratio (GER) in higher education itself is low as compared to these countries. In 2018-19, India's GER in higher education was 26.3%.[16] In comparison, the GER in higher education in countries such as USA, China, and Germany was 88%, 49%, and 70%, respectively.[17] The National Education Policy 2020 recommends increasing GER in higher education to 50% by 2035.[18] The Economic Survey (2017-18) observed that considerable improvement in mathematics and cognitive skills is required at the primary and secondary education level to enable the R&D ecosystem in the country.[8] The National Education Policy 2020 also aims to improve foundational literacy and numeracy and cognitive capacities of students.[18]

Low number of female researchers

The Ministry of Science and Technology observed that women in India face several challenges in moving up the academic and administrative ladder due to systemic barriers and structural factors.[19] The share of female researchers in India has increased from 14% in 2015 to 19% in 2018.[15] However, it is less than other countries such as Sri Lanka (47% in 2017), European Union (34% in 2017), and Switzerland (35% in 2017).[15] A Report by UNESCO (2015) noted the lack of women's participation in

research globally.[20] Further, it stated that women actively pursue bachelor's and master's degree but their participation drops at the PhD level. High proportion of women in tertiary education is, thus, not translated to a greater participation in research.[20]

The share of female researchers in engineering and technology in India also remains low. In 2018, share of female researchers in engineering and technology was 14%.[15] Initiatives to promote gender equity in the field of research include: (i) Women Scientists Scheme (2002-03) that seeks to give financial incentives (fellowships, and grants) to women in the age group 27-57 years who wish to pursue research in various fields, and (ii) Gender Advancement for Transforming Institutions (2020), that aims to mentor institutions in order to make them more inclusive and sensitive towards women, and to promote gender equity in science, technology, engineering and mathematics (STEM) domains.[19,21]

Inadequate incentives for researchers

UNESCO (2021) observed that university graduates in India from STEM represent a little over one in four graduates.[15] Science graduates also make up a greater share of the total than graduates in engineering and technology.[15] UNESCO (2021) observed that, although India has a low researcher density, there is little evidence to show that demand for STEM graduates has increased, as investment in R&D has not kept pace with the rise in GDP.[15]

NITI Aayog (2018) had observed that the link between research, higher education, and the industry is weak and nascent in India.[12] It further observed that so far, the education system has not focussed on cultivating scientific temperament at an early age. Even in the later stages, the lack of career opportunities in basic sciences leads to the diversion of potential researchers to other rewarding sectors. It had recommended that once the Higher Education Commission is set up, the Commission may consider giving credits for innovation and startups.[12] The Commission should also consider setting up online entrepreneurial development courses in colleges and universities.[12] The Higher Education Commission is proposed to replace the existing regulatory institutions for higher education.[12]

The Economic Survey (2017-18) also noted that more than one lakh people with PhDs, who were born in India, live and work outside India.[8] In USA alone, the number of immigrant scientists and engineers from India increased from five lakh in 2003 to 9.5 lakh in 2013.[8] It noted that government programs such as Ramanujan Fellowship Scheme, INSPIRE Faculty Scheme, and Ramalingaswami Re-Entry Fellowships provide opportunities to Indian researchers residing in foreign countries to work in Indian universities. However, the number of people returning has been modest (243 during 2007-12 and 649 during 2012-17).[8] The Survey recommended enhancing the scope of these schemes to also provide additional support for good research instead of just financial incentive. The additional support should include: (i) laboratory resources, and (ii) ability to hire post-docs.[8]

Exploring upcoming areas of R&D

The Draft Science and Tech Policy (2020) noted that India is largely dependent on the import of technologies in the priority sectors (such as agriculture, health, energy, and environment).[13] The Policy outlined the need to achieve self-reliance and address local problems, through science, technology, and innovation.[13] Further, it observed that there is a need to focus on: (i) indigenous development of technology, (ii) providing sustainable solutions through technology, and (iii) promoting the development of disruptive technologies (such as blockchain, and artificial intelligence).[13] NITI (2021) Aayog recommended undertaking steps to promote R&D in emerging fields such as artificial intelligence artificial intelligence, automation, and cybersecurity.[28] The National Strategy for Artificial Intelligence, NITI Aayog (2018) noted the need to promote R&D in artificial intelligence technologies to improve health care, education, agriculture, and to enable smart cities infrastructure, and smart mobility.[22]

Table 2: National research expenditure by areas (2017-18)

Sector	% Share
Health	19%
Defence	17%
Agriculture, forestry, and fishing	13%
Industrial production and technology	10%
Exploration of Space	9%
Transport, telecommunication and other infrastructure	9%
Energy	7%
General advancement of knowledge	7%
Others	11%

Source: Research and Development Statistics 2019-20; Ministry of Science and Technology; PRS.

Some recent measures to incentivise R&D across sectors include:

- In December 2021, the Union Cabinet several programmes to promote R&D and manufacturing in semiconductor and electronic display industry in India.[23] The Ministry of Electronics and Information Technology will take steps to modernise and commercialise the Semi-Conductor Laboratory, an autonomous body engaged in R&D in areas of microelectronics.
- Ministry of Electronics and Information Technology released the National Strategy on Blockchain (2021) which seeks to promote

advanced research in indigenous blockchain technology.[24] It identified the lack of availability skilled manpower as a challenge for the development of blockchain.

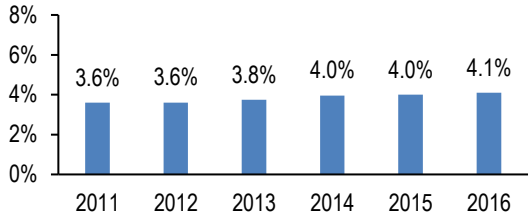
- The National Mission on Transformative Mobility and Battery Storage, approved in March, 2019, seeks to promote R&D in production of electric vehicles and batteries.[25]
- In 2021, a production linked scheme for promoting telecom and networking products manufacturing in India.[26] Under the scheme, there is a component to provide capital expenditure on R&D and product development. The total outlay of the Scheme is Rs 12,195 crore (2021-22 to 2025-26).
- In the 2022-23 budget speech, there were two announcements for promoting R&D- (i) government contribution and support for R&D in upcoming fields such as artificial intelligence, drones, green energy, and space economy, and (ii) introduction of a PPP scheme for delivery of digital and high-tech services to farmers with involvement of public sector research alongside other stakeholders.[27]

NITI Aayog (2021) noted that R&D should be geared towards providing solutions to national problems such as climate change, inadequate potable clean water, and affordable healthcare.[28] The use of R&D outputs for providing end-to-end solutions requires strong linkage of the R&D sector with central and state governments. NITI Aayog recommended: (i) formulating an oversight and monitoring mechanism may be formed to oversee R&D programmes, and (ii) constituting six sector task forces on R&D mission on water, agriculture health, energy, climate change, and national security.

Share in global scientific publications increased but target set in the 2013 Policy likely to be missed

The Economic Survey (2017-18) noted that looking at scientific publications can help in assessing the productivity and quality of research.[8] The Science, Technology, and Innovation Policy 2013 observed that India's share in the global scientific publications had increased from 1.8% in 2001 to 3.5% in 2011.[8] The Policy had set a target of doubling the global share in the scientific publications by 2020.[8]By 2016, India increased its share in the global scientific publication to 4.1% (latest data available).[9] The compounded annual growth rate (CAGR) for scientific publications during the 2011-2016 period for India has been 6.4% as against the CAGR of 3.7% for the world.[9] If the publication output were to grow at the same rate, India's share in 2020 will be about 4.5%. This will be lower than the target set by the 2013 Policy for 2020 (7% share in the global scientific publications).

Figure 13: Share in Global Scientific Publication (SCI Database)



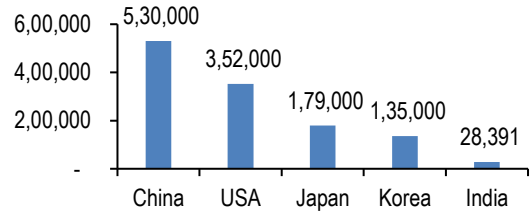
Note: Data is as per the Science Citation Index (SCI) Database.
Source: Research and Development Statistics 2019-20; Ministry of Science and Technology; PRS.

The Economic Survey (2017-18) observed that in addition to increasing publications, India needs to improve in terms of high-quality research output (measured as highly cited articles).[8] It noted that India lags considerably on this parameter when compared to other large countries such as USA and China.[8]

Low number of patents in India; delays in patent approval

There has been gradual increase in the filing and granting of patents in India. The number of patents filed in India has gone up from 39,400 in 2010-11 to 58,502 in 2020-21 and the patents granted in India has gone up from 7,509 to 28,391 during the same time period.[30] India's ranking in Global Innovation Index has also improved, from 81 in 2015-16 to 46 in 2021.[30] However, the number of patents granted in India is low when compared to other countries like China, USA, Japan, and Korea.[30]

Figure 14: Patents granted (2020)



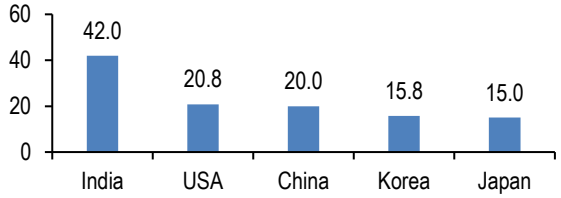
Source: Economic Survey (2021-22); PRS.

One of the key reasons for relatively low patents in India is the low expenditure R&D.[30] The Standing Committee on Commerce noted that India grants a low number of patents (as compared to China and the USA), which can be attributed to low spending on research and development (0.7% of the GDP in 2020).[29] It recommended: (i) allocating funds to each government Department for research, (ii) providing incentives to private companies for undertaking research, and (iii) directing large industries to give CSR funds for research.[29]

The Economic Survey (2021-22) observed that the procedural delays and complexity of the process is another cause for low patents in India.[30] The average pendency for final decision in acquiring patents in India is 42 months as of 2020. This is much higher

than other countries (See Figure 15). Note that average pendency for final decision in acquiring patents has reduced in India from 64 months in 2017 to 42 months in 2020.[30]

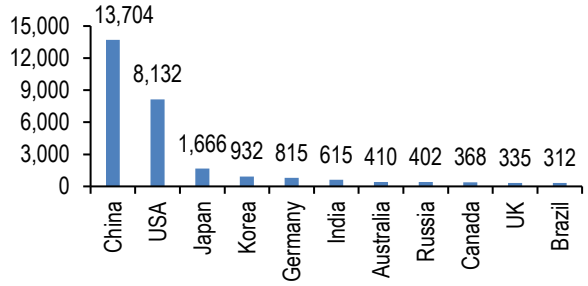
Figure 15: Average pendency for final decision in acquiring patents (in months) (2020)



Source: Economic Survey (2021-22); PRS.

Delay in India's patent application is also due to the low number of patent examiners in India.[30] The number of patent examiners in India in 2020 were 615 as opposed to 13,704 in China, 8,132 in United States and 1,666 in Japan (Figure 16).

Figure 16: Number of patent examiners (2020)

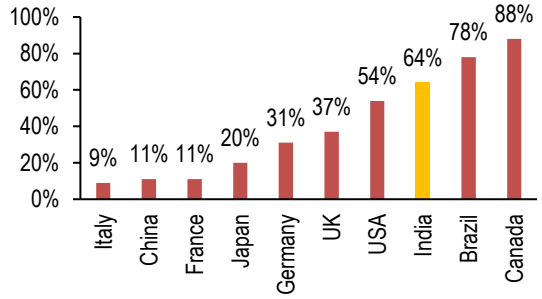


Source: World Intellectual Property Indicators, 2021; PRS.

Resident share in patent applications needs to increase

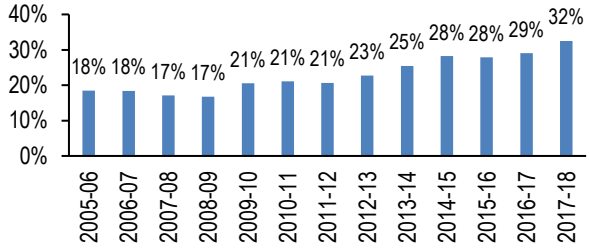
The Economic Survey (2017-18) had observed that patents reflect a country's standing in technology.[8] During the 2007-18 period, the patent applications filed in India grew at a CAGR of 3%.[8] As can be seen in Figure, a larger number of patent applications in India are filed by non-residents (64% in 2019) as compared to countries such as China (11%) and USA (54%).[31] However, the share of residents in patent applications has been steadily increasing (Figure 18).[9] The Economic Survey (2021-22) noted that the number of patents application are increasingly coming from Indian residents rather than MNCs.[30] The share of Indian residents in total applications has increased from 20 per cent in 2010-11 to around 30% in 2016-17 and 40% 2020-21. The Economic Survey (2020-21) had observed that resident share in the patent applications needs to rise further for India to become an innovation nation.[31] The Standing Committee on Commerce noted that only 36% (2019-20) of patents filed in India are filed by domestic entities.[29] It attributed this to lack of awareness of Intellectual Property Right (IPR), and recommended the Department for Promotion of Industry and Internal Trade (DPIIT) to increase awareness among small businesses, artisans, and establishments in remote areas with participation of non-governmental organisations.[29]

Figure 17: Percentage of patent applications filed by non-residents in the top 10 economies (2019)



Source: Economic Survey 2020-21; PRS.

Figure 18: Percentage of patent applications filed in India by residents



Source: Research and Development Statistics 2019-20; Ministry of Science and Technology; PRS.

Role of universities in R&D needs to increase

The Economic Survey (2017-18) observed that in several countries, universities play a critical role in both creating the talent pool for research as well as generating high-quality research output.[8] However, publicly funded research in India is concentrated in specialised research institutes under different government departments.[8] This leaves universities to largely play a teaching role. Hence, universities play a relatively small role in research activities. The Survey recommended linking national laboratories to universities for improvement in the knowledge ecosystem. The National Education Policy (2020) proposed to establish a National Research Foundation (NRF) to enable a culture of research through universities.[32] NRF seeks to promote R&D through suitable incentives at the state universities and other public institutions where research capacity is limited.

Foreign Direct Investment in R&D remains low

The Office of the Principal Scientific Advisor noted that Foreign Direct Investment (FDI) is one of the key factors for enhancing R&D exports.[33] India's share in global R&D exports was about 2.8% in 2019.[33] R&D exports include: (i) licensing of intellectual property, (ii) technology embodied in exported intermediate goods, (iii) technology transfer through FDI, and (iv) outflow of technical services. India has a trade surplus in R&D services.[33] During

2011-20, India's R&D exports grew at a CAGR of 26.6%, the highest growth among the top 10 exporting countries in R&D.[33] However, R&D accounts for only a tiny share of FDI inflows into India (0.25% in 2018-19).[34] Further, it is mostly concentrated in four sectors - Information and Communication Technology, Natural Sciences and Engineering, Pharmaceuticals, and Clinical Research (more than 80%).[34] The Economic Advisory Council to the Prime Minister suggested a goal of increasing yearly FDI inflow into R&D to USD 300 million by 2022.[35] However, FDI in R&D has been on a decline since 2015-16 (Table 3).[34]

Table 3: FDI equity inflow (in USD million)

Year	R&D	Total	% Share
2015-16	235	40,001	0.59%
2016-17	84	43,478	0.19%
2017-18	107	44,857	0.24%
2018-19	110	44,366	0.25%
2019-20	67	49,977	0.13%

Source: Note titled "FDI into R&D: Current Status and Way Forward" by the Office of the Principal Scientific Advisor; PRS.

Adoption of technologies developed by public-funded research organisations is low

NITI Aayog (2018) had observed that the rate of transfer of technology developed by public-funded institutions such as the Council of Scientific and Industrial Research (CSIR) is relatively low.[12] It highlighted poor marketing skills and information dissemination as key reasons for this.[12] It suggested the following measures to enhance technology commercialisation by public-funded institutions:

- Value addition centres may be set up in these institutions for: (i) upscaling technologies and improving technology readiness level, (ii) coordinating with investors to incubate entrepreneurs, (ii) enabling commercialisation and marketing, and (iii) providing technology support during production.
- A National Technology Data Bank should be created by the DST which will act as the central database for technologies that are ready for deployment or under development.
- Public funded research institutions should focus on the development and deployment of socially relevant technologies in areas such as clean drinking water, sanitation, energy, healthcare, and organic farming. These technologies have a large potential for commercialisation.

The Standing Committee on Science and Technology (2021) observed that the research done in industrial sciences by National Laboratories under CSIR is credible.[7] However, it noted that there is still a gap between the requirements of the industries and the research output of the National Laboratories. The Committee recommended that avenues for translation of technology and commercialisation of research should be further augmented. CSIR should work towards bridging the gap between the needs of industries and research provided by the laboratories.

Tax incentives for R&D to the private sector have been reduced

India used to allow a weighted tax deduction of 200% of expenditure towards in-house research and development to corporations.[31] This was reduced to 150% from April 2018. This is going to be reduced further to 100% from April 2021. The Standing Committee on Science and Technology (2020) was informed that withdrawal of tax incentive on R&D as well as exemptions on funds spent in acquiring patents by the private sector, has negatively affected the R&D investment in the private sector.[4] The Committee observed that the tax incentive had stimulated R&D spending by the private sector.

Public procurement does not encourage new and innovative technologies

NITI Aayog (2018) had observed that public procurement is biased in favour of experienced and established products and technologies.[12] This discourages new and innovative technologies offered by startups.[12] It recommended that:

- international competitive bidding should be resorted to only when Indian manufacturers are unable to supply products or services of comparable international quality;
- to adopt innovative technologies, experts or scientific practitioners should be mandatorily included on committees related to public procurement; and
- Indian startups should be given preference in the technical evaluation for public procurement.

Following incentives are available to startups recognised by the Department for Promotion of Industry and Internal Trade: (i) relaxation in prior turnover and prior experience requirements, subject to meeting of quality and technical specifications (notified in March 2016), (ii) relaxation in bid security deposit requirements (notified in July 2017).[36,37,38] Startups can also get the opportunity to work on trial orders with the government.[36] The recognised startups are allowed to offer their products and services for procurement on government's e-marketplace platform.[39] This is aimed at helping startups to introduce unique innovations to government and public sector unit buyers.[39]

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Annexure

Table 4: Major Allocation Heads-DST (in Rs crore)

Particular	2020-21 Actuals	2021-22 BE	2021-22 RE	2022-23 BE	% Change from 2021-22 RE to 2022-23 BE
Autonomous Bodies	1,375	1,488	1,488	1,500	1%
Institutional and Human Capacity Building	893	1,100	984	1,128	15%
Innovation, Technology Development and Deployment	630	952	701	813	16%
Statutory and Regulatory Bodies	751	950	975	903	-7%
-Science and Engineering Research Board	741	900	900	803	-11%
-Technology Development Board	10	50	75	100	33%
Research and Development	396	594	457	604	32%
Survey of India	423	531	472	524	11%
National Mission on ICPS	270	270	-	350	-

Note: SERB: Science and Engineering Research Board; TDB: Technology Development Board; ICPS: Interdisciplinary Cyber Physical Systems. RE: Revised Estimates; BE: Budget Estimates. Autonomous bodies include 25 research institutes.
Source: Expenditure Budget; PRS.

Table 5: Major Allocation Heads-DSIR (in Rs crore)

Particular	2020-21 Actuals	2021-22 BE	2021-22 RE	2022-23 BE	% Change from 2021-22 RE to 2022-23
Total-CSIR	4,202	5,144	5,234	5,563	6%
a. National Laboratories	3,802	4,669	4,759	5,103	7%
b. Capacity Building and Human Resource Development	400	475	475	460	-3%
Industrial Research and Development	13	21	21	29	38%
Assistance to PSEs for Other Scientific Research Schemes	9	14	11	10	-9%

Note: RE: Revised Estimates; BE: Budget Estimates.
Source: Expenditure Budget; PRS.

Table 6: Major Allocation Heads- DBT (in Rs crore)

Particular	2020-21 Actuals	2021-22 BE	2021-22 RE	2022-23 BE	% Change from 2021-22 RE to 2022-23 BE
Biotechnology Research and Development	1,287	1,660	1,494	1,315	-12%
Industrial and Entrepreneurship Development	341	960	710	365	-49%
Assistance to Autonomous Institutions	577	807	697	830	19%
Biotechnology Industry Research Assistance Council	28	40	25	35	40%

Note: RE: Revised Estimates; BE: Budget Estimates. Autonomous institutions include 16 R&D institutions.
Source: Expenditure Budget; PRS.

Table 7: Key Statistics-Department of Biotechnology

Indicator	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22*
Ongoing Projects	2,212	1,955	1,893	2,165	2,460	2,405	2,081	2,143
Projects Sanctioned	656	415	552	831	847	594	259	161
Ongoing International Collaborative Projects	42	66	79	101	139	96	69	82
Scientists Supported (PI/CoPI)	4,801	4,493	4,569	5,121	5,553	4,521	2,364	-
Research Personnel (JRF+SRF+RA)	5,766	6,076	6,180	6,195	6,221	6,312	-	-
CTEP-Proposals Sanctioned								
Conferences	-	-	161	92	83	96	8	16
Travels	-	-	522	421	314	317	303	15
Exhibitions	-	-	9	8	9	17	16	3
Popular Lectures	-	-	6	13	10	28	2	9
Technologies Generated	117	90	136	75	82	119	-	-
Publications	2,482	2,494	2,654	1,904	3,478	3,758	-	-
Patents Filed	186	160	181	102	93	76	-	-

Note: *as of February 13, 2022. PI: Principal Investigator; CoPI: Co-Principal Investigator; JRF: Junior Research Fellowship; SRF: Senior Research Fellow; RA: Research Assistant. CTEP: Conference, Travel, Exhibition, and Popular Lectures.
Source: Dashboard of the Department of Biotechnology as accessed on February 13, 2022; PRS.

Table 8: Key Statistics-Department of Science and Technology

Indicator	2018-19	2019-20	2020-21	2021-22
Human Capacity Building				
Fellowships provided	1,16,854	92,869	2,528	2,323
Number of people trained	20,381	2,805	77,972	33,995
Number of conferences	640	389	531	521
Research and Development				
New R&D Projects	3,658	691	1,014	53,410
Ongoing Projects	7,982	10,479	4,004	2,906
Institutional Capacity Building				
New R&D Infra	251	102	325	352
Innovation and Startups				
Number of Innovations	468	658	797	937
Startups	898	791	815	549
International Cooperation				
International Collaborative Visits	3,302	774	1	6
Ongoing Projects	478	2,931	2,554	1,702
Fellowships	66	144	147	262
Number of Manpower Trained	1,221	569	283	336
Science and Engineering Research Board				
Number of Ongoing Projects	6,033	26,664	30,532	23,156
Number of New R&D Projects	2,492	2,076	1,641	748
Human Resource Development	2,912	2,049	658	118
Development Activities	2,212	1,868	0	135
Autonomous Institutions				
Number of Publications	2,336	2,624	3,702	3,164
Number of PhDs Produced	221	296	217	183
Number of Manpower Trained	1,896	5,452	4,120	5,975
Number of Patents Granted	38	98	138	107

Source: Dashboard of the Department of Science and Technology as accessed on February 10, 2022; PRS.

Table 9: % Distribution of R&D expenditure by states (2017–18)

State	% Share
Gujarat	10.9
Tamil Nadu	9.5
Punjab	7.6
Andhra Pradesh	7.5
Madhya Pradesh	6.7
Uttar Pradesh	6.5
Assam	6.3
Haryana	5.2
Karnataka	5.1
Jammu & Kashmir	4
Uttarakhand	3.9
West Bengal	3.8
Telangana	3.8
Chhattisgarh	3.6
Maharashtra	3.1
Rajasthan	2.7
Kerala	2.2
Himachal Pradesh	2.2
Odisha	2.1
Manipur	1.4
Jharkhand	1.3
Bihar	0.7
Meghalaya	0.1

Source: Research and Development Statistics 2019-20; Ministry of Science and Technology; PRS.

Demand for Grants 2022-23 Analysis
Petroleum and Natural Gas

The Ministry of Petroleum and Natural Gas is concerned with exploration and production of oil and natural gas, refining, distribution and marketing, import and export, and conservation of petroleum products.

Overview of Finances

The Ministry has been allocated Rs 8,940 crore for 2022-23, a 1% increase over the revised estimates of 2021-22.

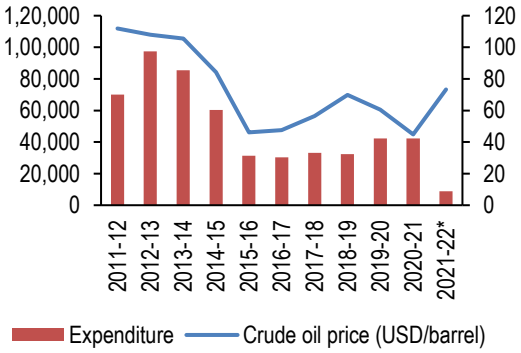
Table 1: Allocation for the Ministry of Petroleum and Natural Gas (in Rs crore)

Major Heads	Actual 2020-21	Revised 2021-22	Budget 2022-23	% change
LPG subsidy	35,195	6,517	5,813	-11%
Kerosene subsidy	3,259	-	-	-
SPR	2,428	374	811	117%
Pipeline and seismic programme	971	1,537	1,798	17%
Others	337	418	518	25%
Total	**42,190**	**8,846**	**8,940**	**1%**

Note: SPR = Strategic Petroleum Reserves. Others include PM JI-VAN yojana, among others.
Sources: Union Budget Documents 2022-23; PRS.

Historically, the Ministry's expenditure trend has followed the trend in global crude oil prices. Since 2011-12, the highest expenditure was in the year 2012-13 when the price of crude oil was more than $100 per barrel.

Figure 1: Expenditure of Ministry (Rs Crore)



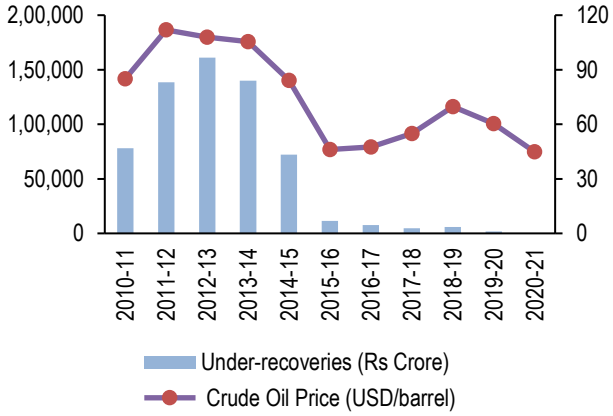
Note: Price of crude oil is the price per barrel of the Indian Basket of crude oil; Data for 2021-22 is till December 2021.
Sources: Petroleum Planning and Analysis Cell; Union Budget 2022-23; PRS.

Rise in crude oil prices has in the past, led to rise in under-recoveries as the government did not want the retail prices to rise sharply. Under-recovery refers to the difference in the cost of producing petroleum products, and the price at which they are delivered to consumers. It indicates the loss incurred by oil marketing companies while supplying these petroleum products. The central government compensates these oil marketing companies (OMCs) by sharing some of this incurred loss through a burden sharing mechanism.

Oil bonds were issued by the government to compensate oil marketing companies to offset losses that they suffer to shield consumers from rising crude oil prices. These bonds were issued to OMCs in lieu of cash at a time when the central government used to administer or fix petrol and diesel prices. Petrol and diesel prices were fixed by the government to cushion consumers from price shocks of costly international crude oil. The total value of the current outstanding oil bonds is Rs 92,200 crore. These bonds will be maturing between 2023-26.[1]

Figure 2 shows the trend of under-recoveries with the price of global crude oil.

Figure 2: Trend in under-recoveries of oil companies and global crude oil prices



Sources: Petroleum Planning and Analysis Cell; PRS.

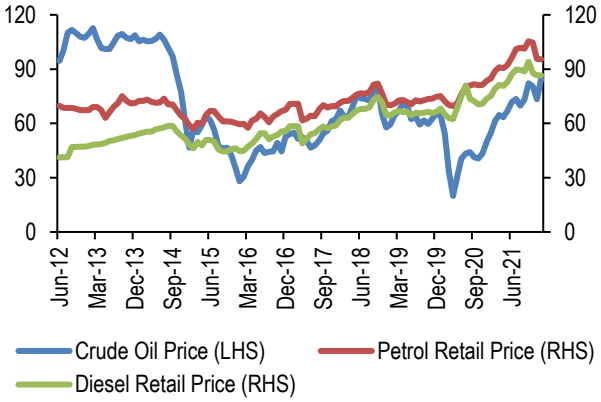
There has been a declining trend in under-recoveries since 2015-16. Since 2014, prices of petrol and diesel have been made market determined.[2] The Public Sector OMCs take appropriate decisions on pricing of petrol and diesel, in line with international product prices and other market conditions.

There have been no under recoveries in Petrol since 2011-12, and in Diesel since 2015-16. Similarly, since 2016-17, there have been no under recoveries in domestic LPG.[3]

In 2017, OMCs decided to start daily revision in the retail selling price of Petrol and Diesel in the entire country to make the retail selling prices more reflective of the current market conditions.[4]

India's dependence on imports for consumption of petroleum products has increased over the years. For instance, in 1998-99, net imports were 69% of the total consumption, which increased to around 95% in 2021-22 (till December 2022).[5] Because of a large share of imports in the domestic consumption, any change in the global price of crude oil has a significant impact on the domestic prices of petroleum products.

Figure 3: Trend of Global Crude Oil Price with respect to Petrol and Diesel Retail Price



Sources: Petroleum Planning and Analysis Cell; PRS.

Tax, Cess and Surcharge: As crude oil prices declined in 2020, the government increased the excise duties on petrol and diesel. Much of the increase was in the form of cess and surcharge. At present, the majority of the excise duty levied on petrol (95%) and diesel (92%) is in the form of cess and surcharge, due to which it is entirely under the centre's share. This implies that over 90% of the tax collected would be earmarked for specific use (such as for building roads and infrastructure), and would not be shared with states under the 15th Finance Commission formula.

In the table below, we show the break-up of excise duty and the percentage share of each component out of the total excise duty.[6]

Table 2: Change in tax and cess (Rs/ litre)

Excise Duty (Rs per litre)	Petrol		Diesel	
	Apr 2017	Nov 2021	Apr 2017	Nov 2021
Tax	9.48	1.4	11.33	1.8
Cess	12	26.5	6	20
Total	21.48	27.9	17.33	21.8
Cess as % of Total Duty	56%	95%	35%	92%

Sources: Petroleum Planning and Analysis Cell; PRS.

LPG Subsidy

The Ministry provides subsidies on LPG cylinders to LPG consumers. Prior to 2013, this subsidy was provided in the form of subsidised cylinders. Following the launch of the PAHAL scheme in 2013, this subsidy is directly credited to the bank accounts of the beneficiary.[7] In 2022-23, the Ministry is estimated to spend Rs 5,813 crore on LPG subsidy, which is 11% lesser than the revised estimates of 2021-22. It constitutes 65% of the total allocation to the ministry.

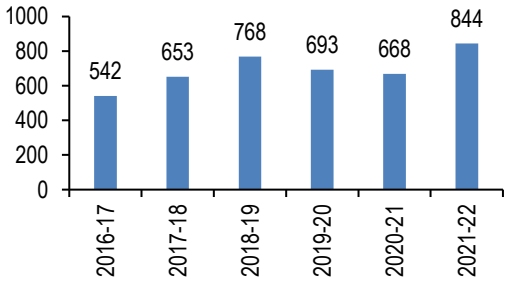
The remaining allocation under the LPG subsidy is for: (i) implementation of the Assam Gas Cracker project (for production of ethylene), and (ii) subsidy to oil companies for supply of LPG to the North East.

Direct Benefit Transfer – PAHAL

PAHAL scheme was launched in 2013 (54 districts in the first phase) and launched in the rest of the country in 2015.[8] Under the scheme, a consumer (with annual income up to ten lakh rupees) can avail Direct Benefit Transfer (DBT) cash-subsidy for an LPG cylinder. The beneficiaries buy LPG cylinders at market rate and subsequently receive subsidies directly in their bank accounts.

The Price of LPG and the extent of subsidy change every month. In 2021-22, the average price of a non-subsidised LPG was Rs 843.6 between April 2021 and October 2021, while the subsidy has been zero from May 2020 onwards.[9]

Figure 4: Non-subsidised price of LPG (in Rs)



Sources: Indian Oil Corporation Limited; PRS.

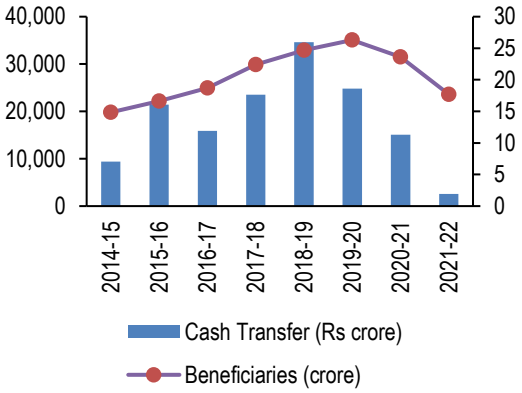
In 2022-23, Rs 4,000 crore has been allocated to DBT-PAHAL. In 2021-22, the budget allocation for DBT-PAHAL was Rs 12,480 crore while the revised estimate is Rs 3,400 crore (decline of 73%). Note that expenditure on subsidy is dependent on the difference between the subsidised and non-subsidised price for LPG. The non-subsidised price is in turn dependent on the price of crude oil, which increased in 2021, after a fall in 2020 due to the impact of COVID-19 induced lockdowns.

The Minister of State for the Ministry of Petroleum and Natural Gas, in February 2022, stated that LPG prices are based on Saudi Contract Price (CP). Saudi CP is the benchmark for international prices

of LPG. It has risen by approximately 258% from April 2020 to November 2021.[10]

The year-wise cash transfer under PAHAL has gone down from Rs 9,384 crore in 2014-15 to Rs 2,560 crore in 2021-22. The number of beneficiaries in the same time-frame have increased from 14.85 crore to 17.67 crore.[11] The overall coverage of LPG has increased from 61.9% in 2016 to 102.2% in November 2021.[12] LPG coverage is defined as the ratio of active consumers to total households.

Figure 5: Implementation of PAHAL Scheme



Sources: Direct Benefit Transfer website, Government of India; PRS.

As per the central government, implementation of PAHAL scheme has resulted in an estimated savings of Rs 72,910 crore (up to March 2021).[11] 4.11 crore duplicate/fake/non-existent or inactive LPG connections have been eliminated under the scheme.[11] Further, there are 1.79 crore non-subsidised LPG consumers, including 1.08 crore people who gave up their subsidy under 'Give It Up' scheme.[11]

The Comptroller and Auditor General (CAG) report on 'Implementation of PAHAL Scheme' (2016) noted that while the scheme appears to have addressed the concern regarding diversion of subsidised LPG cylinders to commercial consumers, the risk of diversion of nonsubsidised domestic LPG to commercial consumers still remains as there is a significant difference in the cost of non-subsidised domestic LPG and commercial LPG.[13]

Pradhan Mantri Ujjwala Yojana (PMUY)

The Ministry also provides LPG connections to poor households under the Pradhan Mantri Ujjwala Yojana (PMUY). The PMUY scheme was launched in May 2016 to provide LPG connections to households with a support of Rs 1,600 per connection.[14] The scheme initially had a target to provide connections to five crore households, which was later revised to eight crore households by 2020.[15]

In 2018, the ambit of the scheme was also expanded to cover all SC/ST households, beneficiaries of Pradhan Mantri Awas Yojana (Gramin), forest dwellers, backward classes, in addition to households identified under the Socio Economic and Caste Census (SECC).[15] The scheme met its target of providing LPG connections to eight crore households in September 2019.[16]

As of January 28, 2022, a total of 8.9 crore PMUY connections have been released. Of these, 99 lakh connections have been released under the revised scheme. The maximum connections were released in Uttar Pradesh, followed by West Bengal and Bihar.[17] The amount allocated for the scheme has declined from Rs 9,235 crore in 2020-21 to Rs 800 crore in 2022-23 (budgeted estimate).

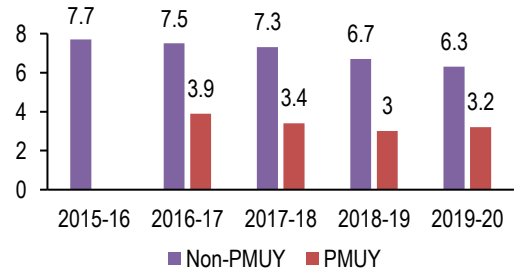
A report by the Petroleum Planning & Analysis Cell (2016) pointed out the key barriers for not applying for LPG connection are: (i) high initial cost, including security deposit/price of gas stove (86%), (ii) high recurring cost of the cylinder (83%), and (iii) easy availability of firewood.[18]

Refill of cylinders: The CAG submitted a performance audit report on the PMUY scheme in December 2019.[19] The Report raised concerns related to lack of sustained usage of cylinders released under the scheme. 75% of consumers opted for one refill under the scheme and 57% opted for three or more refills (from date of getting the connection till December 2018).

The CAG performance audit report noted that the average annual refill rate for PMUY beneficiaries is low compared to the refill rate for non-PMUY beneficiaries (Figure 6). The Standing Committee on Petroleum and Natural Gas (2020) also highlighted the disparity in the average refill of cylinders for regular LPG consumers and the average refill of cylinders by PMUY beneficiaries.[16]

The Ministry noted certain efforts by oil marketing companies to improve refill consumption such as: (i) increase in LPG distributors to improve last mile connectivity, and (ii) facility to swap 14.2 kg (standard) cylinder refill with a 5 kg refill.[16]

Figure 6: Average annual refill consumption for PMUY and non-PMUY consumers



Sources: CAG Performance Audit, December 2019; Standing Committee on Petroleum and Natural Gas (2020); PRS.

Between April to October 2021, 84% of PMUY beneficiaries, who had got LPG connections under PMUY-I, got their connections refilled. Further, the average annual refill consumption for PMUY was 4.39 during 2020-21.[20]

The report by the Petroleum Planning & Analysis Cell (2016) also identified easy availability of firewood in the vicinity of forests as another primary barrier to adoption of LPG. The top five states where over 40% of the households procure firewood for free are Gujarat, Madhya Pradesh, Jharkhand, Uttar Pradesh and Nagaland.[18]

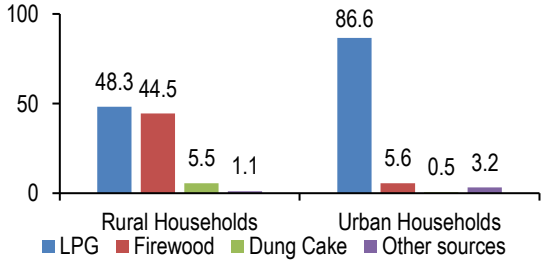
Pradhan Mantri Garib Kalyan Yojana: In 2020-21, the Ministry had estimated spending Rs 1,118 crore on PMUY at the budget stage. This amount was to clear past dues of the government to oil marketing companies implementing the PMUY scheme.[16] However, in March 2020, the Finance Minister announced the provision of up to three free LPG refills for eight crore poor families under the Pradhan Mantri Garib Kalyan Yojana.[21] The cost of free refills availed between April to August 2020 was Rs 9,670 crore for 13 crore refills.[22] In 2020-21, the Ministry actually spent Rs 9,235 crore on PMUY.

Ujjwala 2.0: Note that in the 2021-22 Budget speech, the Finance Minister had announced that the PMUY scheme will be expanded to cover an additional one crore beneficiaries. Subsequently, Ujjwala 2.0 was launched in August 2021.[23] Under the revised scheme, beneficiaries are given deposit free connections along with free first refill and stove.[24] In January 2022, the scheme was further extended to release additional 60 lakh LPG connections on existing modalities.[24]

Rural households continue using firewood as source of energy for cooking

According to the National Sample Survey (2018-19), around 44% of the rural households in the country used firewood as the primary source of energy for cooking (see figure below).[25] In urban areas, most of the households (87%) used LPG for cooking. As per NFHS-5 (2019-21), 58.6% households use clean fuel for cooking in India.[26]

Figure 7: Primary source of energy for cooking in households (2018-19)



Sources: Drinking Water, Sanitation, Hygiene, and Housing Conditions in India, NSS 76th Round, July 2018-December 2018; PRS.

Kerosene Subsidy

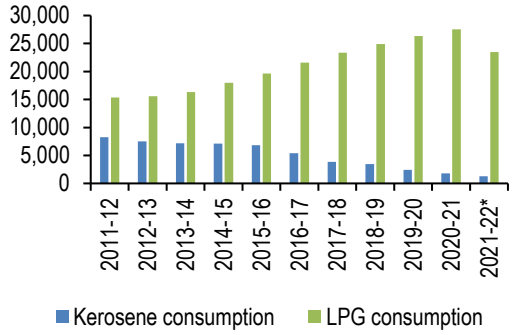
The Ministry provides subsidised kerosene through the Public Distribution System (PDS). In the last two Budgets, the Ministry has not allocated any funds for the kerosene subsidy. In 2020-21, the Ministry spent Rs 3,259 crore on the kerosene subsidy.

Over the last few years, the Ministry's expenditure on providing subsidy for kerosene has been reduced from Rs 7,339 crore in 2015-16, to an estimated zero in 2022-23. In 2018, the Ministry stated that with the increase in LPG coverage and electrification in villages, the allocation for kerosene had been rationalised.[27]

The Standing Committee on Petroleum and Natural Gas (2017) had recommended that the Ministry should reduce the expenditure on this subsidy and work towards the eventual withdrawal of the subsidy.[28] It noted that an increase in the coverage of LPG beneficiaries is necessary to reduce their dependence on kerosene.

The Standing Committee on Petroleum and Natural Gas (2020) observed that an increase in the coverage of LPG beneficiaries is necessary to reduce dependence on kerosene.[16] This will result in the usage of cleaner fuel, and promote the health of users. However, large segments of the population are still dependent upon kerosene and only ten states have become kerosene free.[29]

Figure 8: Consumption of Kerosene and LPG (in TMT)



Note: TMT is Thousand Metric Tons; Data for 2021-22 is till January 2022.
Sources: Petroleum Planning and Analysis Cell; PRS.

Dependence on imports has been increasing

India's import of crude oil has increased from 1,71,729 Thousand Metric Tons (TMT) in 2011-12 to 1,96,461 TMT in 2020-21, at an average annual growth rate of 2%.[3] Crude oil is refined in oil refineries to transform oil into useful petroleum products such as high speed diesel, LPG and kerosene. These petroleum products are used as raw materials in various sectors and industries such as transport (fuel) and petrochemicals. Further, they may also be used in factories to operate machinery or fuel generator sets.

India exports petroleum products to countries such as Singapore, the Netherlands, and the United Arab Emirates. [30] In 2020-21, India's total export of petroleum products was 56,769 TMT.[3]

Further, India's production of crude oil and condensate has fallen from 38,082 TMT in 2011-12 to 30,494 TMT in 2020-21, an annual average decline of 2%.[3] Production as a percentage of imports of crude oil declined from 22% to 16% during this period. The Ministry attributed the decline to the natural ageing of oil fields. [31]

Table 3 shows the total import of crude oil and petroleum products, consumption of petroleum products in the country and India's exports of petroleum products for the last 10 years. India's net import (total imports - exports) as a fraction of consumption has risen from 86% in 2011-12 to 95% in 2020-21.

Table 3: Import, export and consumption of petroleum products in the country (in TMT)

Year	Crude Oil imports	Petroleum products import	Petroleum products export	Petroleum products consumption
2011-12	1,71,729	15,849	60,837	1,48,132
2012-13	1,84,795	16,354	63,408	1,57,057
2013-14	1,89,238	16,697	67,864	1,58,407
2014-15	1,89,435	21,301	63,932	1,65,520
2015-16	2,02,850	29,456	60,539	1,84,674
2016-17	2,13,932	36,287	65,513	1,94,597
2017-18	2,20,433	35,461	66,833	2,06,166
2018-19	2,26,498	33,348	61,096	2,13,216
2019-20	2,26,955	43,788	65,685	2,14,127
2020-21	1,96,461	43,248	56,769	1,94,295
2021-22*	1,56,509	30,384	46,194	1,48,320

Note: *Data for 2021-22 is till December 2021.
Sources: Petroleum Planning and Analysis Cell; PRS.

The Standing Committee on Petroleum and Natural Gas (2019) noted that the Middle East accounts for more than two-thirds of India's crude oil imports, and urged the government to continue its crude oil import diversification efforts. [32]

Strategic Petroleum Reserves

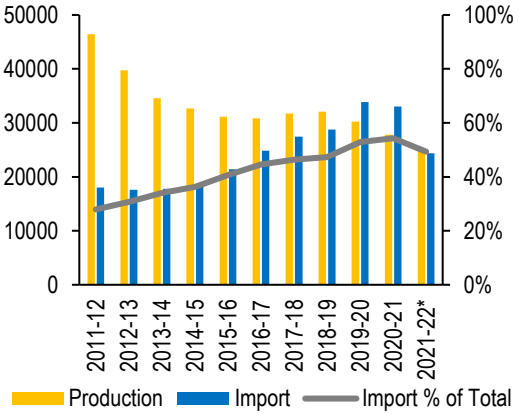
Strategic Petroleum Reserves (SPRs) are underground caverns to store crude oil. SPRs are essential to the energy security of the country which serves as a cushion during any supply disruptions in global crude oil.[33] In 2022-23, Rs 811 crore has been allocated towards SPR, an average increase of 117% over 2021-22 revised estimates, but lower than the spending of Rs 2,428 crore, in 2020-21.

In July 2021, phase 2 of the SPR programme was approved for establishing two additional commercial-cum-strategic facilities with a total storage capacity of 6.5 MMT underground storages at Chandikhol (4 MMT) and Padur (2.5 MMT).[34]

Increase in share of natural gas in energy mix

Total imports of natural gas as a percentage of consumption (production plus import) has risen from 28% in 2011-12 to 54% in 2020-21.[3] Figure 9 shows the total production and imports of natural gas, and the share of imports in the total.

Figure 9: Production and Imports of Natural Gas (in MMSCM)



Notes: MMSCM = Million Metric Standard Cubic Meters. Data for 2021-22 is till December 2021.
Sources: Petroleum Planning and Analysis Cell; PRS.

Between 2011-12 and 2020-21, import of natural gas increased from 17,997 MMSCM (Million Metric Standard Cubic Meters) to 33,031 MMSCM, at an average rate of 8%. Whereas the production of natural gas has fallen from 46,453 MMSCM to 27,784 MMSCM. In 2015, the Ministry had targeted a reduction in import in the energy sector (oil, gas, and petroleum products) from 77% to 67% by 2021-22.[35] The Standing Committee on Petroleum and Natural Gas (2018) had noted that the Ministry has not undertaken any concrete action and not developed a clear strategy with stipulated timelines to achieve this target.[36]

The Report of the Roadmap for Reduction in Import Dependency in the Hydrocarbon Sector by 2030 (2014) had called for an increase in the share of natural gas in the energy consumption mix from 10% to at least 20% to 25% by 2025. [37] A necessary precondition to achieve this is to increase the gas pipeline infrastructure. In 2012, India had 13,000 km of natural gas transmission pipeline. As of September 2021, the total authorised length of natural gas pipelines is 33,548 km of which 15,004 km is under construction.[38]

Natural gas pipeline is a mode of bulk transportation and is a natural monopoly since it is impractical to have multiple pipelines in the same route. Common carrier arrangements allow the pipeline to be utilised by any entity on a non-discriminatory basis which leads to competition in the natural gas market. This is currently regulated by the Petroleum and Natural Gas Regulatory Board.[39]

IGGL: The Indradhanush Gas Grid Limited (IGGL) is a joint venture of five central public sector enterprises to develop and operate a natural gas pipeline grid in the North-East region.[40] The total length of the pipeline would be 1,656 kilometer and it will be developed in the eight north-eastern states - Arunachal Pradesh, Assam, Manipur, Meghalaya, Mizoram, Nagaland, Sikkim and Tripura. In 2022-23, the project has been allocated Rs 1,798 crore, 112% more than revised estimate in 2021-22 (Rs 850 crore).

Promotion of alternate fuels

PM JI-VAN: The strategy of import reduction includes increasing production of domestic petroleum and natural gas, and promoting alternate fuels.[16] The Pradhan Mantri Jaiv Indhan-Vatavaran Anukul Fasal Awashesh Nivaran (PM JI-VAN) Yojana was launched in 2019 to provide financial support for setting up bio-ethanol projects using biomass and other renewable feedstock.[41] The scheme has been allocated Rs 314 crore for 2022-23, which is a 66% increase over the revised estimates of 2021-22. Note that in 2020-21, the government did not spend any part of the budgeted allocation of Rs 53 crore on the scheme, due to COVID-19 related reasons.

PM JI-VAN aims to provide viability gap funding to provide initial thrust to create second generation (2G) ethanol capacity in the country and attract investment in this sector.[42] 2G ethanol utilises surplus biomass and agricultural waste to produce bioethanol while first generation ethanol utilises sugarcane juice and molasses, byproducts in the production of sugar, as raw material. Under the scheme, financial support will be provided to 12 Integrated Bio-ethanol Projects using lignocellulosic biomass and other renewable feedstock, along with support to ten demo projects for 2G technology. The total financial outlay is Rs 1,970 crore for the period 2018-19 to 2023-24. Four 2G bio-ethanol plants have been supported with Rs 150 crore financial assistance as of December 2021.[43]

The Standing Committee (2020) observed that this scheme could help reduce import dependence by substituting fossil fuels with bio-fuels.[16] The Standing Committee (2021) recommended the Ministry to properly utilise the budgetary allocation for the scheme. [42]

Ethanol blended petrol: The government has been promoting the usage of biofuels with the twin objective of reducing the country's import bill and contributing to lower carbon emissions. In this regard, the National Policy on Bio-Fuels, 2018 was formulated to increase biofuel usage in the energy and transportation sectors. The Policy envisaged an indicative target of 20% blending of ethanol in petrol by 2030 and 5% blending of biodiesel in diesel by 2030.[44]

The Standing Committee (2021) recommended the Ministry to advance the target of 20% blending of ethanol in petrol from 2030 to 2025.[45] Subsequently, in June 2021, the target was revised to achieve 20% blending of ethanol by 2025.[46] Further, the Ministry released a notification stating that OMCs shall sell ethanol blended petrol with a percentage of ethanol up to 20% as per BIS Specifications in the whole of India and Union Territories. This will come into effect from April 1, 2023.[46] The Committee also observed that majority of the ethanol produced for blending is coming from the sugar sector. Sugarcane is a water-intensive crop with adverse effects on the environment and thus not sustainable in the long run for producing ethanol. The Committee observed that more than 60% of the ethanol in the world is produced using maize, whereas India primarily uses sugarcane. It recommended the government to study the policies followed in countries using other feedstocks and suitably adopt them. Further, it recommended the government to diversify the feedstocks used for producing ethanol to include maize and other food grains and motivate farmers to increase their production accordingly.

The government has set a target of 5% blending of bio-diesel with diesel for 2030.[46] Presently, the blending level is less than 0.1%, with 10.56 crore litre of bio-diesel supply in 2019-20. The Committee observed that bio-diesel blending has not kept pace with ethanol blending. It noted that bio-diesel has not been accorded due importance, even though diesel is the most consumed fuel, used mostly in commercial and public transport vehicles. Further, it noted that higher biodiesel blending will have a greater impact in reducing crude oil imports.

When suggesting a roadmap for ethanol blending in India, the NITI Aayog suggested that an annual roadmap be prepared for the: (i) production and supply of ethanol till 2025-26, and (ii) systems for country wide marketing of ethanol.[47] To enable roll out across India, ethanol may be supplied from surplus to deficit states based on the requirements. This will ensure uniform availability of ethanol blends in the country. Further, a single window system may be formulated by Department for Promotion of Industry and Internal Trade to facilitate speedy clearances for new projects and expansion of current projects for ethanol production. In December 2021, the Ministry lowered the Goods and Services Tax (GST) rate to 5% from 18% on ethanol meant for blending under the Ethanol Blended Petrol Programme.[48]

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Demand for Grants 2022-23 Analysis
Environment, Forests and Climate Change

The Ministry of Environment, Forests and Climate Change is responsible for the planning, promotion, co-ordination of, and overseeing the implementation of India's environmental and forestry policies and programmes. This note presents the budgetary allocations to the Ministry for 2022-23, and analyses various issues related to the sector.

In November 2021, the 26th United Nations Climate Change Conference (COP26) was held in Glasgow, Scotland where leaders and representatives from 197 countries met to decide on the actions to be taken to address climate change. At the conference, the Prime Minister of India announced certain targets for India.[1] These include achieving net zero emissions by 2070, and increasing the share of renewable energy in India's energy mix to 50% by 2030. The Economic Survey 2021-22 observed that there is a greater thrust on climate action following these announcements.[2] It stated that climate finance will remain critical to successful climate action by developing countries including India.[2]

Budget speech 2022-23 highlights[3]

Key highlights in the budget regarding environment include:

- Sovereign Green Bonds will be issued for mobilising resources for green infrastructure. The proceeds will be deployed in public sector projects which help in reducing the carbon intensity of the economy.
- A battery swapping policy will be formulated to promote the electric vehicles sector. To achieve the goal of 280 GW of installed solar power by 2030, an additional allocation of Rs 19,500 crore will be made for Production Linked Incentive scheme for manufacturing of high-efficiency solar modules.
- 5-7% biomass pellets will be co-fired in thermal power plants to reduce carbon emissions. Further, four pilot projects for coal gasification and conversion of coal into chemicals will be set-up to evolve technical and financial viability.

Allocation in Union Budget 2022-23

In 2022-23, the Ministry of Environment, Forests and Climate Change has been allocated Rs 3,030 crore, which is a 20% increase over the revised estimates in 2021-22. The allocation to the Ministry is 0.1% of the total estimated expenditure of the union government for 2022-23.

Table 1: Budgetary allocation to the Ministry 2022-23 (in Rs crore)

	Actuals 20-21	BE 21-22	RE 21-22	BE 22-23	Percentage change (Revised 21-22 to BE 22-23)
Total	1,967	2,870	2,520	3,030	20%

Note: BE is budget estimate and RE is revised estimate.
Sources: Demands for Grants 2022-23; PRS.

In 2022- 23, 31% of the Ministry's allocation (Rs 930 crore) is estimated to be on centrally sponsored schemes on environment, forests and wildlife such as National Mission for Green India and Integrated Development of Wildlife Habitats. 10% of the allocation of the Ministry is towards autonomous bodies and about 15% is towards pollution control. Table 2 represents the budgetary allocation for major heads under the Ministry.

Table 2: Major heads of expenditure under the Ministry (in Rs crore)

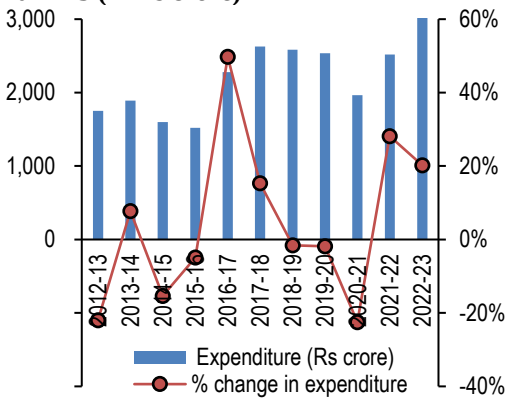
Heads	2020-21 Actuals	2021-22 RE	2022-23 BE	% change (21-22 RE to22-23 BE)
Environment, Forestry and Wildlife	552	670	930	39%
Control of Pollution	267	390	460	18%
Autonomous Bodies	290	316	287	-9%
National Coastal Mission	68	101	195	93%
Statutory and Regulatory Bodies	125	161	155	-4%
National Authority	89	262	250	-5%
Decision support System for Environmental Awareness, Policy, Planning and Outcome Evaluation	76	108	87	-19%
Environmental Knowledge and Capacity Building (such as Eco-Task Force)	40	65	79	22%
Climate Change Action Plan	20	30	30	-
National Adaption Fund	43	60	60	-
Others	457	579	699	21%
Total	**2,056**	**2,782**	**3,280**	**18%**
Funded from budget	**1,967**	**2,520**	**3,030**	**20%**
Funded from Compensatory Afforestation Fund	**89**	**262**	**250**	**-5%**

Note: Others include, Pollution abatement, among others
Sources: Union Budget 2022-23; PRS.

Overview of the financial allocation

Between 2010-11 and 2022-23, the expenditure of the Ministry has seen an annual average growth of 2%. Between 2010-11 and 2021-22, on average, the actual expenditure of the Ministry has been less than the budget estimates for the year. However, the Standing Committee on Science and Technology, Environment, Forests, and Climate Change (2020) had noted that the utilisation of funds by the Ministry in 2017-18 and 2018-19 is satisfactory.[4] The Standing Committee (2021) also highlighted that the utilisation of allocated amount by the Ministry during the last three financial years has been satisfactory.[5]

Figure 1: Expenditure between 2010-11 and 2022-23 (in Rs crore)



Note: Values for 2021-22 and 2022-23 are Revised Estimates and Budget Estimates respectively.
Sources: Union Budgets 2010-11 to 2022-23; PRS.

Table 3 shows the utilisation trend of the funds allocated to the Ministry between 2010-11 and 2021-22.

Table 3: Trend of fund utilisation by the Ministry (in Rs crore)

Year	BE	Actuals	Over/Under Utilisation
2010-11	2,351	2,372	1%
2011-12	2,492	1,982	-20%
2012-13	2,629	1,753	-33%
2013-14	2,630	1,890	-28%
2014-15	2,256	1,599	-29%
2015-16	1,682	1,521	-10%
2016-17	2,250	2,278	1%
2017-18	2,675	2,627	-2%
2018-19	2,675	2,586	-3%
2019-20	2,955	2,538	-14%
2020-21	3,100	1,967	-37%
2021-22	2,870	2,520*	-12%

Note: BE – Budget Estimate; *Revised Estimate; (+) indicates over-utilisation; (-) indicates under-utilisation.
Sources: Union Budgets from 2010-11 to 2022-23; PRS.

In 2021-22, the Ministry was allocated Rs 2,870 crore, which decreased to Rs 2,520 crore (-12%) at the revised estimates stage. This includes reduction in funds towards: (i) Environment, Forestry and Wildlife (reduced by Rs 94 crore), (ii) Establishment Expenditure of the Centre (reduced by Rs 70 crore), and (iii) Control of Pollution (reduced by Rs 193 crore), among others. This may be due to the impact of the COVID-19 pandemic, and a change in spending priorities of the government over the year.

Key issues for consideration

Climate Change

Climate change refers to a change of climate which is attributed directly or indirectly to human activity that alters the composition of the global atmosphere.[6] Studies indicate that the amount of greenhouse gases including carbon dioxide, methane, and nitrous oxide in the atmosphere have increased rapidly over the last few centuries as a result of human activities.[7,8] The increased concentration of greenhouse gases in the atmosphere has led to a rise in global temperatures leading to other changes in global climate, such as erratic rains, floods, and cyclones.[7,8]

According to the Intergovernmental Panel on Climate Change (IPCC), the average global temperature is estimated to have increased by 0.85°Celsius (°C) between 1880 and 2012.[8] At the end of the 21st century, the increase in global temperature is likely to exceed 1.5°C as compared to pre-industrial levels (1850 to 1900).[8] However, in August 2021, the IPCC estimated that a 1.5°C increase may happen much earlier, by 2040.[9] This could lead to a reduction of the snow cover, increase in heat waves, extreme precipitation, intensification of tropical cyclones and increase in sea levels.

Over the years, several international efforts have been made for global co-operation to address issues of climate change. In 1992, the United Nations Framework Convention on Climate Change (UNFCCC), an international framework for cooperation was established to stabilise greenhouse gas concentrations in the atmosphere.[10] The European Union (EU) has dedicated a modernisation fund to support 10 lower-income EU Member States in their transition to climate neutrality.[11] Further, EU has also proposed that at least 25% of its expenditure will contribute to climate action during 2021-27.[12]

The United States of America (USA) has called for the preparation of a Climate Finance Plan, to focus on international climate finance. USA intends to double its annual public climate finance to developing countries by 2024.[13]

After India's announcement of additional targets at COP26, experts have estimated that India will require over Rs 700 lakh crore to meet its goal of net zero emissions by 2070.[14] Of this, investment of over Rs 600 lakh crore will be required to shift to renewable energy sources.[14] This financing

would require significant actions across all the concerned ministries.

Significant investment needed to finance adaptation and mitigation measures for Climate Change

The Economic Survey (2020-21) observed that India is relying on domestic resources to implement adaptation and mitigation action for climate change.[15] It noted that the financing considerations will remain critical as the country had increased its targets substantially. Preliminary estimates provided by the NDC indicate that India's climate change actions till 2030 will require financial resource of USD 2.5 trillion (at 2014-15 prices). It recommended a clearer assessment of the financial requirement for implementing the NDC for appropriate allocation of resources. Further, the possible sources for meeting these requirements should also be devised.

The Survey noted that availability of adequate financial resources for implementing the NDC goals is a major challenge.[15] It recommended that additional financial resources and technological support to the developing countries (as was committed by the developed countries under the Paris Agreement) should be implemented. The Glasgow Conference Pact noted that developed countries failed to meet their commitment of providing USD 100 billion (over Rs 7.5 lakh crore) per year by 2020 to developing nations to tackle climate change. It urged developed nations to provide the 100 billion dollars through 2025.[16]

Currently, 100% Foreign Direct Investment (FDI) is permitted in the renewable energy sector.[17] Between April 2000 and June 2021, the cumulative FDI equity inflow in the renewable energy sector was USD 10,279.81 million. This was 1.88% of the total equity inflow received in all sectors during this period. The Ministry is estimated to spend Rs 30 crore on the Climate Change Action Plan and Rs 60 crore on the National Adaptation Fund. This is equal to the revised estimates of 2021-22.

National Action Plan on Climate Change needs additional funding and redesigning

The National Action Plan on Climate Change (NAPCP) was launched in June 2008 to deal with issues related to climate change.[18] The NAPCP has eight missions: (i) the National Solar Mission, (ii) the National Mission on Enhanced Energy Efficiency, (iii) the National Water Mission, (iv) the National Mission for Green India, (v) National Mission on Sustainable Habitat, (vi) National Mission for Sustainable Agriculture, (vii) National Mission for Sustaining the Himalayan Ecosystem, and (viii) National Mission on Strategic Knowledge for Climate Change.

NITI Aayog in its report on Strategy for New India (2018) recommended that all eight national missions under the NAPCP should be revised in light of new scientific information and technological advances.[19] Further, new national missions on wind energy, waste-to-energy, and coastal areas should be developed. In addition, NITI Aayog in its report recommended the following to maintain a clean, green, and healthy environment:

- **Changes to regulatory framework**: Stringent civil penalties should be introduced to strengthen enforcement of environment-related Acts. Further, Rules related to waste management should be revised and strictly implemented. These include: (i) Plastic Waste (Management and Handling) Rules, (ii) Bio-Medical Waste (Management and Handling) Rules, (iii) E-Waste (Management) Rules, and (iv) Hazardous and Construction & Demolition Waste Management Rules.
- **Funds**: National Adaptation Fund for Climate Change and other global funds for strengthening resilience against climate change in sectors such as agriculture, forestry, and infrastructure should be utilised. Further, scientific and analytical capacity for climate change related assessments should be strengthened.

In 2015, the Paris Agreement was adopted by the Conference of Parties with the consensus of 197 parties to the convention (including India).[20] The Paris Agreement aims to reduce greenhouse gas emissions globally and limit the increase in the global average temperature to a level between 1.5ºC to 2ºC above pre-industrial levels.

India submitted its Nationally Determined Contributions to the United Nations Framework Convention on Climate Change. It included various targets to be achieved by 2030 such as increasing forest and tree cover by creating additional carbon storage and absorption capacity for 2.5-3 billion tonnes of carbon dioxide and achieving 40% of installed electric power capacity from non-fuel-based energy sources (such as solar, wind, hydropower) with help of transfer of technology and low-cost international finance. Note that India's current share of non-fossil sources based installed capacity of electricity generation is more than 40%.[21]

In December 2020, the Ministry of Environment, Forest and Climate Change constituted a high-level inter-ministerial Apex Committee for Implementation of Paris agreement.[22] The Committee will be the national regulatory authority for carbon markets in India. Its functions include: (i) developing policies and programmes to make India's domestic climate change compliant to international obligations, (ii) coordinating communications of nationally determined contributions, and (iii) defining responsibilities of

concerned ministries for achieving India's nationally determined contribution goals.

India contributes to 7% of world emissions, but this may increase with growing industrialisation and urbanisation

Among all greenhouse gases released due to human activities, CO_2 is the largest contributor to global warming.[23] Sources releasing CO_2 into the atmosphere include: (i) combustion of fossil fuels (such as thermal power generation), (ii) forest burning (for the purposes of land clearance), and (iii) industrial activities. Combustion of fossil fuels is likely to be the dominant contributor of CO_2 in the atmosphere.

The IPCC (2005) observed that power and industrial sectors together dominate the global CO_2 emissions.[23] As of March 25, 2021, power generation from coal, oil, and gas contributed to 40% of global CO_2 emissions.[24] By 2050, these sectors are expected to contribute to about 50% of the total global CO_2 emissions. In 2019, the total CO_2 emissions across the world were 33,622 million tonnes. Table 4 compares India's CO_2 emissions from fuel combustion to that in other countries.

Table 4: Global comparison of CO2 emissions (2019)

Country	CO_2 emissions from fuel combustion (million tonnes)	% of world emissions	Per capita emissions (tonnes CO_2)
China	9,877	29%	7.1
US	4,745	14%	14.4
EU	2,994	9%	5.8
India	**2,310**	**7%**	**1.7**
Russia	1,640	5%	11.4
Japan	1,056	3%	8.4
UK	342	1%	5.1
World	**33,622**		**4.4**

Note: EU is European Union; US is United States if America.
Sources: International Energy Agency; PRS.

In 2019, China was the largest contributor to the world's CO_2 emissions (29%), while the USA had the highest per capita emissions.[25] India is well below the average global emissions per capita. However, with growing urbanisation and industrialisation, India's CO2 emissions will increase significantly unless proper measures are taken now to ensure that any future growth is in a manner that does not indiscriminately increase our emissions.

At the 2021 Glasgow Conference, India announced additional targets to be achieved by 2030.[1] These include: (i) increasing non-fossil energy capacity to 500 gigawatt (GW), (ii) meeting 50% of energy requirements through renewable energy, (iii) reducing total projected carbon emissions by one billion tonnes, and (iv) reducing the carbon intensity of the economy by less than 45%.

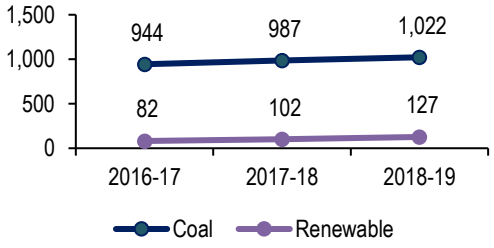
Investing in thermal power generation and subsidising polluting fuels could undo the impact of climate change mitigation

Transition to renewable energy sources (solar, wind, hydro) is one of the ways to reduce CO_2 emissions.[23] The share of renewable energy in global electricity increased from 27% in 2019 to 29% in 2020.[26] According to estimates by the International Energy Agency (2021), the global renewable energy electricity generation will increase by more than 8% in 2021, the fastest one-year growth since the 1970s. China will account for almost 50% of this increase, followed by USA, European Union, and India.[24]

The Glasgow Conference Pact urged all countries to reduce greenhouse gas emissions including CO_2 by 45% (relative to 2010 level) by 2030 to limit global warming.[16] However, the Standing Committee on Energy (2020-21) has noted that despite the significant increase in renewable energy capacity and more addition planned in the coming years, coal will remain the main source of power in this decade.[27] It noted that there may be a 30% increase in the installed thermal power generation capacity by 2029-30.

Further, thermal power plants are currently running at about half of their capacity.[27] However, their capacity utilisation may be increased in the future, leading to an increase in coal requirement. Over the past few years, generation capacity of coal and renewable energy has increased at an annual rate of 4% and 24%, respectively (see Figure 2). Thus, it given the potential demand of coal in the future, it is unclear how the transition to renewable energy will be feasible based on the committed timeline and targets.

Figure 2: Electricity generation (in megawatt)



Source: Central Electricity Authority; PRS.

The 15th Finance Commission observed India's dependence on thermal energy and the consequent effect on emission levels.[28] It noted that about 60% of the country's installed capacity is thermal based (coal based thermal power accounting for the largest share). Further, it noted that while the share of renewables in total power generation has increased from 6% in 2014-15 to 10% in 2018-19, substantial investment is required in renewable energy. It recommended that a comprehensive energy policy should be framed. It also noted that

the prices of coal, natural gas, and kerosene in India are below environmentally efficient levels (which can partly be due to subsidies given for LPG and kerosene to select consumers). It recommended bringing the prices of these fuels closer to environmentally efficient levels, while providing targeted assistance to potentially affected vulnerable households.

The projected changes in climate change pose a major threat for India in particular, given that the national economy is closely tied to climate sensitive sectors such as agriculture and forestry.[29]

Environment Impact Assessment and Clearance process has several issues

Environment Impact Assessment is a planning tool to integrate environmental concerns into the developmental process from the initial stage of planning.[30] The Ministry of Environment, Forests and Climate Change has made Environmental Clearance (EC) for certain development projects mandatory such as certain building, construction, and area development projects.[30]

The Comptroller and Auditor General of India (CAG) (2016) had noted certain issues with the environmental clearance process. Its observations and recommendations include:[30]

- **Delay in process**: The CAG noted a delay in the process of EC (including grant of Terms of Reference, public consultation, and grant of EC by the Ministry). For example, (i) out of 216 projects examined, the Terms of Reference was granted within the prescribed time limit (60 days) to only 14% of the projects, and (ii) the EC was granted within the prescribed time limit (105 days) in only 11% of the cases. It recommended the Ministry to increase transparency in the grant of EC, streamline the processes, and adhere to the timelines given under the EIA Notification.
- **Compliance to Conditions of Environment Clearance**: The CAG noted non-compliance in the 216 sampled projects (ranging from 4% to 56%), in respect of 13 general Environmental Clearance conditions. It recommended the Ministry to grant fresh EC only after verifying the compliance to the earlier EC conditions. Further, it recommended the Ministry to mandate certain other conditions for an EC, including installation of monitoring stations and frequency of monitoring of various environment parameters for air, surface water, ground water, and noise pollution.

Air Pollution

National Clean Air Programme (NCAP): The Ministry of Environment, Forest and Climate Change launched the NCAP in January 2019. It receives funding under the budget head Control of Pollution. The programme sets a national level target of 20% to 30% reduction of $PM_{2.5}$ and PM_{10} concentration levels by 2024, with 2017 as base for concentration levels.[31] The NCAP is implemented in 132 cities, of which 124 cities have been identified based on non-conformity with national ambient air quality standards for five consecutive years. This includes 34 million plus cities / urban agglomerations identified by the 15th Finance Commission. NCAP aims to: (i) prepare comprehensive mitigation actions for prevention, control and abatement of air pollution, and (ii) augment the air quality monitoring network and strengthen awareness activities.

Financing for reducing air pollution

In 2022-23, Control of Pollution has been allocated Rs 460 crore, a 18% increase over the revised estimates of 2021-22. In 2020-21, the allocation for Control of Pollution was reduced by 17% (from Rs 470 crore to Rs 390 crore) at the revised estimates stage.

The Standing Committee on Science and Technology, Environment, Forests, and Climate Change (2020) noted that the NCAP is a programme of utmost importance in the present-day context and controlling air pollution must be given the topmost priority.[4] It recommended that the Ministry must be provided the requisite allocation as sought by it with respect to Control of Pollution at the revised stage.

The Standing Committee (2021) noted Control of Pollution scheme is implemented through various central and state government agencies. It recommended central mechanism for coordination of such agencies. The Committee also recommended that the grant made available by recommendation of 15th Finance Commission for installation of systems to monitor air quality must be prioritised by the Ministry in the smaller cities and towns that are often neglected, and suffer from a lack of quality data on air pollution.[5]

The Standing Committee on Science and Technology, Environment, Forests, and Climate Change (2020) noted that the Finance Minister, in her budget speech (2020-21), announced Rs 4,400 crores for clean air for large cities having population above one million. The Ministry stated that the fund is being made available to the Ministry of Housing and Urban Affairs (MoHUA).[4] However, no allocation has been made for this in MoHUA's demand for grants in 2020.[32]

The Ministry of Environment, Forests, and Climate Change has identified 102 non-attainment cities for utilising this fund under the NCAP. These are cities which do not meet the National Ambient Air Quality Standards (NAAQS) for a period of five years.[33] The Economic Survey (2021-22) stated that the number of cities within the prescribed

NAAQS increased from 18 in 2019-20 to 27 in 2020-21. However, an increasing trend in PM_{10} concentration has been observed in 36 cities in 2020.[2]

The Committee (2020) noted that there are 46 cities (with population more than one million), which may be kept out of the non-attainment category.[4] This will help the Ministry of Environment, Forests, and Climate Change to reduce the shortfall of funds for the schemes of pollution control.

The 15th Finance Commission recommended the Ministry of Housing and Urban Affairs be made the nodal ministry for grants to cities with population more than one million to take steps to check air pollution.[28] The Ministry of Environment, Forests and Climate Change may be given a separate grant for installation of systems to monitor air quality.[28] The WHO provides intervention measures for combating outdoor and indoor air pollution.[34] It suggests interventions across seven different areas, namely transport, housing, cities, waste management, industries, agriculture, and power generation. Some of these intervention measures include: (i) implementing stricter vehicle emissions and efficiency standards, (ii) creating green spaces that help remove pollutant matter, (ii) improving urban waste management, such as capturing of methane gas from waste sites, (iii) replacing traditional household fuel with lower-emission cook stoves or cleaner fuels, and (iv) adopting clean technologies that reduce industrial emissions.

NITI Aayog in its report on Strategy for New India (2018) noted certain challenges to reduce the problem of air pollution, including:[19] (i) convincing farmers to discontinue the practice of burning crop residue by providing alternative methods, (ii) lack of awareness of the ill effects of pollution, thereby making it difficult to bring about behavioural change in people, and (iii) ineffective implementation of 'polluters should pay for the pollution' principle (costs of pollution be borne by those who cause it).

It recommended the following:

- **Funds**: A "Clean Air Impact Fund" should be created to provide viability gap funding for long-term projects aimed at reducing air pollution (such as bio-power or bio-ethanol projects).
- **Reward and monitoring at the local level**: A reward scheme for village panchayats with zero burning may be instituted, and a mechanism to monitor farm fires should be devised.
- **Industry Emissions**: Emission and effluent standards for industries should be revised and effectively implemented. Further, a task force should be set up to study and implement measures to control pollution from brick kilns.

WHO also suggests addressing air pollution by monitoring, reporting and spreading awareness about its health impacts. It suggests improving the health sector's capacity to address the adverse health effects from air pollution through training, guidelines, and national action plans.[35]

Among the risk factors of diseases in India, air pollution ranks the second highest (after malnutrition), accounting for 10% of the disease burden, and thus, is one of the leading causes for premature death and disabilities.[36] According to estimates published by the India Disease Burden Initiative, in 2017, 12.4 lakh deaths, i.e., 12.5% of the deaths in India, were attributable to air pollution.[37]

Act to set up a commission for air quality management in NCR

Due to the rising levels of pollution in NCR and the powers of the EPCA being limited to Delhi, the Commission for Air Quality Management in National Capital Region and Adjoining Areas Act, 2021 was passed in Parliament on August 5, 2021.[38] The Act constitutes the Commission for better co-ordination, research, identification, and resolution of problems related to air quality in NCR and adjoining areas. Adjoining areas have been defined as areas in Haryana, Punjab, Rajasthan, and Uttar Pradesh, adjoining the National Capital Territory of Delhi and NCR, where any source of pollution may cause adverse impact on air quality in the NCR. The Act provides for penalties for contravention of provisions of the Act. While these penalties do not apply to farmers causing air pollution by stubble burning, the Commission may impose an environment compensation on such farmers causing pollution by stubble burning.

In August, 2021 the Commission issued directions to Uttar Pradesh, Haryana, and Rajasthan for shifting of industries operating in NCR to cleaner fuels.[39] The Supreme Court noted that these directions were partly compiled by industries. Industries not having cleaner fuels will be allowed to function for up to eight hours during weekdays and will remain closed on weekends.[40] Further the Commission has also constituted an enforcement task force to take punitive and preventive measures against authorities not complying with the directions of the Commission.

Forestry

In India, forests are considered as a part of the natural and cultural heritage. They provide variety of ecosystem services including: (i) absorption of greenhouse gases, (ii) prevention of soil erosion, and (ii) habitat to wildlife. One of the critical challenges faced by forests in the country is degradation of forest cover.[41]

Land Forests

Forest Area refers to area recorded as forest in government records and is also called "recorded forest area". As per the India State of Forest Report 2021, India was the 10th largest country by forest area in 2020. The top five countries were: (i) Russia, (ii) Brazil, (iii) Canada, (iv) United States of America, and (v) China. In India, forests cover 24% of its geographical area, which accounts for 2% of the world's total forest area.[2]

The report noted that India has significantly increased its forest area over the past decade. It ranks third globally in average annual net gain in forest area between 2010 to 2020 (behind China and Australia). India has added around 0.38% of the 2010 forest area every year between 2010 to 2020.

Forest cover comprises all lands, more than one hectare in area, with a tree canopy density of more than 10 per cent, irrespective of ownership and legal status. Such lands may not necessarily be a recorded forest area, and also include orchards, bamboo and palm plantations. India's total forest cover was 7,13,789 square kilometres in 2021, a 3.14% increase over the forest cover in 2011.

The Economic Survey 2021-22 observed that going forward, there is a need to further improve forest and tree cover. It stated that social forestry could play a significant role in this regard.[2]

Green India Mission

Green India Mission (erstwhile National Afforestation Programme) was launched in February 2014. Its objectives include: (i) increasing forest cover by up to 5 million hectare and improving quality of forest cover on additional 5 million hectare of land, (ii) enhancing eco-system services such as capturing and storing atmospheric carbon to reduce global warming, and (iii) increasing forest-based livelihood income of about 3 million households.[42]

NITI Aayog, in its report on Strategy for New India (2018), identified increasing the forest cover to 33.3% of the geographical area between 2021-23 as one of the key objectives for a clean, and healthy environment in India. Between 2017 and 2019, the forest cover across India increased by 0.6% (0.4 million hectares).[43] As of 2019, total forest cover in India accounts for 22% of the total geographical area (71 million hectare out of 329 million hectare).[44] The states with comparatively higher forest cover as share of their geographical area include: (i) Lakshadweep (90%), (ii) Mizoram (85%), (iii) Andaman and Nicobar Islands (82%), (iv) Meghalaya (76%), and (v) Manipur (75%), among others.

Note that, the 14th Finance Commission assigned 7.5% weightage to "forest cover" in its calculation of states' share in the central taxes.[45] The 15th Finance Commission (2020) replaced this by the a weightage of 10% to "forest and ecology".[46] This was done to reward states for the ecological services from the forest cover, and to compensate them for constraints arising from the dense forests in the state.[46]

NITI Aayog recommended promoting afforestation through peoples' participation and the involvement of the private sector, with priority to restoration of degraded forests.[19] Further, it recommended that the public land along railway tracks, highways, and canals should be used for tree plantation.

The Standing Committee on Science and Technology, Environment, Forests, and Climate Change (2018) had noted that despite the overall increase in the forest cover in India, some of the North-Eastern states observed a decline in the forest cover in 2017.[42] These states include Manipur, Arunachal Pradesh, and Mizoram.

The Standing Committee on Science & Technology, Environment & Forests on the 'Status of Forests in India' (2019) also expressed concerns about the decline in the forest cover in the North-Eastern States, which constitute 65.34% of their geographical area in comparison to the national forest cover of 21.54%.[41] It recommended that the concerned state governments and the Ministry of Environment, Forests and Climate Change must take all necessary steps to ensure that the decline in forest cover in these states is stopped at the earliest.[41]

In addition, the Committee noted that no action plan has been prepared by the Ministry for controlling illegal cutting of trees in forests. It recommended the Ministry to take cognizance of the illegal felling of trees in different parts of the country and prepare an action plan for tackling this menace, in coordination with state governments.[41]

Financing afforestation: In 2022-23, the Green India Mission has been allocated Rs 362 crore (an increase of 42% over the revised estimates in 2019-20).

The Standing Committee on Science & Technology, Environment & Forests on the 'Status of Forests in India' (2019) had noted that the budget allocation to National Afforestation Programme has been insufficient. This has affected the achievement of the annual targeted area of afforestation during the last few years. The Committee recommended the Ministry to ensure adequate allocation to the National Afforestation Programme to achieve the targets under the Programme.

The Standing Committee on Science and Technology, Environment, Forests, and Climate Change (2020) noted that the Green India Mission is an important programme.[4] However, there has been under-utilisation of funds in the Mission. In 2021-22, up to the revised stage, 88% of the funds allocated to the Mission has been utilised.

Evaluation: The Standing Committee on Science & Technology, Environment & Forests on the 'Status of Forests in India' (2019) noted that the mid-term evaluation study on National

Afforestation Programme conducted by the Indian Council of Forestry Research and Education (ICFRE) in 2008 had highlighted the successful implementation of the programme.[41] However, the Committee observed that more than ten years have passed since the previous ICFRE evaluation and recommended the Ministry to undertake a new study. This will help in assessing the actual impact of the Green India Mission on the forest cover and formulate strategies accordingly.[41]

The Committee also recommended the Ministry to take necessary action for determining the availability of total land for afforestation in the country. This will help state governments in formulating strategies for taking up the afforestation activities at their level.

Compensatory Afforestation Management and Planning Authority (CAMPA) funds

The CAMPA funds were established under Compensatory Afforestation Fund Act, 2016 in August 2016.[47] The Act requires an entity, diverting a forest land towards non-forest purposes (such as mining), to pay for planting forest over an equal area of non-forest land or over twice the area of the degraded forest land. The purposes for utilisation of the fund include: (i) artificial plantations, (ii) wildlife and forest protection, and (iii) forest related infrastructure development.

The Standing Committee on Science and Technology, Environment, Forests, and Climate Change (2020) noted that the CAMPA fund has a huge corpus of Rs 54,394 crore. The funds have accumulated due to deforestation. However, the current guidelines on the utilisation of fund restrict its utilisation for other schemes with similar objectives (such as Green India Mission) under the Ministry.[4]

The Committee recommended the Ministry to explore possibilities of utilisation of fund for schemes with objectives like those defined for utilisation of CAMPA fund. It specified that amendment to CAMPA Act and rules should be also considered for enabling utilisation of the fund for schemes with similar objectives.[4]

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