

2017 BRICS Calls for Proposals for Multilateral R&D Projects

Part-1

DST NATIONAL GUIDELINES FOR 2017 BRICS CALL FOR PROPOSALS

DST (India) National Guidelines for Coordinated Call for BRICS Multilateral Research and Development Projects – BRICS Call for Proposal 2017

1. Goal of BRICS Coordinated Call:

The BRICS STI Framework Programme aims to support excellent research on priority areas which can best be addressed by a multinational approach. The initiative should facilitate cooperation among the researchers and institutions in the consortia which consist of partners from at least three of the BRICS countries.

2. Funding Agencies:

Following research funding organizations from the BRICS countries have agreed to support BRICS 2017 Call:

Brazil: National Council for Scientific and Technological Development (CNPq)

Russia: Foundation for Assistance to Small Innovative Enterprises (FASIE), Ministry of Education and Science (MON) and Russian Foundation for Basic Research (RFBR)

India: Department of Science and Technology (DST)

China: Ministry of Science and Technology (MOST) and National Natural Science Foundation of China (NSFC)

South Africa: Department of Science and Technology (DST) and National Research Foundation (NRF)

3. Aim of the Joint Call and Thematic areas

Collaborative multilateral basic, applied and innovation research projects in the following thematic areas can be submitted in response to the call:

Major Area of the Call:

1. Prevention and monitoring of natural disasters
2. Water resources and pollution treatment
3. New and renewable energy, and energy efficiency
4. Biotechnology and biomedicine including human health and neuroscience
5. Information technologies and high performance computing
6. Material science including nanotechnology

4. Eligibility:

Eligible Indian Partners: Eligible Indian partners can be legal research entities from public funded academic institutions, national R&D laboratories or R&D entities having recognition as a Scientific and Industrial Research Organisation (SIRO) by the Department of Scientific and Industrial Research under the Scheme on Recognition of Scientific and Industrial Research Organisations (SIROs), 1988. The R&D performing Indian industry may participate voluntarily in this call with participating Indian industry has to invest its own resources.

Consortium: A joint project will comprise of at least one PI from each of the participating countries, and a project coordinator or the leading PI acting as the project coordinator. Project consortia should consist of partners from at least three BRICS countries.

All applicants must fulfil their respective national eligibility rules for research grant applications (please refer to the National Guidelines/Annex document and consult with national research funding organization participating in the call).

5. Funding Support by DST

5.1 Maximum Indian support for each Project: upto Indian Rupees Rs. 50 lakhs approx. for 3 years' duration.

5.2 Funding instruments

	For Indian Participants (in Rupees)
<p><u>Direct Costs</u></p> <p>5.2.1 Manpower Cost (as per DST Norms)</p> <p>Junior Research Fellow-JRF, Senior Research Fellow-SRF/SRF, Research Associate-RA. (emoluments will be as per DST OM No. SR/S9/Z-09/2012 dated October21, 2014 and revised time to-time).</p> <p>5.2.2 Consumables Cost:</p> <p>(As essential for collaborative work. DST will fund such requirement of Indian project partners and BRICS countries will fund that of BRICS project partners).).</p> <p>5.2.3 Mobility of scientists</p> <p>[<u>For Indian project scientists/ staff visiting BRICS countries collaborating institute:</u> Number of Indian scientists to undertake project work related visit and & man-days of stay in BRICS countries will have to be stated for each year- Sending Indian institution takes care of its project staff's return international travel cost (full fare economy class) between place of work in India and place of institution being visited in BRICS country as well as medical insurance (silver class); and Receiving BRICS countries institution takes care of accommodation cost (board and lodging) of the incoming visiting Indian project staff for the actual period of stay in BRICS countries (as per BRICS countries norms)]</p> <p><i><u>For BRICS countries project staff visiting Indian collaborating institute:</u> (Number of BRICS countries scientists to undertake project work related visit and & man-days of stay in India will have to be stated for each year- Sending BRICS countries institution takes care of its project staff's return international travel cost between place of work in BRICS country and place of institution being visited in India as well as medical insurance and Receiving Indian institution takes care of accommodation (in Guest House or up to 3-star hotel) and subsistence cost of the</i></p>	

<p><i>incoming visiting BRICS countries project staff for the actual period of stay in India (Per diem of Rs.1000/day for Experienced Researcher or Rs.20,000 per month for Early Stage Researcher)</i></p> <p><i>All the Expenditure will be debited from DST funded BRICS Project.</i></p>	
<p><u>Overhead /Indirect Cost (As per DST norms:</u> Overhead expenses payable to institute for Indian partners:</p> <p>10% of the total project cost for educational institutions and 8 % for laboratories and institutions under central Government Departments/Agencies.</p>	
Total Cost	
Admissible Cost demanded from DST	

6. General guidelines for building BRICS multilateral projects-BRICS call 2017

- i) The applicants may clearly define project goals that could be achieved within 3 years.
- ii) The applicants need to provide short account of on-going bilateral projects with BRICS Member States and BRICS countries at large, if any. This is required to determine the essentiality/redundancy of India-BRICS countries and the genuine need for applying for grants under the present coordinated Call for BRICS.
- iii) The proposals should clearly bring out novelty and innovation component vis-à-vis global scientific and technological benchmarks.
- iv) The proposal should elaborate linkages proposed to be developed amongst various project consortium partners for optimization of time and achievement of deliverables.
- v) The project managements, milestones, quantitative parameters for monitoring and internal monitoring systems/ procedures need to be spelt out
- vi) The proposal should bring out industrial partner's commitment for taking forward successful solution for wider applications.
- vii) The proposal should clearly demonstrate a balanced participation of BRICS partners with properly integrated research activities and complementary roles.
- viii) The IPR sharing will be govern by national domestic laws and under the framework of BRICS STI MoU and/or India bilateral S&T Agreement with BRICS Countries as applicable. The Indian PI along with other BRICS partner will have to submit an IPR arrangements, technical annex documents and coordination agreement, in case, the proposal is finally selected for funding support.

7. Process for submission of Joint Project Proposals

There are two level online submission system to submit the joint R&D proposal.

- i) Online Submission of Joint Application Form by one of the Project Coordinator to centralized Call Secretariat
- ii) Online submission of application by main PI in their own country to their funding agency in the prescribed Format. In case of India it is DST (Department of Science & Technology), GOI.

7.1 Submission of Joint Application Forms (JAF) by Project Coordinator

A **Joint Application Form (JAF)** must be submitted by one of the Project Coordinator to centralized Call Secretariat RFBR (Russia) through the online submission. To submit an Joint Application Form an online-submission form should be completed through the BRICS STI Framework Programme Application Management System (AMS) at <https://ams.rfbr.ru/BRICS>. The project coordinator should register in AMS, log in and create a proposal for the BRICS Call 2017. Project coordinator must fill in all the required fields, attach completed JAF to the online submission form and submit an application. The online submission form fields are identical to the information provided in JAF, however the completed JAF as attachment to the online form must be provided (should be uploaded in the respecting section of online submission form). Applications submitted to the Call Secretariat by any method other than through online submission form at <https://ams.rfbr.ru/BRICS>, such as post, fax or telex will be rejected.

7.2 Submission of Online Application to DST

Indian Principal Investigator should submit the project proposal online through DST's Electronic Project Management System (e-PMS) on portal www.onlinedst.gov.in the given format along long necessary documents in Word and pdf file format. This is additional requirement in each participating countries. Please ensure that your partners have submitted the national document in their country.

INSTRUCTIONS FOR FILLING ONLINE APPLICATION

- i. Log on onlinedst.gov.in to access the home page of the "DST e-PMS Portal", register, log in and submit the BRICS project proposal in prescribed Format.
- ii. Before filling up the form candidates are advised to carefully go through the Relevant Advertisement published at the DST Website (www.dst.gov.in) and also available under Proposal Formats in the e-PMS Portal after logging in the portal site.
- iii. To save your time and avoid data loss please download the appropriate proposal format and fill all the information required as per the format as a Word and PDF file and then keep it ready for upload during submission of mandatory documents.
- iv. Click on "Submit proposals" link which would take you to a page seeking multiple information starting with – General information, Principal investigator etc. **Please note for BRICS Program you do not need to fill – Suggested referees and Current Ongoing Project.** Fill all the mandatory information sought against each menu except (**Suggested referees and Current Ongoing Project**).

- v. After filling all above particulars there is provision for preview your detail before final submission of application form on clicking on "Preview" button. Preview page will display all facts/particulars that you have mentioned on entry time if you are sure with filled details then click on "Submit" button to finally push data into server.
- vi. Candidates are advised to carefully fill and verify the details filled in the online application themselves as no change will be possible/ entertained after clicking the FINAL SUBMIT BUTTON.

8. LAST DATE FOR RECEIPT OF APPLICATIONS :

Online Application must be submitted by 18th January 2018 after which the web-link will be AUTOMATICALLY disabled FOR ANY USAGE. Last date of submitting the HARD COPY of the PRINT VERSION of the online submitted form is 31st January 2018. The hard copy of the print version should reach the following address on or before 31st January 2018.

Dr. Arvind Kumar
Scientist 'E'
Room No. 14 D
Technology Bhavan
Department of Science and Technology
New Mehrauli Road, New Delhi -110016

PLEASE NOTE

- i. IT IS MANDATORY TO SUBMIT THE PROPOSALS THROUGH **ONLINE MODE**. SUBMISSION OF PROPOSAL ONLY ON OFFLINE THROUGH HARD COPY WITHOUT ONLINE SUBMISSION OF THE PROPOSAL WOULD BE SUMMARILY REJECTED AND WOULD NOT BE CONSIDERED FOR FURTHER PROCESSING.
- ii. CANDIDATES ARE REQUIRED TO SUBMIT **ONLY ONE HARD COPY AS PRINT OUT** OF THEIR ONLINE SUBMITTED APPLICATION TO THE DST WITH THE SIGNATURES AND RUBBER STAMPS OF THE CONCERNED PERSONS/ OFFICIALS.
- iii. INCOMPLETE OR WRONGLY FILLED UP APPLICATION FORMAT OR APPLICATION WITH LACK OF ESSENTIAL DOCUMENTS WILL BE SUMMARILY REJECTED. ANY LEGAL PROCEEDINGS IN RESPECT TO ANY MATTER OF CLAIM OR DISPUTE ARISING OUT OF THIS ADVERTISEMENT AND / OR APPLICATION CAN BE LODGED ONLY IN DELHI COURTS/ TRIBUNALS/ FORUMS AND DELHI COURTS / TRIBUNAL/ FORUMS ONLY SHALL HAVE THE SOLE AND EXCLUSIVE JURISDICTION TO TRY ANY CASE / DISPUTE.
- iv. PROPOSAL SUBMITTED THROUGH E-MAIL WILL NOT BE ENTERTAINED. **SUBMISSION OF PROPOSAL OTHER THAN THE PRESCRIBED FORMAT SHALL SUMMARILY BE REJECTED WITHOUT ANY FURTHER PROCESSING AS PER PROGRAM NORMS.**

9. Contact Information

Smt Sadhana Relia, Scientist G & Head International Multilateral and Regional Cooperation Division(IMRCD, Department of Science and Technology Government of India., Email:srelia@nic.in	Dr. Arvind Kumar Principal Scientific Officer Scientist 'E' Room No. 14 D Technology Bhavan Department of Science and Technology New Mehrauli Road-110016 Email : arvind.kumar71@nic.in
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List of documents required for online submission

The followings documents may be prepared by Indian PI and uploaded on the DST Portal- www.onlinedst.gov.in . The requisite format is listed below.

- a) Biodata (max size 512KB)
- b) Certificate from Investigator(s) (max size 512KB)
- c) Endorsement from the Head of Institution (on letter head) (max size 512KB)
- d) Conflict of Interest (max Size 512KB)
- e) Complete Proposal (1pdf file and 1Doc file) as indicated in online portal(max size 2 MB)

FORMAT for BRICS Call for Proposal (2017) for Multilateral Research and Development Project

1. Title/Name of the Project:
2. Major Thematic Area:
3. Duration of the Project:
4. Project partners' details:

India	Brazil	Russia	China	South Africa

5. Aims/objectives of the project:
6. State of the Art of knowledge, process, technology, product, services.
7. Relevance of the project proposal in BRICS and global context.
8. Harmony of project proposal with India 'National Missions program in related areas or inter-disciplinary areas.
9. Methodology
10. Deliverables:
11. Target via-a-vis Technological Benchmark:
12. Potential application areas:
13. Roles and responsibilities of each BRICS partnering institutions
14. Gain or Value addition from International collaboration in terms of technology and expertise expected from BRICS partners
15. Budget requirement from Indian side:

S.No.	Item	1 st Year	II nd Year	III rd Year	Total
1	Manpower (as per DST norms)				
3	Consumables				
4	Mobility India to BRICS Countries:				
	Mobility BRICS Countries to India:				
	Workshop/Terminal Review Meeting				
5	Overheads (as per DST norms)				
6	Total				

16. List of facilities being extended by parent institution(s) for the project implementation

a. Infrastructural Facilities

b. Equipment available with the Institute/ Group/ Department/ Other Institutes for the project

* End of the Application Format *

DEPARTMENT OF SCIENCE AND TECHNOLOGY

POLICY ON CONFLICT OF INTEREST

FOR REVIEWER & COMMITTEE MEMBER or APPLICANT or DST OFFICER ASSOCIATED/ DEALING WITH THE SCHEME/ PROGRAM OF DST

Issues of Conflicts of Interest and ethics in scientific research and research management have assumed greater prominence, given the larger share of Government funding in the country's R & D scenario. The following policy pertaining to general aspects of Conflicts of Interest and code of ethics, are objective measures that is intended to protect the integrity of the decision making processes and minimize biasness. The policy aims to sustain transparency, increase accountability in funding mechanisms and provide assurance to the general public that processes followed in award of grants are fair and non-discriminatory. The Policy aims to avoid all forms of bias by following a system that is fair, transparent and free from all influence/unprejudiced dealings, prior to, during and subsequent to the currency of the programme to be entered into with a view to enable public to abstain from bribing or any corrupt practice in order to secure the award by providing assurance to them that their competitors will also refrain from bribing and other corrupt practice and the decision makers will commit to prevent corruption, in any form, by their officials by following transparent procedures. This will also ensure a global acceptance of the decision making process adopted by DST.

Definition of Conflict of Interest:

Conflict of Interest means "any interest which could significantly prejudice an individual's objectivity in the decision making process, thereby creating an unfair competitive advantage for the individual or to the organization which he/she represents". The Conflict of Interest also encompasses situations where an individual, in contravention to the accepted norms and ethics, could exploit his/her obligatory duties for personal benefits.

1. Coverage of the Policy:

- a) The provisions of the policy shall be followed by persons applying for and receiving funding from DST, Reviewers of the proposal and Members of Expert Committees and Programme Advisory Committees. The provisions of the policy will also be applicable on all individuals including Officers of DST connected directly or indirectly or through intermediaries and Committees involved in evaluation of proposals and subsequent decision making process.
- b) This policy aims to minimize aspects that may constitute actual Conflict of Interests, apparent Conflict of Interests and potential Conflict of Interests in the funding mechanisms that are presently being operated by DST. The policy also aims to cover, although not limited to, Conflict of interests that are Financial (gains from the outcomes of the proposal or award), Personal (association of relative / Family members) and Institutional (Colleagues, Collaborators, Employer, persons associated in a professional career of an individual such as Ph.D. supervisor etc.)

2. Specifications as to what constitutes Conflict of Interest.

Any of the following specifications (non-exhaustive list) imply Conflict of Interest if,

- (i) Due to any reason by which the Reviewer/Committee Member cannot deliver fair and objective assessment of the proposal.

- (ii) The applicant is a directly relative# or family member (including but not limited to spouse, child, sibling, parent) or personal friend of the individual involved in the decision making process or alternatively, if any relative of an Officer directly involved in any decision making process / has influenced interest/ stake in the applicant's form etc.
- (iii) The applicant for the grant/award is an employee or employer of an individual involved in the process as a Reviewer or Committee Member; or if the applicant to the grant/award has had an employer-employee relationship in the past three years with that individual.
- (iv) The applicant to the grant/award belongs to the same Department as that of the Reviewer/Committee Member.
- (v) The Reviewer/Committee Member is a Head of an Organization from where the applicant is employed.
- (vi) The Reviewer /Committee Member is or was, associated in the professional career of the applicant (such as Ph.D. supervisor, Mentor, present Collaborator etc.)
- (vii) The Reviewer/Committee Member is involved in the preparation of the research proposal submitted by the applicant.
- (viii) The applicant has joint research publications with the Reviewer/Committee Member in the last three years.
- (ix) The applicant/Reviewer/Committee Member, in contravention to the accepted norms and ethics followed in scientific research has a direct/indirect financial interest in the outcomes of the proposal.
- (x) The Reviewer/Committee Member stands to gain personally should the submitted proposal be accepted or rejected.

The Term "Relative" for this purpose would be referred in section 6 of Companies Act , 1956.

3. **Regulation:**

The DST shall strive to avoid conflict of interest in its funding mechanisms to the maximum extent possible. Self-regulatory mode is however recommended for stake holders involved in scientific research and research management, on issues pertaining to Conflict of Interest and scientific ethics. Any disclosure pertaining to the same must be made voluntarily by the applicant/Reviewer/Committee Member.

4. **Confidentiality:**

The Reviewers and the Members of the Committee shall safeguard the confidentiality of all discussions and decisions taken during the process and shall refrain from discussing the same with any applicant or a third party, unless the Committee recommends otherwise and records for doing so.

5. **Code of Conduct**

5.1 **To be followed by Reviewers/Committee Members:**

- (a) All reviewers shall submit a conflict of interest statement, declaring the presence or absence of any form of conflict of interest.
- (b) The reviewers shall refrain from evaluating the proposals if the conflict of interest is established or if it is apparent.
- (c) All discussions and decisions pertaining to conflict of interest shall be recorded in the minutes of the meeting.
- (d) The Chairman of the Committee shall decide on all aspects pertaining to conflict of interests.
- (e) The Chairman of the Committee shall request that all members disclose if they have any conflict of interest in the items of the agenda scheduled for discussion.
- (f) The Committee Members shall refrain from participating in the decision making process and leave the room with respect to the specific item where the conflict of interest is established or is apparent.
- (g) If the Chairman himself/herself has conflict of interest, the Committee may choose a Chairman from among the remaining members, and the decision shall be made in consultation with Member Secretary of the Committee.
- (h) It is expected that a Committee member including the Chair-person will not seek funding from a Committee in which he/she is a member. If any member applies for grant, such proposals will be evaluated separately outside the Committee in which he/she is a member.

5.2 To be followed by the Applicant to the Grant/Award:

- (a) The applicant must refrain from suggesting referees with potential Conflict of Interest that may arise due to the factors mentioned in the specifications described above in Point No. 2.
- (b) The applicant may mention the names of individuals to whom the submitted proposal should not be sent for refereeing, clearly indicating the reasons for the same.

5.3 To be followed by the Officers dealing with Programs in DST:

While it is mandatory for the program officers to maintain confidentiality as detailed in point no. 6 above, they should declare, in advance, if they are dealing with grant applications of a relative or family member (including but not limited to spouse, child, sibling, parent) or thesis/ post-doctoral mentor or stands to benefit financially if the applicant proposal is funded. In such cases, DST will allot the grant applications to the other program officer.

6. Sanction for violation

6.1 For a) Reviewers / Committee Members and b) Applicant

Any breach of the code of conduct will invite action as decided by the Committee.

6.2 For Officers dealing with Program in DST

Any breach of the code of conduct will invite action under present provision of CCS (conduct Rules), 1964.

7. **Final Appellate authority:**

Secretary, DST shall be the appellate authority in issues pertaining to conflict of interest and issues concerning the decision making process. The decision of Secretary, DST in these issues shall be final and binding.

8. **Declaration**

I have read the above "Policy on Conflict of Interest" of the DST applicable to the Reviewer/ Committee Member/ Applicant/ DST Scheme or Program Officer # and agree to abide by provisions thereof.

I hereby declare that I have no conflict of interest of any form pertaining to the proposed grant *

I hereby declare that I have conflict of interest of any form pertaining to the proposed grant *

* & # (Tick whichever is applicable)

Name of the Reviewer/ Committee Member or Applicant or DST Officer

(Strike out whichever is not applicable)

(Signature with date)

Endorsement from the Head of Institution

(To be given on letter head)

Project Title :

1. Certified that the Institute welcomes participation of Dr _____ as the Principal Investigator and Dr _____ as the Principal Co-Investigator for the project and that in the unforeseen event of discontinuance by the Principal Investigator, the Principal Co-Investigator will assume the responsibility of the fruitful completion of the project (with due information to DST).

2. Certified that the equipment and other basic facilities as enumerated at Point 16 and such other administrative facilities as per terms and conditions of the grant, will be extended to the investigator(s) throughout the duration of the project.

3. Institute assumes to undertake the financial and other management responsibilities of the project.

Date:

Name and Signature of Head of Institution

Place:

Certificate from the Investigator

Project Title:

1. I/ We agree to abide by the terms and conditions of the DST research grant.
2. I/ We did not submit the project proposal elsewhere for financial support.
3. I/ We have explored and ensured that equipment and basic facilities (enumerated at Point 16) will actually be available as and when required for the purpose of the projects. I/We shall not request financial support under this project, for procurement of these items.
4. I/ We undertake that spare time on permanent equipment made available to other users.
5. I/We have enclosed the following documents uploaded online portal.
 - f) Biodata of all Lead PIs.
 - g) Certificate from Investigator(s)
 - h) Endorsement from the Head of Institution (on letter head)
 - i) Conflict of Interest
 - j) Complete Proposal.(1pdf file and 1Doc file)

Name of PI and Signature

Date:

Place:

2017 BRICS Calls for Proposals for Multilateral R&D Projects

Part-2

SCOPE OF 2017 BRICS CALL FOR PROPOSALS

BRICS STI Framework Programme Coordinated call for BRICS multilateral projects 2017

Call is open until 28th November 2017, 17:00 Moscow Time (UTC+3)

I. General Description

I-1. Joint Funding of Multilateral Research Cooperation

The BRICS STI Framework Programme aims to support excellent research on priority areas which can best be addressed by a multinational approach. The initiative should facilitate cooperation among the researchers and institutions in the consortia which consist of partners from at least three of the BRICS countries.

As part of the initiative the following research funding organizations from the BRICS countries have agreed to jointly establish a new scheme for funding multilateral cooperative activities:

Brazil:

National Council for Scientific and Technological Development (CNPq)

Russia:

Foundation for Assistance to Small Innovative Enterprises (FASIE)

Ministry of Education and Science (MON)

Russian Foundation for Basic Research (RFBR)

India:

Department of Science and Technology (DST)

China:

Ministry of Science and Technology (MOST)

National Natural Science Foundation of China (NSFC)

South Africa:

Department of Science and Technology (DST)

National Research Foundation (NRF)

I-2. Aim of the Joint Call and Thematic areas

Collaborative multilateral basic, applied and innovation research projects in the following thematic areas can be submitted in response to the call:

(a) Prevention and monitoring of natural disasters

Human factors such as globalization, population growth, poverty, urbanization and changes in land use are aggravating the negative consequences of natural hazards. Earthquakes and more frequent and intense extreme weather and climate events are also increasing the risks faced by populations living in vulnerable areas. The losses are increasing in BRICS countries. Repeated exposure to disasters is hampering sustainable development in vulnerable localities. Although we have increased scientific knowledge and technology, we have not yet been successful in anticipating and effectively coping with unprecedented natural hazards. We need to identify potential risks, evaluate system vulnerabilities, take action from lessons learnt from past experiences and improve emergency preparedness and capacities to manage crises. At present, international collaboration in disaster risk reduction is not sufficient.

To reconcile the relationships between development, environmental issues, and improved resilience to disasters, important global decisions were made and came to fruition in 2015, with the Sendai Framework for Disaster Risk Reduction (SFDRR) in March. To end poverty and hunger and make human settlement inclusive, safe, resilient and sustainable, it is essential to strengthen capacity for adaptation to climate change and holistic disaster risk management at all levels. It is first of all important to identify, visualize, and evaluate under-recognized disaster risks that hinder sustainable development by taking a holistic view of the changes in hazards, vulnerabilities and exposures arising from societal and environmental problems. Metrics and indicators should be developed for evaluating vulnerability and resilience. Then, effective measures should be taken to anticipate, prepare for, and reduce the consequent disaster risks. It is equally essential to be able to develop response and recovery countermeasures even in the face of disasters and to build capabilities to make proper decisions for action in a timely manner to protect lives, livelihoods, and communities in order to fully recover from the impact of a disaster. Thus, it is critical to construct societies resilient to disasters by improving understanding of natural and human-made hazards, by developing new technologies for disaster prevention, by constantly raising political and public awareness and by preparing for effective emergency response - including mental and physical health management - and recovery under the concept of "Build Back Better."

To build such resilient societies, scientists and engineers should develop and practice concrete steps to make full use of science and technology with the following two perspectives. The first perspective concerns the promotion of inter-disciplinary research between natural/applied sciences and humanities/social sciences, the former specializing in understanding disaster occurrence mechanisms and design/maintenance of infrastructure and its functions, and the latter in evaluating disaster impact on socio-economic activities and analyzing human perceptions from the viewpoint of behavioral science. The integration of these two domains should be proactively pursued to enhance the disaster reduction capabilities of humankind. The second perspective concerns the promotion of trans-disciplinary cooperation, which enables the social implementation of science and technology for disaster risk reduction, through effective collaboration with Future Earth, to secure sustainable development. Efforts should be made to develop and strengthen a national platform for disaster risk reduction where scientists and practitioners in each country can work closely together

with all relevant stakeholders based on discussions on the actual situations faced by their respective countries in their mother tongues

The priority (thematic) areas addressed in this call for proposals in the BRICS is as follow:

1. Understanding Disaster Risk.

It is critically important to make unflinching efforts for understanding hazards expected to happen and for reducing vulnerability of our infrastructure and society. To make the efforts bear fruit, each country should be supported in

- Collecting and archiving hazard event records and characterizing them with relevant information on land use and socio-economic activities;
- Producing wide-area hazards and its impact data and information with the utilization of satellite observation and numerical modeling;
- Producing reliable disaster statistics will be conducive to allowing each country to make well-informed decision making for disaster risk reduction;
- Improving assessment of disaster risks, monitoring and prediction of changes in disaster risks levels;
- Conducting data integration, analysis and visualization supporting a holistic understanding of disaster processes and consequences;
- Developing new (preferably, fully automated) systems of monitoring and forecasting natural disasters and emergencies.

2. Strengthening Disaster Risk Governance to Manage Disaster Risk.

in order to Strengthen Disaster Risk Governance, Initiatives should provide support in

- How society may curb the increase in disaster vulnerability arising from misguided development activities in land use, construction of infrastructure and housing.
- How individuals, communities and authorities may behave appropriately and be better informed before and during emergencies for protecting their lives, livelihoods and health.

Meanwhile, It is urgent to strengthen international cooperation in the development of monitoring, systems (in situ and from satellite technology), early warning networks and enhanced emergency cooperation during disasters, such as the International Disaster Charter by space agencies. BRICS should also

- Support initiating a forum to discuss practical solutions to reduce disaster risks in line with the Sendai Framework, with all types of stakeholders from all over the world.

(b) Water resources and pollution treatment

Sustainable Water Resources Management and Pollution Treatment are the most important challenges evolved due to ever increasing water stress and water crisis in several regions of the world.

Water is a critical limiting factor for food production and also is pivotal to energy production. It is important to adapt an integrated approach to designing resilient strategies that can account for food, water and energy nexus.

More than 70% of world's freshwater use is in agriculture with increasing dependence on groundwater. The pressure of water scarcity is expected to increase due to new patterns of consumption by an additional three billion middle-class people by 2030 and the predicted global population exceeding nine billion soon after. The intensive use of pesticides and fertilizers, to enhance agricultural yields, impacts water quality through return flows.

Water Resources Management and Water Pollution Treatment thus form the two focal themes that deserve research and demonstration applications.

Water Resources Management includes STI, inter alia: sustainable water resources management and governance, including optimum withdrawal, conservation by large consumers, transboundary pollution issues, securing safe drinking water, sanitation and hygiene (WASH), technologies for sustained use and reuse of water, optimization of water use in energy production, prevention of water-related diseases, evaporation control technologies, monitoring and mitigation of water-related disasters, climate change impacts on water resources, sustainable management of water ecosystems and rejuvenation of water reservoirs and basins; minimize water loss in distribution and transmission, high capacity cost effective desalination and ICT for water resource management and governance.

Water Pollution Treatment includes STI, inter alia: treatment of agricultural return flows, modular treatment systems for treatment of industrial effluents, decentralized systems for treatment of domestic wastewater, storm and urban runoff, chlorine-free water treatment technologies, nanotechnologies for pollution control and treatment, reuse and recycling of water as a resource, control and treatment of emerging pollutants including Persistent Organic Pollutants (POP's), control of marine pollution including oil-spills, marine litter, ballast water treatment and seaport waste treatment systems, sea-land interface, including pollution from land based sources.

(c) New and renewable energy, and energy efficiency

To encourage research institutions, enterprises, universities and other relevant entities from BRICS countries to jointly develop collaboration and demonstration projects on new and renewable energy, energy saving, and energy efficiency. The projects may include the water, energy and food security nexus. The priority topics for this call are:

New and Renewable Energy: Photovoltaic Power Generation and System Application Technology; Power electronics for grid synchronization, High Quality Biomass Energy

Utilization Technology; New Technology for Energy Storage. New nuclear energy technologies for the minimization of long-lived radionuclides production, environmental impact and for nuclear fuel cycle closure.

Energy Efficiency: Development of Accelerated Life Cycle Models for LED Lamps; Development of Solar Powered LED Lighting Systems with Distributed Batteries; Research on the key technologies of coal to clean gaseous fuel and its environmental protection to realize clean and efficient coal utilization. Obtaining of new nuclear data to improve the economic efficiency of nuclear power systems, including accelerator driving system.

(d) Biotechnology and biomedicine including human health and neuroscience

One of the hallmarks of XXI century consists in using biotechnology to develop new materials for medicine, novel therapeutics for personalized medicine, long acting drugs, alternative methods to animal testing for non-clinical trials, and in the development of new standards including telemedicine, healthcare of disabled and aging persons. The biotechnological revolution applied to molecular biology, immunology and neuroscience allows to discover new cancer antigens, genetic predictors of the development of disease based on genetic and epigenetic aspects, new antibody based therapies and vaccines for cancer and infection diseases, and new drugs to combat autoimmune neurodegeneration and aging. The following areas can be highlighted for this BRICS coordinated call:

1. Personalized medicine based on genetic and epigenetics to treat cancer and autoimmune diseases, including autoimmune neurodegeneration. Deep sequencing of T and B cell repertoires.
2. Development of new drugs:
 - Development of new drugs using combinatorial chemistry and biology, design of new antibody- based drugs for cancer and autoimmune diseases. Biotechnology aspects of therapeutic antibody expression and purification. Development of novel genetically engineered antibodies towards different pathological targets.
 - Development of new long-acting drugs based on engineered recombinant proteins. Design of sustained release insulins, cytokines, and hormones.
 - Development of new drugs for neurodegeneration, cognitive dysfunction and aging. Telomerase targeted drugs, small molecules and antibodies to treat Alzheimer disease, Huntington disease, Multiple sclerosis.
 - Drug repurposing, and development of new drugs and vaccines to cure and prevent infectious diseases including AIDS, Hepatitis, Tuberculosis and neglected diseases.

- Antimicrobial resistance. Investigations of new aspects of drug resistance including antibiotics and anti-viral drugs. Computational drug design.

- Development of new drugs to combat neuro. Design of new approaches for optogenetics, bioimaging.

3. Design of genetically engineered protein constructs for targeted delivery of anticancer drugs. Drug delivery and radiotherapy.

4. New materials for regeneration medicine. Tissue engineering and 3D bioprinting. Development of new principles of material design including computer simulations, polymer material design.

5. Alternative methods to animal testing for non-clinical trials for non-clinical trials using “lab-on-chip” principles. Development of new platforms for drug testing on human cell lines. Validation of experiments using proteomic, transcriptomic and metabolomics approaches.

6. Telemedicine for healthcare. Development of new devices for telemetric investigations of different aspects of human life. Construction of special highly mobile medical vehicles for on-site medical help and development of new approaches and standards in the field of telemedicine.

(e) Information technologies and high performance computing

Within all the BRICS member countries the utility of high performance computing (HPC) systems form an integral part of national development strategies and the deployment of HPC infrastructures occupy a central place. Presently China is the global leader in the HPC industry, with the Tianhe-2 supercomputer, having maintained its leadership of the Top 500 for the past three years. Similarly, Russia has invested significantly in building its own HPC industry with the renowned HPC developer T-Platforms, having deployed its systems not only in Russia itself but also in other developed economies in Europe such as Germany. Recently through the National Scientific Computing Laboratory (LNCC) in partnership with Ministry of Science, Technology and Innovation (MCTI) Brazil acquired its first petascale HPC infrastructure, the biggest supercomputer in Latin America, for open use by the academic community. The supercomputer, named *Santos Dumont* places Brazil among the world’s leading group of nations that have HPC capacities. Today, India has 11 supercomputers in the Top 500 and a combined supercomputing power of the nation at 5.25 petaflops. The prevailing view of the Indian government on HPC is that supercomputing must serve not only to improve India’s large expanding corporate industrial base, but the country’s small and medium business sectors as well. To this end, the Department of Science and Technology and the Ministry of Electronic and Information Technology of the Government of India have launched a National Supercomputing Mission with the Indian Institute of Science, Bangalore and Centre for

Development of Advanced Computing (CDAC) as implementing agencies. In South Africa the national government has identified HPC as a critical resource to achieve its objectives of building advanced skills required for the knowledge-based economy and promoting competitive and innovative industries. Through the national Centre for High Performance Computing the country has positioned itself as the leader in HPC on the African continent.

It is clear that within the framework of BRICS there are important opportunities for collaboration in HPC that can be aligned to accelerate the national priorities and goals of BRICS member countries to accelerate scientific discovery and engineering design, minimize the time to create and test new commercial products, lower the cost of innovation and develop high-value innovations that would otherwise be impossible. This call for proposal aims at enhancing HPC driving innovation and interdisciplinary collaboration between BRICS' research organizations through joint development of novel algorithms and software scalable up to exascale computer system for solving grand challenge problems in science, engineering and complex system. The priority topics for this call are:

- Compute in Memory architecture, Silicon Photonics interconnects and development of lightweight Operating Systems, energy efficient computing towards exascale computing
- Development of novel algorithms and HPC software for processing and analysis of big data;
- Development of novel algorithms and HPC software for solving agent-based model with no less than 100 million agents and detailed hierarchical description down to individual status on the basis of physical geographic information system, to predict emerging phenomena of the socio-economic system in BRICS countries;
- Human Capital Development;
- Building Open Source based architecture and tools to enable deployment of HPC systems;
- Open stack developments in Cloud Computing;
- Digital manufacturing (e.g. 3D printing technology for aircraft, ships, nuclear reactors etc.);
- Energy related technology;
- Astronomy, geosciences and environmental engineering; and
- Smart cities.

Under this call for proposals on BRICS HPC cooperation, the following areas are proposed for consideration:

- Human Capital Development for HPC
- Science Data Processing (SDP)
- Development of the HPC industry.

(f) Material science including nanotechnology

The rapid development of five priority directions of science, technology and innovations chosen by the BRICS countries and included in the Moscow Declaration and BRICS science, technology and innovation Work Plan 2015-2018 is impossible without development of such fundamental scientific areas as material science. Creation

and research of new perspective materials determines the development of the existing branches of economy and sometimes even the creation of new industries.

Materials for Power engineering: functional and structural materials for more efficient production, storage and distribution of electric energy; functional materials for alternative (bio, hydrogen, solar, wind and ocean) power, advanced catalysts; functional materials for thermal, hydro and nuclear energy; thermo electrical materials and products for waste energy recovery, new composition materials for power industry; materials for improving the reliability and effectiveness of power supply networks and systems.

Nanostructured materials and products: nanodevices and nano sensors; nanomedicine; synthesis of nano-biomaterials and their characterisation for performance; nanomaterials in batteries, fuel cells, super capacitor and hydrogen generation; nano sensors and their fabrication and incorporation in health diagnostic kits; nano catalysis; nano and advanced coatings; nanocomposites; advanced nano bulk materials with improved properties; functional materials with nanoscale dispersion; advanced nanostructured ferroelectric and related materials, ionic and mixed conductors and biomaterials; new nanostructured materials for sensors and transducers based on multicomponent inorganic crystalline, composite and glassy materials; thin films and phase-change materials for data recording and storage; strongly-correlated and low-dimensional systems.

Magnetic materials: nanostructured magnetically-ordered thin-films and bulk materials with new functional characteristics; new functional materials: multiferroics, helimagnets, magnetic fluids and gels, biocompatible magnetic materials; high-efficiency magnetosensitive medium for physical sensing applications; soft magnetic, hard magnetic, and magnetocaloric materials with desired magnetic structure; exploration of new effects in the dynamics of magnetic domain structures; composite magnetic materials with polymer matrix, etc.

Please note that the thematic areas and type of supported research vary depending on particular participating funding organization. More details can be found in respecting National Annex document (available on <http://brics-sti.org/index.php?p=new/15>) or from national contact points. However, the general information on thematic areas supported by each of the participating funding organization is presented below:

	<i>Thematic areas</i>	Brazil	Russia			India	China		South Africa
		CNPq	FASIE	MON	RFBR	DST	MOST	NSFC	NRF
a	Prevention and monitoring of natural disasters	V	V	V	V	V	V		V
b	Water resources and pollution treatment	V	V	V	V	V		V	V
c	New and renewable energy, and energy efficiency	V	V	V	V	V	V		V
d	Biotechnology and biomedicine including human health and neuroscience	V	V	V	V	V		V	V

e	Information technologies and high performance computing	V	V	V	V	V	V		V
f	Material science including nanotechnology	V	V	V	V	V		V	V

I-3. Invitation of Proposals and Prospective Applicants

The participating funding organizations shall invite researchers from their countries to identify potential partners in at least two other BRICS countries and to jointly prepare proposals for cooperative research projects in the thematic areas of the call.

All applicants must fulfil their respective national eligibility rules for research grant applications (please refer to the National Annex document and consult with national research funding organization participating in the call).

I-4. Financial Support

The participating funding organizations plan to support cooperative activities including exchange of researchers within the participating counterpart countries. Conditions of support will vary by country and respecting national funding organizations' approaches, with a common rule that each participating funding organization funds its national researchers or institutions.

The duration of a cooperative research project will be up to three years with start of projects in 2nd quarter 2018.

II. Application

A joint project will comprise of at least one PI from each of the participating countries, and a project coordinator or the leading PI acting as the project coordinator. Project consortia should consist of partners from at least three of the BRICS countries participating in a specific thematic area of the call.

A **Joint Application Form (JAF)** (link for download: http://brics-sti.org/files/JAF_BRICS_2nd_Call_2017.docx) shall first be submitted by the project coordinator to the Call Secretariat through the online **BRICS STI Framework Programme Application Management System (AMS)** at <https://ams.rfbr.ru/BRICS>. JAF shall be written in English.

In addition to the JAF, each national team of a project **shall submit an additional national component** (i.e. proposal) to the relevant national participating funding organization following all required procedures of each particular organization.

The Joint Application Form includes information on:

- 1) Thematic area;
- 2) Title and acronym of cooperative research project;
- 3) Abstract;
- 4) Proposed period of cooperative research project;
- 5) Research team;
- 6) Budget requested.

The national component to be submitted shall vary in form, terms and information provided depending on the particular participating funding organization. More details can be found in the National Annex document (can be downloaded from <http://brics-sti.org/index.php?p=new/15> page) and on the websites of participating funding organizations.

The project which does not submit in due date a fully completed Joint Application Form to the Call Secretariat through Application Management System (ams.rfbr.ru) or a national components to all respecting national funding organizations will automatically be considered as non-eligible.

II-2. Preparation of Application Forms

Applicants should agree on aims, strategy of research and management, and the title of the project, and agree on the project coordinator. Based on those agreements the applicants should complete the Joint Application Form (JAF) and national component.

II-3. Submission of Application Forms by Applicants

Applicants should submit the Joint Application Form (JAF) to the Call Secretariat through the online application submission form until **17:00 (Moscow Time, UTC+3) on 28th November 2017.**

To submit an application an online-submission form should be completed through the BRICS STI Framework Programme Application Management System (AMS) at <https://ams.rfbr.ru/BRICS>. The project coordinator should register in AMS, log in and create a proposal for the BRICS STI FP Call 2017. Project coordinator must fill in all the required fields, attach completed JAF to the online submission form and submit an application. The online submission form fields are identical to the information provided in JAF, however the completed JAF as attachment to the online form must be provided (should be uploaded in the respecting section of online submission form).

Applications submitted to the Call Secretariat by any method other than through online submission form at <https://ams.rfbr.ru/BRICS>, such as post, fax or telex will be rejected.

An additional national component should be submitted to the respective national funding organization according to its own rules and procedures.

II-4. Receipt of Application Forms by Call Secretariat

Following the online submission of an application, the respecting confirmation message with proposal registration number will be shown in confirmation message. On “my projects” page in AMS the project thereafter will be shown with assigned registration number and status “registered”.

III. Evaluation of Project Proposals

III-1. Evaluation Procedure

Each participating funding organization evaluates all proposals where researchers from its own country request funding from their respective funding organization. Based on the results of the evaluation, a joint decision by the participating funding organizations will be made regarding the selected proposals to be co-funded.

III-2. Evaluation Criteria

The following general evaluation criteria will be considered:

- Scientific quality and innovation of the joint research plan
- Sound project management, methodological approach, feasibility and appropriateness of the joint research plan
- Added value to be expected from the research collaboration
- Balanced cooperation
- Competence and expertise of teams and complementarities of consortium (interdisciplinary / all necessary expertise)
- Appropriateness of resources and funding requested
- Expected impacts: e.g. scientific, technological, economic, societal
- Opportunities for early career researchers
- To encourage the participation and joint research by the business sector.

III-3. Announcement of Decision

Applicants will be notified of the final decision by November 2018 regarding the

approved joint projects for funding.

IV. Responsibilities of the PI following Approval of Projects

After the proposals have been approved, the PI and his/her own affiliated institution will observe the following when carrying out the cooperative research and utilising funding:

IV-1. Progress Report

IV-1.1 Progress Report to the BRICS STI Funding Working Group

Halfway through the research period (i.e. after one and a half years), the leading PI shall promptly develop and submit an integrated progress report to the Call Secretariat on the status of the joint research. The report will be reviewed by the BRICS STI Funding Working Group.

IV-1.2 Progress Report to each participating funding organization

All researchers must follow their own funding organizations' rules and procedures.

IV-2. Final Report

IV-2.1 Final Report to the BRICS STI Funding Working Group

After completion of the period of joint research, the project coordinator shall develop and submit within one month an integrated final report to the Call Secretariat on the results of the joint research. The report will be reviewed by the BRICS STI Funding Working Group.

IV-2.2 Final Report to each participating funding organization

All researchers must follow their own funding organizations' rules and procedures.



BRICS STI Framework Programme– Joint Call Secretariat

<http://brics-sti.org/>

Contact person:

Mr. Yaroslav Sorokotyaga

Russian Foundation for Basic Research

E-mail: brics@rfbr.ru

tel: +7 499 941 0196

V. National Contact Points

Applicants should contact the following national contact points for information on each Party's national eligibility rules or support conditions:

Brazil:

National Council for Scientific and Technological Development (CNPq)



Lelio Fellows Filho

General Coordinator of International Cooperation
National Council for Scientific and Technological
Development - CNPq
Tel: +55-61-3211-9247
E-mail: leliof@cnpq.br

Russia:

Foundation for Assistance to Small Innovative Enterprises (FASIE)



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Foundation for Assistance to Small Innovative Enterprises

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Department of Science and Technology (DST)



Department of Science & Technology
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