



Agency for
Science, Technology
and Research

SINGAPORE FOOD STORY (SFS) R&D PROGRAMME

1ST GRANT CALL (THEME 1: SUSTAINABLE URBAN FOOD PRODUCTION)

CALL FOR PROPOSALS - INFOSHEET

SFS R&D Programme Office (SFA):

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1. BACKGROUND

- 1.1. Singapore imports more than 90% of its food today, and is vulnerable to global trends that impact food supply and safety, such as climate change, urbanisation, growing complexity of food systems, and new business models and food products.
- 1.2. To ensure food security for Singapore, the Singapore Food Agency (SFA) adopts three broad strategies, called the 3 Food Baskets: Diversify import sources, Grow local, and Grow overseas. The ‘Grow local’ basket helps to mitigate Singapore’s reliance on imports and serve as a buffer during supply disruptions to import sources.
- 1.3. As part of the ‘Grow local’ basket, SFA has set an ambitious **‘30 by 30’ goal, to raise local production from less than 10% today, to meet 30%¹ of Singapore’s nutritional needs locally by 2030**. This multi-fold increase will have to be achieved with less than 1% of our land that is set aside for agriculture food production. Constrained by limited land and resources (water, energy, labour), we will have to ‘grow more with less, sustainably’. Harnessing highly productive, climate-resilient and resource-efficient technologies through innovation is key to this effort.
- 1.4. To turn food challenges into advantages, SFA and the Agency for Science, Technology and Research (A*STAR) have jointly developed the **Singapore Food Story R&D Programme**, to build a strong base of R&D capabilities in local research institutions in partnership with the industry, and undertake cross-domain research in emerging areas of the agri-food space. It focuses on three R&D Themes:
 - a) Sustainable Urban Food Production;
 - b) Future Foods: Advanced Biotech-based Protein Production; and
 - c) Food Safety Science and Innovation.

2. SUSTAINABLE URBAN FOOD PRODUCTION – OBJECTIVES OF GRANT CALL

- 2.1. The grant call under this R&D Theme aims to encourage researchers, technology providers and potential adopters to co-develop innovative solutions for the tropical aquaculture and urban agriculture industries.
- 2.2. The tropical aquaculture and urban agriculture industries are sectors that align with Singapore’s existing industry base and have potential for further growth and development to achieve the ‘30 by 30’ goal. Aquaculture will be increasingly important for food production as global fisheries decline and demand for fish increases. With the use of intensive farming technology, there is high potential for growth of Singapore’s tropical aquaculture sector. In urban agriculture, climate control technologies and indoor multi-tier farming systems can increase Singapore’s capacity to grow locally in a climate-resilient manner. Such technologies can also enable the growth of seasonal crops not typically found in the tropics.

¹ This consists of 20% from vegetables and fruits, and 10% from proteins (e.g. fish and eggs).

- 2.3. For both sectors to significantly develop in Singapore, various technological challenges will need to be overcome. Through this grant call, SFA is seeking **solutions with the ability to increase the productivity of local food producers beyond what is achievable by current best-in-class technologies**. Such solutions shall also take into consideration aspects such as cost effectiveness, resource use efficiency, sustainability, and climate resilience.

3. SCOPE OF GRANT CALL

- 3.1. This grant call consists of two categories: (A) Targeted research leading to translation/scale-up and (B) Other new research areas pushing the frontier.

Category A: Targeted research leading to translation/scale-up

- 3.2. Category A supports targeted research, in specific areas of interest, which has strong potential for translation/scale-up. Applicants shall address at least one of the following desired outcomes in their Research Proposals:

- a) Tropical aquaculture
 - i. Raise growth rate and improve other desirable traits of key tropical aquaculture species;
 - ii. Raise survival rate of key tropical aquaculture species to solve persistent bottlenecks at production level caused by disease issues;
 - iii. Improve cost-effectiveness and sustainability of feed for key tropical aquaculture species while increasing productivity; and
 - iv. Develop novel solutions (e.g. shelf-life extension and nutrient preservation, upcycling technologies) to reduce waste generated by the industry.
- b) Urban agriculture
 - i. Improve yield and other desirable traits of vegetables in indoor production;
 - ii. Develop novel indoor crop protection technologies;
 - iii. Improve efficiency of resource use and reduce costs of indoor production of vegetables; and
 - iv. Develop novel solutions (e.g. shelf-life extension and nutrient preservation, upcycling technologies) to reduce waste generated by the industry.

- 3.3. The research areas of interest, which applicants are encouraged to focus on, include the following:

- a) Genetics: Genetic improvement of key tropical aquaculture species, and cultivars of vegetables with traits adapted for indoor farming.
- b) Disease and Health Management: Development of alternative/smart health solutions (e.g. novel vaccines, etc.) to manage fish health, stress and diseases, as well as novel indoor crop protection technologies that can enable detection and mitigation of plant stress and diseases before outbreaks occur.

- c) Nutrition: Development of nutritional solutions (e.g. sustainable feed, functional feed additives) optimised for key tropical aquaculture species. Fundamental research into the nutritional requirements of specific aquaculture species would also be considered.
 - d) Nutrient & Quality Preservation for Farm Produce: Development of novel nutrient preservation and shelf-life extension technologies for fresh-chilled vegetables and fish, as well as novel cost-effective technologies to upcycle postharvest food loss and waste back into the food system as raw materials (e.g. feed, fertilisers).
- 3.4. Research Proposals shall demonstrate strong potential for real-world application within and beyond Singapore. Applicants shall clearly articulate the levels of improvement the proposed research will contribute to achieving the specified desired outcome. These improvements will need to be compared with the global best-in-class technologies or solutions that are already available in the market. The target TRL² at the end of the project is expected to be higher than the entry TRL specified in the Research Proposal.
- 3.5. Research Proposals shall include a clear commercialisation plan for technologies developed, which includes, but is not limited to, an analysis of the target market, plans and partners for test-bedding, manufacturing or scaling up of the technologies.
- 3.6. Research Proposals with identified relevant industry partners (e.g. through provision of Letters of Intent from industry partners stating their intended contributions) shall be considered favourably. Such contributions include in-kind services, cash, or a combination of the two towards the project. In-kind services can include labour, materials and other services.
- 3.7. Funding support for each Research Proposal awarded shall be capped at a quantum of up to **S\$2 million** for a **period of up to three years**.
- 3.8. If the Research Proposal entails components such as the use of genetic improvement techniques (e.g. selective breeding, gene editing, etc.), funding support for the awarded Research Proposal shall be capped at a quantum of up to **S\$5 million** for a **period of up to five years**.

Category B: Other new research areas pushing the frontier

- 3.9. Category B aims to support proof-of-concept research in areas within the tropical aquaculture and urban agriculture space, which are not covered under Category A.
- 3.10. Applicants are strongly encouraged to take on new approaches that challenge the best-in-class technologies or solutions utilised in the tropical aquaculture and urban agriculture industries.

² Technology Readiness Level (“TRL”) is a scheme to assess the maturity of technologies.

- 3.11. Research Proposals shall clearly articulate the long-term target of the proposed research effort as well as its potential contribution to the '30 by 30' goal. Applicants shall clearly articulate the levels of improvement the proposed research will contribute to achieving the specified desired outcome.
- 3.12. Research Proposals with identified relevant industry partners (e.g. through provision of Letters of Intent from industry partners stating their intended contributions) shall be considered favourably. Such contributions include in-kind services, cash, or a combination of the two towards the project. In-kind services can include labour, materials and other services.
- 3.13. Funding support for each Research Proposal awarded shall be capped at a quantum of up to **S\$500,000** for a **period of up to 18 months**.
- 3.14. Projects would be considered for further funding support, upon successful proof-of-concept of the research.

- 3.15. For both Categories A and B, cross-disciplinary/multi-disciplinary Proposals, are strongly encouraged. Applicants are also strongly encouraged to collaborate with foreign organisations and experts, especially in areas with potential for introduction of new research capabilities and transfer of technical expertise into Singapore.
- 3.16. Proposals with a funding quantum and/or project length that exceed(s) the limits stated in Paras 3.7, 3.8 and 3.13 may be considered. Strong justifications will be required.

4. ELIGIBILITY, FUNDING SUPPORT & OTHER IMPORTANT INFORMATION

- 4.1. Principal Investigators (PI) from all Singapore-based institutions of higher learning (IHLs), public sector agencies and not-for profit research laboratories, as well as companies and company-affiliated research laboratories/institutions, are eligible to apply.
- 4.2. Singapore-based IHLs, public sector agencies and not-for profit research laboratories/institutions will qualify for up to 100 percent of the approved qualifying direct costs³ of a project. Companies and company-affiliated research laboratories/institutions will only qualify for up to 70 percent of the approved qualifying direct costs of a project.
- 4.3. Support for indirect costs⁴ of research may be provided, only for Singapore-based IHLs and not-for-profit entities. Funding support of up to 20 percent of the total qualifying approved direct costs (i.e., total direct costs less exceptional items) will be allowed. This

³ More information on the non-fundable direct costs of research can be found in Appendix I.

⁴ Indirect costs in research are those costs that are incurred for common or joint objectives and therefore cannot be identified readily and specifically with a particular sponsored research project, but contribute to the ability of the Institutions to support such research projects (e.g. providing research space, research administration, utilities), and not through the actual performance of activities under the sponsored research projects.

is subject to the approval from SFA. Host Institutions will be responsible for administering and managing the support provided for the indirect costs of research.

- 4.4. All projected output and achievements of the proposed research are expected to be commensurate with the level of funding requested.
- 4.5. Principal Investigators (PIs) are allowed to submit multiple Research Proposals.
- 4.6. Research Proposals already funded by other agencies or are being considered for funding by other agencies will not be considered under the present call. PIs will need to declare other funding sources during the application.
- 4.7. The Lead PI must be based in Singapore⁵. All funding awarded must be used to carry out the research and innovation activities in Singapore unless approved in the grant.
- 4.8. Collaboration with foreign organisations and experts in the capacity of Co-Principal Investigator (Co-PI), or as Collaborator is allowed. However, contracting out the whole or substantial part of the research work is not permitted.
- 4.9. Collaborators are not permitted to receive, directly or indirectly, any part of the funding, whether in cash or in the form of assets acquired using the funding or otherwise. All assets acquired using the funding must be located in Singapore and maintained within the control of the grantees.

5. APPLICATION

- 5.1. This call for proposals is a single full proposal stage.
- 5.2. The Lead PI is required to submit an online application via the IGMS. Separate submissions outside of IGMS will not be considered. Once PIs have submitted their documents online, their applications will be routed to the Director of Research (or equivalent) of their respective Host Institution for online endorsement.
- 5.3. Please download and refer to the manuals and training guides from the Integrated Grant Management System (IGMS) at <https://researchgrant.gov.sg/Pages/faqs.aspx> for all instructions and guidelines on the submission process.
- 5.4. It is mandatory for applications to be lodged in the IGMS system and endorsed by **31 March 2020, 1200hrs, Singapore time (UTC +08:00)**. Late submissions or submissions from individual applicants without endorsement from the Host Institution will not be entertained.

⁵ Lead PIs must have a minimum of 9 months employment with a Singapore-based organisation (Singapore-based institutions of higher learning (IHLs), public sector agencies, not-for profit research laboratories as well as companies and company-affiliated research laboratories/institutions), and fulfil at least 6 months of residency in Singapore over a period of 1 calendar year.

- 5.5. Applications are considered to be successful only if all relevant documents are submitted. The Research Administrative Office from IHLs or equivalent outfits in companies are required to ensure information submitted by their researchers for the grant call are compiled according to the requirements set out. Incomplete submissions will be rejected.
- 5.6. The application documents required for the submission can be downloaded from, and should be uploaded onto the ‘Research Proposal’ section of the IGMS application. A soft copy of the application documents should also be sent by email to the Singapore Food Story R&D Programme Office (SFA) at SFA_RND@sfa.gov.sg.
- 5.7. The following documents are required for the submission. It is advised to restrict the total attachment size to be less than 25MB. Please follow the naming convention and format for labelling of soft copy attachments:

Attachment	Naming Convention	Format
Research Proposal	RP_ [Cat A/B*] Project title	PDF
Annex A – Project Implementation Schedule	Schedule_ [Cat A/B*] Project title	PDF/MS Excel
Annex B – Budget	Budget_ [Cat A/B*] Project title	MS Excel
Annex C – Curriculum Vitae	CV_ [Cat A/B*] Project title	PDF
Annex D – Capability Indicators	Capability Indicators_ [Cat A/B*] Project title	MS Excel
Annex E – Letters of Intent (optional)	LOI_ [Cat A/B*] Project title	PDF
Annex F – International Peer Reviewers	IPR_ [Cat A/B*] Project title	PDF

*Note: To delete where applicable

- 5.8. In case of discrepancy between the information in the IGMS application form and the attachments uploaded, the information in the attachments shall be taken as final.
- 5.9. Applicants are to note that **where relevant privileged or confidential information is needed to help convey a better understanding of the project, such information should be disclosed and must be clearly marked in the proposal.**

6. SELECTION PROCESS AND AWARD

- 6.1. All endorsed proposal(s) eligible for funding will be subjected to a round of Peer Reviews, followed by evaluation by a Scientific Evaluation Panel. Where appropriate, proposals may also be sent to industry resource persons and relevant national agencies for additional review. All information needed for a proper and complete evaluation should therefore be included in the application.

6.2. Proposals will be evaluated based on the following criteria:

a) Contribution to Grant Objectives

- i. *Relevance and amount of contribution of proposed research in addressing the challenge(s) posed.*

b) Scientific Excellence and Innovation

- i. *Quality and significance of proposed research, including the potential for breakthrough/innovation to advance knowledge and understanding within its own field or across different fields.*

c) Application & Deployment in Singapore and Commercialisation

- i. *Potential for application of research outcomes/solutions within and beyond Singapore.*
- ii. *Feasibility for commercialisation of research outcomes/solutions.*

d) Execution Strength and Technical Competency of Research Team

- i. *Quality of plans for execution and delivery of the research programme and goals, including the appropriateness of the proposed milestones, deliverables and reasonableness of the budget.*
- ii. *Quality, significance, and relevance of the recent research record of the PI and co-PIs and the strength of the applicant group, including likely synergy in delivering research and potential for international leadership.*

6.3. Selection of Peer Reviewers/Evaluators is at the sole and exclusive discretion of the Singapore Food Story R&D Programme Office, which shall not be liable for the release of information concerning proposals to third parties by individuals involved in the review process. The Singapore Food Story R&D Programme Office reserves the right to modify the review process.

6.4. Applicants shall agree that they shall not take legal action against the SFA, the Peer Reviewer, or any member of the Scientific Evaluation Panel in relation to their role in evaluating and deliberating the project proposal.

6.5. **(Latest as of 30 Sep 2020) Successful applicants will be notified of in-principle approval for the award of the grant by Dec 2020.** The SFA is under no obligation to award research grant in whole or in part to any proposal. SFA may require proposals to be revised or combined as it sees fit to enhance research outcomes, facilitate integration of research concepts and technologies, and optimise funding resources. **SFA's decision on project and funding support will be final** and shall be abided by the applicants.

7. POINT OF CONTACT

7.1. For further enquiries, please contact the Singapore Food Story R&D Programme Office (SFA) at SFA_RND@sfa.gov.sg.

APPENDIX 1 – NON-FUNDABLE DIRECT COSTS OF RESEARCH

Information on non-fundable direct costs of research is appended in the tables below. This list is adapted from the 2016 National Research Fund Guide Annex L.

Applicants are to note that the list is being subject to revision. Finalised details will be made available in 2020.

1. EOM Related Expenses

Type of Expenses	Description
General policy	<p>The general principle is that grants should support EOM costs and related benefits (as per employment contract) as long as it is in line with the consistently applied Host Institution's HR policies.</p> <p>This will extend to Host Institution policies that govern staff recruitment and related costs (e.g. costs associated with the onboarding of staff, staff insurance, overtime claims, staff relocation, employment benefits, employment levy, employment pass, pre-examination medical check-up and housing allowance.)</p> <p>All Manpower related costs that fall under Other Operating Costs (OOE) should be accurately reflected in the Budget.</p> <p>Fractional charging for staff costs based on time commitment to the project must be practised.</p>
Principal Investigators / Co-Investigators / Programme Managers EOM cost	Not allowable.
Unconsumed leave	Provision for unconsumed leave is not allowable.
Student Assistants / Interns	<p>Not allowable for students who are recipients of existing awards (or stipends) or students who are not residents of Singapore.</p> <p>Only full-time students enrolled in local institutes of higher learning qualify to be supported as a student assistant/intern.</p>

2. Equipment Related Expenses

Type of Expenses	Description
General policy	<p>No purchase of equipment is allowed unless specifically provided for in the grant approved by the Grantor.</p> <p>The procurement of such equipment must be made according to the formal established and consistently applied policies of the Host Institution.</p> <p>The invoices for all claims must be dated before the end of the Term.</p>
Cost of capital works, general infrastructure, general purpose IT and communication equipment, office equipment, and furniture and fittings	<p>Not allowable under direct costs, unless specifically provided for in the grant and approved by NRF.</p> <p>Examples of such costs are computers, office productivity software, PDAs, mobile phones, photocopier machines, workstations, printers, etc.</p>

3. OOE Related Expenses

Type of Expenses	Description
General policy	<p>Not allowable for expenses that are <u>not directly related</u> to the Research.</p> <p>All procurement of such items must be made according to the formal established and consistently applied policies of the Host Institution.</p>
Visiting Professors/Experts	Not allowable unless specifically provided for in the grant and approved by the Grantor. The visiting professor must be identified and his/her contribution to the project must be clearly defined and described in the proposal.
Audit fees	Not allowable. This includes both internal and external audit fees.
Entertainment & Refreshment	Not allowable.
Fines and Penalties	Not allowable.

Legal Fees	Not allowable.
Overhead Expenses	Not allowable unless specifically provided for in the grant and approved by the Grantor based on the nature of the research. This includes rental, utilities, facilities management, telephone charges, internet charges, etc.
Patent Application	Not allowable. This includes patent application filing, maintenance and other related cost.
Professional Membership Fees	Not allowable. This applies to PI and Co-Investigators as well as all research staff funded from the grant.
Software	Not allowable under direct cost unless specifically provided for in the grant and approved by the Grantor.
Professional fees (including fees to consultants)	Not allowable unless specifically provided for in the grant and approved by the Grantor.
Staff retreat	Not allowed.

4. Overseas Travel Related Expenses

Type of Expenses	Description
General policy	<p>Not allowable unless specifically provided for in the grant and approved by the Grantor.</p> <p>Conference participation should be directly relevant to the research area outlined in the project and necessary to accomplish project objectives.</p> <p>All travel must align to the existing and consistently applied institutions' travel policies regardless of the source of funds.</p>

5. Research Scholarship

Not allowable.