



Department of Science & Technology
Government of India



Department of Biotechnology
Government of India



IC-IMPACTS Centres of Excellence,
Canada

COLLABORATIVE RESEARCH PROJECT PROPOSAL

India-Canada Joint Call for Proposals (CFP) 2022

On

BUILDING RESILIENT AND CARBON-NEUTRAL COMMUNITIES POST COVID

Extended Deadline: September 14, 2022 (5:00 PM IST)

The impact of COVID-19 has been felt disproportionately by remote and rural communities which prior to the pandemic had limited access to reliable infrastructure, secure food supplies, clean water and access to health facilities. As we enter the post COVID era, supply chains have become stressed, there is a back log of patients waiting for routine procedures and our food supplies have become less secure.

Another serious problem the world faces today is Climate Change. Warmer temperatures over time are changing weather patterns and disrupting the usual balance of nature. This poses many risks to human beings and all other forms of life on Earth. Nearly all land areas are seeing more hot days and heat waves; 2021 was one of the hottest years on record. Higher temperatures increase heat-related illnesses and can make it more difficult to work and move around. Wildfires start more easily and spread more rapidly when conditions are hotter. Scientists have further predicted that long-term effects of climate change will include a decrease in sea ice and an increase in permafrost thawing, an increase in heat waves and heavy precipitation, and decreased water resources in semi-arid regions.

In 2021, climate change triggered serious flooding, leading to the collapse of eight arterial bridges in British Columbia, Canada, due to landslides and scour, and submerged thousands of homes and debilitated remote communities. In the scenarios assessed, limiting warming to around 1.5°C requires global greenhouse gas emissions to peak before 2025 at the latest, and be reduced by 43% by 2030; at the same time, methane would also need to be reduced by about a third. Humanity faces an existential crisis.

India and Canada have continuously worked in partnership with researchers of both the sides to develop and deploy low-cost solutions to support healthy communities. In this Joint Call for Proposals, DST, DBT from India and IC-IMPACTS from Canada are seeking joint applications aimed at addressing the issues faced by remote and rural communities in the post COVID world. The following 4 areas are proposed under this Joint Call:

A. Agritech and Food Security (DBT and IC-IMPACTS)



Department of Science & Technology
Government of India



Department of Biotechnology
Government of India



IC-IMPACTS Centres of Excellence,
Canada

COLLABORATIVE RESEARCH PROJECT PROPOSAL

Health, food, and nutrition have been the major focus in the post COVID-19 scenario. A need to develop an ecosystem of a resilient food supply with adequate nutritional security for the world community is greatly realized. Exploiting the large pool of less explored and underutilized crops may provide both food and nutritional security. Research in the direction of producing future climate-resilient crops will further provide an impetus to the mission of achieving global food security.

With the advent of newer agritech approaches, global health problems can be addressed by propagating high valued medicinal plants and their utilization for a healthy society and boosting the global bio-economy. Projects are invited in the following areas:

1. **Climate Adaptation:** Deciphering strategies for developing climate resilient crops for food security.
2. **Nutritional Security:** Explore nutritional rich forgotten and underexplored crops and their utilization for global nutritional security.
3. **Smart Agriculture:** Technology-driven approaches for the propagation of high-valued medicinal plants for health and economic dividends.

B. Carbon Reduction in Our Built Environment (DST and IC-IMPACTS)

Canada wants to be carbon-neutral by 2050 and India by 2070. Creating the thriving and resilient post-COVID communities of the future requires developing technologies that enable us to dramatically reduce the embedded carbon and operational emissions from our civil infrastructure and buildings. These emissions currently amount to around 39% of total emissions, and we need:

- A 40% reduction in embodied carbon as soon as possible for all new buildings, infrastructure, and major renovations, and 65% by 2030.
- For existing buildings – a 65% reduction by 2030 in operational carbon emissions.
- Zero carbon emissions for the entire built environment by 2050.

Projects are invited in the following areas:

1. **Circular Economy and Wealth from Waste:** Recycling waste products from energy, steel and other industries into construction materials and building systems.
2. **Advanced and Additive Manufacturing:** 3D-printed structures in steel, polymers, ceramic and concrete that are carbon-neutral.
3. **Carbon Capture, Utilization and Storage:** Using captured carbon into building products and developing resilient storage facilities.
4. **Power Generation Systems:**



Department of Science & Technology
Government of India



Department of Biotechnology
Government of India



IC-IMPACTS Centres of Excellence,
Canada

COLLABORATIVE RESEARCH PROJECT PROPOSAL

- a. Sustainable and durable design/construction/development of new infrastructure of renewable energy options.
 - b. Evaluation, monitoring, maintenance, refurbishment, and life extension of existing facilities, structures, and systems.
5. **Smart Systems, Cyber-Physical Networks, Sensors, & AI:** Design, construction, evaluation, monitoring and maintenance of smart, low energy and low carbon structures including buildings using advanced sensors and digital technologies.

C. Water (DST and IC-IMPACTS)

The UN Sustainable Development Goal (SDG) 6, is to ensure the availability and sustainable management of water and sanitation for all by 2030. The COVID-19 pandemic and the critical role of proper sanitation have heightened the need for urgent measures by all countries and the international community to make clean water accessible to all communities for drinking and sanitation purposes. In order to build climate resilient communities in the post COVID-19 era and to move to a green and resilient society, we welcome projects in the following areas:

1. **Drinking Water in Remote and Rural Communities:** Climate-neutral technologies for water purification systems.
2. **Circular Economy and Wealth from Wastewater:** (i) Strategies and solutions for potable and non-potable wastewater re-use (ii) Climate-neutral technologies for nutrient recovery; (iii) Aqua mining technologies for rare earth elements (REEs) recovery; (iv) Hydrophytobial mining technologies using wetland plants and their associated microbes; (v) Valorization of extracted resources to versatile and high value chemicals.
3. **Wastewater-based epidemiology:** (i) Genomic and sensor technologies for monitoring water quality; (ii) Epidemiological models using artificial intelligence algorithms for monitoring and surveillance of infectious diseases including COVID-19, Malaria, Dengue and Zika, among others.
4. **Impacts of climate change on water availability and quality:** (i) Artificial intelligence and deep learning for predicting the impacts on water availability and quality; (ii) adaptation and mitigation and resilience strategies.

D. Health, Post COVID Health Issues and Long COVID (DBT and IC-IMPACTS)

Long COVID is a complex issue which affects multiple organs and systems in the body and is still not well understood. Symptoms can last from 4 weeks up to over a year and can affect over 10% of patients recovering from COVID. Symptoms typically fall into two clusters. The tiredness cluster where patients experience muscle aches, shortness of breath and difficulty in sleeping and the respiratory cluster where symptoms include shortness of breath and chest pain. These issues are exacerbated in patients with underlying health conditions when they contract COVID. We welcome project addressing the following issues:



Department of Science & Technology
Government of India



Department of Biotechnology
Government of India



IC-IMPACTS Centres of Excellence,
Canada

COLLABORATIVE RESEARCH PROJECT PROPOSAL

1. **Managing Long COVID:** Technologies and infrastructure to support patients with suffering for the effects of Long COVID, such as systemic inflammation and progressive scarring of the lungs. Solutions which can provide portable oxygen generation and remote health monitoring.
2. **Co-Morbidities:** Technologies which can support patients with co morbidities such as those suffering from combinations of diabetes and long COVID, heart disease and long COVID.
3. **New Variants of COVID:** New, and reconfigurable testing solutions which can accurately identify different variants of COVID. In particular, technologies which can be rapidly expanded to detect new infectious diseases.

Implementing Agencies for this Call for Proposals

- **The Department of Science and Technology (DST)**, Ministry of Science and Technology, Government of India, was established with the objective of promoting new areas of science and technology and to play the role of a nodal department for organizing, coordinating and promoting these activities in India. The department is mandated to formulate policy statements and guidelines and to support basic and applied research in national institutions.
- **The Department of Biotechnology (DBT)**, Ministry of Science and Technology, Government of India, was established with the objective of attaining new heights in biotechnology research, shaping biotechnology into a premier precision tool of the future for creation of wealth and ensuring social justice – specially for the welfare of the poor.
- **IC-IMPACTS Centres of Excellence** is a not-for-profit organization, established by the Federal Government of Canada through the Networks of Centres of Excellence Program to serve as a pan-Canadian agency responsible for the delivery of research programs in the areas of safe and sustainable infrastructure, integrated water management, and public health, disease prevention, and treatment between Canada and India. It is the only Networks of Centres of Excellence (NCE) with a mandate focused on research collaborations between Canada and India.

Contents

- Important Dates
- Eligibility
- Intellectual Property
- Project Timeline and Budget Parameters
- Application Instructions
- Merit Evaluation Criteria and Deliverables



Department of Science & Technology
Government of India



Department of Biotechnology
Government of India



IC-IMPACTS Centres of Excellence,
Canada

COLLABORATIVE RESEARCH PROJECT PROPOSAL

- Review Process for Evaluation of Applications
- Contact information

Important Dates

- Launch of CFP on IC-IMPACTS, DBT and DST websites: **July 15, 2022**
- Deadline to submit Full Application: **August 31, 2022 (5:30 PM IST)**
- **Extended Deadline: September 14, 2022 (5:00 PM IST)**
- Review and evaluation: **September, 2022**
- Announcement of final result: **October 2022**

Eligibility

- Each application must list one Principal Investigator along with one Co-Principal Investigator in India and one in Canada with additional team members listed as collaborators. There is no limit to the number of collaborators. Industry cannot be the partner under this Call.
- **All Indian faculty** normally eligible to apply for DST/DBT funding opportunities are eligible to apply as Principal Investigators with at least one eligible faculty from Canada listed as co-Principal Investigator. Please check eligibility against Indian funding organization guidelines.
- Please follow **DBT guidelines (Annexure I)** for submitting the proposals under Agriculture and Health (for Point A and D of proposed areas under this Joint Call. The Projects should have industrial perspective and participation from both Indian and Canadian companies is strongly encouraged. However, no financial support would be given to the Industries by Indian/Canadian side. Only the Academic Institutions would receive funding under this call.
Please follow **DST guidelines (Annexure II)** and application format for submitting the proposals under Carbon Reduction and Water (for Point B and C) of proposed areas under this Joint Call. The guidelines and application format may be seen at www.dst.gov.in / www.onlinedst.gov.in.
- **All Canadian faculty** eligible to receive funding from IC-IMPACTS and Tri-Council agencies (NSERC, CIHR, SSHRC) are eligible to apply as Principal Investigators with at least one eligible faculty from India listed as co-Principal Investigator.
- The proposals should only be led by faculty members who are eligible to receive funding, as indicated above. NGOs, or Not-for-profit organizations may be listed as collaborators but are not considered as eligible Principal Investigators and will not receive funding.
- Project utilizing a technology at Technology Readiness Level (TRL) 2 or above will be prioritized for funding; the technology concept and/or application must be formulated and the potential application validated.
- For higher TRL projects, for scaling of solutions and eventual commercialization, the Canadian agencies prefer to see industrial involvement in terms of cash and/or in-kind



Department of Science & Technology
Government of India



Department of Biotechnology
Government of India



IC-IMPACTS Centres of Excellence,
Canada

COLLABORATIVE RESEARCH PROJECT PROPOSAL

contributions. Such collaboration can be evidenced in the form of a support letter from the partner company/companies. Industrial involvement is not required from the Indian side.

Intellectual Property

DST/DBT and IC-IMPACTS funded participants to the projects shall agree upon the ownership, access rights and exploitation of the intellectual property generated during the cooperation. The agreements shall be made in writing. The guidelines of the funding organizations should be followed when making the agreements. At a minimum, a letter of intent between the collaborators should be included in the application stating the desire for cooperation and acknowledging that each participant has understood the general terms and conditions of the other project parties.

Project Timeline and Budget Parameters/Amount

We seek innovative proposals with a maximum duration of **24 months**. The budget will cover:

- Training of HQP, direct cost of research, reasonable equipment, laboratory consumables and travel costs for both dissemination and deployment of research results in partner communities.
- **Consumables, Accessories, Fellowships and Other Research Expenses:** Expenditure by project team in their country would be borne by the respective country, i.e., DST/DBT would support expenditure on Indian side of the project whereas IC-IMPACTS would meet the expenditure of Canadian side.
- **Support for Exchange Visit Component:** The sending side would provide international airfare (to and from), visa fee, medical insurance etc. During exchange visits of both sides, hospitality of counterpart (such as accommodation, local travel, per diem, etc.) would be taken care by the host country.
- **Consumables:** A maximum of 40% of the Indian side's budget may be allowed for consumables.
- **Institutional Overhead:** For Indian PI, as per DST/DBT norms. For Canadian faculty, there is no overhead charged to Tri-Council funding.
- Canadian PIs may request a budget of up to approximately \$100,000 CAD to fund projects for a maximum of 24 months.
- For DBT submissions, please refer to DBT Guidelines (Annexure I)
- For DST submissions, please refer to DST Guidelines (Annexure II). The guidelines and application format may be seen at www.dst.gov.in / www.onlinedst.gov.in

Application Instructions



Department of Science & Technology
Government of India



Department of Biotechnology
Government of India



IC-IMPACTS Centres of Excellence,
Canada

COLLABORATIVE RESEARCH PROJECT PROPOSAL

Each application should be submitted to **both** the Canadian funding agency (IC-IMPACTS) as well as the Indian funding agency (DST or DBT). Please note following important application instructions:

- Applications in the area of **Water and Carbon reduction would be submitted to DST** as well as IC-IMPACTS.
- Applications in the area of **Agritech, food security, Health care and post COVID issues would be submitted to DBT** as well as IC-IMPACTS.
- Research projects of two (2) years in duration are eligible for funding.
- Funding beyond the first year of the project will be contingent upon successful progress being made in the previous year as determined by the review processes in place by each funding organization.
- Each project application must consist of an Indian and Canadian applicant (Principal Investigators) who together have developed a joint project proposal and project budget.
- For a DST submission, the Indian researchers can download the proposal formats from websites www.dst.gov.in / www.onlinedst.gov.in and should submit completed application form and all relevant information through e-PMS portal of the DST. Proposals must be submitted to DST through the e-application system provided at <https://onlinedst.gov.in>. Indian Applicants also requested to send one hard copy to DST through proper channel. It should be ensured that application with identical title has been submitted by his/ her Canadian counterpart to IC-IMPACTS by due date. **Proposal not submitted through ePMS portal by due date will not be considered.**
- For a DBT submission, the joint project proposal must be submitted online *via* <https://dbtindia.gov.in> along with all supporting documentation required by the funding organization. All documents and forms required for the application are accessible online. Please refer Annexure I for submission of proposal.
- The budget documentation must clearly delineate funding being requested from DST/DBT in support of Indian researcher participation and funding being requested from IC-IMPACTS for Canadian research participation.
- Applicants are encouraged to contact their respective funding organization before submitting their applications if they have any questions regarding the Call for Proposal or budget eligibility.
- Canadian PIs are requested to consult the IC-IMPACTS website for any additional information.
- Any shortcomings in the proposal or non-submission through the concerned official portal of the organization selected for the thematic areas will be liable to the PI. No organization will be responsible for these shortcomings.

Merit Evaluation Criteria and Deliverables



Department of Science & Technology
Government of India



Department of Biotechnology
Government of India



IC-IMPACTS Centres of Excellence,
Canada

COLLABORATIVE RESEARCH PROJECT PROPOSAL

Projects funded in this Joint Call are expected to be of a high international standard that will lead to a technology or solution directly impacting the lives of Indian and Canadian citizens. India-Canada joint projects must be based on meaningful engagement, include a common project plan, and involve at least one researcher from Canada and one researcher from India. Student and HQP (High Quality Professional) training is a mandatory component of all funded projects.

We support research excellence and therefore contributions to research, training and mentoring are considered and valued as part of the merit review process, with a focus on the quality and impact of these contributions. Applications must address all of the following criteria in order to be considered for funding:

- Quality of the proposal and research findings, including significance and originality;
- Relevance and outcomes, including benefit to society;
- Impact on HQP, including participation, skills acquisition, and employment;
- Knowledge transfer, exchange, and dissemination;
- Partnership and international collaborations;
- Participation of under-represented groups;
- Applicants should submit a Letter of Support from partner organizations with details of potential funding commitment; and a consent letter from their parent Institute.
- Expected results, outcomes and appropriateness of budget strategy to achieve them.

Review Process for Evaluation of Applications

- All applications will be handled in the strictest of confidence.
- A Joint Review Committee comprised of representatives and independent external reviewers from India and Canada will thoroughly examine the proposals and reach consensus within the overall budget framework of the two contributing organizations about which projects should be funded.
- Once a consensual decision has been reached on projects to be jointly funded by DST/DBT and IC-IMPACTS, will follow their organization's normal processes and norms to notify applicants about their funding decisions.
- DST/DBT and IC-IMPACTS may consider inviting Project coordinators for presentation of the proposed work as part of the review process. Applications must attain a positive rating to be considered eligible for funding. Joint selection of successful applications by DST/DBT and IC-IMPACTS will be discussed by the respective nodal agencies and informed by the rankings.
- Decisions made by the India-Canada Joint Review Committee will be final.



Department of Science & Technology
Government of India



Department of Biotechnology
Government of India



IC-IMPACTS Centres of Excellence,
Canada

COLLABORATIVE RESEARCH PROJECT PROPOSAL



Department of Science & Technology
Government of India



Department of Biotechnology
Government of India



IC-IMPACTS Centres of Excellence,
Canada

COLLABORATIVE RESEARCH PROJECT PROPOSAL

Contact Information

For any questions regarding this funding opportunity, please contact:

Department of Science and Technology (DST)

Dr. Charu Agarwal

Scientist 'C'

International Cooperation Division

Department of Science and Technology

c.agarwal@gov.in

Department of Biotechnology (DBT)

Dr. Vinita Nitin Chaudhary

Scientist 'E'

International Cooperation Division-Bilateral Programs

Department of Biotechnology

vinita.chaudhary@nic.in

IC-IMPACTS

Ms. Ferya Moayedi

Manager of Operations

IC-IMPACTS

info@ic-impacts.com