BIRAC announces third Call of SPARSH

on

Innovative Technology Solutions for Waste to Value

Request for proposals for Technological interventions for conversion of faecel sludge and MSW to energy and other products

Introduction

SPARSH is the **Social Innovation programme for Products: Affordable & Relevant to Societal Health** which highlights the need of Innovative solutions to society's most pressing social problems. The scheme tackles major social issues and offers new ideas for wide-scale change.

The scheme aims to invest in ideas and innovations that improve the health and well-being of all Indians and provides affordable product development in the social sector. The scheme also targets creating a pool of Innovators who identify the specific needs and gaps in critical sector and then work towards funding innovative solutions. The social innovators are supported for developing market-based solutions that have a potential to bring breakthrough technologies and product to vulnerable populations.

BIRAC, under third call of SPARSH, intends to promote interventions for the conversion of solid waste to energy and re-usables thereby contributing to the sustainable management and cleaner, greener and viable ways to process waste and to extract energy and re-usables from it. This is in line with the Millennium Development Goal (MDG) 7 which aims at halving the proportion of the world's population without safe drinking water and basic sanitation between 1990 and 2015 (UN, 2002). **The focus of SPARSH third call also reflects the mandate of Swatch Bharat mission** which aims at elimination of open defecation, conversion of unsanitary toilets to pour flush toilets, 100% collection and processing/disposal/reuse/recycling of municipal solid waste and facilitating private-sector participation in capital expenditure and operation and maintenance costs for sanitary facilities.

Sparsh objectives

1. Identify and provide support to cutting edge innovations towards affordable product development that can bring significant **social impact and address challenges of inclusive growth**.
2. Provide support in form of **impact funding of biotech product innovations** (with social goals) that can be **scaled**.
3. Create and foster a **pool of social innovators** in biotech and provide a **platform** to share best practices, understand intricacies of business models in social innovation and network.

The Challenge

Rapid urbanization, industrialization and burgeoning population growth have led to severe waste management problems in India. Management of urban wastes constituting sewage, MSW and faecal sludge has been a major challenge mainly due to lack of affordable technologies. In urban areas Septic tank constitutes highest percentage of total sanitation coverage. Major part of urban India has not been connected to municipal sewer system, which makes the population dependent on the conventional individual septic tanks. In the absence of any consolidated faecal sludge management practices, septage from septic tanks is mostly unattended and discharged in nearby open space, river or low land areas, causing environmental pollution, ground water contamination and health hazards. According to a WHO-UNICEF report, around 638 million people do not have access to toilets in India, which accounts for about 58% of open defecation. Indians leave about 100,000 tons of fecal matter in the open every day.

It is estimated that about 1,00,000 MT of Municipal Solid Waste is generated daily in the country. Per capita waste generation in major cities ranges from 0.20 Kg to 0.6 Kg per person per day. Most of such wastes remain unattended (http://www.iitk.ac.in/3inetwork/html/reports/IIR2006/Solid_Waste.pdf).

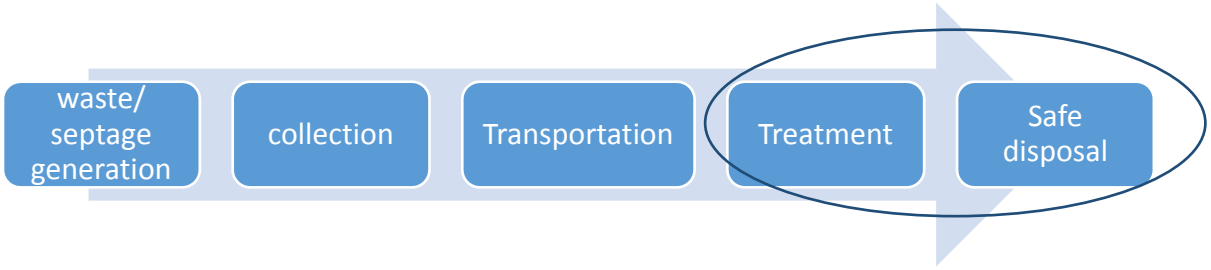
There is an urgent need to focus on scientific and safe disposal of this waste. In general, there is non-availability of sustainable technologies, lack of financial resources and adequate institutional arrangements for proper handling of solid waste. These result in

the creation of environmental pollution and health hazards. Most of the solid wastes are put into landfill sites and leachates from such landfills cause severe ground water pollution. Technology of incinerator is used at some places. However, it does not appear suitable as it causes environmental pollution.

Septage is a complete organic matter. It has a lot of potential for generation of bioenergy. Besides after proper treatment liquid as well solid parts can be profitably used for agriculture purposes. Additionally, MSW also has a lot of potential for resource recovery. It can be used for energy generation to be used in different forms. Besides, there is lot of scope for using inorganic and other recyclable materials in MSW for different purposes. However, potential of using septage and MSW has not been practically explored on a large scale. In many town and cities, most of the MSW remains unattended causing severe health hazards and environmental pollution.

Lack of affordable technologies coupled with lack of proper management and awareness are important issues for such situation in urban areas. There is a need to find affordable solutions with innovative technological interventions so as to tackle this problem.

The value chain management for waste basically consists of collection, treatment and proper disposal of waste. The major mandate of BIRAC involves focusing on development of treatment technologies and safe disposal of waste.



In addition, community public toilet is the only option to prevent open defecation in slums and market places. In general, public toilets in unsewered areas are connected with septic tank system. Due to lack of sewage treatment, effluent passes through uncovered drains and ultimately lands into water bodies. Hence, it is even more important to find innovative solutions for non-sewered toilets specially catering to community toilets.

In order to address the challenge of open defecation and the absence of robust, functioning sanitation systems, BIRAC had partnered with the Department of Biotechnology, Government of India and Bill and Melinda Gates Foundation in announcing the Reinvent the Toilet Challenge-India. This challenge involved building next-generation toilets based on innovative, sustainable and affordable sanitation technologies. In order to take this challenge forward, the focus of third call of SPARSH is on "**Technological interventions for conversion of faecel sludge and MSW to energy and other products**".

Focus Areas

The scope of the call will be limited to cost effective, novel and innovative approaches for:

1. Treatment of faecel sludge and municipal solid waste in combination or in separate units
2. Biological or thermo-chemical routes for generation of clean energy
3. Technologies catering to conversion of waste collected from non-sewered toilets
4. Technologies resulting in reduction in the wash water and including minimal usage of power
5. Resource recovery from waste
6. Safe re-use of treated waste/by products

Criteria for selection of technologies for treatment of faecel waste:

1. Affordable and scalable
2. Applicable under community settings at decentralized level
3. Preferentially be independent of any networked sewer system
4. Encompass no contamination of ground water, surface water and surface soil
5. Safe disposal/reuse of by-products generated
6. Minimal input of water and least requirement of electricity
7. Quality of the treated waste water generated should be good enough for re-use in flushing in toilets or agriculture purposes or for safe discharge in any water bodies

Criteria for selection of technologies for treatment of MSW

1. Self-sustainable
2. Aim at reducing the quantity of wastes
3. Applicable to decentralized settings with a scope for scaling up.
4. Encompass complete waste management involving segregation (if required) and treatment of the waste.
5. A clear strategy for putting the recyclable wastes to an effective use
6. Requiring minimum processing time, minimum footprint and minimum implementation period.
7. In case, biomethanation is being used, the biogas generated during the process should be completely used as thermal energy or to generate electricity for power grid supply.
8. The EOI should clearly bring out
    a. Processing efficiency and land requirement of the technology
    b. Biogas generation rate, cu.m/tonne (if applicable)
    c. Power generation in KW (minimum 10-20 kw/tonne/day)
    d. Manure/compost generation, Kg / day (on dry basis; minimum 12-13% of the weight of the waste)
    e. O and M cost with suitable business model
    f. Clear definition of break-even point for sustainable operation and management

Inclusions

Technologies which may be considered as a part of the call but not limited to:

1. **Innovative digestor designs** for treatment of faecel sludge with or without organic solid waste which could be linked to an existing non-sewered super structure.
2. Innovative thermal/biological technologies for generating energy in the form of electricity
3. **Development of safe microbial consortium** capable of degrading the waste under aerobic and anaerobic conditions at a faster rate.
4. Biological/other affordable technologies for reduction of green house gases and odour producing gases

5. **Maximum resource recovery** in the form of energy, re-usable water, nutrients and organic manure
6. Sustainable technologies to sanitize waste for pathogen destruction
7. Conversion of waste to burnable fuels such as pellets, briquettes or biochar or in construction materials

Exclusions

Examples of areas that will not be considered:

- R and D projects involving exploratory research and not resulting in any technology
- Projects that are not scalable either by their nature or because they apply to small subsets of the population.
- Proposals based only on screening, collection or segregation of waste
- Solutions that are only slight improvements over existing approaches
- Behaviour change programmes, surveys or education (e.g., implementation of community led total sanitation or related approaches)
- Mass burn technologies unless involving a major innovation

Application Directions

Affordable Product Development

Category A: Early Transition

This category is for funding the projects, which are at initial stages of technology development. It is an opportunity to test particularly bold ideas for development of proof of concept. Additionally, the projects which have established the Proof of Concept and require incremental prototype innovations and validation can also apply under this category. The minimum scale of the treatment of septage should be 2000 l/day. For treatment of MSW, the minimal scale for treatment should be 10 TPD.

Funding Support: Grant-in-aid assistance up to Rs. 50 lakhs for a period up to 18 - 24 months

Eligibility: This category is open to:

- Indian start-ups (Incorporated under the Indian Companies Act and having a minimum of 51% Indian Ownership) (Less than 3 years old as on the date of advertisement)/Indian entrepreneurs (Indian citizen willing to form a Company as per Indian Law).
- Limited Liability Partnership (LLP) incorporated under the Limited Liability Partnership Act, 2008 (less than three years old as on the date of advertisement) having a minimum half of the persons who subscribed their names to the LLP document as its Partners should be Indian citizens.
- Indian Academic Scientists, Researchers, PhDs, Environmentalist, Public Health degree Holders, Social Sciences Graduates (who must be willing to incubate in a business incubator)
- No DSIR certification is required

NOTE: Applicants and Co- applicants should not have any other legal disqualification that will prohibit them from participating in the scheme process and execution of necessary agreements thereafter.

Category B: Pilot scale Implementation models

The category is for the projects which have already shown promising data on establishing the Proof of Concept and has generated enough validation data. The applicant should have demonstrated proof of concept for the technology that is being proposed as well as plants running on similar technology elsewhere within the country. The minimum scale of the treatment of septage should be 5000 l/day. For treatment of MSW, the minimal scale for treatment should be 100 TPD. Demonstration scale facilities may be set up in a Public Private Partnership (PPP) model by engaging Indian entities with experience in the management and treatment of solid waste.

Funding Support: Total project cost up to INR 100 Lakhs for 24 months with matching contribution from BIRAC (Grant in aid) and Company.

Eligibility: This category is open to:

FOR COMPANIES (For profit/ nor for Profit)

- Incorporated under the Indian Companies Act having a minimum of 51% Indian ownership.
- DSIR recognition
- The product/technology should have gained necessary approvals from the concerned regulatory authority (-ies) for pilot studies.
- It is desirous that the projects show partnership or a consortium between product/service innovator Company, an implementer/deployer (Research Foundations, Section 25 companies etc). Any such Partner for execution/implementation can become Co-Applicant in the proposal. Co-Applicant should have been established as a legal entity under the relevant Law of India having at least half of the stakeholders (owners/partners/ trustees/ members/ associates etc) as Indians. Local/state/ Central Departments can also become part of the execution/ implementation/ survey etc.

Social Innovation Immersion Program (SIIP)

SIIP is the Social Innovation Immersion program of SPARSH which intends to create a pool of "Social Innovators" who can identify needs & gaps within communities and then can help bridge the gaps either through an innovative product development or services. This programme is envisaged to be operationalised with partners (academic technology centres, technology incubators and related organisations) who help provide a whole host of technical, business and implementation mentoring to the fellows.

Eligibility criteria for SIIP Fellows & BIRAC Fellowship Support:

A SIIP fellow could be drawn from fields such as life sciences, Environmental engineering, Social Sciences, Public Health with educational qualification raging from undergraduate or postgraduate degree.

Selected Fellows would have the designation as '**BIRAC Social Innovators**' who would receive a fellowship from BIRAC (amounting to INR 45,000/month for 18 months) and a onetime mini-kickstart grant of INR 5lakhs per fellow which will be provided during the course of the fellowship. The BIRAC Fellowship requires the Innovators to work fulltime and cannot be combined with fellowships from other funding organisations.

Operational Elements & Work plan of SIIP:

The overall administrative responsibility of the SIIP would rest on the partnering organization which would operationalize the programme (henceforth referred to as BIRAC SIIP Partner).

The following is a suggested work flow for SIIP, which will also act as the Milestones and Deliverables. The selected SIIP fellows will work with state governments, academic institutes and other organisations involved in managing Community Toilet. Identifying specific problems and finding on-site sanitation solutions relevant to a particular region within the country may form a part of the proposed work plan. The organizations involved should have in-house expertise in waste management for mentoring of the SIPP fellows. The formal 18 months of the SIIP will start from Pre-Immersion orientation and Induction phase.

1. **Recruitment & Selection of Social Innovator Fellows (Upto 6 weeks)**
2. **Pre-Immersion orientation & induction: (Upto 4 weeks)**
3. **Immersion Programme (Upto 24 Weeks)**
4. **Post Immersion Filtration (Upto 12 weeks)**
5. **Product Design, Prototyping and Delivery Mechanism (Upto 36 weeks)**

Outcome

BIRAC expects the Social innovators to reach a point where they either have a ready business plan to pitch to investors, or an advanced proposal with some preliminary results suitable for funding by BIG or equivalent funding source or a technology / patent suitable for licensing

Intellectual Property

The IP generated during the SIIP programme would rest with the social innovators and neither BIRAC nor partners would claim the IP rights.

Application Process

The Application process for both the components of SPARSH is common and will take around six to seven months for final selection of projects.

The full Application process is online including the proposal submission and evaluation. No hard copies of proposals are accepted.

BIRAC will also be pleased to explore opportunities to partner with organisations like healthcare/biotech/biomedical area of operations which include Research Foundations, Private and Public Health Organisation, Corporates etc.

For further details on the program please see Sparsh Solicitation document at www.birac.nic.in

Or contact

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