

Expectation of DARE/ICAR

from Union Budget 2019-20

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A budget is a financial plan for allocating money to an organization that uses it to express strategic plans of activities in measurable terms along with the summary of intended expenditures along with proposals for how to meet them with a defined period of a year. The budget is needed to reallocation of resources according to the need of society for the government's profit maximization to push public welfare. It is through budgetary policies that the government tries to bridge the economic gap in the society besides managing the demand for public enterprises which directly connects with the public interest. Thus, the annual financial statement helps manage the effective and efficient use of economic resources.

Key words: Budget, DARE, ICAR

THE Department of Agricultural Research and Education/Indian Council of Agricultural Research (DARE/ICAR) holds manifold power in running National Agricultural Research System (NARS) – from national food security, enhancing the production stability and fostering social – economic reforms in the sector. All the R&D activities are mainly conducted through its research institutions. Direct collaboration with states in joint programmatic venture is mainly under: i) most of the schemes through All India Co-ordinated Research Projects (AICRPs), ii) Agricultural Education Schemes through Sub-scheme, ‘Strengthening and Development of Higher Agricultural Education in India’ and Agricultural Extension Sub-scheme through number of Krishi Vigyan Kendras (KVKs) operated by State Agricultural Universities (SAUs)/ State Line Departments.

The Indian National Agricultural Research and Education System (NARES) has to find solutions to the immediate problems of farming as well as keep it competence in

technology development in the forefront and to address the continuously emerging problems. To discharge these functions effectively and upgrade the NARS's economic and agri-research structure, the DARE/ICAR requires adequate resources so that the economy in general and agriculture in particular can flourish.

Why research is so important?

Technological changes in agriculture and allied activities, supported by investments in irrigation, infrastructure and institutions have propelled India into food self-sufficiency (near-tripling of the food grain production) and a more than four-fold increase in the production of fruits and vegetables. There was also an unprecedented increase (6-10 times) in the production of animal food products.

Globally, agricultural science, natural environment and the society are undergoing rapid transformations. ICAR is committed to reinvent, redesign and transform to address the complex changes and harness the domestic and global opportunities to become a leading

agricultural research organization, which is responsive and sensitive to the needs of stakeholders. This is possible to harness the power of science and innovation for food security, food safety, farmer prosperity and enhance natural resources base to promote inclusive growth and sustainable development. The guiding principles that will provide direction to ICAR for determining its future research investment priorities and strategic framework are:

- Provide leadership in ensuring national food and nutritional security, farmers' prosperity, consumer health and enhancing the natural resource base of agriculture for future generations.
- Ensure strategic competitive advantage of Indian agriculture to enable access to the existing and emerging markets, and address the emerging challenges.
- Leverage the advances in other sciences, engineering and social science to enhance agricultural research.
- Nurture scientific excellence and promote interdisciplinary, systems-based, knowledge-intensive,



problem-solving research.

- promote economic opportunities for the rural community and society.
- Promote complementary partnerships for value addition in agriculture and accelerate innovation.
- Respond proactively to farmers, consumers, partners and policy makers.
- Promote ethical conduct, scientific integrity and accountability of performance and decisions; and
- Promote organizational transformation to an efficient, effective, and responsive innovation system.

During the XII and earlier plans, DARE/ICAR were allocated very less funds as compared to recommendations of Working Group constituted by Planning Commission. During the XII plan, Working Group recommended for ₹ 55,000 crore and Planning Commission reduced it to ₹ 25,553 crore. Due to severe financial crunch, the department was communicated a total BE of ₹ 17,741 crore i.e (69.42% of the XII plan allocated outlay) and actual allocation was ₹ 13,786.58 crore which was 53.98% of the XII Plan allocated outlay. The overall annual compound growth rate of allocation of budget to DARE/ICAR is 11.42% during 2007-08 to 2018-19. Therefore, sufficient funds should be allocated to the Department for proper implementation of the research and education activities effectively and cater to the needs of enormous challenges in agricultural sector. The budget estimates for last ten years are

depicted in Fig 1.

Investment in agricultural research

The government has consistently provided funds for agricultural research. The total government expenditure on agricultural research and education (R&E) has increased from ₹ 11.9 billion in 1975-76 to ₹ 113.8 billion in 2014-15 (at 2011-12 prices). Note that about 20% of the total expenditure on R&E, research accounts for about 80%. As such the research intensity, measured as expenditure on research as proportion of agricultural GDP, is 0.4%. Although this ratio has improved over time, it remains much below than that in China (0.54%), Brazil (1.52%) and the average for developed countries (>2%). However, the agricultural Research and Development (R&D) intensity is generally recommended as 1.0% for developing countries. Thus, there is a clear case of under investment in agricultural R&E in India. The scientific progress in agriculture have helped in development of new technologies having added potential and proved options to derive the same or even higher benefits at lower cost per unit of output. The historical rate of returns to the public investment has been in excess of 50%. Technology is capable of offering better durable solutions for managing the problems of agriculture. However, with the size of agricultural research system and actual expenditure along with emerging complex challenges and opportunities, reasonable increase in public spending will be in offing.

The future R&D activities of ICAR

The ICAR is in the process of charting an innovative research agenda to fulfill its mission within the broad emerging science and technological trajectory, which is in harmony with nature and aspirations of society. Advances in science and technology help solve problems that have been in the realms of imagination. The Council has a vast mandate dealing with agriculture and food spanning across crops, natural resources, livestock and fisheries, and with all links in the value chain from primary production to processing-packaging-storage, etc. The technologies - new, currently in-use, in pipeline and awaiting harnessing-fall in three categories: generic or platform technologies (bio, nano, info, and geospatial technologies), sector-specific technologies, and trans-boundary research. There is a growing need to move towards trans-disciplinary research, which has more to do with transgressing boundaries among disciplines and actors leading to a 'fusion' among disciplines and partnerships. The future research needs to support a profitable, more productive and sustainable' agriculture; laying emphasis on food and farm technologies that mitigate climate change impact and adapt to a low-carbon, low-water regimes, and highly modified biological responses to climate changes.

The research vision in key areas of technology development are:

- Genetic enhancement of plants/ animals/fish for higher productivity under increased intensity of biotic and abiotic stresses.
- Productivity enhancement through sustainable intensification.
- Productivity enhancement through mechanization of agriculture and food system.
- Enhancing value, safety and income through food processing.
- Energy development and management.
- Computational initiatives in agricultural research using artificial intelligences, vast data analytics and connectivity of large data set across sectors. As the demand for national agricultural portal on bioinformatics grid (NABG)

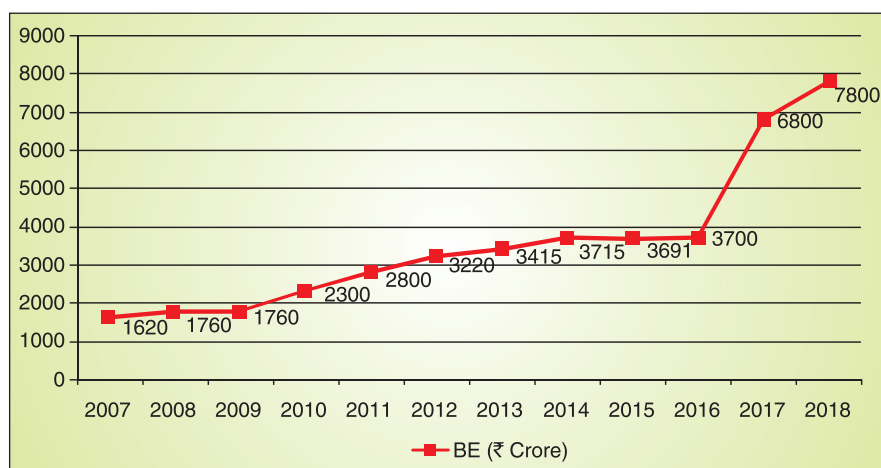


Fig. 1. DARE/ICAR budget allocation (BE) for the last ten years



grows, creation of higher supercomputing framework will have to be undertaken.

- Innovations in policies and institutions herein research needs to reframe the conceptual maps regarding agriculture, environment, competitiveness, markets and state interventions. Further, agricultural research policy needs to address the mechanisms of generation of new sources of knowledge. Technology forecasting is of utmost importance. Foresight on research priorities, potential impacts of emerging technologies and consumer preferences in technology generation process, intellectual property regimes and seed systems, etc. needs to be generated. Innovative institutional models, pro-agricultural policies and regulatory mechanisms would have to be evolved for accelerating innovations.
- Education and human-resource development to meet the future demand of the sector, and
- Innovations in technology transfer system need to be geared up to respond to new and rapidly changing economic, ecological and technological environment. The ICAR has been engaged in development of efficient and effective technology transfer systems for shortening the time lag between technology generation and adoption. There have been continuing efforts to evolve innovative pathways for disseminating breakthroughs in technology to farmers and the industry. The capacity building of community-based organizations and farmers' groups for acquiring knowledge and its transfer is being put in place for a faster dissemination among masses.

To fulfill the mandate of the Council for next 5 years, commensurate budgetary support is required. It is acknowledged that there are unmet

needs for R&D, innovation and commensurate absorptive capacity within agricultural R&D institutions indicating a good case for a justifiable increase in central allocation to Scientific Department like DARE. The Council has envisioned for modernization of infrastructure due to happening of 4th Industrial revolution in technology. This is going to imbibe knowledge and technological spillover from other sectors and enhance the scope of networks research for frontier science besides setting up new institutions in the country. Keeping the past pace of annual growth in budget allocation after adjusting inflation, proposed around ₹ 8,931 crore has been in the coming budget of 2019-20. Table 1 presents budgetary proposal for next five years.

Table 1. DARE/ICAR Budgetary Proposal for financial period 2020-2021 to 2024-25

Year	Budgetary Estimate* (₹ crore)
2020-21	11,361
2021-22	13,060
2022-23	15,014
2023-24	17,260
2024-25	19,843
Grand Total	76,538

*Estimates are arrived using inflation rate of 4.5% and annual increment of 10%.

In addition, the following grants will be necessary

One time catch-up grant for modernization of infrastructure	₹ 1,000 crore
Capital grant for new IARI Institutions and full establishment of CAUS	₹ 2,000 crore
Extra-mural grant for frontier science	₹ 1,000 crore
Agricultural policy research networks	₹ 20 crore
Total	₹ 4,020 crore
Grand Total	₹ 80,558 crore

To achieve and sustain the targeted 4% agricultural growth in the economy and doubling of farmer income, the policy shift is going to influence the patterns and the sources of agricultural growth in India. As per futuristic direction of agricultural research literature, generation of technology in changing society would be the most important source of agricultural growth. Nevertheless,

agricultural diversification toward high-value crops would be the next most important source of agricultural growth. Moreover, agricultural diversification toward high-value crops has been pro-poor bias and thus can serve as an important pathway for smallholders to move out of poverty. The contributions of area expansion and commodity prices to agricultural growth is going to be erratic and small, suggesting that would not be sustainable sources of agricultural growth. The future growth in agriculture has to come from acceleration in the rate of technological change and sustainable intensification of the production systems. The growth in Total Factor Productivity (TFP) is affected by technological change, technical improvement and scale efficiency. The decomposition revealed that 55% change in TFP is attributable to technological change (shift from traditional to new technology), 43% is due to technical improvement (improved resource use efficiency) and 3% is due to scale of farming. In addition, research and technology led growth has helped decline in real cost of production (at 2005-06 prices) in the range of 1.0-2.3% per annum in case of cereals, gram, cotton and rapeseed and mustard as per study at NIAP. The literature suggests that the returns to investment in agricultural research (2.47%) rank next only to investment in private investment in irrigation (9.72%). Thus, the estimated actual economic benefits from research far exceed the investment and therefore justify higher investments by the Government. To realize the benefits of agricultural R&D and its transparent percolation of benefits to farming community, it would be possible through creation of culture of enabling policies and institutions for efficient production of crops, realization of reasonable good price of agricultural commodities for enhancing income of the farmers.

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