

Recommendations on

NRF

National
Research
Foundation

Submitted to



सत्यमेव जयते

Ministry of Education
Government of India

Submitted by



Vidya Bharati
Ucca Shiksha Sansthan
(VBUSS)



Indian Institute of
Technology (IIT)
Guwahati



Vellore Institute of
Technology (VIT)
Vellore

The recommendations are based on the outcome of a Virtual Consultation on the proposed National Research Foundation, held on June 12, 2021.

The Virtual consultation was organized jointly by:
Vidya Bharati Uccha Shiksha Sansthan (VBUSS),
Indian Institute of Technology (IIT), Guwahati and
Vellore Institute of Technology (VIT), Vellore

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This report is an outcome of the consultation on the proposed National Research Foundation organized jointly by VBUSS, IIT Guwahati and VIT Vellore. At the outset Vidya Bharati Uccha Shiksha Sansthan expresses its heartfelt thanks to IIT Guwahati and VIT Vellore for having accepted to jointly organize this consultation workshop. The team representing VBUSS, IIT Guwahati and VIT Vellore has done a commendable job in organizing this event in a very matured fashion. The team deserves a great appreciation.

We thank the esteemed dignitaries Prof. V.K Malhotra, Member Secretary, ICSSR, Dr. Sateesh Reddy, Secretary, Department of Defence R & D, GoI and Chairman DRDO and Shri Rakesh Ranjan IAS, Additional Secretary, MoE, GoI for delivering key note address. Thank you for providing an insight of the NRF and for guiding us to take the discussion in the right direction.

We remain thankful for all the senior academicians, researchers and academic administrator for joining us in the consultation.



We thank all the speakers who have shared their valuable comments and suggestions. Your suggestions will be of immense help in putting forth a recommendation on the NRF which will be submitted to the concerned ministry. We also thank all the participants who have joined the consultation. Considering the paucity of time many of us couldn't share our views. But we have certainly received your ideas through mail.

We also thank the moderators of the sessions and team behind organizing the discussion. Special mention and thanks to the editorial team of this report who have done a wonderful job in compiling all the ideas, suggestions and reflection and bringing the report as a great piece.

Warm regards

Vidya Bharati
Uchcha Shiksha Sansthan

Message

from the National President of VBUSS

This webinar is being organized jointly by Vidya Bharati Uccha Shiksha Sansthan, and two reputed institutes of the country that are IIT Guwahati and VIT, Vellore. The subject of NRF is recommended by National Education Policy 2020 which has the power to boost to the Atmanirbhar Bharat Abhiyan. Research is a vehicle, which has the potential to bring changes and impact on human life with the power of control for the sustainability of the planet.

Vidya Bharati Uccha Shiksha Sansthan (VBUSS) has also aim to bring the quality changes in higher education of India. VBUSS has been working since last six to seven decades in our country, and has contributed significantly to school education by empowering lives of millions of children, who are deprived of Quality School Education. Having this background of Vidya Bharati, VBUSS is working to enhance the quality of higher education, particularly the quality of our educational institutions which can provide the updated, traditional and non-conventional knowledge to our youth. Aiming to inculcating all the capacities in youth, and who by leading a purposeful and quality life can bring all require developmental this.



Since July 2020, after the announcement of NEP 2020, Vidya Bharati Uchcha Shiksha Sansthan is organizing various types of events regarding awareness of its recommendations, and the effective implementation of all these recommendations. In toto. The Government of India and the national educational agencies have constituted various task forces, various working groups at different levels and we propose to supplement these efforts by government of India, by involving so many distinguished academicians. The report is being prepared, which can serve the purpose at a faster pace, National seminar on teacher education was organized in March, 2021, and prior to that, around three dozen regional webinars and group discussions were also organized. National webinars each on Higher Education Commission of India, NETF. And the recommendations will be sent to the relevant corners.

Similarly, the consultation on NRF has been planned to deliberate on the envisioned objectives, administration and its function. There are so many issues relating to research in India, the issues regarding quality, brain drain, funding of research, accountability of research, innovation, creative ability of students, awarding of fellowships and finances to researchers at different levels, priorities of the areas of research and relevance, etc. To deal with all these problems and issues related to research in India, NEP 2020 has proposed to constitute a National Research Foundation. I'm happy that many senior and acclaimed academicians and researchers of our country have joined in this consultation. I believe these recommendations will surely help the government in giving a serious thought on the functioning of NRF. My heartfelt thanks and congratulations to the team for organizing this consultation and for the recommendations.

Prof. Kailash Sharma

National President

Vudya Bharati Uchcha Shiksha Sansthan

ABOUT THE ORGANIZERS



Vidya Bharati Uchcha Shiksha Sansthan (VBUSS) is a voluntary organization working in the field of education with a primary focus on policy implementation and structural reforms in India's Higher Education landscape. The core concept and ideal of VBUSS are to address the emerging needs of quality education and to reflect on the framework of Bharatiya knowledge, concepts, practise, philosophy and approach. The organisation has emerged as a transforming voice and movement led by learned, eminent educationists, scholars and concerned citizens of modern-day India. VBUSS firmly believes that a conducive education ecosystem could be developed through contact, dialogue, discourse and coordination among the institutions of higher education. VBUSS has been actively engaged in constructive engagement, developing thought process, policy intervention



and recommendations. Engaging stakeholders in synthesising the National Education Policy (NEP) 2020 is one of the activities that VBUSS strongly commits and advocates. In the recent years since its inception, the organisation has been relentlessly engaged in numerous activities to promote, create awareness, decoding NEP 2020. Having done a series of thought process and submitting policy recommendations VBUSS is also playing a crucial participatory role in policy implementation and practice.



Indian Institute of Technology, Guwahati

Indian Institute of Technology Guwahati, the sixth member of the IIT fraternity, was established in 1994. The academic programme of IIT Guwahati commenced in 1995. At present the Institute has eleven departments and five inter-disciplinary academic centres covering all the major engineering, science and humanities disciplines, offering BTech, BDes, MA, MDes, MTech, MSc and PhD programmes. Within a short period of time, IIT Guwahati has been able to build up world class infrastructure for carrying out advanced research and has been equipped with state-of-the-art scientific and engineering instruments. Indian Institute of Technology Guwahati's campus is on a sprawling 285 hectares plot of land on the north bank of the river Brahmaputra around 20 kms. from the heart of the city. With the majestic Brahmaputra on one side, and with hills and vast open spaces on the others, the campus provides an ideal setting for learning.



Vellore Institute of Technology, Vellore

VIT was established with the aim of providing quality higher education at par with international standards. It persistently seeks and adopts innovative methods to improve the quality of higher education on a consistent basis. The campus has a cosmopolitan atmosphere with students from all corners of the globe. Experienced and learned teachers are strongly encouraged to nurture the students. The global standards set at VIT in the field of teaching and research spur us on in our relentless pursuit of excellence. The highly motivated youngsters on the campus are a constant source of pride. The Memoranda of Understanding with various international universities are the major strength of VIT. They provide for an exchange of students and faculty and encourage joint research projects for the mutual benefit of these universities.

It was established under Section 3 of the University Grants Commission (UGC) Act, 1956, and was founded in 1984 as a self-financing institution called the Vellore Engineering College. The Union Ministry of Human Resources Development conferred University status on Vellore Engineering College in 2001. The University is headed by its founder and Chancellor, Dr. G. Viswanathan, a former Parliamentarian and Minister in the Tamil Nadu Government.



About MyNEP initiative



Inspired by Honourable Prime Minister's call to People to take 'collective responsibility' of implementing the National Education Policy in 'letter and spirit', VBUSS has been extensively engaged in creating awareness, facilitating implementation, policy intervention, consultation exercises on NEP 2020.

MyNEP Competition

VBUSS had organized an online competition in September and October month of the year 2020 to create awareness on the significance of NEP 2020 amongst the student and citizen group. The competition drew huge recognition and inspiration from different corners of India. Policymakers, academicians, celebrated personalities have extended their support and association in this campaign. A large number of students and citizen group of 17,34,694 participants had registered online for the competition. The competition was conducted in eight major Indian languages so to encourage participants from all corners of India.

MyNEP portal

Further to the stakeholder's awareness and citizen engagement programs, a dedicated news portal "MyNEP" has been launched. This Portal aims in offering one-stop information on all the events, updates, communications related to the NEP2020 implementation in India. Through this portal, it is envisioned to capture the minds and thought process of stakeholders towards NEP 2020. Educative and informative sessions are being arranged through interviews and webinars on the various dimensions of NEP2020 implementation. The portal also highlights the important decisions and initiatives taken by the governing bodies like MoE, UGC and AICTE. It also portrays the best practices, policy implementation approach and initiatives taken by the institutions and the voluntary organizations in making NEP2020 successful.

MyNEP webinar series

VBUSS has organized a series of informative and tutorial sessions design to address the technical and logistic challenges in implementing NEP 2020 at institutions. 36 such webinars were organized which were addressed by experts in both the school and higher education segment. The subject of the webinars was aligned to the key areas as highlighted by the Ministry of Education, GoI. VBUSS deemed it fit to raise the concerns of possible challenges in implementing the policy. At the same time, it is pertinent to raise to the concerned agencies the present situation of the institution and gaps in implementing the policy in its letter and spirit.

MyNEP Interviews

To understand the complexities and dynamics of structural reforms a well-thought exercise of addressing the critical challenges of policy implementation was initiated by VBUSS through interviews with subject/domain experts. During the interview, the experts were requested to address the questions related to policy implementation and provide a feasible road map of the implementation process. These interviews have helped the implementing institutions in a big way by acting as a ready reckoner and suggestions to some of the pain areas.



‘शिक्षा पथ प्रदीपिका’

VBUSS has published a book titled “शिक्षा पथ प्रदीपिका”. This book is a compilation of webinars abstracts, interviews transcripts, expert’s opinion, articles on some of the important aspects of NEP2020 implementation, policy research analysis on the gaps of the present status and envisioned policy intervention. This book is an ambitious product of VBUSS that has been brought out with deep concern to address the possible challenges that may arise during implementation. The webinars and interviews addressed by the subject experts have been reflected in this book in the form of transcripts. Many senior and esteemed domain experts of the nation have echoed their views about NEP 2020 in this book through articles and comments.

Regional Seminar on NEP 2020 and Transforming Teacher Education

VBUSS strongly believes that it is pertinent to address the issues of Teacher Education and also engage teachers and institution in this thought process of policy implementation across the country. With this view, a series of regional seminars on NEP 2020 and transforming teacher education were organized across the country in collaboration with the host institutions, colleges and universities. 24 such seminars were organized across the country on a similar theme.

National Seminar on Rejuvenation of the Teacher Education in 21st Century

As a culmination of thought process and synthesizing of diverse ideas a national seminar on “Rejuvenation of Teacher Education” was organized on 5th & 6th of May 2020 at Bhopal. The idea of this seminar is to bring to fore various ideas and concern that were deliberated in the regional seminars. The seminar witnessed the participation of more than 200 faculty members from nearly 50 college/university across India.

VBUSS Initiatives on Virtual Consultations

VBUSS is also playing a crucial and participatory role in contributing ideas and shouldering into building a foundation in establishing some of the administrative bodies that are advocated under NEP 2020. VBUSS has formed a working group that will conduct wide consultation and discussion on the structural reforms on the proposed institutions under NEP 2020. It has been planned to organize discussion/consultation on the important areas as mentioned below:

1. Higher Education Council Commission of India (HECI)
2. National Educational Technology Forum (NETF)
3. National Research Foundation (NRF)
4. Socio Economic Disadvantage Groups (SEMG)
5. National Higher Education Regulatory Council
6. National Accreditation Council
7. Higher Education Grants Council
8. General Education Council
9. Academic Credit Bank
10. Promotion of Indian Knowledge System
11. Education in Mother Tongue

The discussion/consultation will be organized in collaboration with a reputed university and institute of national importance. The outcome of these deliberations will be submitted to the concerned ministry and agencies in the form of a memorandum for necessary action and consideration.



List of Speakers/Dignitaries who have attended the discussion

Sl No.	Name	Designation	Institution/ Department
1	Shri Rakesh Ranjan, IAS	Additional Secretary	Ministry of Education, GoI
2	Prof. VK Malhotra	Member Secretary	ICSSR
3	Dr. Sateesh Reddy	Secretary	Department of Defence R & D, GoI
4	Dr. MP Darokar	Principal Scientist	CSIR
5	Prof. Gautam Radhakrishna Desiraju	Professor	Indian Institute of Science, Bengaluru
6	Dr. Somanath S	Director	VSSC ISRO, Trivandrum
7	Prof Ashutosh Sharma	Secretary	DST, GoI
8	Prof. T.G Sitharam	Director	IIT Guwahati
9	Prof. V.K Tiwari	Director	IIT Kharagpur
10	Prof. Abhay Krandikar	Director	IIT kanpur
11	Prof. Nagesh Thakur	Member Secretary	UGC
12	Dr. Pradip Kumar Jain	Professor, ECE	IIT BHU
13	Prof. Uday Kumar Yaragatti	Director	MNIT, Jaipur
14	Prof. K.R.S. Sambasiva Rao	Vice Chancellor	Mizoram University
15	Prof. Vaidhyasubramaniam S	Vice Chancellor	Sastra University
16	Prof. Raman Trivedi	Professor	Bihar Animal Sciences University
17	Prof B Metri	Director	IIM Nagpur
18	Prof Mahadev Jaiswa	Director	IIM Sambhalpur
19	Prof Poonam Kumar	Faculty	IIM Sambhalpur
20	Prof Kapil Pandla	Dean	IMI Bhubaneswar
21	Prof Pawan Singh	Director	IIM Tirichy
22	Prof. Nomes Bhojkumar Bolia	Faculty	IIT Delhi
23	Prof. Gomathi Devi	Vice Chancellor	Maharani Cluster University Bangalore
24	Prof. Ruchir Gupta	Faculty	JNU

Sl No.	Name	Designation	Institution/ Department
25	Shri. Alok Pandey	National Incharge	SHODH
26	Dr. Gita Menon	Assistant Professor	IIT Indore
27	Shri Prakash Chandra	National Orgising Secretary	VBUSS
28	Shri KN Raghunandan	National Joint Organising Secretary	VBUSS
29	Prof. Kailash Sharma	National President	VBUSS
30	Prof. Narendra Taneja	National Secretary	VBUSS
31	Prof. Manjushree Sardeshpande	Vice President	VBUSS
32	Prof. Prashant Gupta	Professor & HOD	IIM Tirichy
33	Dr. Sanjeev K Ningombam	Centre Coordinator, Dr. APJ Abdul Kalam Centre for Policy Research and Analysis	IIM Shillong
34	Gaurav Sundaram	Research Scholar	IIT Patna
35	Dr Geetha Manivasagm	Professor	VIT, Vellore
36	Dr. N. Chandrasekaran	Professor	VIT, Vellore
37	Prof. Vasudevan R	Professor	VIT, Vellore
38	Dr. Vijayraghavan R	Professor	VIT, Vellore
39	Dr. Vimal Katiyar	Professor	IIT Guwahati
40	Dr. G Krishnamoorthy	Professor	IIT Guwahati
41	Prof. Biman B Mandal	Professor	IIT Guwahati
42	Dr. Uday Shanker Dixit	Professor	IIT Guwahati
43	Prof. Ratnajit Bhattacharjee	Professor	IIT Guwahati
44	Prof. Biplob Bhattacharjee	Faculty	IIM Shillong



National Research Foundation (NRF)

After wider and rigorous process of consultations, deliberations and comprising almost all the stakeholders horizontally as well as vertically from bottom to up involving over two lakh suggestions from 2.5 lakh [gram panchayats](#), 6,600 blocks, 6,000 [Urban Local Bodies](#) (ULBs), and 676 [districts](#) we have a New Education Policy (NEP) 2020 approved by Union Cabinet. This Indo-centric, forward looking, flexible, multidisciplinary and holistic policy is aligned to the needs of 21st century and 2030 UN sustainable development goals (SDGs). NEP envisions an education system that *“contributes directly to transforming our nation sustainably into an equitable and vibrant knowledge society by providing high-quality education to all.”* Under NEP to boost research culture in country to become global leader in New India NRF has been proposed.

As we know in this policy that National Research Foundation (NRF) will be formed as an apex body for fostering a strong research culture and building research capacity across all levels of education. NRF shall serve as a high-level think



tank for the coordination and short- and long-term planning of research in the country in the coming years. The NRF will be given an annual grant that will eventually aim to reach at least 0.1% of GDP (in current terms, approximately Rs. 2 kharab or 20,000 crores) and will be conferred with the autonomy to set its own finances, governance, and statutes. National Research Foundation (NRF) has been conceptualized and proposed to be set up, at the earliest, with the overarching goal of enabling a culture of research and innovation across disciplines to permeate through India's universities, colleges, research institutions, and R&D laboratories. It is proposed that NRF will be established initially as a Society under the Societies (Registration) Act, 1860, and will be governed by its Memorandum and Articles of Association (MoA), regulations and bye-laws framed thereunder. The Society will be registered in Delhi and will have a pan-India jurisdiction. Within three years – once the details of the methodology of the functioning of the NRF have stabilised – the NRF will, by an Act of Parliament, become an autonomous body of the Government of India. The NRF will have complete autonomy (with accountability and internal checks and balances) in its functioning, with a robust system of governance in accordance with the very best international practices. The idea to set up a National Research Foundation (NRF) in India, as a body to catalyse, facilitate, coordinate, seed, grow, and mentor research in institutions around the country, has been in the minds of researchers in the nation for many decades. A multidisciplinary approach to address the key societal problems like clean drinking water and sanitation, quality education and healthcare, social equity, improved transportation, sustainable infrastructure, elimination of poverty, air quality, clean energy with the flexibility of conducting research through all our languages, and not only in English would be set up. There are several objectives that this body will fulfil to cater the needs of society as well as take up mega projects with enormous funding to become leader in emerging and disruptive technologies of Industry 4.0. It aims to fund competitive peer-reviewed grant proposals of all types, submitted in any of our official languages to individuals or groups of individuals, across all disciplines (including for interdisciplinary research) and across



all types of institutions, in order to significantly strengthen India's research and innovation potential. It also envisions to facilitate research at academic institutions, particularly at universities and colleges where research capacity is currently in a nascent stage, through mentoring of such institutions by eminent research scholars, by hiring excellent young research students, postdocs, and faculty, and by funding, strengthening, and growing already-existing high-quality programmes at such institutions. Funding the overall research infrastructure (e.g., computing facilities) at individual institutions as well as infrastructure such as laboratories and other research equipment that can be shared across multiple institutions has also been included in the proposal. To increase India's role and participation in key areas of national and global importance, and in major national and international collaborations, through large-scale mission projects and megaprojects are major objectives that will propel the country forward and inspire the Gen Next to join this highly ambitious mission. It shall also act as a liason and coordinator amongst researchers, relevant Central and State government bodies, and industry, so that researchers are constantly connected with each other and with potential collaborations (including with government and industry), and so that policymakers are constantly made aware of the latest research breakthroughs in the country – thus enabling breakthroughs to be brought into policy or implementation in an optimal fashion. It shall support the development of the next generation of researchers and the long-term development of global-quality R&I through innovative initiatives in education, including enhancing the cognitive and R&I skills of students and new researchers through various online and offline courses, workshops, conferences, and summer programmes on topics of current research interest. The focus is to also support various activities and initiatives for increasing the participation of women and other underrepresented groups in research which becomes important in context of country like India. The foundation will recognise outstanding research and progress achieved via NRF funding/mentoring across subjects and categories, through various prizes and special seminars recognising the work of the researchers that will further motivate the researchers to accelerate the engine of growth.

PROLOGUE on virtual consultation on NRF

Eminent dignitaries of global recognition joined the discussion on NRF as stakeholders to give suggestions and in-depth deliberations were made based on their vast knowledge and decades of experience in building and promoting research environment in our country and a national dialogue on the proposed National Research Foundation was organized jointly by Vidya Bharati Uchcha Shiksha Sansthan (VBUSS), ICSSR, IIT Guwahati and VIT, Vellore. In the first session of discussion member secretary of ICSSR, Prof. V K Malhotra opined the research and innovation have to be at the focus of education, especially higher education in the country. Lot many countries are spending a much greater proportion of their GDP as compared to India, he quoted the NEP and cited a lot of examples of other countries like USA, China, Germany, Sweden, Britain etc. to compare spending on research as compared to India and highlighted that a lot more is needed to be done in India. Chairman of DRDO Dr. G. Satheesh Reddy emphasized on the strengthening of academia, industry, R&D organizations and industries collaborations. These collaboration need to be strengthened in a big way in emerging areas of technology in a big way in the coming years. He informed that the government has thought about and trying to put in 50,000 crore rupees in five years for the promoting the research in the country at all levels. He also deliberated on futuristic research areas, which need to have the basic research and applied research around, an academic institute, or a university. Dr Mahendra P Darokar, Central Institute of Medicinal and Aromatic Plants was of the view that the role of NRF should be primarily to strengthen, to coordinate and to fund the research, as well as to lay down a broad policy framework for carrying out research in multifarious domains in the country. Though



there are other funding organizations like DBT and these organizations are doing excellent work, but they are specific in their domains and they are not addressing the overall concerns of the country, and therefore, there is a need for India's research and innovations hub with comprehensive professional research and education framework. Shri G V Selvam, Vice-President of Vellore Institute of Technology, Vellore stated that if India needs to be developed into a knowledge economy, then R&D efforts need to be enhanced tremendously. Research has to be percolate down to colleges, even in schools to set the research culture from the grass root level, may be by introducing the project-based learning. Padma Shri Shree Virander Singh Chauhan, Eminent Scientist and a Rhodes Scholar in the fields of genetic engineering and biotechnology threw light on the genesis of NRF itself. He concluded with the remarks that very small institutions, if not collaborating with each other, will not go forward. NRF has to focus on funding of universities and colleges of state universities, he said "do not expect much out of that in next five years, select those universities, very carefully and make them competitive. He embarked upon the structure that will look after the competitiveness of these universities to decide, who should get funding and social sciences should not be neglected". Shri Somanath, Director of Vikram Sarabhai Space Centre (VSSC) talked about the interaction of ISRO with leading technology institutions and research interphase and support provided by ISRO. For research which is not really a basic research but they're more product, process or even hardware oriented. Shri KRS Sambasiva Rao, Vice Chancellor of Mizoram University, told that we need to get people to do changes and how to make themselves aware of working hard with the innovativeness. He also said that everyone has to feel that they should work for the development of the country and unless this happens, there will not be any change, no matter how many schemes are introduced. Prof. Sambasiva also emphasized on providing good infrastructure to all the state universities that are not even having minimum facilities, as most of these universities and state institutes are not having proper infrastructure and proper research facilities. Prof. A D N Bajpai,

Vice Chancellor, Bilaspur University (Former Vice Chancellor, Himachal University) suggested that researches should be done on our rich heritage, culture, value system, and traditions and emphasis should be given on focussing research on the concepts, definitions and content. Shri. Rakesh Ranjan, Additional Secretary, Ministry of Education, Government of India has deliberated on the overall scenario of research and how NRF shall cater the demands and needs of our country in promoting research culture as well as capacity building measures. Dr Mahadeo Jaiswal, Founding Director of Indian Institute of Management (IIM), Sambalpur stated that the structured system like NRF is already implemented in many countries for providing funds in Science and Engineering and to cope up with current worldwide scenario and attract young talents to create a core scientific community in our country, the execution of NRF is critical. Prof. Nagesh Thakur, Himachal Pradesh University, Shimla and member of UGC embarks that to promote young minds, inclusion of NRF in National Education Policy is crucial and much awaited step to be taken. Dr. Vaidyasubramaniam, Vice Chancellor, Sastra University and member UGC expert team on research innovation and ranking emphasized the selection mechanism must be transparent, fair, robust, and comprehensive in the sense that it addresses research from a multi-dimensional perspective while fulfilling the agenda of translational research to be applicable in day-to-day life. In order to align with global practices, structural arrangement of any policy mentioned in documents should be put into effective manner to move in the right direction. Prof. V K Tiwari, Director, IIT Kharagpur emphasized that quality research can create high impact on country's development and can be translated to the grounds. NRF is indispensable to be executed in reality over a period and he especially mentioned that every institute should work on promoting research culture and also motivating under graduate students towards Research & Development. Shri Kapil Pandla from International Management Institute, Bhubaneswar stated that National Research Foundation is a much-awaited initiative of Government of India to boost research culture in the country as this sector has faced tremendous problems



in the past in terms of research facilities and capital support and with the establishment of NRF research culture can be boosted throughout the country which will provide sufficient capital to carry out the research and will put us ahead of many developed nations soon. Prof. Uday K R Director MNIT, Jaipur highlighted that the motive of National Research Foundation is not just to provide funds, but it also should create an ecosystem having PMO cabinet ministers, local and foreign members, corporate people, people from science and technology, environmental specialists, social science experts and many more. Moreover, government labs such as DRDO, ISRO, ICMR etc. should be incorporated in the NRF's ecosystem so that the interdisciplinary approach can be developed. Prof. Gomathi Devi, Vice Chancellor, Maharani Cluster University, Bangalore mentioned that to promote and develop research, every institute should be given equal opportunities to receive scholarships and post-doctoral fellowships. She cited the example that in Karnataka, there are 4407 higher education colleges in which only 1009 colleges promote research and innovation. This represent a big lag and hence motivation is required to inculcate research culture. Moreover, women's contribution (26.8%) in research is very less than men's contribution (73.2%). Therefore, to maintain success and growth in all spheres and to maintain gender equality, participation of women in research should be encouraged. Shri Gaurav Sundaram, Ph.D Scholar from IIT Patna emphasized the research scholar's perspective and critically highlighted that to perform any research, identification of the problem is very important. Also, the problems must be synchronized with the key societal problems, which affect the local people in villages and there should not be any constraints to move in this direction. He mentioned that there should be ample of opportunities in the native country to further work on the ideas after completion of the Ph.D so that the expert mind could stay in India and bring out the best and constructive researches here. Students should be promoted as a research engineer or, research scientist or research associate after completion of Ph.D, so that manpower could be retained.

KEY NOTE ADDRESSES



Prof. V K Malhotra,
Member Secretary, ICSSR

Prof V. K. Malhotra on his address told that the foundational pillars of the policy are access equity, quality, affordability, and accounting. The research and innovation have to be at the focus of education, and especially higher education in the country. A lot of countries are spending a much greater proportion of their GDP as compared to India. Further, he quoted the NEP and cited a lot of examples of other countries like USA, China, Germany, Sweden, Britain etc. to compare spending on research as compared to India and highlighted that a lot more is needed to be done in India. But the silver lining is that despite investing lesser in research and development, India has definitely been in a position to make it smart as its rank ranges between third to fourth or fifth position in science and technology publications globally. However, in terms of outcome of research, primarily measured in three terms; the first, the citations and impact



factor, to check the quality of publication, policy documents, then, how many policy documents are produced as an outcome of those researches and the third, a very strong component is Patent. India's visibility in these international interpretations, has been very low. Prof. Malhotra emphasized that there are a few issues that we need to understand, one that has been lack of investments in research and there is a strong realization in the national education policy document that researches innovations that have to be at the forefront of the country, economy, and for building society and India intends in next 10 to 15 years to increase its spending on research and innovation to the extent of 2% and gradually, we will be moving in a phase of investing more on research activities.

In the new national education policy, with the agenda of National Research Foundation, few things seem to be settling down in terms of our priority as a nation that we are largely convinced that if a nation has to rise, it has to perform at the international level. Our thrust on research & development and innovation has to be of a very high order in all fields like mathematics, physics, metallurgy, medicine, surgery, humanities, languages, literature, art, architecture, or even environment which is a vital concern these days and India, definitely is aspiring to be in a very significant role at the international platform in all these fields. Any spending in research has to be viewed against certain parameters, including publications, policy documents and patents. There is a new focus on the upcoming areas, such as robotics, big data analysis, artificial intelligence and how these technological developments are getting into, or finding their entries into every sphere of a nation's life, industry, agriculture, study of the consumer behavior or the market or the study of the people and their behavior in general.

The very big development in this draft of National Research Foundation is that there is an effort, or there seems to be an effort, which would definitely a combine of all major research areas. There are 10 areas that they have already mentioned in major directorates under para 7.4, that this draft has tried to highlight, and it's about natural sciences, mathematical sciences, engineering, environmental

and earth sciences, social sciences, humanities, Indian languages, Indian knowledge system including health, agriculture, innovation, and entrepreneurship.

The whole canvas, that researchers in India have largely meant, so far includes science, technology, engineering, and mathematics, popularly called as STEM, but we are definitely going beyond and thus there is a thrust on interdisciplinary, multidisciplinary, and transdisciplinary researches in the new areas, such as big data, robotics, artificial intelligence, environment or industry 4.0. There are good researchers in India and the researchers of the country have performed at the international level, and their works have been very vastly acknowledged, and they definitely carry a very big credit with themselves in terms of publications and also impacts, but when it comes to putting our resources together, the different scientists of the country, different scholars of the country in different domains has a lack of coordination. With this National Research Foundation, we can expect that coordinated effort to be taken place in days to come, and people from science and technology would be knowing more about humanities and social sciences and people from social sciences researcher would be knowing the developments in science and technology or even earth sciences through the collaborations and networks.

Prof. Malhotra posed questions by saying that we Indians have been less interested in issues on which world seems to be more interested in India than we ourselves seem to be interested in. So, what should be the reasons behind that, is it lack of talent or we do not understand the methods of research so well or is it the lack of self-assurance that we suffer from certain fears? He concluded his remarks by saying that research is always trying to know the truth. We have been missing within the country, an effort directed at collaborations among ourselves and then collaborations with the rest of the world. If we take a stock of the situation and really take steps in right direction, we can build a very strong research ecosystem and infrastructure, that the country is looking for.





Dr. G Sateesh Reddy,
Secretary, Department of Defence
Research and Development and
Chairman, DRDO

Dr. Reddy spoke on the objectives of NRF. He said that one of the important objectives of NRF is to enhance the quality research in the country, not just in the premier Institute's but also in several universities and colleges, at all levels specially in state owned universities or institutes, wherein a large number of students pass out from these institutes, and wherein we need to enhance the level of research. The basic research culture needs to be brought in. Second, a synergized one place is needed where all of the secretaries are sitting, and then able to think of a national problem. We need to try to see a synergetic approach across various departments of a country, and see that we're all able to work together to that national mission.

Third, in most of the areas we have been till now followers, such that the advanced nations or other countries lead the progress in a particular area. We also need to reach that level and need to try to come up in these areas. So, working more and more on the futuristic research areas is required. Identify the areas, get the necessary funding and collaborate among the various academic institute's or R&D organizations in the country and work together to see that we're working on the futuristic research areas, ensuring that the country is leading in these areas. There is another important thinking behind the NRF.

According to Dr. Reddy the strengthening of academia, industry, R&D organizations and industries collaborations need to be strengthened in a big way in emerging areas of technology in the coming years. He informed that the government has thought about and trying to put in 50,000 crore in five years for promoting research in the country at all levels.



Shri Rakesh Ranjan,
IAS, ACS, MoE, GoI

He deliberated upon the status of IPR and publications status of some leading countries and informed that India is filing around 50,000 patent applications compared to USA which is filing over six lakhs and for china this number is close to 14-15 lakhs. In case of publications, China and USA have around four times as compared to India. As far as data contribution of our country is concerned, our researchers only contribute 16% compared to China (36%) and USA (28%) in top 10 journals. So, scientific fraternity must be more aggressive on quality research. Further, research and innovation need to be strengthened in our higher education institutions to boost the scientific temperament of this great nation. He emphasized that NRF can act as nodal agency to coordinate the research through various research facilitating organizations including DST, DBT, DRDO, etc., and promote multidisciplinary research and critical and mega projects of national repute. It is noteworthy to mention that CFTIs contribute only about 4% students. However, 95 - 96% of students either study in state universities or in private universities with negligible research temperament. Therefore, imbibing research culture in higher educational institutions is highly imperative and the same was reflected during the address of our Honorable Prime Minister's speech in Parliament in June 2019, in which he emphasized on strengthening the higher education system and proposed to establish a National Research Foundation. Further, he deliberated that it is contemplated to inculcate research environment in state universities and NRF would sponsor NRF professorship. It is also recommended to set up centre of excellence around the country which could emphasize on national mission projects (about Rs.1000 Crore projects). Further, NRF proposes grant of doctoral and post-doctoral fellowships in major fields including Natural



Sciences, Mathematical Sciences, Engineering, Social Sciences etc., that can ultimately accelerate innovation, entrepreneurship, and agriculture. However, further interdisciplinary research culture can also be created above verticals and could be managed by divisions or directorates, led by a program officer who will co-ordinate the research in these areas with his team. All the co-ordination will be with a co-ordination board which is proposed to be chaired by a principal scientific advisor. It is further elaborated that the different ministries like Department of Science & Technology, Department of Biotechnology, and Ministry of Education, etc. brought quite a few schemes for promoting research, like the Prime Minister's Research Fellowship, ASEAN fellowship, GIAN, STARS, SPARC etc. Recently, the announced glue grant scheme will also be relevant to increase the coordination among research institutions and research laboratories of multiple higher education institutions. This will nurture the handholding capability among the researchers of different institutions and of different cadre. Further, one good institution in that group can act as nodal centre whereas other institutions in that area will be the networking institutions to promote research and development effectively.



Expert Comments on NRF



Dr Mahendra P Darokar, **Central Institute of Medicinal and Aromatic Plants,** explained that the role of NRF is primarily to strengthen, coordinate and fund the research, as well as to lay down a broad policy framework for carrying out research in

multifarious domains in the country. Though there are other funding organizations like DBT and these organizations are doing excellent work, but they are specific in their domains and they are not addressing the overall concerns of the country, and therefore, there is a need for India's research and innovations hub with comprehensive professional research and education framework.

The primary objective of the NRF will be to remove the various obstacles of research in the nation. The main focus is on knowledge creation. It will work as a bridge between different government departments science laboratories, higher educational institutions, and also the industrial institutions. The NRF will actively aim to build on the existing national strengths in research and innovation and



will fill the gaps in the current research and education ecosystem. In order to take India's research and innovation to the achievements into the much higher orbit and in the objectivity state that it will competitively fund the research in all disciplines, across the landscape of academic landscape in education institution or research organizations, and covering almost all the subject areas right from the medicine to engineering to archeology to languages to literature. So, all these areas are covered for the funding proposals.

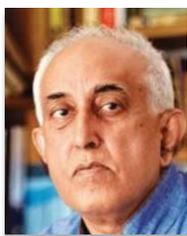


Mr G V Selvam, Vice-President of Vellore Institute of Technology

stated that If India needs to be developed into a knowledge economy, then R&D efforts need to be enhanced tremendously. Research has to be percolated down to colleges, even in schools to set the research culture from the grass root level, may be, by introducing the project-based learning. In India, the number of publications seems to be better in fields like material science, but not in products and activities with industries. India lags behind smaller countries like Taiwan in the industrial connectivity. NRF will address all these issues, to put India's research at par with developed countries in next five years, focusing on product and process development. This will lead to solve societal problems like clean water, clean air, clean energy and environment so that the common man will see the benefits of the research.

He emphasized on the role of intuition at augmenting India's research capacity that may be signified by attracting a large number of bright researchers in educational institutes and support them structurally, administratively and academically to bring significant change in R&D output and quality research.





Padam Sri Shree Virander Singh Chauhan, Eminent Scientist and a Rhodes Scholar in the fields of genetic engineering and biotechnology

threw light on the genesis of NRF itself, three years back when the Prime Minister actually made a comment from the stage saying that 90% to 85% of all research funding goes to only 10% of institutions, and that was a major concern. He sighted example of China's expenditure on research and consistent efforts in last 40 years to have top Universities from China in world ranking. So, he emphasized that when it comes to the role of NRF and it has been understood that unless we spend money, the research at the university level will not improve drastically.

He posed many questions like; for those who opt to become 'teaching university' as per NEP, how do you make these university research fit? What NRF is going to do differently if the institutions of DBT or DST or ICMR are already funding and how NRF will deal with very serious competitive subjects like tuberculosis, COVID-19 and immunology etc. He concluded with the remarks that very small institutions, if not collaborating with each other, will not go forward. NRF has to focus on funding of universities and colleges of state universities, he said "do not expect much out of that in next five years, select those universities, very carefully and make them competitive. There should be a structure that will look after the competitiveness of these universities to decide, who should get funding and social sciences should not be neglected".



Shree Somanath, Director of Vikram Sarabhai Space Centre (VSSC)

talked about the interaction of ISRO with leading technology institutions and research interphase and support provided by ISRO. For research which is not really a basic research but they're more product,



process or even hardware oriented. The major issue in terms of research is how to access these funds, and also the resources which are already there, and then how to really make the research expertise of other national organizations or institutions available to the bottom of the target of research?

Then, another key issue is that how to attract and maintain high quality people in this research? The stipend /scholarships / salary or whatever we call them has to be linked to the research quality as well as the goal of the research. We need to increase the number of Ph D scholars in institutions. According to him “another important point of concern is that in an organization, there is a lower intake of Ph D holders. Now we start believing that it is important to intake in taking only the graduates and we can mold them and bring them up to become great people, and we need to enforce that Ph D holders should be taken in such institutions in large numbers and we should have better incentives/reward system and recognition to those who work behind the scene.” He suggested that there are many resource organizations in our country through which they can talk to each other, to bring in innovative research ideas and then sharing the resources, researchers and leaders in these organizations. NRF should be in a position to enable this inter-linking across research houses, research organization and laboratories in a much stronger way.



Prof. KRS Sambasiva Rao, Vice Chancellor of Mizoram University, stated that

we need to get people to do changes and how to make themselves aware of working hard with the innovativeness. He also said that everyone has to feel that they should work for the development of the country and unless this happens, there will

not be any change, no matter how many schemes are introduced. Prof. Sambasiva Rao emphasized on providing good infrastructure

to all the state universities that do not even have minimum facilities as most of these universities and state institutes are not having like proper infrastructure and research facilities. He questioned that even though we introduced National Research Foundation, how far we can expect returns from this particular one, this is what actually, everyone has to think. He opined that research culture needs to be build right from the school days. He cited examples of many countries to have a system where the children will go, from the class five onwards, to most of the advanced institutes which encourage them to come to their laboratory and observe what is the kind of research going on in those universities, and institutes. This way they are actually motivating to go for innovative thinking and innovative thoughts. This is what actually children have to be motivated at school level itself. Finally, he concluded that we have the best talent pool available and their capabilities should be utilized. There should be accountability for all. No one should think they are permanent. Regular evaluation of performance is needed so that all work for the best results.



Prof. A D N Bajpai, Vice Chancellor, Bilaspur University (Former Vice Chancellor, Himachal University) suggested 4 points regarding NRF: first, there should be a consolidation of the research efforts. Second, during the time of adoption of new technologies, we should try to innovate and develop these

in our country to make our country self-reliant and reduce the import of technology, wherever possible. Third, researchers should come out with original work or own ideas of research, rather than just replicating the research happening globally. A lot of research potential is available if we explore our ancient scripts and knowledge. Fourth and the last is that social science should not be neglected while promoting research across the country. Researches should



be done on our rich heritage, culture, value system, and traditions. Emphasis should be given on focusing research on the concepts, definitions and content.



Dr. Mahadeo Jaiswal, Founding Director of Indian Institute of Management (IIM), Sambalpur stated that the structured

system like NRF is already implemented in many countries for providing funds in Science and Engineering. It is noteworthy to mention that the developed nations spent a large amount of their GDP on R&D which has resulted in numerous product patent applications contributing societal benefits. He stated that to cope up with current worldwide scenario and attract young talents to create a core scientific community in our country, execution of NRF is critical. Arrangement of funds is the foremost task for developing a well-ordered scientific community. However, apart from government bodies, Research & Development department should also be supported by corporate and private sectors. It is important to set up certain criteria based on MoU for classifying and recognizing competent institutes to be funded through NRF. For example, universities dedicating considerable time in research and innovation should only be supported by NRF funding. It is to promote that the faculty members who involve mainly in teaching should spare extra effort for the research as well. Furthermore, strategy, vision, and quality publication could be key identifiers to acknowledge capability of respective institute to be supported with appropriate capital. He further highlighted that not only universities/institutions as a whole, but also individual professor/scientist can be funded through NRF to drive the research in right momentum.





Prof Nagesh Thakur, Himachal Pradesh University, Shimla and member of UGC

embarked that to promote young minds, inclusion of NRF in National Education Policy is crucial and much awaited step to be taken. Central government has already made budgetary allocations for NRF under NEP provision, however, the sustainability of such research foundation should also be supported by other sectors including corporate sectors and thus adequate amount of capital can be allocated during every financial year to support scientific temperament. So that this foundation can be emerged as center of motivation and attraction for every researcher. NRF is expected to fulfil the gap of this miscellaneous researches by taking research to the new horizons while improving quality of research. NRF should focus on indigenous knowledge creation and development. This is a crucial step to transform our nation into “AatmaNirbhar Bharat”. Approximately, 61.4% research expenditure funded by central government is invested on defense, atomic energy, and space sciences. However, there is need to support and motivate other sectors of science and technology with equal zeal to achieve optimum positive outcomes. Current national situation emphasizes on need-based innovation/ research. Therefore, interdisciplinary research must focus to advance the science and technology of India. There is a need to nurture curious and creative minds with a view to develop analytical and critical thinking abilities even at the school level.



Prof. S. Vaidhyasubramaniam, Vice Chancellor, SASTRA University, Thanjavore (Deemed to be University)

emphasized the selection mechanism must be transparent, fair, robust, and comprehensive in the sense that it addresses research from a multi-dimensional perspective while fulfilling the agenda of translational research to be applicable in day-to-day life. In order



to align with global practices, structural arrangement of any policy mentioned in documents should be put into effective manner to move in the right direction. First, it is crucial to promote basic research, applied research, transactional research, transformational research, social sciences research and this needs to be synchronized perfectly in the selection mechanism along with science and technology in order to marginalize socio-economic profile of the country. Second, capacity building of research organizations is an important aspect and has to be implemented across different institutions in broad-based manner. Third, institutional and academic leader's role are crucial for building leadership capacity to understand the importance of research in India among global higher education research landscape. Hence, capacity building is important at the faculty, facility and at the leadership level. Fourth, a sustainable financial model is necessary to transform NRF into self-sustaining foundation over a period of time either by involving corporates, or by creating special purpose vehicles that can raise capital, or by involving stakeholders by co-opting them as research participants, or by bringing finance just like in PPP mode, or by creating soft financial resources to allow institutions to raise capital for the very specific purpose of research, or by selecting institutions that are recognized as Scientific and Industrial Research Organizations, or those that have FCRA, or access to foreign currency denominated loans. These are special purpose vehicles for which we need to encourage access and the NRF must facilitate this process, it is not just a funding agency, it has to be a facilitating agency as well as provides access to easy capital to deserving institutions at lower rates, and that is one important area which can attract more investments into research. Fifth, there is a need to have a good benchmark matrix to recognize the progression of research projects. NRF should also function in a way to ensure highest order research benchmarking matrix and proper implementation mechanism. Briefly, in summary, in order to ensure if all the deliverables are met, a comprehensive research audit mechanism need to be thought of. And NRF should act as prime organ in this ecosystem for transferring newly emerged technologies to markets and facilitating ease in commercialization.





Prof. V K Tiwari, Director, IIT Kharagpur

emphasized that quality research can create high impact on country's development and it can be translated to the grounds. NRF is indispensable to be executed in reality over a period of time. In research, interdisciplinary approach should be promoted. Every institute should be funded and they should work on a common thrust area. However, there is a need to set up a mechanism to manage and monitor funds so that duplication could be avoided. Every institute should work on promoting research culture and also motivating under graduate students towards Research & Development.



Shri Kapil Pandla from International Management Institute, Bhubaneswar

stated that National Research Foundation is a much-awaited initiative of Government of India to boost research culture in the country as this sector has faced tremendous problems in the past in terms of research facilities and capital support. Post-independence, the focus was more on establishing the institutes of excellence with focus more on teaching and learning, and less towards research. With the establishment of NRF research culture can be boosted throughout the country which will provide sufficient capital to carry out the research and will put us ahead of many developed nations soon. Funds should not be a constraint and should be available to every competent institute or person irrespective of age, gender, experience, and affiliation to carry out constructive research. This initiative can be marked as a breakthrough to fulfil the dream of "AatmaNirbhar Bharat". NRF should be broadly categorized into two wings. One, that provides funds to research organizations, and academic institutions. Second, that can cater to individual researcher having a promising idea. Lastly, to develop an excellent research



culture, collaboration between academia and industry should be promoted in order to maximize research outputs.



Prof Uday K R, Director, MNIT, Jaipur

highlighted that the motive of National Research Foundation may not be just to provide funds, but it also should also create an ecosystem having PMO cabinet ministers, local and foreign members, corporate people, people from science and technology, environmental specialists, social science experts and many more. Moreover, government labs such as DRDO, ISRO, ICMR etc. should be incorporated in the NRF's ecosystem so that the interdisciplinary approach can be developed. Funding through NRF should support the national vision of research and innovation. Strengthening the research sector through enough funding can build competency, scientific capabilities, and positive economical and national impact which can attract foreign researchers and our students while fulfilling the motive of "Kushal Bharat, Kaushal Bharat" campaign. Firstly, the structure of NRF should present India into knowledge-based society with strong research development capacity and design capabilities. Secondly, NRF should promote research and innovation, new initiatives in the knowledge creation in science and technology, and long-term economic growth for sustainable benefits. The fundamental of every stream should be to drive excellence in their respective area. Public-private relationship should be promoted to achieve Sustainable Development Goals (SDGs). There should be more patents, more technology transfer from academia to industries. This culture should be promoted in all the institutions with the aim of upgrading research culture. Implementation of rating score based on the past performance and quality publications can improve global ranking of the institute. This will make principal investigator more responsible and accountable and can motivate the institute to

create a conducive and positive ecosystem for carrying out research projects. Moreover, to promote the research and innovation in state universities and NITs, professors should be provided with focused time on day to day basis to execute the research so that they may feel more belongingness to the institute. The faculty led students start-up should be encouraged from the campuses so that the customers, as well as the stakeholders feel belongingness to the institutions that will impact sustainable research productivity throughout the nation.



Prof. Gomathi Devi, Vice Chancellor, Maharani Cluster University Bangalore mentioned that to promote and develop research, every institute should be given equal opportunities to receive scholarships and post-doctoral fellowships.

She cited the example that In Karnataka, there are 4407 higher education colleges in which only 1009 colleges promote research and innovation. This represent a big lag and hence motivation is required to inculcate research culture. Moreover, women's contribution (26.8%) in research is very less than men's contribution (73.2%). Therefore, to maintain success and growth in all spheres and maintain gender equality, participation of women in research should be encouraged. Moreover, to motivate young minds towards research and Ph.D, there should be a well-maintained system in the universities to provide students a basic fellowship amount for which a professor should write and propose potential and valuable projects to procure funds from different funding agencies. A full time and fellowship supported research culture should be promoted to impart value to the projects and research.

To attract young and talented scientists, there should be enough positions and fellowships to carry out their research in India. A Simple modus operandi should be implemented for the utilization



of funds procured by an individual scientist inside the institution. So that the research can be carried out in a more effective manner. When NRF is considering facilitating research, they should create many instrumentation facilities across the country so that all the researchers can use these instrumentations that can promote publishing research in high impact factor journals, ultimately increasing citation index and recognition internationally Recognition should be provided to experienced researchers and has to be taken up somehow or the other. As in other country, there should be a popular publishing house in India as well to motivate, promote, and publish high impact research.



Mr. Gaurav Sundaram, Ph.D Scholar from IIT Patna emphasized the researcher scholar's perspective and critically highlighted that to perform any research, identification of the problem is very important. Also, the problems must be synchronized with the key societal problems, which affects the local people

in villages and there should not be any constraints to move in this direction. Further, there should not be constraints to carry out the research in given area rather the research should be more liberal and open. There should be ample of opportunities in the native country to further work on the ideas after completion of the Ph.D so that the expert mind could stay in India and bring out the best and constructive researches here. Students should be promoted as a research engineer or, research scientist or research associate after completion of Ph.D so manpower could be retained. Also, admission standards should be maintained throughout the nation to produce good researchers. Hence, both quality and quantity should be taken into consideration while admitting.

KEY RECOMMENDATIONS

During the National level deliberation involving high level science administrators and academicians from various institutions it was emphasized that there is not only the need for establishment of National Research Foundation (NRF) but there is an urgent requirement to focus on enhancing the research capacity building and research quality of the country. There are so many issues relating to research in India, such as quality, brain drain, funding, accountability, innovation, creative ability of students, awarding of fellowships and finances to researchers at different levels, priorities of the areas of research and relevance, etc. The participants discussed on almost all of these aspects including structure and administration of NRF and on the function as to how it may work with the existing funding agencies. Discussions of this kind would certainly prompt the policy makers to consider, in the country's efforts to bridge the gap between India and developed countries with respect to research. The deliberations may be submitted to the working groups of Government of India.



The following are some of the important recommendations emerged out of this deliberations:

- India needs to spend at least 0.69 % of its GDP on R & D in the next 5 years.
- Publications, policy documents, patents, policy evaluation and future rights are important in leveraging country's research and all these areas are needed to be focused.
- Research has to be of international level, and multi-disciplinary in nature. Social Science and Humanities need more integration into STEM.
- India has to regain its old strengths in its research (metallurgy, medicine physics, mathematics) so that we become knowledge creators for a knowledge economy.
- Synergetic working on National problem with futuristic idea has to be evolved.
- Collaboration has to be much extensive among R & D institutions and academia.
- Both fundamental research and applied research have to be evolved simultaneously.
- Industries need to be involved by R & D institutions and academia in their research.
- NRF should focus more funding to State universities.
- NRF should fund for development of many Centres of Excellence and National Missions.
- NRF - Chair Professors, NRF - Doctoral and Post-Doctoral Fellows need to be supported.
- NRF should focus more funding to Societal related problems, Start-ups & Entrepreneurship.
- Project based learning at school level can be initiated to nurture research aptitude. Visits of school students to universities and research institutions be organized to motivate them.
- Best practices to be identified to promote research activities at all levels. High impact publications to be made mandatory for university teachers.

- NRF may act as a coordinating agency with a well –defined structure and function.
- NRF should support outcome-based research.
- NRF should take clues from NSF in terms of funding institutions and individuals. International ranking criteria may be adopted.
- Interdisciplinary research is to be supported.
- Curious and creative research is to be encouraged.
- Facility capacity building is to be broad based across different types of institutions.
- Financial sustainability such as PPP model, or FCRI can be explored.
- System for implementation and overview and comprehensive research audit mechanism needs to be in place.
- Repetition of projects between NRF and the existing funding agency is to be eliminated.
- Rural development initiatives need to be supported.
- NRF should promote innovative research so that knowledge creation in S&T occurs to boost economy.
- Research students at state universities need to be supported.
- More facilities need to be created at State Universities.
- More women researchers need to be encouraged and funding can be provided to build up the research career.
- Publishing houses originating from India need to be encouraged and made more popular globally.
- Research problems need to be chosen that would benefit society.
- Performing Research students need to be supported even after submitting thesis to continue their research.
- Research Parks can be built at various locations through which knowledge will be deiminated.
- Sustainable growth in research needs to be ensured.
- Number of all types of research fellowships be enhanced.
- Standards of admission to research may be maintained.



WAY FORWARD

The money allotted for NRF seems to be very small as compared to the global spending on research. For achieving higher and ambitious goals in research, it needs to be increased manifold. Moreover, money infused in NRF may be necessary condition but it cannot be sufficient enough. Systems have to fall in place to execute this in years to come. If a mango seed is sown today it will be completely impossible to pluck mangoes from the trees tomorrow. One can't expect immediate results or outcome from NRF. Structural changes at grassroot level with a vision to spend the money transparently and liberally for few years can allow us to expect the results in long term. Based on performance many such new institutions can be selected to take the lead. The acceptance of patents is a major bottleneck for becoming global leader. Ecosystem should be developed so that research may be promoted to large number of universities of the country. Strengthening research in universities and making them research-fit is the need of the hour and NRF should take lead in this direction. The mechanism should be developed in state universities state universities to assure utility of the funds more judiciously or effectively. The promotion of research in social-science is something that needs to be focused and it will be integral to bridge the gap between technology and society. The collaboration is another major issue that NRF should handle effectively. The facilities created at one place



should be utilized and shared and this knowledge sharing is very necessary because the tendency to collaborate is vanishingly small in Indian context. Promotion of basic research is very important with applied research and translational research. In NRF, the methods of rewarding high performance should be defined very clearly and it should be transparent and unprejudiced. Retaining the excellent brains in the native country is another major thing that needs to be effectively tackled by NRF. NRF should be broadly categorized into two wings. One, that provides funds to research organizations, and academic institutions. Second, that can cater to individual researcher having a promising idea and to develop an excellent research culture. Collaboration between academia and industry should be promoted in order to maximize research outputs. The structure, function, and the location of the NRF should be decided by keeping in view the spatial, disciplinary, and institutional diversities of the country. How to set the accountability of funded research in terms of outcome as well as providing systems and processes. Providing a right system and processes so that an ecosystem for smooth working of researchers is ascertained along with accountability.



CONCLUSION

NRF is a very far-sighted and visionary approach of our country and has addressed almost every issue concerning to the development of robust and holistic research across the country keeping in view its diversity as well as representation from all strata of society. The effective and proper implementation of NRF is to be sought in the days to come. The involvement of experts and giants from the field of academia and all other stakeholders in the governing body of NRF as well as its flexibility shall ensure its credibility and will provide excellent outcome in the near future.