Office of the Principal Scientific Adviser
to the Government of India

WASTE TO WEALTH
Swachh Bharat Unnat Bharat

INVEST INDIA
NATIONAL INVESTMENT PROMOTION AND FACILITATION AGENCY

Swachhta Saarthi Samaroh

2022

AN INITIATIVE OF THE OFFICE OF THE PRINCIPAL SCIENTIFIC ADVISER TO THE GOVERNMENT OF INDIA

30TH SEPTEMBER – 1ST OCTOBER 2022

Office of the Principal Scientific Adviser to the Government of India

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"The Swachhta Saarthi Fellowship and its extensive outreach to ensure countrywide participation in waste management has brought new enthusiasm across regional and local communities. The Swachhta Saarthis act as torchbearers of our nation by engaging the public through awareness campaigns on waste management. The Swachhta Saarthi Samaroh 2022 was an excellent depiction of community engagement and innovative solutions for converting waste into wealth."

Prof. Ajay Kumar Sood

Principal Scientific Adviser to the Government of India

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EXECUTIVE SUMMARY: SWACHHTA SAARTHI SAMAROH 2022

Abstract

This is an Executive Summary of the Report on the Swachhta Saarthi Samaroh, 2022, organised by the Office of the Principal Scientific Adviser (PSA) to the Government of India, during 30th September to 1st October 2022, at the Indian Institute of Technology, Delhi campus. The Samaroh was organised under the aegis of the Waste to Wealth Mission of the Prime Minister's Science, Technology, and Innovation Advisory Council (PM-STIAC), in partnership with the Invest India Department for Promotion of Industry and Internal Trade.

I. Background

A. Waste to Wealth Mission of the PM-STIAC

The Hon'ble Prime Minster launched the Swachh Bharat Mission on 15th August 2014. The PSA office was committed to take the Swacch Bharat Mission to next level where technology would be deployed to manage the huge volume of waste being generated every day in this country. In view of the same, the 'Waste to Wealth' (W2W) Mission was brought forth by the Prime Minister's Science, Technology, and Innovation Advisory Council (PM-STIAC) for consideration.

In the first meeting of the PM-STIAC, held on 9th October 2018, the W2W Mission was proposed as one of its nine missions. Subsequently, in the 10th meeting of the PM-STIAC, it was decided that that a W2W Project Management Unit (PMU) would be set up at in PSA's Office in partnership with Invest India.

Accordingly, a Memorandum of Understanding (MoU) was signed by the PSA's Office with Invest India on 28th February 2020, for a period of five years. Subsequently, a PMU was established at Invest India in August 2020.

The W2W Mission aims at strengthening the waste management system in India by demonstrating innovative solutions and models to achieve a zero landfill and zero waste nation.

B. Objectives of the Mission

- To provide scientific and technological inputs towards conservation, sustainable use, and restoration of our land, air, and water resources. The technology solutions will support Urban Local Bodies (ULBs) to create circular economic models that are financially viable for waste management and streamline waste handling in the country.
- To identify and support the development of modern technologies that can help create a cleaner and greener environment in a sustainable way.
- To boost and augment the Swachh Bharat Mission and Smart Cities Project by leveraging science, technology, and innovation.
- To create ready reckoners that are financially viable for waste management and best practices for cities to learn & adopt from.
- To streamline waste handling in India through innovative technology solutions.
- To handhold certain promising technologies by providing deployment opportunities to test and overcome the on-field challenges, thus acting as accelerators.

C. Major Work Done in the Mission

The Mission took several initiatives last year in different areas of waste management, including technology deployments in multiple waste management domains, community engagement, and development of an online portal on waste management (specially focused on urban local bodies) as a repository and reference for all stakeholders.

A snapshot of the Waste to Wealth Mission's work done in the past year

750 + technologies evaluated	**09** technologies implemented on-ground	**2** open dumpsites converted into waste processing sites	**1600+** Tons of waste removed from drains	**140+** technologies displayed on the portal
64+ policies and guidelines on the portal	**100+** stakeholder engagements	**3.1 Lakh** citizens sensitised	**25+** field visits across the country	**379** Swachhta Saarthi Fellows engaged across 27 states

D. Technology Showcase

In partnership with the local Municipal Corporations, the Mission has deployed nine (09) technologies at different locations in Delhi-NCR and Bihar to address the problems of Municipal Solid Waste management and cleaning of urban drains. Following is an overview of the initiates taken by the Mission so far:

#	Initiatives	Category	Site Location
1.	Decentralised Waste Management Technology Park	Municipal Solid Waste	New Jafrabad, East Delhi
2.	Segregation of Fresh Mixed Municipal Solid Waste	Municipal Solid Waste	Kasturba Dhallao, East Delhi
3.	Removal of Floating Solid Waste and Debris from 52-Cusec Drain	Municipal Solid Waste	Babarpur, East Delhi
4.	Removal of Floating Solid Waste and Debris from the Gaunchi Drain	Municipal Solid Waste	Sanjay Colony, Faridabad
5.	Desludging of Barapullah Drain	Municipal Solid Waste	Sarai Kale Khan, South Delhi
6.	Small Scale Biomedical Waste (COVID-19 household waste) Incinerator	Biomedical Waste	Buxar, Bihar

E. Events, Outreach and Other Activities

The Mission virtually launched the 'Waste to Wealth Portal (wastetowealth.gov.in) on 2nd October 2021. This portal serves as the gateway to the W2W initiative for our key stakeholders, including citizens, state governments, industry players (prospective IAs) and funders. It provides knowledge and information on technology approaches to address waste problems across India.

The Swachhta Saarthi Samaroh held during 30th September and 1st October 2022, felicitated 344 Swachhta Saarthis across the country who embarked on a journey to implement actions to tackle waste management scientifically and sustainably while at the same time engaging communities around them. Over 3.1 lakh people were sensitised through 2700+ workshops and awareness sessions carried out under the programme.

II. Swachhata Sarathi Fellowship and Samvaad

A. About the Fellowship

The Swachhta Saarthi Fellowship is a programme initiated in July 2021 by the Office of the PSA to the Government of India, under its Waste to Wealth Mission. The programme aims at sensitizing the communities towards waste management and offering innovative solutions for the conversion of waste to wealth by recognising young students from schools and colleges, citizens working in the community through Self Help Groups (SHGs), and sanitation workers.

The idea behind the fellowship is to inspire an increasing number of young citizens and community workers to participate in this programme and create value from the waste around them through their innovations, and ultimately form a wide network of waste warriors on the ground as Swachhta Saarthis.

The Fellowship was awarded across three different categories as below:

Category A	**Category B**	**Category C**
Open to school students from 9th to 12th standard engaged in waste management community	Open to college students (UG, PG, research students) engaged in waste management community work	Open to (i) citizens working in the community and through Self Help Groups and (ii) municipal or sanitary workers working beyond the specification of their job requirements/descriptions

The Swachhta Saarthi Fellows (SSFs) selected under the three categories are being supported with monthly fellowships of ₹500/-, ₹1,000/- and ₹2,000/- respectively for a period of one year.

B. Fellowship Cohort 1

A total of 1062 applications were received from across the country (from Jammu & Kashmir, Ladakh, Tamil Nadu, Mizoram, Gujarat, the Andaman & Nicobar Islands, and more), for the 2021 Cohort.

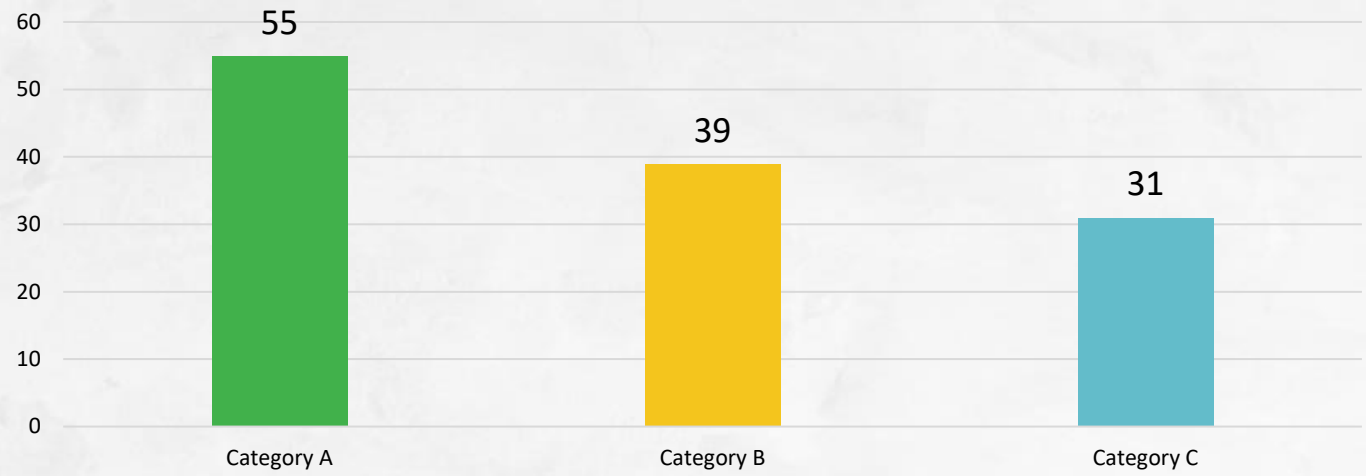
Out of the 1062 applications, 379 SSFs were selected from 27 States and 6 Union Territories, based on their proposed ideas and action plans to tackle the challenge of waste management scientifically and sustainably.

An 8-member expert committee (nominated by the Office of the PSA to the Government of India) evaluated a total of 3800 reports submitted by the fellows and provided critical feedback on the portal to each fellow for improvements within their specific projects going forward, over a course of 12 months. Based on the evaluations and feedback on the individual project reports, the respective monthly fellowship amount was disbursed to the fellows across India.

C. Fellowship Cohort 2

The applications for the 2022 Cohort were open during 4th February - 4th May 2022.

A total of 125 fellows have been selected in Cohort 2 from 27 States (excluding Nagaland) and 4 Union Territories (excluding Ladakh, Daman & Diu, Dadra & Nagar Haveli, Lakshadweep), under the following categories:



A 9-member expert committee (nominated by the Office of the PSA to the Government of India) has been selected for the evaluation of reports over the next one year.

D. Swachhta Saarthi Samvaad

1. About the Samvaad

On the 14th of every month, we host the 'Swachhta Saarthi Samvaad', a live interaction with ambassadors within the waste management community, to enlighten the SSFs about the opportunities within the space and the potential to implement action sustainably within their communities.

Every month, all the fellows attend the Samvaads virtually, and discuss various sections of the waste management domain like current opportunities, challenges, how to increase their impact on ground, how to benefit from Carbon Credits, the journeys of other waste start-ups, how they can be part of the Swachh Bharat mission, and how to collaborate with Municipal Corporations.

2. Samvaads hosted during Cohort 2021

We have successfully hosted 12 Swachhta Saarthi Samvaads with experts from the waste management domain:

01	Live interaction with Prof. K. VijayRaghavan, former Principal Scientific Adviser to the Government of India, in August 2021
02	Discussion on reducing waste streams in India with Sudhara in September 2021
03	Overview on the start-up ecosystem with 3 waste management start-up founders and Start-Up India in October 2022
04	Overview on carbon credit and the sustainable future of India with Enking International in November 2022
05	Overview on plastic waste management and municipal solid waste segregation with Triotap Technologies and E3WasteSolutions in December 2022
06	Strategic research insights and reports with Invest India in January 2022
07	Impact of waste management on climate change, technologies, and facilities with GIZ in February 2022
08	"Water and Sanitation—Stories from Small Indian Towns" with BORDA in March 2022
09	W2W Overview and Fellowship Impact with W2W Mission in April 2022
10	Insights on Swachh Bharat Mission with SBM, MoHUA, in May 2022
11	Insights on waste management initiatives in Assam with The Midway Journey in June 2022
12	Insights on creating dense self-sustaining forests with Afforrestt in July 2022

III. Swachhta Saarthi Samaroh 2022

A. About the Samaroh

To celebrate the work done by the fellows in the first year of this fellowship, the Waste to Wealth Mission hosted a 2-day event, the 'Swachhta Saarthi Samaroh', on 30th September and 1st October 2022, in Delhi. All the SSFs from 27 States and 6 UTs under the 2021 Cohort were invited to Delhi for the event. The event was held at the Indian Institute of Technology Delhi, Hauz Khas. It was attended by eminent dignitaries, including the Scientific Secretary at the Office of the PSA to the Government of India and other dignitaries from academic institutions, industries, Council of Scientific and Industrial Research (CSIR) labs, start-ups, etc.

This 2-day event gave the SSFs under the Waste to Wealth Mission an opportunity to showcase their work and the impact made within their community with their peers to a large audience, which will help in inspiring people across the nation to work toward waste management actively. In the first batch of the fellowship, the Mission selected 379 fellows but over the fellowship period, 344 fellows were able to continue based on their ideas and action plans to tackle the enormous challenge of waste management scientifically and sustainably.

As ambassadors of change, these 344 fellows have:

- Conducted over 2700 sensitization programmes, including workshops, cleanliness drives, technology interventions, development of prototypes, audio-video demonstrations, one-on-one discussions, and creation of innovative radio jingles, and
- Sensitised over 3.1 lakh citizens.

B. Samaroh Day 1 [30th September 2022]

- After the opening ceremony on Day 1, different sessions and workshops were conducted for the fellows pertaining to their fellowship category.
- Category A fellows attended a workshop on Foldscopes (low-cost paper microscopes), with the goal to motivate and encourage young researchers, while Category B & C focused on understanding the carbon credit market and its future in India.
- A live interaction session on entrepreneurship opportunities in waste management and a 'Charcha' on the Swachhta Saarthi Fellowship Cohort 2021's impact was also attended by all fellows and their parents/guardians.
- During the Certificate Distribution Ceremony, 110 fellows from all 3 categories and 6 experts were felicitated.

C. Samaroh Day 2 [1st October 2022]

- Day 2 of the Samaroh had site visits and the Closing Ceremony. During the latter, I.T.C. Limited under its Wellbeing Out of Waste (WOW) Programme, felicitated 20 fellows with a fellowship amount of Rs. 5001 each.

D. Main Highlights

- During the two-day event organised at IIT Delhi, the fellows showcased their work done over the past year in the form of posters, prototypes, papers, presentations, and products in the event exhibition.
- The fellows displayed their work across 8 waste categories, and a total of over 100 posters and 60+ prototypes were displayed at the exhibition venue.
- A certificate distribution ceremony was organised at the end of the day to felicitate fellows and to award them with certificates and mementos.
- A total of 110 fellows from all 3 categories and 6 experts were felicitated during the ceremony.
- On the second day of the event, an excursion to the Nehru Planetarium and the Rashtrapati Bhavan Museum was organised for the SSFs from all categories, along with their guardians and parents.

IV. Summary and Way Forward

A. About the Main Report

This is a comprehensive report on the Swachhta Saarthi Fellowship programme, its 2021-22 cohort, and the outcome of the fellowship programme as well as the details of the 2-day event, the Swachhta Saarthi Samaroh', held on 30th September and 1st October 2022, organised in Delhi by the Waste to Wealth Mission under the Office of PSA to the Government of India. Following components have been included in the report:

1. Swachhta Saarthi Fellowship Programme
2. Swachhta Saarthi Fellowship Cohort 2021-22
3. Projects Undertaken by Fellows
4. Fellowship Monitoring and Online Reporting System
    a. the Swachhta Saarthi Fellowship Dashboard
    b. Expert Committee Members
    c. Monitoring and reporting process
5. Fellowship Outcomes
    a. Quantitative impact of fellowship
    b. Qualitative Impact of fellowship
6. Swachhta Sarthi Samaroh 2022
    a. Day 1: Details of the programme
    b. Day 2: Details of the programme
7. Swachhta Saarthi Samaroh 2022- Press release and coverage

B. Way Forward

The Office of the PSA to the Government of India under its Waste to Wealth Mission announced the "Swachhta Saarthi Fellowship 2022" to empower young innovators who are engaged in community work of waste management, waste awareness campaigns, waste surveys etc. as Swachhta Saarthis and implement actions to reduce waste for a greener planet. 125 fellows have been finally selected under the fellowship which will commence from November 2022.

SWACHHTA SAARTHI FELLOWSHIP PROGRAMME

The W2W Mission is one of the nine scientific missions of the PM-STIAC. The Mission, spearheaded by the Office of the Principal Scientific Adviser (PSA) to the Government of India, aims to identify, test, and validate technologies that recover value from waste, and are commercially viable. These technologies will be piloted at Mission Sentinels, which will demonstrate solutions for critical waste challenges and contribute to conserving, restoring, and enhancing India's land, air, and water resources. Additionally, to ensure community engagement and to recognise efforts of individuals working independently in the waste management domain, the Mission started the Swachhta Saarthi Fellowship (SSF) programme.

The SSF programme aims at sensitising the communities towards waste management and offering innovative solutions for the conversion of waste to wealth by recognising young students from schools and colleges, and citizens working in the community through Self Help Groups (SHGs) and sanitation workers.

SWACHHTA SAARTHI FELLOWSHIP COHORT 2021–22

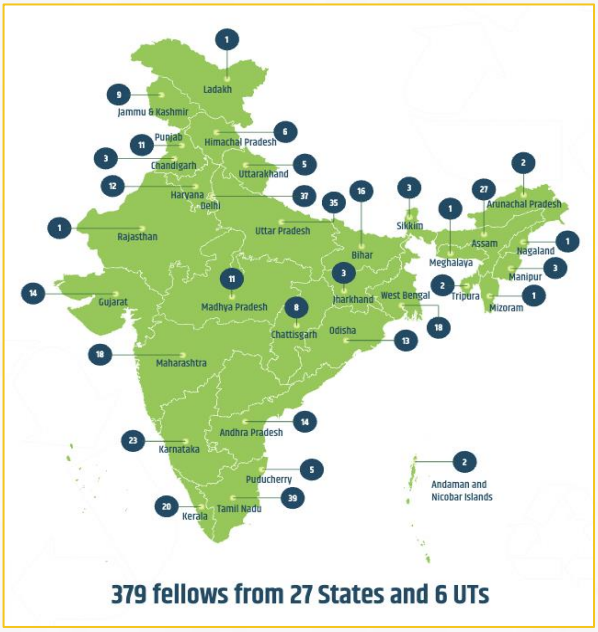
SSF 2021 was a year-long programme with a focus towards waste management. Applications were invited from across the country under three categories for waste to wealth management activities including waste management/processing on source, awareness campaigns, field surveys and studies, etc.

Category-A: School students from 9th to 12th standards

Category-B: UG, PG, and research students engaged in waste management

Category-C: Citizens working in the community through SHGs, and municipal or community citizens/sanitation workers

379 fellows across the three categories were selected in SSF 2021.



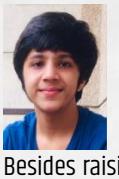
379 fellows from 27 States and 6 UTs

In addition to having a significant positive impact on society's ability to create value through waste management, fellows promoted waste segregation at source by engaging the general public in extensive awareness campaigns, coming up with creative ideas for value creation and waste management, and developing prototypes and products. The intention of the fellows to continue working for the cause in society beyond the fellowship term is what is most inspiring. Many of them have plans to advance their innovative ideas/solutions towards validation and towards the start-up level, to make a noticeable difference in society. The most significant accomplishment of this programme is the instillation of a culture of waste management among the fellows.

PROJECTS UNDERTAKEN BY FELLOWS

Throughout the Fellowship period, fellows worked on-ground to spread awareness on waste segregation, on-site waste processing, and waste reduction, reuse, and recycling. A snapshot of the work done by a few of the fellows is mentioned below (category wise):

Domestic Waste

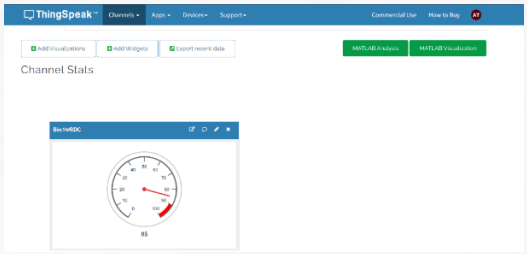


Arya Swaroop
SSF ID: A/11; New Delhi

Besides raising awareness for garbage-free communities, Arya has also recovered floating waste from the blocked drains in his community and made them functional again. Further, the fellow has started making briquettes out of the collected biodegradable and semi-biodegradable waste material by using a briquetting machine, which can be further used as a source of energy in the form of domestic fuel.

Akshat Tripathi
SSF ID: A/57; Uttar Pradesh

Akshat has developed a 'Smart Waste Collection and Management Platform' that enables concerned authorities to gather information about garbage bins in various localities and plan their collection route accordingly. It helps to analyse the garbage levels of various bins remotely and displays the bin status of various localities on a single page. This prototype developed by the fellow optimises the garbage collection process and makes it easier, along with saving workforce and fuel. In addition, the fellow has organised various workshops and campaigns on hazardous plastic waste and single-use plastic. The platform will be open for public usage in the near future.



Bhuvan Luthra
SSF ID: B/26; New Delhi

The fellow made Onion Peel Bio-Enzyme, Natural Insecticides and Banana Peel Tonics for supplementing the growth of healthy plants. Apart from this the fellow also make potato, potato peel, and hibiscus flower tonics as well. He also recycled old food containers, old teacups, and glass perfume bottles to make planters and made cow dung liquid manure to use as a fertilizer. He also organized a workshop on the same in the public park for the society residents. He also organized a workshop at Amity University to teach his fellow classmates to make vermicompost, tonics, and natural insecticides and one workshop at Doon Public School to teach students how to make vermicompost in their homes respectively.

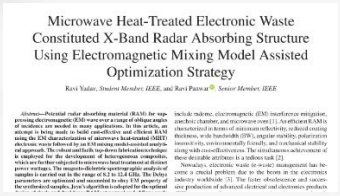
STV Raghavamma
SSF ID: C/21; Andhra Pradesh

Dr. Raghavamma educated the communities and students to reuse kitchen waste for manure preparation which can be further used for the organic cultivation of mushrooms. She started collecting kitchen waste and subjected it to manure preparation. With her guidance, several households in her community started to follow this process and scaled it up further to cultivate mushrooms and other vegetables.

Electronic Waste

Ravi Yadav
SSF ID: B/7; Madhya Pradesh

Ravi has worked in developing affordable e-waste management solution and radar wave absorbers for both commercial and defence applications. He has filed a patent on his work, ' A process for developing broadband microwave absorbing composite using the heterogeneous electronic waste of discarded batteries and a product thereof' and 'Method for manufacturing radar absorbing material using microwave heat treated electronic waste.' He has published two research papers as well in offering e-waste management solutions. Offer affordable waste management solutions and affordable radar wave absorbers for both commercial and defense applications. Not only this, he has been encouraging the younger students to research prospective waste management strategies for various types of garbage, such as industrial and agricultural waste, etc, and has organized several workshops on making people understand the possible applications of e-waste management. Further in future he wishes to continue working on solving the e-waste management issues in India and involve communities to have a widespread impact of his work.



Microwave Heat-Treated Electronic Waste Constituted X-Band Radar Absorbing Structure Using Electromagnetic Mixing Model Assisted Optimization Strategy

Ravi Yadav, Student Member, IEEE, and Ravi Panwar, Senior Member, IEEE

Numerical and Experimental Dielectric Investigation of Heterogeneous Electronic Waste Derived Cost-Effective Composite for Stealth Applications

Ravi Yadav and Ravi Panwar

ABSTRACT

Amit Anand
SSF ID: B/67; Odisha

The fellow has worked to develop an industrially acceptable process for the production of individual pure compounds from phosphor coating of waste tube lights through research and experimentation. For this, he collected waste tube lights from the electrical maintenance department of different office buildings in Bhubaneshwar and recovered phosphor, the source material for the production on individual rare-earth compounds by end cut push method. After several experiments he found out the most suitable leachant and produced 99.9% pure yttrium-europium oxalate from it, which is sold at 2400-3200 rupees per kg. He is very keen on optimizing these processes in the future and scaling them to extract individual pure compounds from the waste tube lights.

Aditaya Raj Paridwal
SSF ID: B/98; Gujarat

The fellow has been very keenly involved in making the communities, companies, and students around him aware of E-waste. For this, he has so far taken 9 In-person Seminars, in which he taught people and made them aware of "Handling waste Electronics". He organized different webinars in Corporates, Schools, and Universities to make them understand the value of handling, recycling, and reusing of E-waste. He also kept his keen observation on finding out whether the company is strict towards the extended producer responsibility (EPR) policy or not. He collected E-waste from his surrounding communities through different awareness drives and sent it to the responsible and certified E-waste recyclers nearby. With the help of his surrounding community, decorative items out of e-waste are being made and gifted to surrounding NGOs. Aditaya wishes to continue working towards making people aware of managing their e-waste and connecting public organizations with corporates for e-waste recycling purposes.

Organic Waste

Arya Pangging
SSF ID: A/6; Arunachal Pradesh

Arya Pangging has worked on a solution for the disposal of human hair waste. He collected over 5.5 kg of human hair from the barbershops and utilised 200 kg of fresh cow dung to make compost. Various lab tests of hair-based vermicompost were done periodically. The developed vermicompost was processed via a bamboo-based sieve, followed by sun drying, and, finally, product packaging. The fellow has worked with farmers in Assam and Arunachal Pradesh for the use of this compost and has conducted awareness sessions in the Lakhimpur district of Assam and the Papum-Pare district of Arunachal Pradesh. In the near future, Arya aims to create awareness among farmers in other north-eastern states and produce vermicompost on a larger scale.

Bunushree Behera
SSF ID: B/86; Odisha

Bunushree has studied the growth of a mixed coalition of microalgae in urinal water, as an approach to promoting ecological sanitation (ecosan). To conduct further tests, the fellow installed a 1000 litre algal pond, from which she was able to successfully recover 1500 g of dried algal biomass with 90% ammonium, nitrate, and almost 100% phosphate ions. The fellow has demonstrated algal cultivation and nutrient takeaway, and the use of algae and source-separated urine as fertilizer, to community workers and 50 village women. Going ahead, Bunushree wants to educate more community workers and farmers on the benefits of algal cultivation. Nutrient deficient crop fields can be replenished at a low cost using this technique. The commercialisation of this natural fertilizer will also be looked at.

Amalesh Adhikary
SSF ID : B/33; Assam

Amalesh has developed a vermicompost production unit with the motive of reducing wet waste and utilising it efficiently. A proper quality check of the produced vermicompost has been carried out. So far, the fellow has also conducted four awareness sessions and two training workshops for his surrounding communities, in cooperation with the Krishi Vigyan Kendra, Baksa, for the promotion of organic farming using vermicompost instead of chemical fertilizers. With many people already associated with the initiative started by him, Amalesh plans on engaging more and more farmers with him. A cooperative society would be set up with farmers and scientists from other Krishi Vigyan Kendras around his locality to mass produce and commercialise the vermicompost produced along with creating awareness among the masses.

Sahima Tabasum
SSF ID: B/150; Jammu and Kashmir

Sahima has introduced a novel photocatalytic material and continuous photocatalytic system to reduce the contamination of pesticides from agricultural aqueous waste disposal. This novel photocatalytic material and photocatalytic continuous system allows for the complete mineralization of pesticides to purify the agricultural aquatic environment. The system can be used in industries to treat wastewater, and is green, sustainable, cost-effective, affordable, and reusable. Sahima has trained many other students as well for the use of this photocatalytic method for the treatment of wastewater and has also presented it at various national and international platforms. She will be training community/sanitation workers and industries on her novel method for the purification of agricultural aquatic environment.

Paper Waste

Pooja Sharma
SSF ID: B/119; Haryana

The fellow has been involved in the segregation of the humongous paper waste on her college campus and further its recycling at DHARA Recycling Unit in the Daulat Ram College. She has allocated a separate place for the segregation of paper waste on the college campus, and this paper collected is further recycled into brown and white paper, respectively. These recycled papers are supplied back to the admin and further used for official purposes. The fellow has also worked towards recycling paper waste, along with cotton cloth, to increase the strength of the recycled paper. This cloth-mixed paper is further used to make file covers, carry bags, decorative handmade sheets, and bottle bags. Further, with the segregated waste, the fellow has developed innovative recycled waste tiles as well. She has trained and educated the students and faculty in her college and conducted workshops to teach the processes as well.

Khushi Rastogi
SSF ID: B/46; Delhi

Khushi, with her friends and community members, has developed various products out of recycled and waste papers, such as pouches, notepads, bookmarks, handmade sheets, etc. For this purpose, she conducted waste paper collection drives in every 10 days in the offices and schools in her locality and also conducted some fun and recreational activities for the community members to increase awareness towards proper management of paper waste. She has also worked on developing her own website as well where all these products made from recycled and waste paper are showcased and up for sale. She also took the initiative to train 5 women from marginalized communities to develop different usable and decorative items out of paper waste and recycled paper and empowered them to become entrepreneurs. In the future as well she wishes to empower people around her and make them self-sustainable whilst contributing to safeguarding the environment as well.

Shivam Shivani
SSF ID: A/66; Bihar

Recyclable products out of waste were made by Shivam Shivani, which include making handmade sculptures and decorative items using discarded newspapers, notebooks, and other papers. The fellow also contributed to conducting awareness drives on waste segregation and taught the technique of making handmade sculptures out of discarded papers in her surrounding community. In the future as well Shivam wishes to continue making decorative items out of newspaper waste and teach the same in her locality to help people make a livelihood out of it.

Lomas Dhungel
SSF ID: C/54; Sikkim

Lomas is working on a mission to reduce multilayer plastic packet waste by reusing them as covers for student workbooks and making new notebooks out of leftover unused pages. The fellow has so far upcycled 65,270 pages into 652 notebooks at a nominal fee, and 3097 plastic pieces/wrappers into book covers for school students. In his mission, he has helped more than 100 students in upcycling plastic pieces into approximately 300 book covers. Lomas wishes to continue this practice with the upcoming batches of his students and make them understand the harm caused by multilayer plastics and how we can find simple yet effective ways of reusing them.

Plastic Waste

Jaiganesh M
SSF ID: C/01; Tamil Nadu

The fellow has so far collected over 100 MT of plastics and remodeled them into solid fuel. This has drastically reduced the area coverage of the waste landfill in their municipality. He has done MoUs with different municipalities and corporations in his surrounding localities and has successfully converted plastic waste into solid fuel, which can be used as an alternative to coal and wood. The waste plastic is collected and shredded into small pieces to which different additives and chemicals are added. Further, it is mixed well, dried, and remodeled into solid fuel using an extruder. The gross calorific value of the fuel is about 800p kcal. He has given training to communities in his localities as well and also given internships to 10 students, teaching them the process and benefits of the developed solid fuel.

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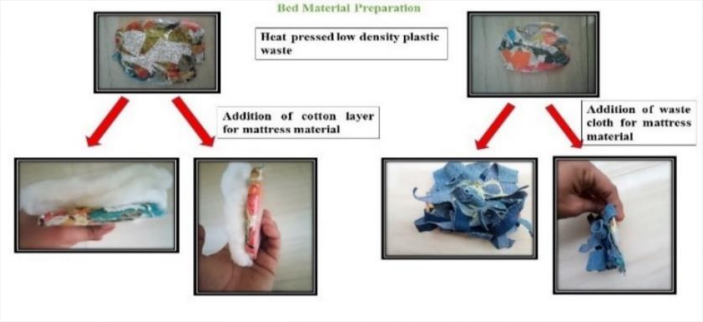
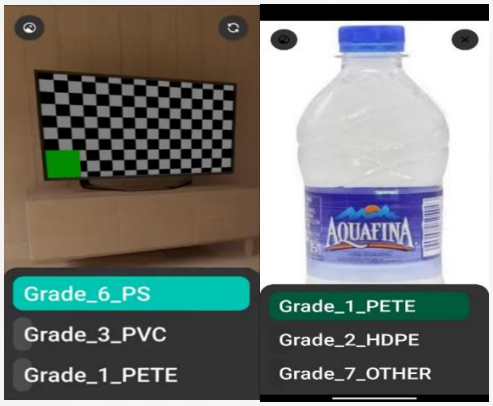
Surjith Ramasamy
SSF ID: B/76; Tamil Nadu

Srujith developed a technique to prepare mattresses using low-density plastic and waste clothes. For this purpose, he collected low-density plastic waste from hostels which were further subjected to heat pressing and pressure after cutting in the required sizes. Further cotton and waste cloths were layered on heat-pressed plastic waste using adhesive material prior to fatigue testing. Further density and hardness of the material were measured and compared to the properties of commercially available mattresses for further improvements. The mattress made by the fellow was of the dimensions – 1.219 × 2.133 meters. He further conducted a drive on the college campus to make people aware of the repurposing of low-density plastic waste into mattresses and proper ways of plastic waste management.



Nishant P
SSF ID: A/121; Karnataka

Nishant has developed an android app and web application to educate the community on plastic waste, and the various categories into which plastic can be divided based on resin codes. This application—the 'Plastic Analyzer'—helps better segregate plastic, thus ensuring better income for informal workers. The app has 7 different forms of plastic coding and will be available on the Google Play Store soon. Nishant intends to optimise the app to allow smooth usage. The app can help in keeping track of the unorganised/informal waste sector, which has always been a challenge in the Indian waste sector.

- 

Binay Krishna Maity
SSF ID: C/44; West Bengal

Binay is working with the motive of converting waste into art and has made numerous handicraft items with plastic waste ranging from handbags to small idols, toys, nets, and many more. He collects used plastic from nearby houses and villages—stopping them from throwing these plastic pouches into fire or soil, and thus reducing the plastic waste menace in his town while also developing a small-scale business out of waste. Along with this, the fellow has conducted two skill development and training workshops in his community. The fellow has represented his creative work at various community centers and events and wishes to continue empowering his surrounding communities by helping them develop a business out of making these creative products from used plastic.

Solid Waste

Vineet Kumar
SSF ID: B/89; Bihar

Vineet has worked on waste segregation and conversion of plastic waste into fuel. Till now, he has facilitated the making of a total of 6 collection points for solid waste collection and has converted more than 4000 kg of plastic into fuel from his developed machinery. The fuel received is then supplied to the local market, facilitating a business model. Additionally, Vineet has collaborated with the Nagar Parishad and other local bodies to conduct waste segregation awareness programmes and has sensitised over 340 students within his community on waste management awareness.

Pandiarajan Mo
SSF ID: C/80; Tamil Nadu

Mo Pandiarajan is working towards reducing coconut waste generated from temples in his locality. From used, broken, left over coconuts he is making coconut oil, thus converting waste into a valuable resource. Given that the coconut oil is pure, it can be commercially sold to generate income as well. Till date, he has produced over 60 kg of coconut oil, and sold more than 35 kg of it. Going forward, he intends to engage sanitation workers and local communities for collecting and selling waste coconuts from temples in and around his neighbourhood directly to him, through which they can earn an income for themselves. He will then be producing and selling organic pure coconut oil to customers to generate revenue, thus achieving a circular economy model in his enterprise.

Gauri Jindal
SSF ID: B/101; Punjab

Gauri started to practise organic farming by utilising kitchen waste during the lockdown period. She has prepared a chemical-free natural bio-enzyme cleaner from organic waste. Gauri has collaborated further with the Municipal Corporation of Jalandhar. She has also trained 10 students from Biotechnology and Botany classes to make bio-enzymes. Gauri is now the founder of a start-up that produces and sells chemical-free natural bio-enzyme cleaner. Going ahead, the Bio-enzyme cleaner will be produced on a large scale.

S. Rehaan
SSF ID: A/109; New Delhi

Biodegradable plates, cups, etc. were made by Rehaan using rice straw and recycled paper. The cellulose was separated from the rice straws and was mixed with recycled wastepaper to convert it into cups. Several stability and biodegradability tests were done to ensure the durability and biodegradation aspects of the plates and cups. Rehaan also conducted many community awareness sessions on how these can be made and used as an alternative to plastic plates and cups. The biodegradable plastics produced by Rehaan require a reduced use of fossil fuel resources compared to existing processes of producing such plastics, leaving a smaller carbon footprint. Rehaan plans on encouraging students and the people in his locality to mass produce the biodegradable plastics using waste paper.

Biomedical Hazardous Waste

Dr. Lata Ghanshamnani

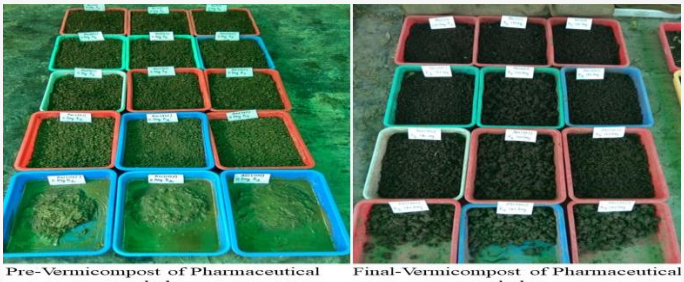
SSF ID: C/12; Maharashtra

Working in the field of Healthcare, Dr. Lata has taken the responsibility of ensuring the safe management of pharmaceutical waste or expired medicine waste from her surrounding households. Till date, she and her team have placed green pharmacy collection bins at 22 sites (residential and drop-off), which have collected over 700 kg of pharmaceutical waste. More than 50,000 citizens have been sensitised on the segregation, separate storage, and scientific disposal of biomedical waste. In the near future, Dr. Lata will identify and place green pharmacy collection bins at multiple locations in collaboration with the local municipality. She also plans on sensitising over one lakh citizens on the safe disposal of pharmacy waste.

Soubam Indrakumar Singh

SSF ID: B/58; Punjab

Soubam has turned pharmaceutical sludge amended with cattle dung into vermicompost and conducted research and performed tests such as physicochemical analysis, heavy metals analysis, SEM analysis, genotoxicity test, and seed germination. He has presented his work at national and international conferences to educate more students, NGOs, and industrial units on the benefits of vermicomposting of pharmaceutical sludge and has published his work pertaining to the optimum quality production of vermicompost. A vermicompost training visit was also conducted by the fellow for the students at his university. His ground-breaking work can benefit industrial units as well as farming communities.



Pre-Vermicompost of Pharmaceutical sludge

Final-Vermicompost of Pharmaceutical sludge

Peddina Sripriya

SSF ID: B/159; Karnataka

Peddina Sripriya aims to teach and make people in her surrounding communities practice sustainable menstruation. For this she ahs conducted numerous live workshops and sessions on teaching people how to stitch their own cloth pads using waste pieces of cotton cloth. She also conducted sessions to make them aware of the non-biodegradability of the readily available disposable sanitary pads. As a part of her initiative she also sold menstrual cups and cloth pads online and offline and also donated in her surrounding localities to the ones who could not afford them. She wishes to continue her mission of establishing sustainable menstruation in her locality and employ more women in making a livelihood by stitching and selling cotton cloth pads.

Greeshma Odukkathil

SSF ID: B/18; Tamil Nadu

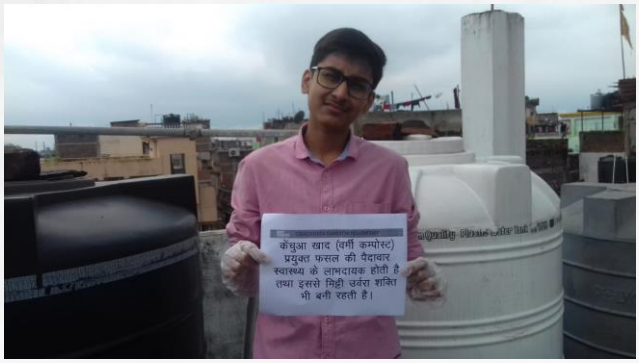
Dr. Greeshma is on a mission to develop value-added products through safe disposal of personal absorbent hygiene products. She started her major activities by creating awareness about Sanitary Napkin Waste management in her localities amongst the community workers and students of Anna University by means of in-person discussion, pamphlets and surveys. She collected a total of over 180kg of sanitary napkins during her fellowship period. These napkins were sterilized and further separated into biodegradable and non-biodegradable part. The non-biodegradable part was converted into fuel oil and char, while the biodegradable part was further anaerobically digested in a pilot scale digestor to convert it into biogas, and the digestate was further converted to compost. She associated with 50 students, society residents, and 10 community workers who helped in source segregation, collection, and spreading awareness.

Awareness Programmes

Aditya Thakur

SSF ID: A/59; Bihar

The fellow worked towards spreading awareness for the decentralised processing of wet waste via vermicomposting at household level and reducing the wet waste dumping. Swachhta Sarathi Club was setup by the fellow to create awareness in his surrounding communities and 25 applicants for setting up a kitchen Garden using wet waste were also supported by him to the State Government of Bihar.



Mr. Veerabhadra Swamy

SSF ID: C/56; Karnataka

Even with his disability, Veerabhadra is working on spreading awareness on waste segregation at source and making his town, Saragur, garbage-free. He has created action plans to conduct door-to-door programmes in his community, conducted survey meetings with villagers, and received support from the Saragur Town Panchayat. To ensure waste segregation and change in citizen behaviour towards waste, he has formed an SHG. The SHG conducts weekly meetings with people who are differently abled to monitor and ensure household waste segregation. He also conducts regular meetings with various stakeholders of the Saragur town and conducts awareness through the community radio station and other activities. Veerabhadra has been and will continue working towards educating the people and bringing change in the society.

Dr. Ruby Makhija

SSF ID: C/25, New Delhi

To reduce the impact of single-use plastic (SUP) bags, Dr. Ruby started a project called 'Vikalp–Borrow a Bag' with the support of the Municipal Corporation of Delhi. Around 160 Vikalp stalls are running successfully in over 100 markets in Delhi to reduce the use of SUP bags. She has also conducted various meetings to raise awareness on source segregation, composting, and reducing SUP with over 2000 Residents Welfare Associations, MTAs, educational institutions, religious institutions, malls, clusters, hotels, dhabas, restaurants, markets, and mandis. Through this initiative, over one lakh individuals have been sensitised. Dr. Ruby will continue her initiative of creating awareness towards reducing the use and impact of SUPs.

Sushmita Sanyal

SSF ID: C/42; Bihar

The fellow empowered women villagers and girl students around her by organizing training sessions on making earthen diyas, DIY comforters, and Quilts made from worn-out clothes, and also organized awareness camps for proper disposal of used sanitary Napkins. Training sessions on how to use Menstrual cups among High School Girl students were also organized by the fellow. She collected domestic waste such as old paint buckets, old worn-out garden pipes, old used bike batteries, and old earthen pots and pitchers from neighbors and converted them into Matka Cooler. She also organized sessions for street-side tea sellers in different villages on how to make such Matka coolers easily on their own and also distributed some of them to the female tea vendors. Sushmita will continue to empower the communities around her and help them to be self-reliant in the journey of repurposing waste and reusing it in another usable form.

FELLOWSHIP MONITORING AND ONLINE REPORTING SYSTEM

1. The Swachhta Saarthi Fellowship Dashboard

To manage the monthly Swachhta Saarthi Fellowship reports received from over 300 fellows, a special portal was developed by the Waste to Wealth Mission. The management of reports was done through a purposefully crafted dashboard—the Swachhta Saarthi Fellowship Dashboard—with strategic monitoring mechanisms. The fellows would submit their monthly, semi-annual, and annual activity reports on the dashboard and would be guided and supported by the Waste to Wealth Mission Project Management Unit to ensure timely reporting. Experts could view reports and submit their score on the dashboard directly. A snapshot of the Dashboard and reports submitted by the fellows is shown below:

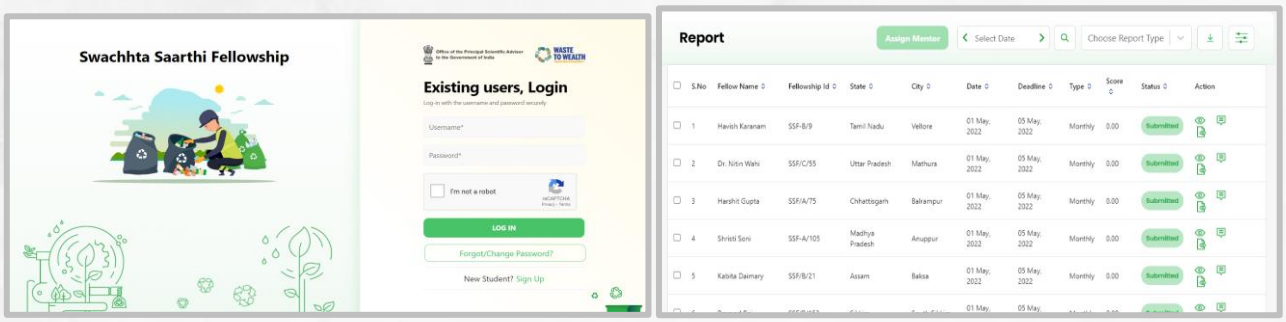


Figure 1: Swachhta Saarthi Fellowship Dashboard Login Page and Report Dashboard

2. Expert Committee Members

The Swachhta Saarthi Fellowship Expert Committee members and mentors are the backbone of the Fellowship program. Ranging from the selection of fellows eligible for fellowship to mentoring, evaluating, and helping the selected fellows throughout the fellowship, their guidance and contribution towards the fellowship is invaluable. Post first-level screening, a First meeting of the expert committee is conducted wherein the experts are given an overview of the fellowship, their roles and responsibilities, and a detailed explanation of evaluation criteria for scoring purposes. Once all the experts complete the assessment and scoring, the Second meeting of the Expert Committee Members is conducted, wherein the cut-off score for selection is decided by them in consensus. Throughout their fellowship period, the fellows are required to submit monthly reports on the work done by them. The Expert Committee Members evaluate these reports every month and give their comments, suggestions, and feedback on the reports shared by the fellows. This detailed evaluation and guidance by the mentors every month help the fellows to make necessary changes, work hard and progress in their journey of creating change in the waste management sector of India. **More than 3800 reports were submitted and evaluated on the portal for 12 months.**

Below is the list of experts selected by the Office of the PSA for reviewing the reports and guiding the fellows:

Prof. Probodh Borah,
Chair, Professor and Head, Dept. of Animal Biotechnology, College of Veterinary Science, Assam Agricultural University

Prof. Uma Chaudhry,
Professor, Bhaskaracharya College of Applied Sciences, University of Delhi

Dr. Praveen Rahi,
Scientist, National Center For Cell Science, Pune

Mr. A N Ramachandra,
Coordinator (Alumni Affairs and Outreach),Navodaya Vidyalaya Samiti

Dr Alavala Matta Reddy,
Head, Department of Biotechnology, School of Life and Health Sciences, Adikavi Nannaya University

Dr. Jayateertha.R.Diwan,
Associate Professor, College of Agriculture, University of Agricultural Sciences

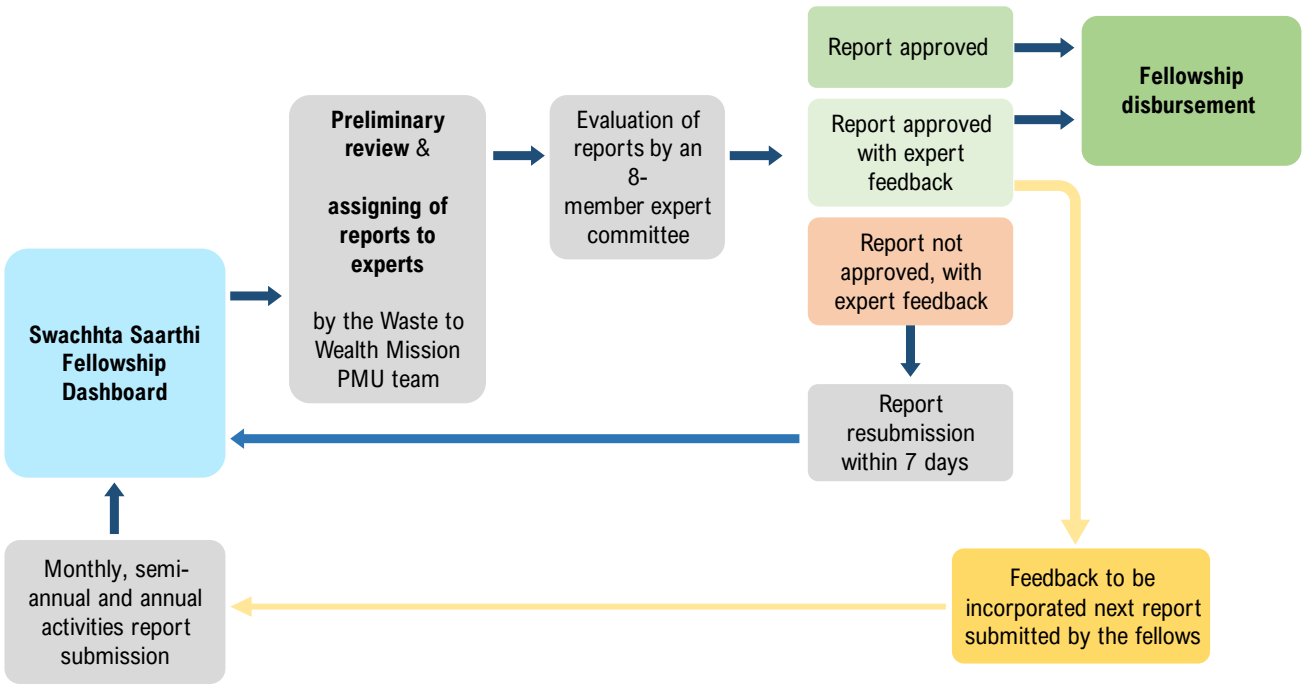
Ms. Smita Ahuja,
Founder, EarthTree

Dr. T. Parimelazhagan,
Professor, Department of Botany, Bharathiar University

3. Monitoring and Reporting Process

A brief flowchart highlighting the entire monitoring, evaluation, and fellowship disbursement process is provided hereunder:

Diagram 1: Monitoring, Evaluation and Disbursement process for Swachhta Saarthi Fellowship



FELLOWSHIP OUTCOMES

The SSF programme has demonstrated that citizens, young and old, have a great deal of interest and enthusiasm for working toward waste management. Numerous fellows have developed new ideas into products, prototypes, and technological innovations. Many of these fellows are eager to take their ideas further towards building their own start-ups. The fellows have demonstrated their entrepreneurial acumen by involving community workers, especially underprivileged people, and generating employment for them.

The SSFs have been successful in encouraging their peers and the community to manage their waste by raising awareness through a variety of sensitization campaigns. The fellows have conducted their proposed activities quite actively and consider themselves the torchbearers of this

programme because of this sensitisation through the award of the fellowship. The most admirable feature of the programme is the fellows' dedication to transforming "Waste to Wealth" through their modest but honest activities.

Most of the SSFs have emphasised on the significance of waste segregation at source itself and have tried to raise awareness of the advantages of appropriate source segregation in the community. They claim that because of their actions, their friends, family, neighbours, and community members have now actively begun source segregation, which is assisting in the delivery of the segregated waste to the appropriate recycling and composting facilities. To provide solutions for efficient waste management, many SSFs have been collaborating closely with local authorities and other stakeholders from various organisations. The SSFs' initiatives have also resulted in a considerable change in society in terms of cleanliness.

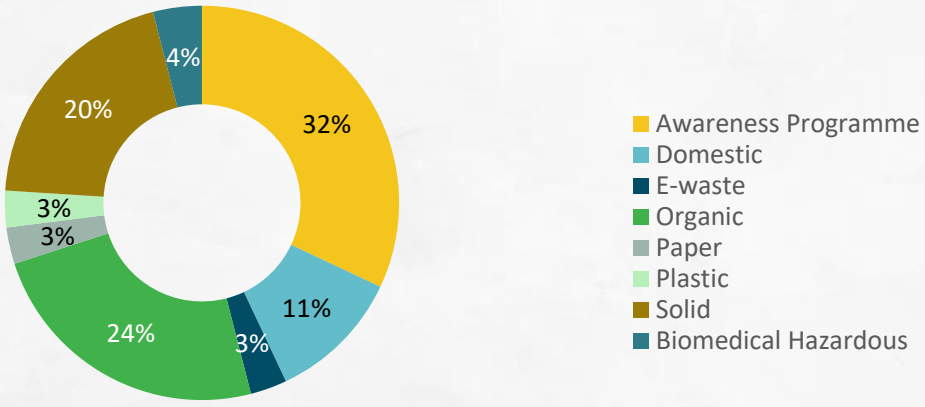
From time to time, fellows have been recognised for their waste-to-wealth initiatives. Many of their activities have also been publicised in the form of pamphlets, posters, and videos on social media platforms and via print media. The programme has reported a significant impact on the community/environment (homes, schools, villages, communities, industries) through increased community involvement which has led to positive behavioural changes of citizens towards effective waste management, a decrease in waste production, and cleanliness.

The fellowship has produced a number of products and prototypes that the fellows can now develop further for commercialization and scaling up by utilising the platform and networking opportunities provided under the fellowship.

A qualitative and quantitative analysis is done below for fellows and fellowship impact:

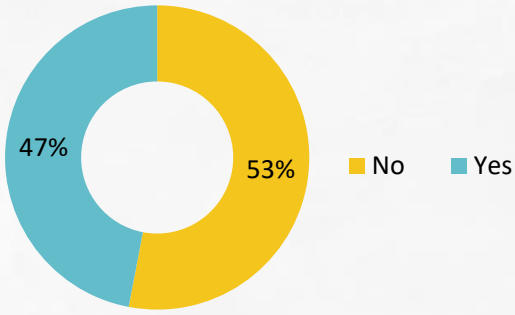
1. Quantitative Impact of Fellowship:

1. Out of 379 selected SSFs, 344 SSFs have continued to be part of the programme. This **shows > 90%** retention—an extremely positive indicator with a relatively higher participation from female fellows.
2. The gender ratio of the program was 54% male and 46% female.
3. Fellows were encouraged to engage in activities that were of interest to them and relevant to their community during the allotted one-year duration under the programme. The areas of activity preferred by the fellows were solid waste treatment, organic waste treatment, and household waste. Other areas included biomedical hazardous/pharmaceutical waste disposal, paper waste, plastic waste, and electronic waste disposal. Most of the selected fellows have chosen to raise awareness about waste management in their surroundings.



4. As part of their work, SSFs were encouraged to organise workshops and awareness programmes in their neighbourhoods/surroundings/community. So far, 2,759 workshops/awareness programmes have been organised by the SSFs, as reported in the annual progress reports. An overview of the category-wise number of workshops conducted by the fellows is depicted in the figure below:

5. Through various awareness programs, SSF has trained and sensitised 3,08,577 students, citizens, and community workers on waste management.
6. At the end of the programme, many fellows reported their work in the form of prototypes and products with 53% wanting to take forward their innovative solutions (prototype, other leads) towards validation, start-up, etc.



2. Qualitative Impact of Fellowship

The different types of activities undertaken by the fellows are summarised below:

1. **Source segregation and waste disposal mechanisms:** Fellows were able to convince and train citizens in their surroundings in the identification of waste categories, segregation, and disposal of wet/dry/biomedical/electronic and other forms of trash, and placement of dustbins for segregation in residential societies/neighbourhoods/surroundings through intensive awareness drive.
2. **Conversion of waste to wealth:** Some of the major waste materials used to produce value-added materials are as follows:
   - Composting: waste recycling for the creation of value-added products from waste, such as organic manure (bio-compost/vermicompost/human hair compost), recycling flower waste from temples, and domestic waste.
   - Bio-enzymes, biofuel, biofertilisers, dhoop cones, room fresheners, incense sticks, coconut oil, etc. by SHGs/NGOs.
   - Decoration items, bags, blankets, *matka* coolers and biodegradable products like straws, plates, cups etc., waste from coconut leaves, rice straws, paper, plastic, and organic waste.
   - Recycling of biomedical waste like PPE kits, surgical masks, tetra packs, and non-biodegradable waste like thermocol, etc.
3. **Technology interventions:** Lab-based technologies to convert human hair waste into manure/fertiliser, development of portable power banks using e-waste for mobile phones and other electronic accessories, bio-electric toilets, power generation from food waste, waste-customised machines such as bioreactors for processing fuel, briquettes, paper processing products, plastic cutting machines, textile wastewater treatment, etc; android app development, bricks from textile waste, biofuel from plastic, production of bioplastics and value-added products from organic waste, and recovery of valuable metals from e-waste by start-ups, SHGs and NGOs.
4. **Reduction in waste production:** Minimising the use of plastics, promoting the use of khadi bags, preparing eco-bricks, etc.
5. **Cleanliness drives/revival of the ecosystem:** Plantation drives, pond/lake revival drives, local cleanliness drives in schools, communities etc.

6. **Community sensitisation/awareness:** The fellows organised many sensitisation and awareness programmes for the local communities to engage them in waste management and value creation from the waste. The fellows carried out these sensitisation campaigns through workshops, demonstrations, rallies, quizzes, debates, talks, plantation and cleaning drives, audio-visual presentations, one-on-one conversations, and the creation of creative radio jingles.

Some fellows collaborated with the local municipalities and organised various awareness programmes in their communities and schools/societies to make the communities aware of the prospects of creating wealth from waste through societal engagement and using innovative methods. Some of the fellows were recognised as brand ambassadors by their municipal bodies and continued their activities and awareness in their cities.

Community members are now more inclined toward creating sustainable alternatives for the disposal of organic waste as a result of the sensitisation and awareness raised on the negative/ harmful effects of stubble burning. Some fellows are training communities in reusing paddy straw to grow mushrooms and to create birdhouses thereby, helping to preserve biodiversity in the process. Mushroom farming also makes use of these paddy straws

SWACHHTA SAARTHI SAMAROH 2022

To celebrate the work done by the fellows in the first year of this fellowship, the Waste to Wealth Mission hosted a 2-day event, the 'Swachhta Saarthi Samaroh', on 30th September and 1st October 2022 in Delhi.

This 2-day event gave the Swachhta Saarthi Fellows under the Waste to Wealth Mission an opportunity to showcase their work and the impact made within their community with their peers to a large audience, which will help in inspiring people across the nation to actively work toward waste management.

In the first batch of the fellowship, the Mission selected 344 fellows across 27 states and 6 Union Territories (UTs), based on their ideas and action plans to tackle the enormous challenge of waste management scientifically and sustainably. As ambassadors of change, these 344 fellows have conducted over 2700 sensitization programmes, including workshops, cleanliness drives, technology interventions, development of prototypes, audio-video demonstrations, one-on-one discussions, and the creation of innovative radio jingles, sensitizing over 3.1 lakh citizens. All the SSFs from 27 states and 6 UTs under the 2021 Cohort were invited to Delhi for the event.

Day 1: Opening Ceremony

The event was held at the Indian Institute of Technology, Hauz Khas, Delhi. It was attended by eminent dignitaries, including the Scientific Secretary of the Office of the PSA to the Government of India, and other dignitaries from academic institutions, industries, Council of Scientific and Industrial Research (CSIR) labs, start-ups, etc.

The Chief Guest for the event, Dr. (Mrs.) Parvinder Maini, Scientific Secretary, Office of the PSA to the Government of India, applauded the commendable work done by the fellows and saluted their commitment towards addressing the major challenge of waste management the whole world is facing today.

Dr. Monoranjan Mohanty, Adviser/Scientist 'G,' Office of the PSA to the Government of India, welcomed Swachhta Saarthis from different parts of the country in the Opening Ceremony of the event, and congratulated the fellows for their fruitful hard work done in the past year of the fellowship.

A special address was given to the fellows by Dr. Sanjay Kumar Sharma, Professor, Indian Institute of Technology, Varanasi. He mentioned that after seeing the innovations made by the Swachhta Saarthis, he is very proud, and he can see the light, enthusiasm, and zeal in each fellow to take their innovations forward to a developed product stage and contribute collectively to the nation's development.

Day 1: Exhibition

During the two-day event organised at IIT Delhi, the fellows were given an opportunity to showcase the work they've done over the past year, in the form of posters, prototypes, papers, presentations, and products in the event exhibition. The fellows displayed work done over 8 waste categories, and over 100 posters and more than 60 prototypes were displayed at the exhibition venue. The display included projects showcasing methods of vermicomposting using waste hair and pharmaceutical sludge, photocatalytic treatment of wastewater, transforming multi-layer plastic wrappers to book covers, conversion of plastic waste to toys, handicrafts, and other decorative items, methods of conversion of waste plastic into fuels, conversion of organic waste into briquettes, bio enzyme cleaners, and many more.

The Scientific Secretary, Office of the PSA, visited the exhibition booths, interacted with all the fellows, and applauded their work. The excitement and enthusiasm of the fellows were unmatchable. The fellows not only got an opportunity to display their own products but also got a chance to interact with other fellows, see their work and take learnings from them as well.

Pic 1: Exhibition Area with 150+ Displays and 50+ prototypes Scientific Secretary and team from the Office of the PSA visited each booth to understand work done on ground by fellows

Pic 2: Projects displayed including oil from waste coconuts thrown in temples, and value recovered from waste segregation

Pic 3: Projects displayed products made from marine plastic waste, household composting solution, and recycling of plastic

Pic 4: Projects displaying low-cost briquette making machine by a category A fellow. and composting

Pic 5: Project for reducing plastic waste by converting them into book covers in schools, simple yet effective solution for multi-layer plastics

Day 1: Workshop, Interactive Sessions, and Panel Discussions

Different sessions and workshops were planned and conducted for the fellows about their fellowship category.

1. Foldscope microscopy workshop for category A fellows:

Experts for the workshop:

- Eminent Foldscope Super Mentors Dr. Uma Chaudhary, Dr. Rafikh Shaikh, and Mr. Mo Pandiarajan.

Agenda of the workshop:

A Foldscope is an optical microscope that can be assembled from a punched sheet of cardstock, a spherical glass lens, a light emitting diode (LED), and a diffuser panel, along with a watch battery that powers the LED. Foldscope combines low-cost materials with precision optics to create inexpensive microscopes that are affordable for communities worldwide. The goal of this session was not only to provide microscopes to those who would not otherwise have access to them, but also to motivate and encourage young researchers for advancing the general study of biomimicry through findings about the microorganisms they observe in their local environment. The Category A fellows practiced their hand

at assembling an optical microscope using simple components and observed the composition of different materials using the microscope they developed.

2. Interactive session on carbon credit & sustainable future:

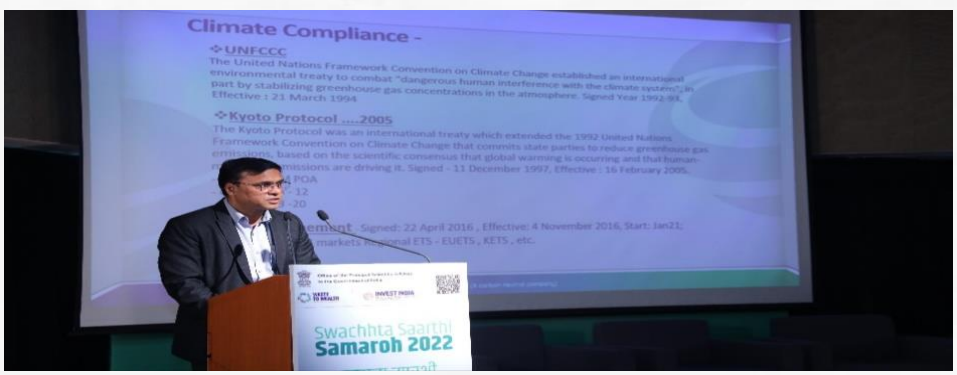
Expert for the session:

Mr. Rohit Kumar, Vice president, EKI Energy Services Ltd.

Agenda for the discussion:

India's international climate commitments include a reduction goal in greenhouse gas (GHG) emission intensity of GDP by 33–35% until 2030 (compared to 2005 levels), and a target to increase the share of non-fossil fuel energy sources to 40% by 2030. Additionally, India also targets to install over 175 GW of renewable energy by 2022. Carbon Pricing is one of the key tools to facilitate a low-carbon transition. Carbon markets and international voluntary co-operations are set to play a critical role in meeting climate targets at the lowest costs. EKI Energy Services is the world's largest carbon offset developer and supplier, and the world's first and only listed company in the carbon market. They are managing carbon assets of 20 GW+ renewable energy installations across the globe.

An interactive session with Category B and C fellows was held with a focus on carbon credits and a sustainable future. The goal of the session was to help young entrepreneurs and start-ups in the waste management sector understand and leverage the opportunities in the emission reduction market. It also provided information for readiness towards a potential carbon market, especially amongst the medium, small, and micro enterprises (MSMEs). Detailed discussions were held on the projects covered under carbon credits, and how small and micro businesses can get registered and benefit from them.



3. Panel discussion on 'Entrepreneurship Opportunities in Waste Management'

Panellists for the session:

- Mr. Shirish Panda, Scientist 'D', Office of Principal Scientific Adviser to the Government of India - Moderator;
- Ms. Shipra Mishra, CEO and MD, CKIC–DRIIV;
- Mr. Nick Booker, Founder, IndoGenius; and
- Mr. Apurv Misal, Marketing head, Phool.co

Discussion agenda:

To encourage fellows working in waste management fields and to showcase how small ideas on the ground can be turned into business opportunities, a panel discussion with entrepreneurs in waste management was organised.

Three panellists discussed their entrepreneurship journey in the Waste Management sector. The discussion included interventions that young entrepreneurs can take to tackle waste at source and generate a circular economy. Questions from the Swachhta Saarthis were also answered by the panellists.

4. "Swachhta Saarthi Charcha: Impact 2021"

Panellists:

- Ms. Malvika Jain, Waste to Wealth Mission (Moderator)
- Dr. T. Parimelazhagan, Professor, Bharathiar University, Coimbatore
- Dr. Alavala Matta Reddy, Associate Professor, Adikavi Nannaya University, Andhra Pradesh
- Dr. Jayateertha R. Diwan, Professor, University of Agricultural Sciences, Raipur

Discussion agenda:

To encourage fellows to take their innovations to the next level and turn their ideas into products which can be sold in the market. Each of the panellists gave a speech to motivate the Swachhta Saarthi Fellows and expressed hopes that they all would go on to become entrepreneurs. Intellectual Property Rights regarding the SSFs' innovations were discussed, along with ways to get funding for manufacturing products and taking them to the market. Dr. Reddy specifically spoke about how the Swachhta Saarthi Fellowship was an excellent step towards including every sector of the community in keeping the country clean. The panellists' discussion was followed by an open mic round. Fellows were invited to share their experiences with their peers who have also been part of the Swachhta Saarthi Fellowship Cohort of 2021. They spoke about their contribution towards keeping their communities and the country clean, and also answered questions posed by other fellows regarding their work.

5. Certificate Distribution Ceremony

A certificate distribution ceremony was organised at the end of the day to felicitate the fellows with certificates and mementos. A total of 120 fellows from all 3 categories were felicitated during the ceremony. The Chief Guest for the event, Dr. (Mrs.) Parvinder Maini, Scientific Secretary, Office of the PSA, applauded the commendable work done by the fellows and saluted their commitment towards addressing the major challenge of waste management the whole world is facing today.

Day 2: Visits to Rashtrapati Bhavan and Nehru Planetarium

On the second day of the event, an excursion to the Nehru Planetarium and the Rashtrapati Bhavan museum was organised for the Swachhta Saarthi fellows from all categories (A, B, and C) along with their guardians and parents. The fellows had a great time getting to know each other and their work, while walking through the Rashtrapati Bhavan Museum and watching the Astronomy Show at the Nehru Planetarium.

Day 2: The Closing Ceremony

The visits were followed by the closing ceremony at IIT Delhi, where Mr. Vijay Kumar, Head of Operations, Wellbeing Out of Waste (WOW) Program, I.T.C. Limited, felicitated 20 fellows with a fellowship amount of ₹5001 each. Mr. Vijay Kumar applauded the efforts and the impactful work done by the fellows and provided an opportunity to all the fellows to join the WOW programme within their operating states.

During the closing ceremony, Dr. Monoranjan Mohanty, Adviser/Scientist 'G', Office of the PSA to the Government of India, congratulated all fellows for the wonderful work they have done over the last year, and for showcasing various ways to reuse, reduce and recycle waste and convert it into wealth.

Dr. Bhagwan Singh Chaudhary, Professor, Kurukshetra University, Haryana was the guest of honour for the closing ceremony and specially thanked the Office of the PSA to the Government of India for making it possible to get such a heterogenous group of fellows from different age groups and different states to one single platform to enable learning from each other.

Ms. Malyaj Varmani, Vice President, Invest India, mentioned, "We encourage and expect our fellows to keep engaging with their communities, be the ambassadors for change, and remain Swachhta Saarthis for life."

SWACHHTA SAARTHI SAMAROH 2022: PRESS RELEASE AND COVERAGE

Press Release:

Office of Principal Scientific Advisor to GoI

Azadi Ka Amrit Mahotsav

Swachhta Saarthi Fellows from across the country attend the Swachhta Saarthi Samaroh 2022

Posted On: 06 OCT 2022 12:48PM by PIB Delhi

The two-day '**Swachhta Saarthi Samaroh**' was organised on **30th September** and **1st October 2022** at the Indian Institute of Technology (IIT), Delhi. This event marked the completion of the first year of the Swachhta Saarthi fellowship (SSF) of the Waste to Wealth Mission of the Office of Principal Scientific Adviser (PSA) to the Government of India.

Media Coverage:

औरंगाबाद के युवक को मिला स्वच्छता सारथी पुरस्कार: IIT दिल्ली में भारत सरकार ने किया सम्मानित, कई उपयोगी अविष्कार के लिए मिला सम्मान

औरंगाबाद एक महीने पहले वीडियो

सुबह सवेरा टाइम्स

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गौरी जिंदल "स्वच्छता सारथि" को इन्वेस्ट इंडिया की तरफ से सम्मानित किया गया

Swachhta Saarthi Samaroh 2022 | स्वच्छता सारथी समारोह 2

भारतीय प्रौद्योगिकी संस्थान दिल्ली INSTITUTE OF TECHNOLOGY DELHI

Azadi ka Amrit Mahotsav

जागरण

राज्य चुनें

होम ताज़ा राष्ट्रीय स्पेशल शेयर बाजार प्राइम न्यूज़ पॉलिटिक्स दुनिया मनोरंजन बिजनेस क्रिकेट लाइफस्टाइ

जागरण फोकस यशस्वी प्रधान T20 World Cup टॉप-डील्स संस्कारशाला चुनाव 2022 विश्वास न्यूज़ वेब स्टोरीज

भारत सरकार द्वारा मिला स्वच्छता सारथी पुरस्कार

भारत सरकार से प्रिंसिंपल साइंटिफिक एडवाइजर व इंवेस्ट इंडिया भारत सरकार द्वारा स्वच्छता सारथी पुरस्कार दिया गया। विनीत को यह पुरस्कार प्रिंसिपल साइंटिएडवाइजर सेक्रेट्री प्रमेंद्र मानी द्वारा आइआइटी दिल्ली में दिया गया। इसके लिए विनीत को पहले एक साल के लिए स्वच्छता सारथी फेलोशिप मिला था जिसमे इसको वेस्ट से वेल्थ कैसे बनाया जाए और अपने आसपास के लोगों को इसके लिए जागरूक किया जाए। इसके प्रोजेक्ट पर काम करना था जो कि भारत सरकार की टीम के निगरानी में विनीत द्वारा किया जा रहा था। बेहतर काम को देखते हुए विनीत को दिल्ली में आयोजित स्वच्छता सारथी समारोह में बुलाया गया और इसके द्वारा किए गए कार्यों का निरीक्षण किया गया।

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SIKKIM EXPRESS

OF THIS LAND, FOR ITS PEOPLE

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'Hariyo Makha' among top-18 'wow initiatives' at Swachhta Saarthi Samaroh 2022

SE Report

GANGTOK, October 1: A two-day Swachhta Saarthi Samaroh 2022 was organised at IIT-Delhi under the banner of the Office of the Principal Scientific Advisor (PSA) to the Government of India.

Earlier in 2021, the office of the PSA under its "Wealth to Waste" mission had launched Swacchta Saarthi Fellowship to recognise students and individuals working on waste management. Thousands of applications from 27 States and seven UTs were received by the Invest India group out of which only 379 fellows were selected. The Waste to Wealth Mission is one of the nine national missions of the Prime Minister's Science, Technology and Innovation Advisory Council.

Lomas Dhungel, a graduate teacher at Makha senior secondary school, was one of the successful candidates who represented Sikkim. He was awarded Swachhta Saarthi Fellowship 2021-22 for his socio-environmental project

of Hariyo Makha which was started in 2015, informs a press release.

At the end of the program, the top 18 initiatives were further complimented by the ITC under the 'Wow Initiative' and the Hariyo Makha project was one of them.

Dhungel thanked the Education department, Sikkim Pollution Control Board, ENVIS, Rural Development department, his students and others for the support that motivated him to earn the recognition, the release mentions.

The Waste to Wealth Mission Team

The Office of the Principal Scientific Adviser aims to provide pragmatic and objective advice to the Prime Minister and the cabinet in matters of Science and Technology. Besides formulating and coordinating major inter-ministerial S&T missions, the Office of PSA also facilitates the enabling of ecosystem for technology led innovations and techno-entrepreneurship and driving innovation and technology delivery towards solving socio-economic challenges for sustainable growth. Facilitating India's progress towards meeting the Sustainable Development Goals 2030 and transition to a Circular Economy is also one the major areas of work of this Office. Sustainable waste management through identification of innovative technologies to handle solid and liquid waste will be key to achieve sustainability. Engaging the community and sensitizing the citizens through various initiatives will also be important. This Swachhta Saarthi Fellowship program was an initiative in this regard aiming at sensitizing the communities towards waste management and offering innovative solutions for the conversion of waste to wealth by recognising young students from schools and colleges, and citizens working in the community through Self Help Groups (SHGs) and sanitation workers or independently.

Waste is of course of different types, but solid waste management is a major concern and something which we can actually control partially and something we can also control through changing our attitudes through life.

Dr. (Mrs.) Parvinder Maini
Scientific Secretary
Office of Principal Scientific Adviser to Government of India

Congratulations to all the fellows for their wonderful work they have done over the last year and for showcasing various ways to reuse, reduce and recycle waste and converting it into wealth.

Dr. Monoranjan Mohanty, FNAAS
Adviser/Scientist 'G'
Office of Principal Scientific Adviser to Government of India

Team

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Office of the Principal Scientific Adviser
to the Government of India

WASTE TO WEALTH
Swachh Bharat Unnat Bharat

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