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From the Director's Desk



The Union Budget 2023-24 was presented against the backdrop of some critical geopolitical developments and was the last full budget before the next general elections. Significantly, 2023 is also the year in which India became the most populated country in the planet and assumed G20 presidency. The Budget served as an opportunity for India to outline its contribution for shaping the global agenda and strengthening its G20 priorities. Also being the first budget of the post-COVID period, it laid out a blueprint for accelerating the Indian growth story while laying down seven priorities of the Union Government.

This issue of ICRIER's Agriculture Policy, Sustainability and Innovation (APSI) Quarterly publication, Agri-Food Trends and Analytics Bulletin (AF-TAB) on **"Budgeting for Agriculture and Food"** focuses on budgetary analysis, particularly around agriculture, subsidies, nutritional security, doubling farmers' income and green growth actions.

The Hon'ble Finance Minister acted on the window of opportunity to significantly reduce numerous subsidies now that the COVID-19 outbreak is under control and global commodity prices are falling. For instance, the amount spent on food subsidies was cut from Rs. 2.87 trillion in FY2022-23 to Rs. 1.97 trillion in FY2023-24, and the amount spent on fertilizer subsidies was decreased from Rs. 2.25 trillion to Rs. 1.75 trillion. Similarly, the MGNREGA budget was cut from Rs. 894 billion to Rs. 600 billion this year. Though the rural poor are at a disadvantage from the standpoint of expenditure allocation, they will benefit from the plethora of new projects launched.

Overall, the budget appeared to have struck the appropriate balance between growth, distribution, and stability at a time when the global economy is grappling with several crises at once and the Indian economy is working to resume a path of rapid growth that is also inclusive. However, the wait just got a little bit longer for those looking for bold structural reforms to put India back on the path of 8-10 percent growth.

Deepak Mishra
Director & Chief Executive
ICRIER



From the Chief Editor's Desk



Agriculture and allied sectors continue to move with a resilient moderate growth rate and widely documented challenges which are getting compounded with the climate change impacts. The sector has recorded an average annual growth rate of 4.6 percent over the last six years, employs 45.6 percent of the workforce and contributed to 18.6 percent of the country's Gross Value Added in 2021-22. Still its viability, as an occupation, remains a major concern. Therefore, the budgetary provisions announced for agri-food policies in Union Budget 2023-24 need to be understood from the long-term perspective of agriculture sector development. At a time when it seems that we have left the pandemic behind, this issue presents an analysis of the agriculture sector priorities in

Union Budget 2023-24. Being the last full Budget before the general elections due next year and the first budget of Amrit Kaal adds to its essence.

Budget 2023 took a bold step towards reorienting support in the agri-food-rural space, away from doles and towards development. Drastic cuts in food and fertilizer subsidy, and on MGNREGA, amounted roughly to Rs. 1.7 trillion were announced. Savings from these doles have been redirected towards more productive expenditures on railways, roads, rural housing and jal shakti that will help rural India through multiplier effect. Budget 2023 also accorded due pre-eminence to agricultural research and education with an increase of 9.8 percent in allocations compared to last year. This analysis of doles in comparison with development is presented in first article of this issue. Many key provisions have been made for Agriculture and Farmers' Welfare in the Budget for the FY 2023-24, which is Rs. 1.25 lakh crore this time (including Agriculture Education and Research). Out of this, provision of Rs. 60,000 crore has been made for PM-Kisan, Rs. 23,000 for KCC and Rs. 13,625 for PM Fasal Bima Yojana. That means 77 percent of the agriculture budget allocation is for safety nets and merely 23 percent for agriculture development activities. There is a need for re-orienting the agriculture budget towards development, at least 50-50.

Hon'ble Prime Minister of India, Shri Narendra Modi, made an ambitious target to double farmers' income by 2022-23 (on 2015-16 base year) and to achieve this target, the required growth rate at the all-India level was estimated to be 10.4 percent (Ashok Dalwai committee). We have completed the target year, but the budget did not promise any critical policy towards fulfilling that goal. As per the report on 'The State of Food Security and Nutrition in the World 2022', India has the largest undernourished population globally which stood at 224.3 million of the 702.7 million people in 2019-21. The third article of the issue presents district-wise analysis of underweight, stunted and wasted children across Indian districts and evaluates the options to dovetail our budgetary allocation in line with the targets of the Sustainable Development Goal (SDG) of ending all forms of malnutrition by 2030. There is also widespread acknowledgement that growth in agriculture sector has come with a cost to the environment, especially to air, water, soil, and green-house gas (GHG) emissions to the environment. Continuation of "business-as-usual" approach to meeting the rising demand for food will result in using natural resources beyond their ecological carrying capacity. The last article comments on the important trends and priorities in Union Government's resource provisioning for green growth in agriculture and allied sector.

We sincerely hope this publication by APSI would help deepen the public and policy discourse in the country on the Union Budget and public financing of agri-food-rural sphere.

Ashok Gulati

*Distinguished Professor
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Budget for Development

Ritika Juneja and Ashok Gulati

The Union Budget 2023-24 was announced on February 1, 2023 the Union Minister of Finance and Corporate Affairs, Smt Nirmala Sitharaman. Seven key priorities of the budget 'Saptarishi' were inclusive development, reaching the last mile, infrastructure, and investment, unleashing the potential, green growth, youth power and financial sector (Ministry of Finance, 2023). As far as the food, agriculture and rural sector is concerned, this is the forward-looking budget that reorients spending away from subsidies and freebies towards more productive overheads that aims to benefit Rural India (Gulati & Juneja, 2023). Broadly, budgeting in agriculture sector can be divided into two categories: budget provisions for individual farmer-centric support (e.g. subsidies, direct income support, credits, risk cover etc.) and provisions that increase the overall capacity of the sector through improvements in infrastructure and agricultural practices (e.g. research and extension, mechanisation, post-harvest and value chains management, institutional support etc.). Food, fertiliser and MGNREGA had dominated previous agri-food-rural sector budgets and the biggest highlight of the Union Budget FY 2023-24 is that these three big-ticket items have been majorly rationalised. The food subsidy, against the revised estimates (RE) of FY 2022-23 at Rs 2.87 lakh crore was budgeted in FY 2023-24 at roughly 1.97 lakh crore, resulted in net saving of Rs. 90,000 crore. This was achieved by discontinuing the earlier Pradhan Mantri Garib Kalyan Anna Yojana (PM-GKAY), which was started during the COVID-19 period by giving an extra 5 kg of grain free to more than 81

crore people of the country (Gulati, 2023). This scheme was, however, stopped from January 1, 2023 and instead PDS supplies under the National Food Security Act (NFSA), for which rice and wheat were being charged Rs. 3 and Rs. 2 per kg, are now made free. Second biggest subsidy – for fertilisers, was also rationalised from Rs. 2.25 lakh crore during FY 2023-24 (RE) to Rs. 1.75 lakh crore during FY 2023-24 (BE) – a saving of about Rs. 50,000 crore (Table 1). Also, the provision under MGNREGA was slashed from about Rs. 89,400 crore in FY 2022-23 (RE) to Rs. 60,000 crore in FY 2023-24 (BE), resulted in net saving of about Rs. 29,400 crore. Cumulatively, savings from these three major doles accounted for roughly Rs. 1.7 lakh crore have been redirected towards productive development of rural infrastructure, through investments in railways, roads, rural housing, and access to drinking water to all. Focus on fiscal prudence helped the union government in managing to adhere to the budgeted fiscal deficit target of 6.4 percent of GDP in FY 2022-23 (RE) notwithstanding the challenges induced by the pandemic and supply-side disruptions emanating from the Russia-Ukraine war (Sood et. al., 2023). In FY 2023-24, the government budgets to further consolidate country's gross fiscal deficit to 5.9 percent of the GDP (Ministry of Finance 2023). The rationality in restraining subsidies and increasing capital expenditure aims to strengthen growth momentum and the economic foundations with commitment to fiscal consolidation through its multiplier effect (Sood et. al., 2023).



Table 1: Budgetary Allocation: FY 2023-24 (BE) vs FY 2022-23 (RE)

	Safety Nets/Subsidy for Farmers
	Development Expenditure/Asset creation

Scheme/Ministry	RE (FY 2022-23) Rs. Crore	BE (FY 2023-24) Rs. Crore	Net of BE (FY 2023-24) over RE (FY 2022-23) Rs. Crore (% change)
Mahatma Gandhi National Rural Employment Guarantee Act	89,400	60,000	-29,400 (-32.9%)
Food Subsidy	2,87,194	1,97,350	-89,844 (-31.3%)
Total Fertilizer Subsidy	2,25,222	1,75,103	-50,119 (-22.3%)
PM Kisan	60,000	60,000	-
PM Fasal Bima Yojana	12,376	13,625	1,249 (10.1%)
Credit Subsidy	22,000	23,000	1,000 (4.5%)
Department of Fisheries, Animal Husbandry and Dairying	4,729	6,577	1,847 (39.1%)
Development Expenditure under Department of Agriculture and Farmers Welfare*	12,250	15,176	2,926 (23.9%)
Expenditure on Agriculture Research and Education	8,659	9,504	845 (9.8%)
PM Awas Yojana (Rural)	48,422	54,487	6,065 (12.5%)
M/o Railways	1,62,312	2,41,268	78,956 (48.6%)
M/o Road Transport and Highways	2,17,027	2,70,435	53,408 (24.6%)
M/o Skill Development and Entrepreneurship	1,902	3,517	1,616 (85%)
PM Kusum	1,325	1,996	671 (50.7%)
D/o Water Resources, River Development and Ganga Rejuvenation	14,000	20,055	6,055 (43.2%)
Jal Jeevan Mission/National Rural Drinking Water Mission	55,000	70,000	15,000 (27.3%)

*It includes schemes like RKVY, National Mission on Natural farming, Agriculture Infrastructure Fund, National Beekeeping Honey Mission, Krishionnati Yojana etc.
Source: Union Budget, 2023-24

On the development expenditure front, the union budget FY 2023-24 has observed a major push to the infrastructure investment including roads, railways, and rural housing. Biggest jump in budgetary allocations is observed towards Indian Railways. Capital outlay of Ministry of Railways is provisioned at Rs. 2.41 lakh crore in FY 2023-24, about 9 times higher than the amount in the FY 2013-14 and an increase of 48.6 percent over the revised estimate in FY 2022-23 (Rs. 1.62 lakh crore). The funds will mostly be spent on commercial lines, building tracks, new coaches, electrification, and developing facilities at stations. Next critical development expenditure is towards Ministry of Road Transport and Highways on

account of building new roads (particularly rural) and bridges. The Finance Minister has budgeted a capital outlay of Rs. 2.70 lakh crore to the ministry which is the highest ever outlay in 2023-24 against Rs. 2.17 lakh crore in 2022-23 (RE). Thus, indicating governments' focus on promoting 'Gati Shakti'. This will not only improve last mile connectivity but only help in reducing high logistics cost which typically impacts the competitiveness of domestic products in the international market. It is critical to highlight that logistics and supply chain costs account for around 12 percent of the Gross Domestic Product (GDP) in India at present. This is much higher when compared to the global average of 8 percent



(Gulati & Juneja, 2023).

To provide a sharper focus to the objective of 'reaching the last mile,' the finance minister has increased capital outlay under the Jal Jeevan Mission (JJM) by 27.3 percent. The scheme aims to provide functional household tap connection to every rural household. An outlay of Rs. 70,000 crore has been earmarked for the programme FY 2023-24 (BE), against Rs. 55,000 crore in the FY 2022-23 (RE).

Another key focus area of the union budget FY 2023-24 is the housing sector. The overall outlay towards PM Awas Yojana (Gramin) has increased to Rs. 54,487 crore in FY 2023-24 from Rs. 20,000 crore provisioned in FY 2022-23 (BE), net increase of 172.4 percent! As compared to the FY 2022-23 revised estimate (actual spending) which was Rs. 48,422 crore, the allocation towards the scheme in FY 2023-24 witnessed the a hike of 12.5 percent. The scheme was launched in 2016 to provide housing for all but it also ensures permanent asset creation for rural households, dignity of life while creating more jobs in rural India. This marks a realigning subsidy towards rural infrastructure development (Gulati & Juneja 2023)

The Finance Minister also introduced 4.0 version of Pradhan Mantri Kaushal Vikas (PM VIKAS) Yojana, which aims to skill lakhs of youth within the next three years. Outlay towards on-the-job training, industry partnership, and alignment of courses with needs of industry etc. has been increased by 85 percent from Rs. 1902 crore (RE) in FY 2022-23 to Rs. 3517 crore (BE) in FY 2022-23 The scheme targets to cover new age courses for industry 4.0 like coding, AI, robotics, mechatronics, IOT, 3D printing, drones, and soft skills. FM also announced that to skill youth for international opportunities, 30 Skill India International Centres will be set up across different states (Ministry of Finance, 2023).

Besides this, prioritising green growth, the Finance Minister has allocated a sum of Rs. 10,222 crore towards the Renewable Energy sector, recording an increase of 48 percent over last year's budget allocation of Rs. 6,900 crore (BE). Furthermore, a sum of Rs. 1996 crore was allocated for solar energy under the Pradhan Mantri Kisan Urja Suraksha Evam Utthaan Mahabhiyan (PM-KUSUM) scheme, launched in 2019, up from Rs. 1325 crore in FY 2022-23 (RE).

Further to promote innovations and technologies in agriculture sector, the Union Budget FY 2023-24 envisages development of the Agriculture Accelerator Fund to encourage agri-startups in rural areas. In keeping with higher growth rates in the livestock and fisheries, enhanced allocations for these two sectors were made in 2023-24. Notable is the sub-scheme of PM Matsya Sampada Yojana

which was launched with an investment of Rs. 6,000 crore to support fishermen, fish vendors, and MSMEs.

Budget FY 2023-24 also made provisions for developing alternatives to chemical fertilisers and giving a boost to natural and organic farming. Setting up digital public infrastructure as an open-source, open-standard and interoperable public good for the agriculture space is also proposed in this budget. This will enable inclusive, farmer-centric solutions through relevant information services for crop planning and health, improved access to farm inputs, credit, and insurance, help for crop estimation, market intelligence etc. These initiatives though are the steps in the right direction but are at a nascent stage and will only make a marginal difference as we are yet to see how much funds are actually allocated under these initiatives/schemes.

One of the critical questions that arises with respect to agriculture transformation is how much investment the country makes in agriculture Research and Development (R&D). According to the recent estimates of the Comptroller and Auditor General (CAG), the Centre and states combined spent less than half of this benchmark on agri-R&D in the pre-COVID year, FY 2019-20 (Gulati, 2023). This is too meagre a change! Thus, the need is to double up investment in Agriculture Research, Development and Education for creating productive, resilient, inclusive, and competitive agriculture in India.

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A Way Forward to Double Farmers' Income

Ranjana Roy and Ashok Gulati

The Prime Minister of India, Shri Narendra Modi, made an ambitious target to double farmers' incomes by 2022-23, at a kisan (farmer) rally in Bareilly on 28 February 2016. The statement was followed by forming a committee for Doubling Farmers' Income (DFI) under the chairmanship of Ashok Dalwai with an objective to formulate a plan of action to achieve this goal (MoA&FW, 2017). The committee prepared 14 volumes proposing strategies on almost every aspect of agriculture. As per the committee, the PM's target was to double the real incomes of farmers in seven years, i.e. by 2022-23 when India sets out for Amritkaal over 2015-16 income level. To achieve the DFI target, the required growth rate at all-India level was estimated to be 10.4 percent. As we have completed the target year, it is right time to revisit that dream to see if the goal is achieved and how best it can be fulfilled.

The only official database available to estimate farmers' income is the Situation Assessment Survey (SAS) of agricultural households released by Ministry of Statistics and Programme Implementation (MoSPI). The latest data available is for the year 2018-19 which was released in September, 2021. This data was earlier available for only two years 2002-03 and 2012-13. Agricultural Households' income¹ increased both in nominal and real terms from 2002-

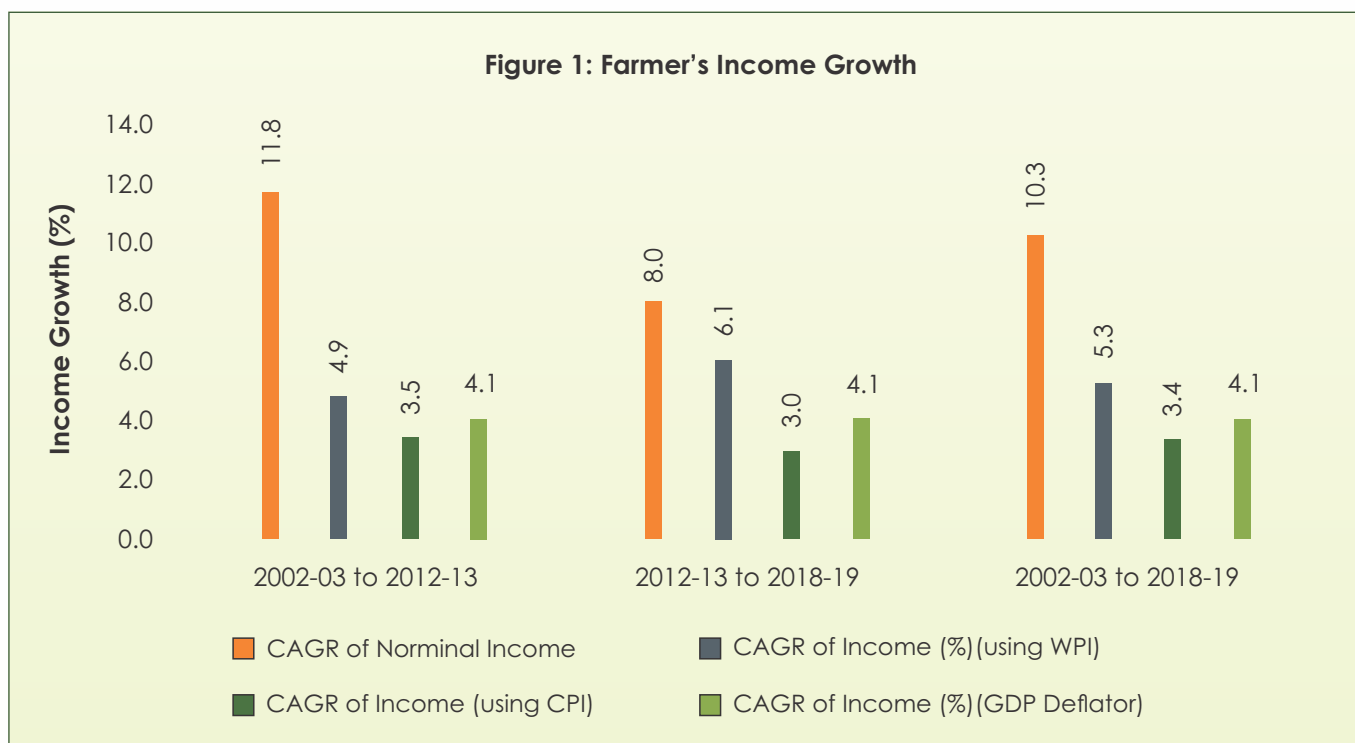
03 to 2018-19. In 2002-03, an average Indian farming household earned about Rs. 2115 (Rs. 6830 in 2020-21 prices), which increased to Rs. 10,218 in 2018-19 (Rs. 11,572 in 2020-21 prices). In nominal term the compound annual growth rate (CAGR) turns out to be 10.3 percent per annum between 2002-03 and 2018-19 (Figure 1). But the actual situation of the farmers can be captured from the real income growth. Even so, the choice of deflator in estimating real income is critical. If nominal incomes are deflated by using consumer price index for agricultural labour (CPI-AL), which should be the rational choice and also used by Dalwai Committee to forecast required growth rate to double farmers' income, then the CAGR turns out to be just 3.4 percent (2002-03 to 2018-19), and if one uses WPI (wholesale price index of all commodities), the CAGR in real incomes turns out to be 5.3 percent. However, if we use GDP deflator, growth rate of income turns out to be 4 percent in this period. This vast difference, from 3.4 percent to 5.3 percent, is entirely due to the choice of the deflator.

The agriculture sector employs 45.5 percent of the workforce (PLFS, 2021-22) and unless the incomes of farmers are augmented, a sustained overall GDP growth cannot be achieved. Therefore, the govt. needs to adopt some groundbreaking policies otherwise DFI will remain a distant dream.

¹The definition of 'farmer' in all the surveys vary somewhat from each other. As per SAS 2018-19, agricultural households are those who receive value of produce more than Rs. 4000 from agricultural activities (Rs. 3000 in SAS 2012-13) and have at least one member self-employed in agriculture in the last 365 days. However, in SAS 2002-03, a farmer was defined as a person who operates some area of land and engaged in agricultural activities in the last 365 days.



Figure 1: Farmer's Income Growth



Source: Calculated by authors using SAS income data, MoSPI and RBI data for GDP deflator
 Note: 2018-19 income figures include income from rental income. This information was not collected in the earlier rounds.
 Real Income Growth in figure 1 is calculated using WPI (2011-12=100) CPI-AL (2020-21=100), and GDP Deflator 2011-12=100.

Budget 2023-24 and Farmers Income

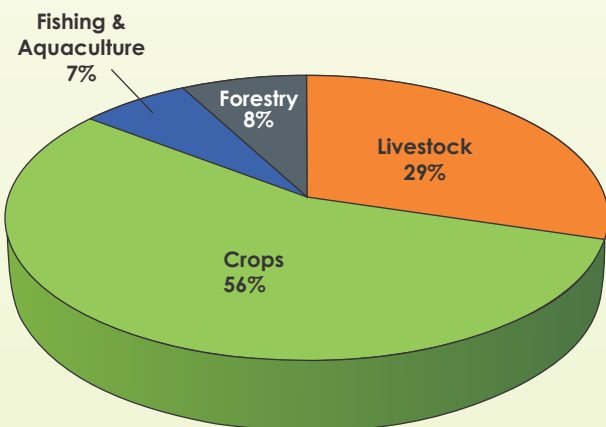
In the following section, we have analyzed the necessary policies and budgetary allocation that are directed to boost farmers' income.

Firstly, farmers' return can be maximized by increasing productivity through better seeds, irrigation and optimum use of fertilizers keeping in mind the environmental outcomes. This depends on how much the govt. allocates on agricultural research and development. The budget for the Department of Agriculture Research and Education (DARE) has been provisioned at Rs. 9,504 crore, up by about 9.7 percent over the RE of Rs. 8,659 crore in FY 2022-23 (Union Budget, 2023-24). Department of Agriculture and Farmers' Welfare has provisioned Rs. 7,066 crore for Krishionnati Yojana and Rs. 7,150 crore for Rashtriya Krishi Vikas Yojana. These provisions although helpful but not adequate enough to achieve climate resilient agriculture. There is a need to double the allocation towards agri-R&D to protect farmers from losses due to weather vagaries and to increase their income with increased productivity and high resource use efficiency.

Secondly, farmers need to move from low value crops like cereals to high value items like poultry, fishery, dairy, and horticulture. The latest SAS data reveals another interesting fact. The share of income from cultivation has fallen over the years from 46 percent in 2002-03 to 38 percent in 2018-19. In the same period income from livestock sector (includes dairy, poultry/duckery, piggery, fishery) has increased quite noticeably from 4 percent to 16 percent. In the gross value of output from agriculture, forestry, and fisheries, crop sector still constitutes the highest share (Figure 2). In terms of sub-sector wise growth in real value of output, fishery sector grew at the fastest rate (6.9 percent) followed by livestock (5.3 percent), pulses (5.0 percent), and horticulture (4.8 percent) in the period of 2005-06 to 2020-21 (Figure- 3). Within livestock, poultry meat (10.6 percent) is growing at the highest rate followed by meat group (7.6 percent), eggs (6.21 percent), and milk group (5.56 percent) (2012-13 to 2020-21).

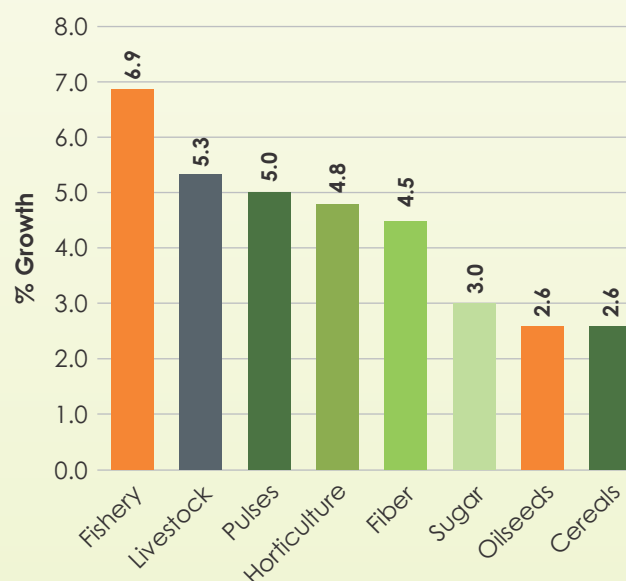


Figure 2: Composition of GVO from Agriculture and Allied Activities, TE 2020-21



Source: National Accounts Statistics, MosPI

Figure 3: Real GVO growth(%) 2005-06 to 2020-21



Allocation to department of fisheries for the budget 2023-24 has increased to Rs. 2,248 crore from a revised estimate (RE) of Rs. 1,624 crore in 2022-23 with considerable increase in expenditure on centrally sponsored schemes under blue revolution. Similarly, the net allocation to department of animal husbandry and dairying has increased from a revised estimate (RE) of Rs. 3105 crore in 2022-23 to a budgeted estimate (BE) of Rs. 4327.85 crore in 2023-24 with increase in provision for centrally sponsored schemes like Dairy Development, National Livestock Mission, Dairying through Cooperatives etc.

These are welcoming steps, but the fast-growing sectors needs more attention from the government. Commercial poultry is a sustainable choice for income of a large number of farming households in the rural sector. It is vital to provide policies that inspired institutionalization of smallholders. Poultry farming model in line with Amul will benefit small farmers to market their products across India. To improve efficiency in the milk value chain, government needs to build infrastructure of milk processing units in the cooperative structure across states.

A positive step towards encouraging high value horticultural crops was announced under the Atmanirbhar Clean Plant Programme that intends to enhance the availability of disease-free, quality

planting material. An outlay of Rs. 2,200 crore has been assigned for the programme (PIB, 2023). However, more devotion from government's side is needed to correct inefficiencies in the horticulture value chain. To substantiate any increased demand of processed horticulture commodities, there is a need to enhance the processing capacity in the major producing states so that post-harvest loss is minimum. There is a need for greater awareness of usage of processed forms like potato flakes, dehydrated onions, tomato puree, and banana biscuits etc. among Indian consumers. The demand of these processed items can be increased through large scale distribution in mid-day meal scheme, government run hostels, army canteens and so on.

Thirdly, provision from government through different input and output support programmes also help in boosting farmers' income. For instance, expenditure on fertilizer is one of the biggest subsidies that has crossed Rs. 2 lakh crore in 2022-23, but declined to a BE of Rs. 1.75 lakh crore in 2023-24 owing to lower cost of import as the shock of the Russia-Ukraine war has subsided to some extent. To summarize other major schemes, the revenue expenditure (RE) and the budget expenditure (BE) under PM-KISAN for the years 2022-23 and 2023-24 are fixed at Rs. 60,000 crore respectively, as against actual expenditure of Rs. 66,825 for the year 2021-



22. Farmers have been expecting increase in the amount per family from Rs. 6000 to Rs. 8000 but decrease in allocation shows government's restraint towards expanding income support programs. The BE allocation under Pradhan Mantri Fasal Bima Yojana (PMFBY) for FY 2023-24 has been kept at Rs. 13,625 crore, marginally higher from the RE of Rs. 12,375 crore of FY 2022-23. There has been a major decline in the food subsidy from Rs. 2.87 lakh crore to Rs. 1.97 lakh crore in the budgeted estimate for 2023-24 compared to the actual spending in 2022-23 (Union Budget, 2023-24). It was expected that savings from these subsidies will be diverted towards building infrastructure and improving the inefficiencies in the agri-value chain. But the budget did not promise any critical policy towards fulfilling that goal. The crucial point is that in order to achieve the dream to double farmers' income, there is an urgent need of innovations in technologies, crops, institutions and policies for more varied high-value agriculture that is also responsible towards the planet.

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Budgeting for Nutrition

Shyma Jose and Ashok Gulati

As per the report on 'The State of Food Security and Nutrition in the World 2022', India has the largest undernourished population globally which stood at 224.3 million of the 702.7 million people in 2019-21. At the same time, the country accounts for about 24.2 percent of the world's stunted children and 44.3 percent of the world's wasted children under five years of age in 2020 (FAO et. al. 2022). The latest National Family Health Survey (NFHS) 2019-21 indicates that nutritional indicators for children under 5 years of age have improved over the last 15 years. Stunting (measured by low height-for-age) has reduced from 48.0 percent to 35.5 percent, wasting (low weight-for-height) from 19.8 percent to 19.3 percent and underweight (low weight-for-age)

prevalence from 42.5 percent to 32.1 percent during 2005-06 and 2019-21. India has made remarkable progress in reducing the Infant Mortality Rate (IMR) measured in terms of death per 1000 live birth from 57 to 35.2 (Table 1). Studies have shown a strong association between malnutrition and childhood mortality in India. These children saved from childhood mortality further add to the pool of undernourished children. The reduction (or the outflow) in stunting and underweight children is not large enough as compared to a drastic reduction in childhood mortality indicator (IMR). Therefore, bringing mortality among children to a permissibly low level is equally important for tackling malnutrition.

Table 1: Trends in the nutrition and mortality indicators among children

Indicators	NFHS-III (2005-06)	NFHS-IV (2015-16)	NFHS-V (2019-21)	Per year Decline (%)	
				NFHS-III to IV	NFHS-IV to V
Underweight (%)	42.5	35.8	32.1	0.61	0.74
Stunted (%)	48.0	38.4	35.5	0.87	0.58
Wasted (%)	19.8	21.0	19.3	-0.11	0.34
Infant Mortality Rate (IMR) (deaths per 1,000 live births)	57	40.7	35.2	1.48	1.10

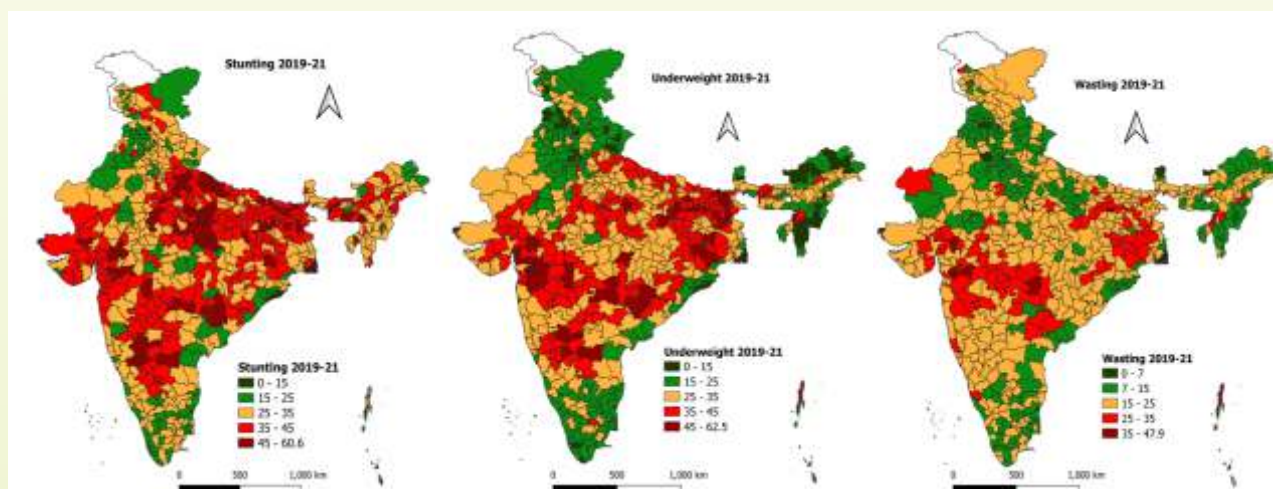
Source: NFHS- III, IV, V. Note: Nutrition indicator are for children under 5 years of age

Despite a significant improvement in nutritional outcomes at all India level, we find there exists a wide inter-district variation across the malnutrition indicators using the unit-level data of NFHS 2019-21 (Figure 1). The proportion of underweight children was in excess of 40 percent in 216 districts in 2019-21 as compared to 210 districts in 2015-16. At the same time, the number of districts reporting high prevalence stunting (more than 40 percent among

children under five years increased from 241 to 334 during 2015-16 to 2019-21. This clearly indicates the need to have a decentralised and targeted approach to tackle malnutrition among children given a sizeable geographical clustering of high-risk districts particularly in Bihar, Uttar Pradesh, Jharkhand, Gujarat, Chhattisgarh, Maharashtra and Madhya Pradesh (Figure 1).



Figure 1: Proportion of underweight, stunted and wasted children across Indian districts, 2019-21



Source: International Institute for Population Sciences (2022), NFHS- V (Nutrition indicator are for children under 5 years of age)

Importantly, how can we dovetail our budgetary allocation in line with the targets of the SDG of ending all forms of malnutrition by 2030?

Even today, about 800 million Indians are still dependent upon the Public Distribution System (PDS) (the world's largest food safety net program) to meet their food and nutritional needs. In Union Budget 2023-24, around Rs. 1.97 lakh crore which is about 4.4 percent of the total budgetary expenditure has been allocated for food subsidy expenditures under the Pradhan Mantri Garib Kalyan Anna Yojana (PMGKAY). Additionally, in FY 2023-24, around Rs. 20,554 crore was allocated for Saksham Anganwadi and Mission POSHAN 2.0, a scheme formed by merging the four centrally sponsored schemes - Integrated Child Development Scheme (ICDS), Anganwadi services, POSHAN Abhiyan, Scheme for Adolescent Girls and National Creche Scheme. The budget estimate earmarked for the mid-day meal scheme (also known as the Pradhan Mantri Poshan Shakti Nirman) was also increased by 13 percent in FY 2023-24 over FY 2022-23 with the reopening of schools and Anganwadi centres after the pandemic-induced shutdown (Table 2). The increased outlay (from Rs. 166 crore in 2022-23 to Rs. 800 crore in 2023-24) for

distribution of pulses to State/Union Territories for Welfare Schemes is a right step towards adding nutritional value in government-run programmes. Other new initiative of the government is support to Indian Institute of Millet Research, Hyderabad, as global hub for Millets "Shree Anna".

Given that the food-based safety nets account for a large chunk (5.1 percent) of the total budgetary expenditure in FY 2023-24, there is a pressing need to bring about reforms and heavy reshuffling in their fiscal outlay to make a significant dent in nutritional outcomes in the country. Lack of a diverse and nutritious diet has a significant impact on stunting, and micronutrient deficiency, which results in increased morbidity and mortality among children. The in-built provision under the National Food Security Act (2013) could be utilised to reform and provide the States and its households a choicebased

system to opt between subsidized food grain or conditional cash transfers. Alternatively, a centralised system could be developed to provide inflation-indexed cash entitlements vouchers to be distributed through the existing network of PDS outlets. This will provide the beneficiaries greater autonomy to decide on their diverse diet plans according to their consumption needs.



Table 2: Budgetary allocation for various nutrition sensitive programmes

Programmes	2023-24 (BE) (in Rs. crore)	As percent of total Budget outlay FY 2023-24
Food & Nutritional Security Programmes		
Food Subsidy under NFSA	197,350	4.86
Saksham Anganwadi & POSHAN 2.0	20,554	
Distribution of Pulses to State/Union Territories for Welfare Schemes	800	
Water & Sanitation Programmes		
Jal Jeevan Mission	70,000	1.83
Swachh Bharat Mission (Rural)	7,192	
Swachh Bharat Mission (Urban)	5,000	
Educational Programmes		
Pradhan Mantri Poshan Shakti Nirman	11,600	1.09
Samagra Shiksha	37,453	

Source: Union Budget 2023-24

Ensuring the availability of a nutritious diet in clusters of districts affected by chronic malnutrition and micronutrient deficiency could also be addressed using the innovative technique of bio-fortification. This could be achieved by investing in biofortification of the seeds of major food grains as well as promoting naturally biofortified crops such as sweet potato, moringa (drumsticks), and various berries (Dev, 2023). The Harvest-Plus programme of the Consultative Group on International Agricultural Research (CGIAR) has been promoting iron-fortified pearl millet and zinc-fortified wheat to improve nutrition and public health in India. Notably, the central government proposal to provide fortified rice to the poor under the aegis of various food-based government schemes by 2024 is a positive step towards reallocating budgetary expenditure towards nutritional security.

Availability of and access to a nutritious diet will tackle only one aspect of malnutrition, however, a multi-pronged strategy to curb the immediate and underlying causes of malnutrition is equally important. In the next section, we provide a critical analysis of existing budgetary allocation towards various nutrition-sensitive programs.

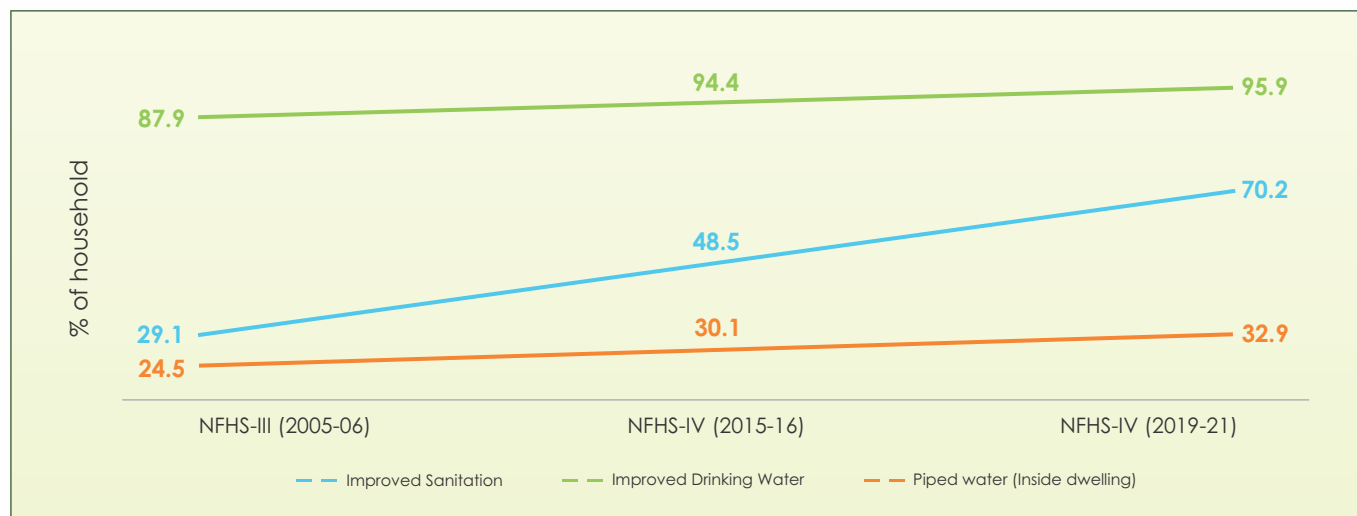
The synergy between WASH initiatives and nutritional interventions has a multiplier effect on nutritional outcomes. Access to better sanitation

and safe drinking water is empirically proven to improve nutritional status among children (Jose et. al. 2020). As per NFHS data, the share of households with tapped water facilities inside their premises increased from 24.5 percent in 2005-06 to 30.1 percent in 2015-16 and stood around 32.9 percent in 2019-21 (Figure 2). In view of this, the central government launched Jal Jeevan Mission based on a community approach which is aimed to provide safe and adequate drinking water through individual household tap connections by 2024 to all households in rural India (Har Ghar Jal).

In FY 2023-24 this centrally sponsored scheme is allocated around Rs. 70,000 crore, about 1.5 percent of the total budget expenditure. The allocation towards Jal Jeevan Mission increased by Rs. 10,000 crore over its last year's budget estimate, emphasising the centre's effort to provide every rural household with the basic necessity of safe drinking water. As per the data provided by the Jal Jeevan Mission dashboard, around 3.2 crore households in rural India had tapped water supply as on August 15, 2019, when the scheme was launched. Within its three years of implementation, the coverage has increased manifolds to 59.4 percent (11.5 crore) of the total rural households in the country as on March 25, 2023 (Ministry of Jal Shakti, GoI).



Figure 2: Outcomes of WASH initiatives over the last 16 years



Source: NFHS- III, IV, V

Similarly, Swachh Bharat Abhiyan (SBA) which aimed to eliminate open defecation and eradicate manual scavenging, saw a remarkable increase in its fiscal outlay in FY 2023-24. The total allocation towards SBA's Urban and Rural mission stood at Rs. 12192 crore. As on October 2, 2019, all 36 states and union territories were declared 100 percent open defecation free in rural areas (Ministry of Jal Shakti, GoI). As per NFHS data, there has been concomitant progress in the coverage of improved sanitation facilities over the last two rounds from 48.5 percent in 2015-16 to 70.2 percent in 2019-21. The Abhiyan should focus now on bringing about behavioural change regarding healthy sanitation practices and generating awareness among citizens regarding sanitation and its linkage with public health.

Our earlier research (Jose et. al. 2020) highlighted that mothers' education, particularly higher education, is strongly associated with the nutritional outcomes of children as well as child mortality indicators. Between 2015-16 and 2019-21, India has made considerable improvement in women's higher education level which increased from 13.7 percent to 25.9 percent. In the Union Budget 2023-24, women's education under the Samagra Shiksha, an overarching school education programme under the National Education Mission is allocated Rs. 37,453 crore (a mere 0.8 percent of the total budgetary allocation). Even today, Indian women who have been left out of higher education still far outweigh those who have got them. Therefore, the state government need to keep aside budgetary allocation to promote women's higher education through liberal scholarship and financial incentives.

This will reduce the dropout rates among girl students, particularly at the secondary and higher education levels.

The above debate gives credence to reshuffling and upscaling the government's budgetary allocation in the right manner towards biofortification of staples and diversified diet; facilitation of safe drinking water and improvement in sanitation facilities within households and lastly, promotion of girl child to have more than 12 years of education. Unless we reform our existing food safety nets and nutritional sensitive programmes towards a more targeted, focused and evidence-based approach with tight monitoring, India may derail from achieving the nutritional target under SDG by 2030.

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Green Growth in Agriculture

Reena Singh and Ashok Gulati

Green Growth

“Green growth is defined as fostering economic growth and development, while sustaining the natural assets base that provides the resources and environmental services on which our well-being relies.

Green growth implies policies that either incrementally reduce resource use per unit of value added (relative decoupling) or keep resource use and environmental impacts stable or declining while the economy is growing overall (absolute decoupling).”

(OECD Green Growth Studies 2013)

In the Union Budget 2023-24, following major green programmes were announced:

green fuel: Rs 19,700 crores for National green hydrogen mission, Rs 10,000 crore for GOBARdhan

green energy: Rs 35,000 crore for priority capital investments by Ministry of Petroleum & Natural Gas, inter-state transmission system from Ladakh with investment of Rs 20,700 crore

green farming: Rs 459 crore for natural farming, setting up 10,000 Bhartiya Prakratik kheti Bio-Input Resource Centre units, MISHTI, Amrit Dharohar, PM-PRANAM

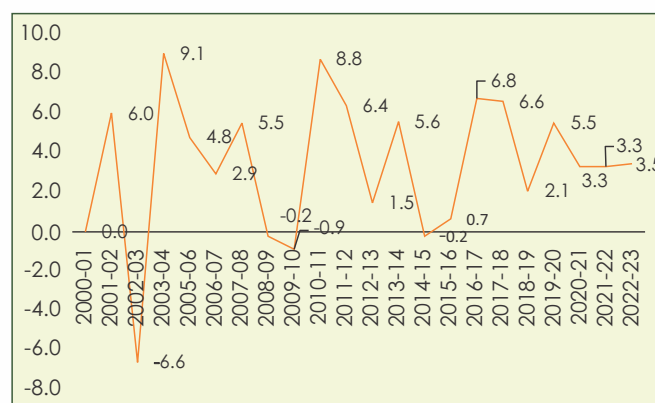
green mobility: funds for replacing old polluting vehicles of Central government

green credit: incentivize environmentally sustainable and responsive actions by companies, individuals and local bodies,

green equipment and policies for efficient use of energy across various economic sectors: Viability Gap Funding (VGF) for 4,000 MWH battery energy storage system, exemption of custom duties on the import of capital goods used in electric vehicles

Agriculture and allied sector has posted a resilient growth (though undulating) during the last two decade with the average growth of 3.4 per cent in GVA at constant prices (2011-12 prices) in the last three years (Figure 1). The sector employs 45.6 percent of the workforce and contributed to around 20 percent of the country's Gross Value added in 2020-21.

Figure 1: Agriculture Growth of Gross Value Added at Constant Prices



Source: National Accounts Statistics

India has also rapidly emerged as the net exporter of agricultural products. During 2021-22, agricultural exports reached US\$ 50.2 billion. This growth in agriculture and allied sector has come with a cost to the environment, especially to water, soil, and agri-biodiversity resources as well green-house gas (GHG) emissions (Singh et al. 2022). Continuation of “business-as-usual” approach to meeting the rising demand for food will result in using natural resources beyond their ecological carrying capacity. In this context, “green growth” has been identified as an alternative global growth trajectory, and economic sectors are being scrutinised for the extent to which they offer growth potential that is environmentally benign and socially beneficial (OECD 2013).

Green growth for agriculture and allied sector

India at CoP 26 has started the one-word movement 'LiFE' which means Lifestyle For Environment urging mindful and deliberate utilization instead of mindless and destructive consumption and committed to achieve net zero by 2070. Environment and Climate Relevant policies and commitments related to



Agriculture and allied sector are as follows:

1. Intended Nationally Determined Contribution (INDC) to create an additional carbon sink of 2.5 to 3 billion tonnes of CO₂ equivalent by 2030.
2. Other voluntary contributions: To restore 26 million hectare degraded land by 2030; 12 National Biodiversity Targets, in line with 20 global Aichi biodiversity goals.
3. United Nations' Sustainable Development Goals (SDGs): Out of 17 SDGs, 11 SDGs are related to AFOLU that include SDG 2 Zero Hunger, SDG 4 Quality Education, SDG 5 Gender Equality, SDG 6 Clean Water and Sanitation, SDG 7 Affordable and Clean Energy, SDG 8 Decent Work and Economic Growth, SDG 9 Industry, Innovation and Infrastructure, SDG 12 Responsible Consumption and Production, SDG 13 Climate Action, SDG 14 Life below water and SDG 15 Life on Land
4. Long-Term Low Emission Development Strategy (LT-LEDS):
 - Restoration, Conservation & Management of Forest Cover (Including Mangrove),
 - Restoration, Conservation & Management of Trees outside forests and green cover: Rural greening with a focus on One Forest–One Village and promoting agroforestry as a major programme for increasing farming income and meeting demand of wood products
 - Infrastructure development

Given that the budget document is the government's central policy document and the important role it plays in determining how resources are allocated to deliver national goals, it is appropriate that priorities related to the environment and climate change be considered as part of the budget process. In 2023-24, the term "green growth" has found an emphatic mention in a budget as "one of seven priorities or 'Saptarishi' to guide India through the Amrit Kaal.

Green budgeting offers a range of tools and techniques for governments seeking ways to bring green perspectives to bear on the budget process. One of the central green budgeting tools in many countries is green budgeting tagging (OECD Green Budgeting Framework). This tool involves assessing each individual budget measure and giving it a "tag" according to whether it is helpful or harmful to

green objectives. In this context, we identified agriculture and allied sector's relevant programmes that have "green budget" component – the budget component for environmental sustainability initiatives that are aligned to national and international commitments (as listed above e.g. INDC, SDGs etc.) and their percentage share of the total.

The identification of "green budget" component was done for:

1. Ministry of Agriculture & Farmers' Welfare, which has two constituent departments: (i) Department of Agriculture & Farmers' Welfare (DA&FW); and (ii) Department of Agricultural Research & Education (DARE).
2. Ministry of Fisheries, Animal Husbandry & Dairying, with two constituent departments: (i) Department of Animal Husbandry and Dairying (DAHD); and (ii) Department of Fisheries (DF)
3. Ministry of Environment, Forest and Climate Change (MoEFCC)

The entire expenditure head under various Ministries under a scheme may not be spent for "green objective", therefore the concept of "attributable share" for "green objective" need to be worked out for each scheme separately. However, in the first approach, we have identified the schemes into two categories:

- Direct Schemes: Schemes which include objectives (stated intent) for environmental sustainability and are contributing to national and international commitments
- Indirect Schemes: Schemes which include environmental sustainability partly but majorly focus on other objectives.

For calculating the percentage of "green budget" out of the total budget, we have taken the total expenditure of only direct schemes (Supplementary Table). The indirect schemes need to be un-bundled for their green share. In the second step, these direct and indirect schemes will be further scrutinized for their "attributable share" for "green objective".

Ministry of Agriculture & Farmers' Welfare

1. Department of Agriculture & Farmers' Welfare (DA&FW)

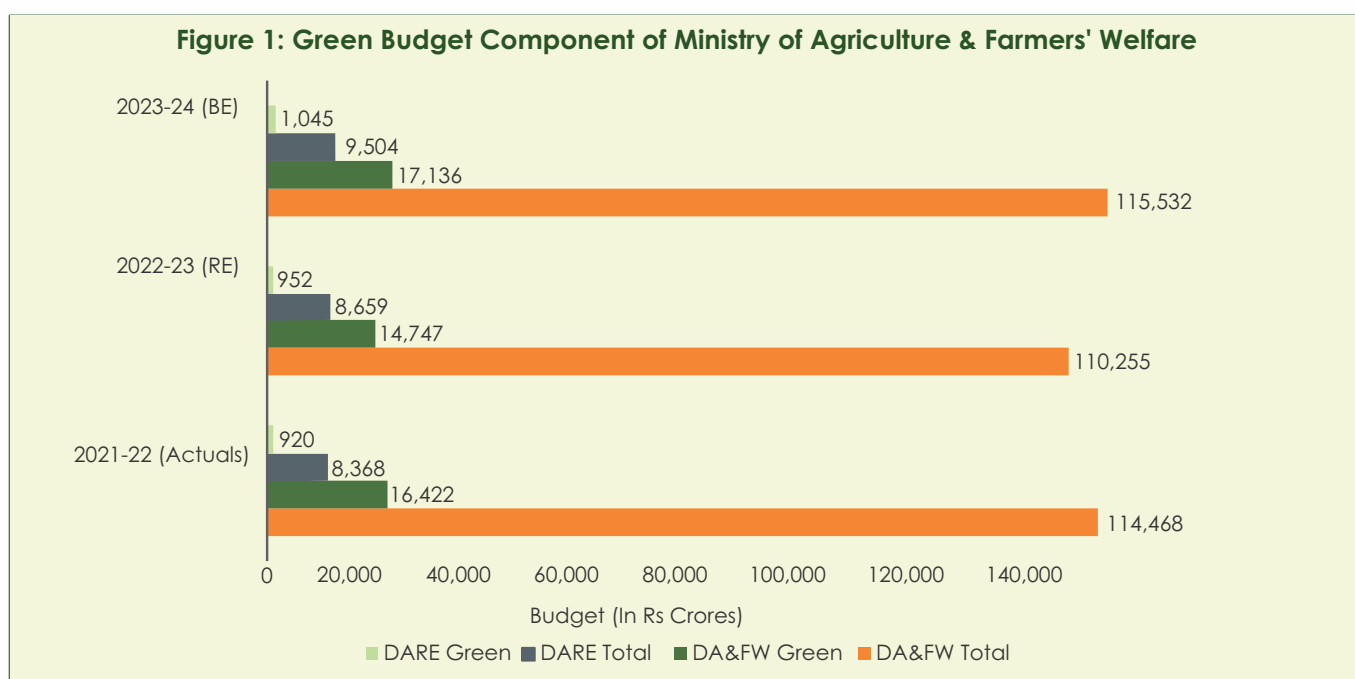
DA&FW is organized into 28 divisions and has five attached offices, 21 sub-ordinate offices, one public sector undertaking, seven autonomous bodies and two authorities. It was observed that the green budget component of DA&FW was in the range of 13-15 percent (Figure 1).



2. Department of Agricultural Research & Education (DARE)

DARE has one attached office (ASRB) and four autonomous bodies: Indian Council of Agricultural Research (ICAR), Central Agricultural University (CAU), Imphal, Dr Rajendra Prasad Central Agricultural University, Bihar and Rani Laxmi Bai Central Agricultural University, U.P. ICAR has 97 ICAR

Institutes, 63 Agricultural Universities, 6 Bureaus, 15 Research Centres, 13 Project Directorates, 11 Agricultural Technology Application Research Institutes, 57 All India Coordinated Research Projects and 25 Network projects. The average Green Budget Component of DARE was 11 percent (Figure 1).



Source: Authors calculations based on Union Budget 2023-24 and ICAR Budget Book 2021-22

Ministry of Fisheries, Animal Husbandry & Dairying

1. Department of Animal Husbandry & Dairying (DAHD)

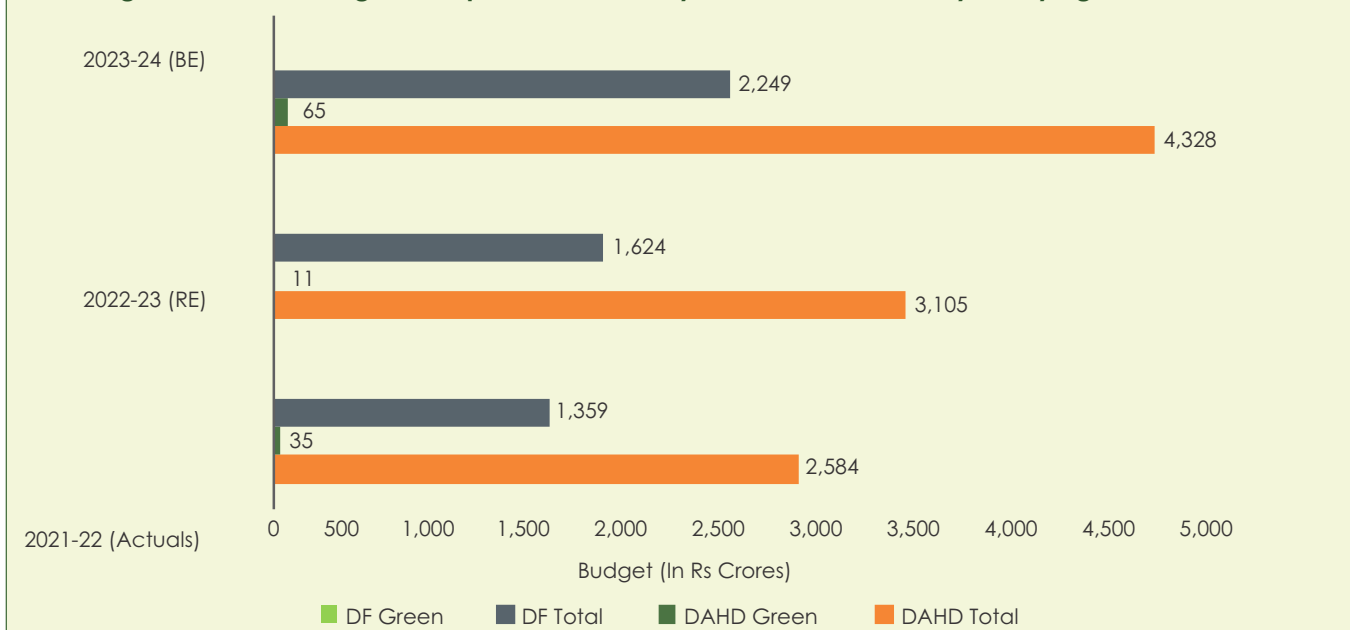
DAHD has 34 sub-ordinate offices and two statutory bodies. The green component of DAHD was less than 2 percent (Figure 2).

2. Department of Fisheries (DF)

DF has 4 sub-ordinate offices, two autonomous bodies and one co-operative ltd. There is no direct scheme in DF for the green budget component. There is one indirect scheme "Pradhan Mantri Matsya Sampada Yojana" that needs to be scrutinized for its green component (Figure 2).



Figure 2: Green Budget Component of Ministry of Animal Husbandry, Dairying and Fisheries



Source: Author's calculations based on Union Budget 2023-24

Ministry of Environment, Forests and Climate Change (MoEFCC)

MoEFCC has 18 regional offices, seven sub ordinate offices, five autonomous organizations, four

authorities/tribunal, three boards and one institute. The entire budget of MoEFCC is green budget (Figure 3).

Figure 3: Green Budget Component of Ministry of Environment, Forest and Climate Change



Source: Author's calculations based on Union Budget 2023-24

While the share of the potentially environmentally beneficial support of agriculture and allied sector is estimated to be about 15 percent of the total support (Supplementary Table), this will be revised when we will take the "attributable share" of direct as well as indirect schemes for "green objective". Union Budget 2023-24 has made few announcements for "green growth" in agriculture and allied sectors. The proposed scheme like Bhartiya Prakratik Kheti Bioresource Centre and

MISHTI initiatives are weighted more towards the "green" dimension rather than "growth". It is also noteworthy that Union Budget 2023-24 has allocated Rs 1.97 trillion for food subsidy and Rs 1.75 trillion for fertilizer subsidy. Minimum support prices and open-ended procurement policies in Punjab have encouraged the cultivation of water-intensive rice in regions not suitable for such crops leading to a situation where 78 percent of water assessment units are found to be over-exploited (CGWB 2021). It



has also dissuaded farmers from crop diversification and planting of other water-efficient crops. Fertilizer subsidies have lowered the relative price of urea with respect to other fertilizers, leading to skewed over-application of urea and hence disturbing nutrient balance and higher nitrous oxide emissions. Unless environmental sustainability concerns are integrated with agriculture producers' progress and economic growth objectives, sustainable agriculture that is people and planet positive will remain a distant objective.

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Supplementary Table: Green Budget Allocations for Agriculture and allied sectors

S.No.	Name of the Schemes	2021-22 (Actuals) In crores	2022-23 (Revised Estimate) In crores	2023-24 (Budget Estimate) In crores
1	Department of Agriculture & Farmers Welfare (DA&FW)			
1.1	Total Budget	114,468	110,255	115,532
1.2	Crop Insurance Scheme ¹	13,549	12,376	13,625
1.3	Distribution of Pulses to State/Union Territories for Welfare Schemes	50	166	800
1.4	Promotion of Agriculture Mechanization for In situ Crop Residue Management	691	No separate allocation ²	No separate allocation ³
1.5	National Mission on Natural Farming	-	-	459
1.6	Rashtriya Krishi Vikas Yojana (RKVY)-Green Revolution	6,747	7,000	7,150
1.6.1	Pradhan Mantri Krishi Sinchayi Yojana (PMKSY)-Per Drop More Crop	1,796	No separate allocation ¹	No separate allocation ²
1.6.2	National Project on Organic Farming	0.26		
1.6.3	Organic Value Chain Development for North East Region	133		
1.6.4	National Project on Soil Health and Fertility	8.76		
1.6.5	Rain-Fed Area Development and Climate Change	76.83		
1.6.6	Paramparagat Krishi Vikas Yojana	88.58		
1.6.7	National Project on Agro-Forestry	8.37		
1.6.8	National Bamboo Mission	20.58		
1.6.9	Green Budget for Krishi Vikas Yojana-Green Revolution	2,132	2,205 ¹	2,252 ²
1.7	Total Green Budget	16,422	14,747	17,136
1.9	Percent of Green Budget for DA&FW	14.3	13.4	14.8



2 Department of Agricultural Research & Education (DARE)				
2.1	Total Budget	8,368	8,659	9,504
2.2	Natural Resource Management (NRM) Institutes including agro-forestry and climate resilient agriculture initiatives	920	952	1,045
2.3	Green Budget for DARE	920	952	1,045
2.4	Percent of Green Budget for DARE	11 ⁴	11 ⁴	11 ⁴
3 Department of Animal Husbandry and Dairying (DAHD)				
3.1	Total Budget	2,584	3,105	4,328
3.2	National Livestock Mission	35	11	69
3.3	Green Budget for DAHD	35	11	69
3.4	Percent of Green Budget for DAHD	1.4	0.3	1.6
4 Department of Fisheries (DF)				
4.1	Total Budget	1,359	1,624	2,249
4.3	Green Budget for DF	0	0	0
4.4	Percent of Green Budget for DF	0	0	0
5 Ministry of Environment, Forest and Climate Change (MoEFCC)				
5.1	Total Budget	2,463	2,478	3,079
5.2	Green Budget for MoEF	2,463	2,478	3,079
5.3	Percent of Green Budget for MoEFCC	100	100	100
6	Total Budget for Agriculture and allied	129,242	126,121	134,692
6.1	Total Green Budget Component for agriculture and allied	19,840	18,188	21,329
6.2	Percent Total Green Budget Component	15.4	14.4	15.8

¹the scheme is not a part of climate resilience but an adaptation initiative to mitigate climate risk

²the scheme is clubbed under Rashtriya Krishi Vikas Yojana with total outlay of Rs 7,000 and for calculation of green budget for 2022-23, it was assumed that it has the same percentage (31.5 percent) of green budget share as that of 2021-22

³the scheme is clubbed under Rashtriya Krishi Vikas Yojana with total outlay of Rs 7,150 and for calculation of green budget for 2023-24, it was assumed that it has the same percentage (31.5 percent) of green budget share as that of 2021-22

⁴This was average of two years 2019-20 and 2020-21 (Source: ICAR Budget Book 2021-22) and it was assumed that it has the same percentage as that of 2019-20 and 2020-21.



APSI in the field



Field Visit with the team of Adani Group to Krishi Vigyan Kendra, Ujwa to see Solar as Third Crop



Ashok Gulati talking to Nari Shakti producing M5 tractor series of John Deere in India, which are being exported to Europe and even to US that houses the HQ of John Deere.





The year 2023 is declared by UN as International Year of Millets...Ashok Gulati studying pearl millet on farmer's field in Rajasthan for its water efficiency and better nutrition characteristics."



Ashok Gulati visiting demonstration plots of heat tolerant varieties of wheat (HI-1633) in Sehore, MP.



Visiting 100-acre farm of ITC for medicinal and aromatic plants under diversification policy of GoMP. ITC working with farmers on more than 5000 acres to promote medicinal and aromatic plants.



AG planting a tree in ITC's MAPE complex.



Bio nutrients is the first one in India to make soya milk powder. With Sumit Agarwal, Director, Bio nutrients...innovation in nutritious food product development.



Book Chapter:



- Gulati, Ashok, Raj Paroda, Sanjiv Puri, D. Narain and Anil Ghanwat (January 2, 2023): **“Food System in India. Challenges, Performance and Promise”** chapter in the book Science and Innovations for Food Systems Transformation published by Springer

Conferences / Seminars:

- Gulati, Ashok (January 10, 2023): Speaker at the State Level Conclave on Agriculture Infrastructure Fund organised by VAMNICOM, Pune
- Gulati, Ashok (January 13, 2023): Part of high-level committee meeting called by the Hon'ble Prime Minister, Shri Narendra Modi at Niti Aayog ahead of Union Budget
 - Singh, Reena (February 11, 2023): “Speaker in the Roundtable Session on **“Women in STEM: Policy, Practices and Inventions 2023”** organised by the Centre for Civil Society and P&G Shiksha



Op-eds:

- Gulati, Ashok (January 2, 2023): “A harvest of Plenty”, India Today
- Gulati, Ashok (January 9, 2023): “Prosperity through Philanthropy, The Indian Express also published in the Financial Express under the title “Towards shared prosperity”
- Gulati, Ashok (January 23, 2023): “Go easy on revdis, The Indian Express also published in the Financial Express under the title “For higher growth, end revdi culture”
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- Jose, Shyma and Kriti Khurana (February 2, 2023): “Budget 2023 tightens purse strings on nutrition, Deccan Herald
- Gulati, Ashok and Ritika Juneja (February 6, 2023): “Dole to Development”, The Indian Express also published in the financial express under the title Doles to Development”
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- Gulati, Ashok (March 6, 2023): “Revisiting a dream”, the Indian Express also published in the Financial Express under the title “Raising farm income”
- Gulati, Ashok (March 20, 2023): “Not with a rate hike”, The Indian Express also published in the Financial Express under the title “Calibrating inflation with growth”

Media Interview:

- Gulati, Ashok (January 11, 2023): “GM Mustard won't solve India's edible oil import problem” interview with Business Standard
- Gulati, Ashok (January 24, 2023): “बजट 2023 में खेती-किसानी के लिए अहम क्या होगा?”, interview with DD Kisan
- Gulati, Ashok (February 6, 2023): “Focus on Jal Shakti, better option than MNREGA” interview with NDTV
- Gulati, Ashok (March, 31, 2023): “Heavy Unseasonal Rainfall Unlikely to Create Serious Problem for Wheat Harvest”, interview with Karan Thapar, The Wire



APSI TEAM



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