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Ministry of Science & Technology  
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National  
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जैव प्रौद्योगिकी विभाग  
Department of Biotechnology  
Ministry of Science & Technology  
Government of India



中华人民共和国科学技术部  
Ministry of Science and Technology of the People's Republic of China



## BRICS STI Framework Programme 6<sup>th</sup> coordinated call for BRICS multilateral projects 2023 “Climate Change Adaptation and Mitigation”

*Call is open until November 1, 2023. 15:00 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 call for multilateral research projects:

#### Brazil:

National Council for Scientific and Technological Development (CNPq)

#### Russia:

Ministry of Science and Higher Education (MSHE)

#### India:

Department of Biotechnology (DBT)

Department of Science and Technology (DST)

#### China:

Ministry of Science and Technology (MOST)

National Natural Science Foundation of China (NSFC)

#### South Africa:

National Research Foundation (NRF)

Water Research Commission (WRC)

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

Climate change has been recognised as the single most important threat to the future well-being and prosperity of our planet and all who inhabit it. Climate change impact ecosystems and societies, and continue to intensify with further warming. Biodiversity loss caused by climate change affects food and water security and increases the incidence of disease and natural disasters. This increases human conflict, displacement and health impacts, including loss of life. Economies are also impacted, as countries struggle with the increased costs of health care, damage to infrastructure and the costs of adaptation measures. Costs related to climate change are increasing annually.

Much of the research to date has focused on countries and regions in the Global North, where there are greater resources to invest in research and development of technologies to mitigate or adapt to the effects of climate change. Conversely, low- and middle-income countries, having contributed proportionally less to the emissions causing global warming, are disproportionately affected by climate change. In these countries, the impact is severe, affecting livelihoods, leading to increased poverty and intensifying vulnerabilities. More research and in-situ capacity development are needed on contextually and culturally appropriate strategies and interventions for effective mitigation and adaptation in populations most affected by climate change due to their geographic, social and/or economic circumstances. Without a critical pairing of scientific knowledge creation and capacity development, such vulnerable groups will be at even greater risk from the impacts of climate change, including future weather events.

Further to this, climate change has been a featured topic in most of the BRICS summit statements since the first BRICS summit in 2009. In declarations of various years, the BRICS leaders referred to climate change as “one of the greatest challenges and threats towards achieving sustainable development” and confirmed their countries’ full commitment to playing their role in the global fight against climate change. Among the key objectives in this area, the declarations highlighted the promotion of green development and low-carbon economy; an increased use of renewable energy sources, and in particular biofuels; mitigation of the negative impact of climate change on food security and the adaptation of agriculture to climate change. Adaptation of agriculture to climate change was named among five priority areas that contribute to stable global agricultural growth and achievement of the United Nations Sustainable Development Goals. In this connection, the 10th BRICS Summit of 2018 (Johannesburg Declaration) reaffirmed the parties’ commitment to strengthening the agricultural research collaborative networks among the BRICS countries to enhance the resilience of the collective agricultural and food systems in the face of the changing climate.

BRICS support for research in Climate Change Adaptation and Mitigation is required to

further the design and implementation of co-produced adaptation and mitigation strategies for vulnerable groups—those groups currently most impacted by the effects of climate change (i.e. for both physical and socio-economic vulnerability). Developing strategies to improve resilience to climate change requires an interdisciplinary approach, including the natural sciences, engineering, health sciences, agricultural sciences, social sciences, and humanities; enabled technologies, including nanotechnology (in food, environment and bio-based nano-fertilisers), advanced materials, photonic and advanced digital technologies; and across sectors, including academia, government, non-profit organisations, civil society, and private industry. Co-development of research and solutions in partnership with the affected groups, enabling collaborative experiential learning and capacity development, is essential for long-term success. To ensure impactful research, collaborative multilateral basic, applied or innovation research projects must directly address at least one of the following key risks:

**1. Building Resilience: local scale adaptation and adaptive response at catchment scale** - Research should focus on improving our understanding of the connectivity between land, water, atmosphere and people and the contribution to climate change. The impact of any change in the environment has an impact on each ecological factor and should be assessed to be able to quantify the risks and assess vulnerabilities, and develop appropriate responses and contribute to disaster preparedness. The focus should be on mainstreaming catchment and site-specific responses, adaptive management, and local scale planning to incorporate climate-resilient approaches, as well as other solutions based on enabling and disruptive technologies. This entails addressing practical adaptation options with a focus on catchment, municipal and national scales. Whist, translating the findings of research to aid operational response/local scale adaptation through mainstreaming adaptive actions to enhance resilience and response to the overall impacts of climate change. Research should also be prioritized to support actions that will encourage resilience of the water sector at a practical scale which advances proactive planning so that climate induced disasters are dealt with through a well capacitated disaster preparedness programme which contributes to water security despite the changing climate. Coordinated subsector and systematic adaptation programmes will culminate into an improved national adaptation capacity supported through evidence-based research.

**2. Earth Observation Technology-based assessment of the impacts and consequences of climate change** – remote monitoring and calculation of carbon balance in natural and anthropogenic ecosystems using field data, drones, satellites, new types of sensors, advanced digital methods, advanced materials, nanotechnology and photonic. Near real-time monitoring and the ability to use satellite data, like Synthetic Aperture Radar (SAR) for example is critical for disaster relief efforts and management of disaster response

by playing a vital role in assessing the impacts and consequences of Global Change (including climate change). Similarly, being able to monitor soil moisture, water levels and changes over time gives a good indication of how likely flood and drought risks are to occur and therefore serves as a foundation for most early warning systems. It is equally important to combine this with detailed weather predictions to understand the likelihood and expected level of extreme events in order to understand the magnitude of risk and be well-informed for disaster preparedness. The ability to provide rapid mapping of areas affected by disasters is also critical for safety of life and rescue operations. It allows relief efforts on the ground to be targeted, routes through affected areas to be identified and help to be directed to areas which most need it. Flood risk maps may also be produced, showing potential economic losses and the spatial distribution of damage potential, and historical mapping of flood events hence change detection techniques can be used to detect flood risk areas. These extreme events are now exacerbated by climate change and earth observation technologies are critically important in this regard.

**3. Systematic response – Using WEF (water, energy, food) nexus approach for a cross-sectoral management of climate change** - Water, energy and food are essential for human well-being, poverty reduction and sustainable development. Future projections suggest that the demand for freshwater, energy and food will rise due to demographic changes, economic development and international trade. Climate change puts additional stress on water availability and quality, while it causes accelerated extreme events (floods /droughts) that have severe socioeconomic and environmental consequences. Actions to mitigate and adapt to climate change and variability can have strong implications for the surface and ground water system and its users. Submarine groundwater discharge (SGD), or groundwater that discharges to the coastal ocean, has long been recognized as both a critical resource to coastal ecosystems as well as a vector for pollutants to reach the coastal ocean. Changes in energy usage and types of energy production (for example, fossil fuels replaced by hydropower, biofuels or green energy) affect water usage and impact agricultural production and in this regard, energy storage technologies, renewable energy options, the potential of the sustainable bio-economy and of the enabling technologies most applicable to partner contexts could be explored. The resulting conflicts in the allocation of water and between the water, energy, and food sectors, cause additional concerns for the sustainable management of surface and groundwater bodies, especially the transboundary ones, where a very large proportion of the world's population lives. Addressing the strong nexus between water, climate, energy and food is essential to reduce climate change consequences by turning climate and environmental challenges into opportunities across different sectors. Water is a key element in all these actions. As part of a drive for further innovation within the WEF, specifically sustainable food production, regenerative production systems can be explored through collaborative approaches by

partners. A climate-water-energy-food nexus will help to address these complex and interlinked challenges, such as energy transition, bioeconomy, decarbonisation of the economy, water pollution (wastewater treatment), food security (resilient plant development) and health sovereignty, by exploiting available synergies across all spheres and promoting positive trade-offs between different sectors.

**4. Risks to low-lying coastal socio-ecological systems** – risks to natural coastal protection and habitats; lives, livelihoods, culture, heritage and well-being; and critical physical infrastructure in low-lying coastal areas, associated with a wide range of hazards, including sea level changes, ocean warming and acidification, weather extremes, sea ice loss, and permafrost thaw. Better science communication among the concerned stakeholders to create a general awareness in the Climate Change sciences would largely help in optimizing the anthropogenic activities and safeguard their lives from the impacts of climate change.

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**Please note that the thematic areas and type of supported research vary depending on the particular participating funding organization.** More details can be found in respecting National Annex document (available on <http://brics-sti.org/index.php?p=new/35>) 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	MSHE	DBT	DST	MOST	NSFC	NRF	WRC
1	Building Resilience: local scale adaptation and adaptive response at catchment scale	V	V	-	V	V	V	V	V
2	Earth Observation Technology-based assessment of the impacts and consequences of climate change	V	V	-	V	V	V	V	V
3	Systematic response – Using WEF (water, energy, food) nexus approach for a cross-sectoral management of climate change	V	V	V	V	V	V	V	V
4	Risks to low-lying coastal socio-ecological systems	V	V	-	V	V	V	V	V

### I-2. Invitation for Proposals and Prospective Applicants

The BRICS STI FP participating funding organizations shall invite applicants from their countries to identify potential partners in at least two other BRICS countries and to jointly prepare proposals for collaborative R&D projects in the four 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-3. Financial Support

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

The duration of a collaborative research project will be three years with expected start date of projects in 2<sup>nd</sup> quarter of 2024.

## II. Application

A joint project will comprise of at least one Principal Investigator (PI) from each of the participating countries (please also refer to national annexes for additional requirements), with one of the project participants also acting as a Project Coordinator (or lead PI). Project consortia should consist of partners from at least three of the BRICS countries participating in a specific thematic area of the call and applying for funding.

A **Joint Application Form (JAF)** (link for download: [http://brics-sti.org/files/JAF BRICS Call 2023.docx](http://brics-sti.org/files/JAF_BRICS_Call_2023.docx)) shall first be submitted by the Project Coordinator to the Call Secretariat through the online **BRICS STI Framework Programme Application Management System (BRICS AMS)** at <http://ams.fbr.ru/BRICS>. JAF must be completed 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 participating funding organization.

The Joint Application Form includes information on:

- 1) Thematic area;
- 2) Title and acronym of cooperative research project;
- 3) Abstract;
- 4) Research team;
- 5) 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/35> 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 national components to all respecting national funding organizations will automatically be considered as ineligible.**

#### II-2. Preparation of Application Forms

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

#### II-3. Submission of Application Forms by Applicants

Applicants must submit the Joint Application Form (JAF) to the Call Secretariat via the online application submission tool until **15:00 (Moscow Time, UTC+3) on 1<sup>st</sup> of November 2023.**

To submit the JAF an online-submission form must be completed via the BRICS STI Framework Programme Application Management System (BRICS AMS) at <http://ams.rfbr.ru/BRICS>. The project coordinator should register in BRICS AMS, log in and create a proposal for the 6<sup>th</sup> BRICS STI FP Call 2023. The Project Coordinator must fill in all the required fields and submit an application. The online submission form fields are identical to the information provided in JAF, however the completed JAF as file attachment to the online form should be uploaded in the “upload file” section of online submission form.

Additional partner(s) to the minimum eligible number of required participants is allowed to join a project at their own costs. If any additional partner is joining the project on own costs,

requested funding amount should be stated as “0” in the corresponding proposal box item.

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

**An additional national component should be submitted to the respective national funding organization according to its own rules and procedures. Please note that submission deadline for national component vary from the deadline for JAF submission to the Call Secretariat.**

#### 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 BRICS AMS the project thereafter will be shown with assigned registration number BRICS2023-XXX (where XXX stands for unique number) and status “Registered”. No additional letter of confirmation will be provided to the applicant. An assigned registration number serves as proof of application registration.

#### II-5. Retraction of submitted application

At any time after online submission of an application before the due date, an applicant can retract the application for modification on “my projects” page in BRICS AMS. Following retraction action an application is considered as “not submitted”. Re-submission of the application is only possible until the call deadline (15:00 (Moscow Time, UTC+3) on 1<sup>st</sup> of November 2023).

### **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 (please also refer to national call

announcements information on national component):

- 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 in second quarter 2024 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 are required to adhere to the following when carrying out the cooperative research and utilising funding:

### IV-1. Progress Report

#### *Progress Report to each participating funding organization*

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

### IV-2. Final Report

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

After completion of the period of joint research, the project coordinator shall complete and submit within three months 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/>

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Russian Foundation for Basic Research

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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:**

#### ***Ministry of Science and Higher Education (MSHE)***



#### **Ms. Albina Kutuzova**

Phone: +7 495 629 73 32  
E-mail: kutuzovaaa@minobrnauki.gov.ru

#### **Ms. Anastasia Zadorina (ICISTE)**

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## **India:**

### ***Department of Biotechnology (DBT)***



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## **China:**

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