SBSI 2023 FINAL PROJECT REPORT

Submitted by

1. Ms. Rishwa Narvekar (L)
2. Ms. Sampada Nadkarni
3. Ms. Isha Vaze
4. Ms. Varsha Naik
5. Ms. Yuvradnyee Naik

Under guidance of

Dr. Lata Gawade
Assistant Professor
Department of Microbiology
Goa University

DECLARATION

I / We have carried out the SBSI 2020 Internship under the guidance of –

(Dr. Lata Gawade),
(Assistant Professor),
(Department of Microbiology, Goa University).

The contents of this report are original and are reporting the 100 hours of work carried out by
me / us during this internship.

22P0420015, Rishwa Narvekar

22P0420011, Sampada Nadkarni

22P0420010, Isha Vaze

22P0420022, Varsha Naik

22P0420024, Yuvradnyee Naik

CERTIFICATE

This is to certify that the following SBSI 2020 Intern/Interns

1. 22P0420015, Rishwa Narvekar
2. 22P0420011, Sampada Nadkarni
3. 22P0420010, Isha Vaze
4. 22P0420022, Varsha Naik
5. 22P0420024, Yuvradnyee Naik

have satisfactorily completed 100 hours of activities related to Swachhata.

During this internship period, it was noticed that the interns acquired and enhanced the following skills –
1. Leadership and team work
2. courage or the skills that will definitely help us to be an entrepreneurship rather than depending on the service or jobs
3. communication skills
4. Time management

This report is being submitted to SBSI 2020 University Nodal Officer, in partial fulfilment for the completion of the SBSI Course during the academic year 2023-2024.

Name and Signature of SBSI Mentor

Name and Signature of SBSI Co-ordinator

Name and Signature of Programme Director, Microbiology, SBSB

ACKNOWLEDGEMENT

Swachha Bhaeat Abhiyan is one of the most significant and popular missions to have taken place in India. Swachha Bharat summer internship is an extension to the Swachha Bharat mission of the Modi Government which was launched as a National Movement on Oct 2nd 2014.
The themes that we concluded in our internship are Marine Farming, waste management, sanitation and hygiene, and Greenery.
The internship has helped us to focus on being a part of this great mission which aims at driving mass awareness about hygiene and cleanliness etc. and also utilising the young people to motivate and push the Swachha Bharat Mission.

We experess our deep gratitude to our guide dr. Lata Gawade for giving her valuable time and guiding us throughout our course of internship.
We express our sincere gratitude to Dr. Lakshangy Charya, head of the department, Microbiology and our teachers for providing their assistance.
We take this golden opportunity to thank our Co-ordinator, Dr. Milind Naik for sharing his valuable knowledge with us and helping us throughout the course of internship.
My sincere thanks to Dr. Subhash Bhosale sir, President, Matrucchaya, Dhavali, Ponda for letting us conduct a outreach activity on mushroom cultivation.
We deeply express our gratitude and sincere thanks to Panchayat, Old Goa and Mr. Nitin Atoskar, Swayampurna Mitra of village and the Sarpanch of Village Panchayat Old Goa. Also we are thankful to the locals of Old Goa for providing us opportunity to carry out outreach activity on wine making.
Finally we thank our friends and family who supported and guided us throughout this internship.

LIST OF ACTIVITIES

Sr. No.	Name of the activity	Hours contributed
	Theme: Marine Farming	
1	Activity 1 **A one-day workshop on marine farming & society engagement in the coastal state of Goa**	22
2	Activity 2. **Talk on 'Biological Challenges for Sustainable Ocean Agriculture'**	20
3	Activity 3. **Aquaculture perspective of multi-use site in the open ocean- The untapped potential for marine resources in the Anthropocene**	6
4	Activity 4. **Mushroom Cultivation**	3
	Theme: Greenery	
5	Activity 5 **Home Composting**	13
6	Activity 6 **Seed Bomb**	3
7	Activity 7 **Plantation**	6
	Theme: waste management	
8	Activity 8 **Creating a greener future: A motivational programme for swachha Bharat student interns, mentors and coordinators**	6
9	Activity 9 **Paper bag making and distribution**	9
10	Activity 10 **Beach cleaning**	8
11	Activity 11 **Outreach Activity on Mushroom Cultivation demonstration in 'Matruchhaya' orphanage**	6
12	Activity 12 **Outreach Activity on Wine Making at Oldgoa**	12

Activity 1.

ONE-DAY WORKSHOP ON MARINE FARMING & SOCIETY ENGAGEMENT IN THE COASTAL STATE OF GOA

Date: 04 February 2023 *Hours contributed: 22 hours*

The workshop on marine farming and society engagement was held on 4th February 2023 at Madkai Grampanchayat hall. The workshop was conducted by the Marine farming subcommittee of the Social Entrepreneurship, Swachhata, and Rural Engagement (SES-REC) of Goa University, with the aim of making awareness of marine farming and the opportunities in the coastal state Goa. The workshop was a combination of expert talks, hands-on training, and mussel spat and seaweed seedlings distribution among interested people to initiate marine farming. Workshop was attended by a large number of participants including locals from various villages of Goa, faculties, and graduate & postgraduate students. Workshop was inaugurated by the honorable minister of power, Govt. of Goa, Shri Sudin Dhavalikar along with the village Sarpanch and Dean of SBSB, Prof. Kerkar. The valedictory event of the workshop was graced by the Honorable Speaker of Goa Legislative Assembly, Shri Ramesh Tawadkar along with the Secretary, village panchayat, and Chairman- Shri Arvind Khutkar. Expert talks were delivered on marine farming prospects on the Goan coast by Dr. Lata Gawade- Asst. Prof., Goa University, Seaweed cultivation by Dr. Karathick-Sea6 Energy pvt. Ltd and Fisheries related benefit from the Govt. of Goa by Fisheries Dept. The demonstration was done to participants on the cultivation of mussels and seaweed seedlings around the chosen area of Madkai.

We the SBSI students volunteered for the event and were part of the entire event including hands-ontraining.

Pictures of one day workshop on marine farming.

Learning:

The workshop benefitted us a lot. We learned the techniques of mussel and seaweed cultivation. For cultivation of mussels, the blue-green mussels spat of approx. 3 cm in size were tied in a muslin cloth having a coir rope at the centre and stitched from all the sides to prevent falling of the spat. The muslin cloth pouch of approximately one meter with the mussel spat was then tied to a bamboo raft and deployed in to the water. Within 3-4 days of deployment, mussels produce thread like structure which attaches to coir rope and starts growing. A bamboo raft of 3*3 meters was made in an area where there is at least 2 meters of water depth during low tide. It is also important to have a salinity of 18 psu and above as well as free-flowing waters without any chemical or domestic pollution. The area near sluice gates with continuous flowing waters and good plankton stock is the best suitable area.

At present, mussels are on the verge of extinction from the intertidal regions of Goa. The tourism industry increases the market demand for mussels. Its cultivation is very necessary to

meet the market demand and it can generate employment and a source of income for the local people. It can also lead to entrepreneurship.

•Picture of muscle.

Seaweeds are the most common type of plankton species found just below the low tide mark. It grows in saline and stable water and requires mild currents. It has wide applications in various sectors eg. The food industry, pharma industry, Agriculture and textile industry, etc. We learned about the cultivation of seaweed saplings. Seaweed cultivation can lead to employment and income generating entrepreneurship in coastal state of Goa.

•Seaweed

•SBSI students of group 1.

Apart from the marine farming workshop, we visited the mussel farming site along with Dr. Lata Gawade, Chairperson, marine farming subcommittee -SES-REC, Goa University. We analysed the mussel samples for their biochemical contents.

Activity 2.

Mushroom Cultivation

Date:11 February 2023 *Hours contributed:20 hours*

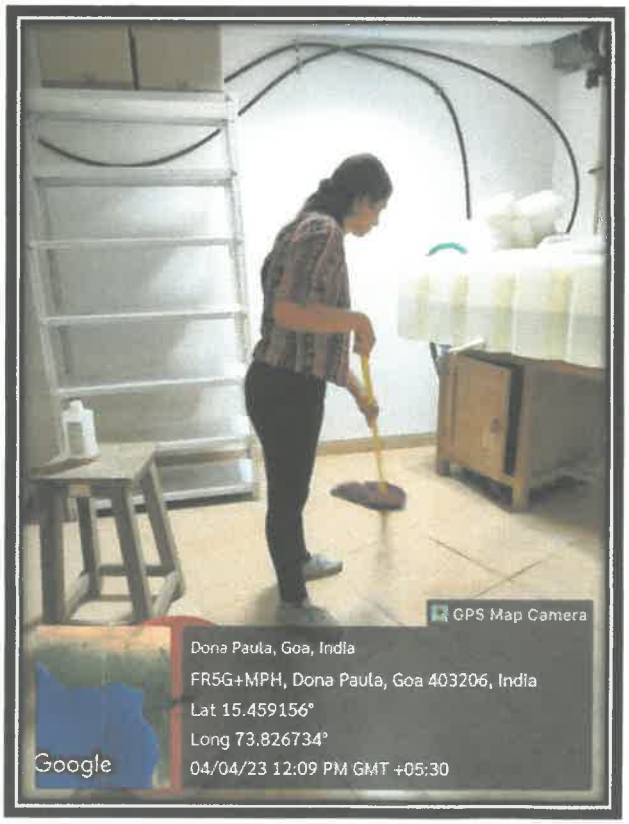
A lot of people love mushrooms because of their delicacy and protein source. They are a great addition to the diet because they are loaded with vitamins and minerals and provide many different recipes and flavors. The nutrients, fiber, protein, and antioxidants in mushrooms are abundant and low in calories. They might also lower the chance of getting serious illnesses like diabetes, cancer, heart disease, and Alzheimer's.

On 11th February 2023, Dr. Milind Naik gave a presentation on how to grow mushrooms using waste substrates like sawdust and paddy straw. First, he explained the process of growing the mushrooms. He also stressed the significance of maintaining hygiene throughout this process. The entire process begins with cleaning the surrounding region, which includes washing the floor, roof, and walls of light and dark rooms. Before beginning the cultivation procedure, the entire room was fumigated with formaldehyde. We must wash our hands before beginning the procedure because maintaining good hygiene is crucial when growing mushrooms.

Collecting substrates was the second stage. Substrates include sawdust, paddy straw, etc. To enhance the surface area, the substrates were chopped into smaller pieces (about 4 to 5 cm). Then they are soaked overnight in water. On the next day after draining the excess water from the substrate, it was autoclaved to prevent contamination. Then the substrate was spread out to cool on the clean floor. It was then put into the plastic bags with the alternate layers of supplied spawns. The mouth of the bag was tied with a rubber band. The mushroom bags were then incubated in the dark room till the mushroom spawn develops into a mycelium.

After the mycelium appears, the bags were then transferred to the light room. When in a light room, the bags must be sprayed with water to keep the straw moist, being careful not to use too much water. The mycelium will develop into mushrooms in around 4 weeks. The mushrooms are harvested by twisting the base.

•Cleaning of Dark room for Mushroom cultivation.



•Substarte for mushroom cultivation.

•Spawn

•Soaking of substrate for mushroom.

Activity 3.

Creating a greener future

Date:27 February 2023 *Hours contributed: 6 hours*

On the occasion of science day, Social Entrepreneurship, Swachhata, and Rural Engagement (SES-REC) cell organized a talk on the topic "Creating a greener future: a motivational program for swachh bharat student interns, mentors, and Coordinators". The talk began at 2:30 pm. The resource person was Ms. Sumita Ghosh. Sumita Ghosh is the director and founder of Village Recyclers Foundation, Goa. Village Recyclers Foundation is a non-profitable social enterprise that caters to providing solutions to villages as well as industries on effective methods of waste segregation/management. The main goal of this talk was to increase youth's understanding of how to handle problems that arise in daily life and in our immediate surroundings, which will result in a clean, green, and hygienic India.

Ms. Sumita Ghosh gave information about how to make bags from plastic waste. Plastic waste such as chips and biscuit rappers was used to make bags and yoga mats.

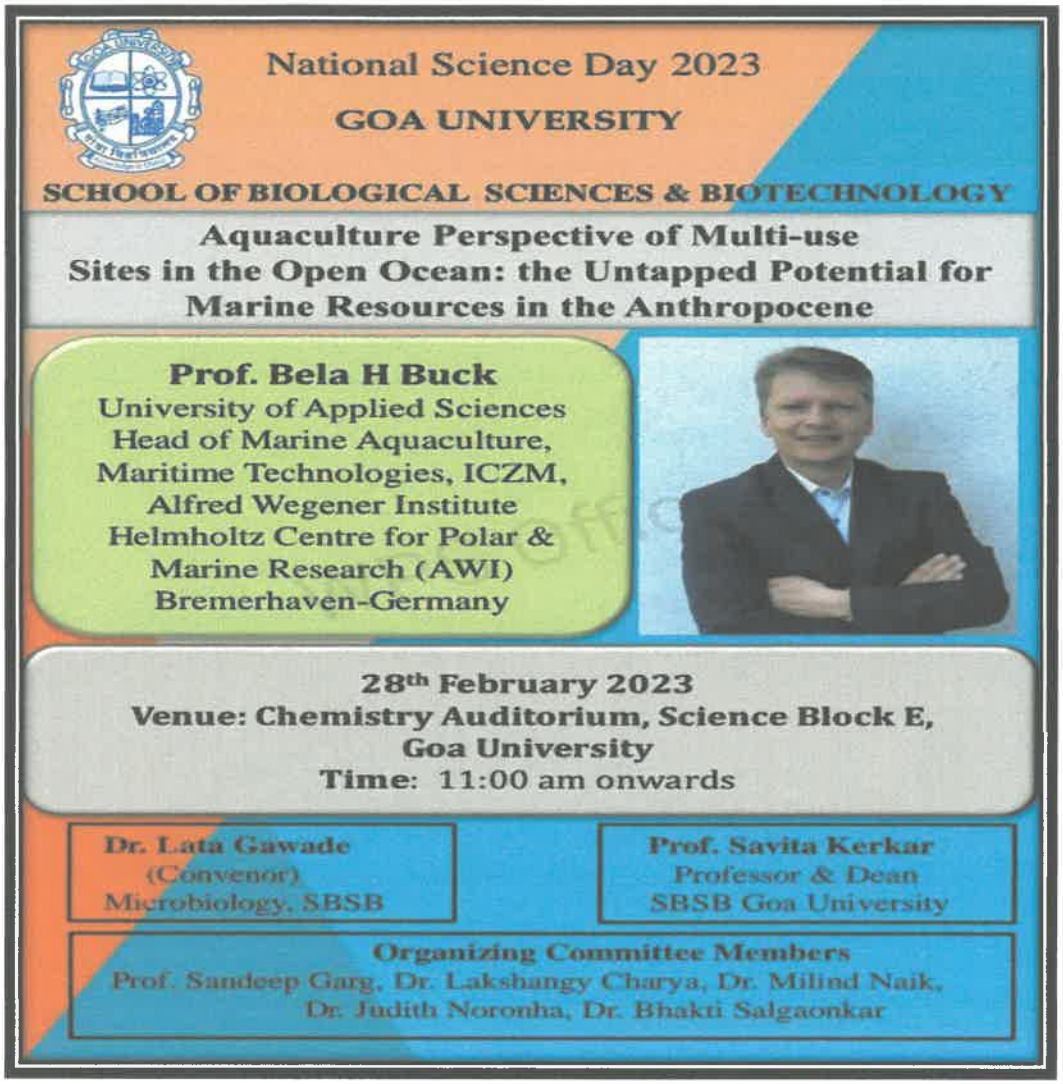
Ms. Sumita Ghosh, delivering a talk

Activity 4.

Talk on 'Biological Challenges for Sustainable Ocean Agriculture'

Date: 28 February 2023 *Hours contributed*: 3 hours

On 28th February 2023, on the occasion of National Science Day, the Microbiology Programme of the School of Biological Sciences and Biotechnology arranged a talk at the chemistry auditorium. The talk on 'Aquaculture perspective of multi-use sites in the open ocean: the untapped potential for marine resources in the Anthropocene' by Professor Dr. Bela H Buck. Prof. Buck does his research in the fields of marine aquaculture and maritime technology. He is presently a professor at the University of Applied Sciences and Head of Marine Aquaculture, Maritime Technologies, ICZM, Alfred Wegener Institute Helmholtz Centre for Polar & Marine Research (AWI) Bremerhaven-Germany. The talk was interesting and briefed the idea of how wind energy is harvested and the technology used in the process. Also, how these restricted areas of open ocean wind farms are utilized for aquaculture purposes? Marine farming in offshore marine waters is the other potential option for increasing seafood production. Favorable features of open ocean waters include ample space for expansion, tremendous carrying and assimilative capacity, reduced conflict with many user groups, lower exposure to human sources of pollution, the potential to reduce some of the negative environmental impacts of coastal fish farming, and optimal environmental conditions for a wide variety of marine species. The establishment of offshore wind farms as a sustainable and economically viable form of energy production has generated interest in the potential for optimizing the use of offshore sites to include other activities. Prof. Buck said that open ocean wind farm farming is sustainable and has economic benefits, particularly area of interest is combining energy and aquaculture-based seafood production within the same ocean. The stability of offshore energy production structures (e.g., wind turbine and oil drilling platforms) is an attractive feature for a suite of requirements for aquaculture production, including attachment points for mooring cages and longlines, and for mounting feeding, hatchery, and nursery systems.



•Flyer for the talk on the Aquaculture perspective of multi use sites in the open ocean by Professor Bela H Buck.

•Picture of participants present for the talk.

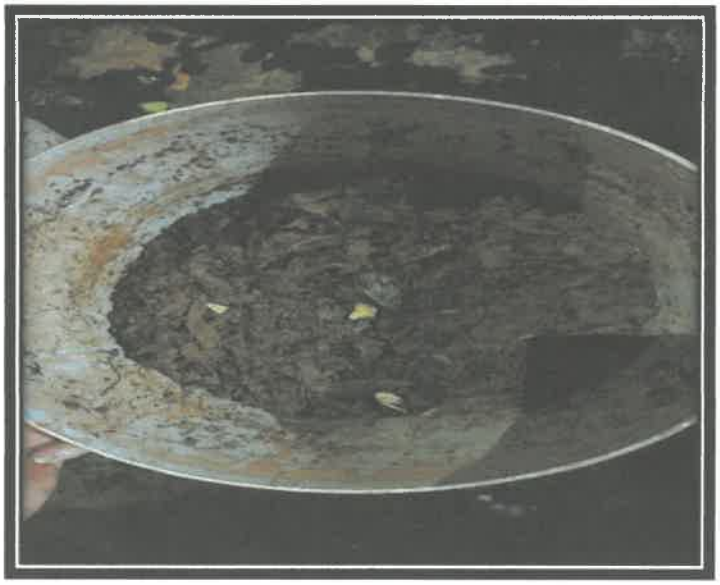
Activity 5

Home Composting

Date: 04 April 2023 *Hours contributed*:13 hours.

On 4th March 2023, we the SBSI interns (Isha, sampada, Rishwa, Varsha, and yuvradnyee) began home composting in Bandoda with a waste management theme.

The first steps in home composting involved gathering the necessary components, which include soil, kitchen trash (uncooked), cow dung, and other materials like a bucket or container with holes underneath. In order for the cow dung to be applied easily, slurry must be created. This homemade compost is kept up by adding water and kitchen waste. On a limited scale, it can be used as a substitute for chemical fertilizers. It was kept up so that it didn't develop an unpleasant odor.



•Picture of Final compost.

Activity 6

Talk on 'Biological Challenges for Sustainable Ocean Agriculture'

Date: 09 February 2023 *Hours contributed*: *3* hours

The workshop on 'Biological Challenges for Sustainable Ocean Agriculture' was held on 9th February 2023. It was conveyed by Dr. Lata Gawade of Microbiology, School of biological sciences and Biotechnology. The main objective of arranging the talk was to make students aware of the ongoing research on Seaweed, its application, and its feasibility in the coastal region of Goa and to motivate students for such research.

Dr. R.A Narayanan, head of Ocean Agtech, Sea6 Energy Pvt Ltd. delivered a talk on Seaweed cultivation towards sustainable Ocean agriculture highlighting the demand for Seaweed in the Indian market and companies and so need for large-scale seaweed cultivation in the country.

Sea6 Energy is a seaweed company based in Bangalore that focuses on cultivating and processing tropical seaweed species. They have developed a cultivation mechanism – Seacombine which can harvest and replant seaweed in the deep ocean simultaneously.

Dr. Narayanan also explained various techniques of seaweed cultivation and new technologies in seaweed research. A large number of audiences were present for the workshop. These new technologies in seaweed research were very much beneficial to the audience, particularly to the research scholars and faculties working on Seaweed aspects, and also inspired others to take up research in this line

•Picture of attendants attending the talk on 'Biological Challenges for Sustainable Ocean Agriculture'

Activity 7

Seed Bomb

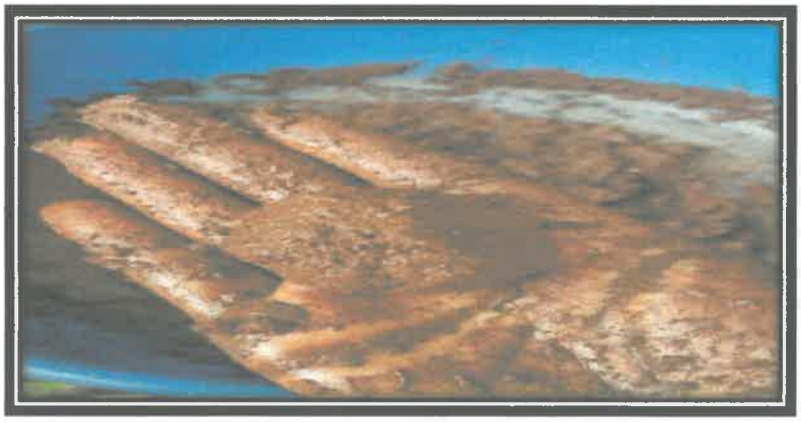
Date:9 April 2023 *Hours contributed*: 6 hours

Seed bombing is a practice of introducing vegetation to the land by throwing or dropping seed balls. It is done mostly during the rainy season to increase the green space. It is a creative and practical tool to promote reforestation, ecological restoration, and biodiversity conservation in areas where natural vegetation has been disturbed. The aim is to allow seeds to germinate and grow, creating habitats favorable to biodiversity, particularly for pollinating insects and birds.

A container is taken and soil, compost, and seeds are added and mixed well. The seeds are then spread throughout the mixture. Add little water if required.

•Seeds used to make seed bomb.

By hands, balls of the required size are made from that mixture, known as Seed bombs or seed balls.



•Seed balls

A seed bomb is a little ball generally made up of a combination of compost, clay, and seeds. The advantage of seed bombs is that they offer a simple, fun method of planting seeds, without the need for tools or special expertise.

The clay/mud in the ball protects the seeds from being eaten by birds and rodents. It also protects seeds from the elements and predators until environmental conditions are right for germination.

The compost offers nutrients for the seeds to germinate and grow strong during their infancy and the clay binds the seed bomb, making it hard enough not to break when it hits the ground.

•Making of seed ball.

The seed bombs are then kept on a cloth or paper to make them dry under the sun. After the seed bombs are dried it is then stored in a container.

These seed balls can be now thrown anywhere onto the ground and when it rains the water gets inside the seed balls and the seed germinates. The compost and clay act as a carrier for the seeds so they can be launched over walls, gardens, and into inaccessible areas.

Activity 8

Paper bag making and distribution

Date: 23 April 2023 *Hours contributed: 6 hours*

We distributed newspaper bags from old newspapers to the local pharmacy. Our newspaper bags are made from old and used scraped newspapers. Newspaper bags are biodegradable and in case burnt, do not pollute the atmosphere as much as other material bags do. Newspaper bags even if eaten by street animals will be digested by them and will not cause any harm to them. One of the advantages of these bags is that they are easily renewable in comparison to other bags and can be given any shape, size, and color easily. The main aim of making newspaper bags is for the benefit of the people and to keep the environment clean and pollution free.

- **Making of Paper bag.**

Activity 9

Beach cleaning

Date:14 April 2023 *Hours contributed : 9 hours.*

As a part of the Swacchh Bharat student's internship program, a beach cleaning drive was conducted on 14 April 2023 at Colva beach. The main aim of this program was to clean the beachside and make a plastic-free environment and aim to create awareness among the people so that we can all contribute to keeping our beaches and water bodies clean and not polluting them by throwing plastic waste and debris into them. We collected plastic bags, bottles, fishing nets, chips rappers, glass bottles, and paper pieces.

•After cleaning

•Before cleaning

Activity 10

Outreach Activity on Mushroom Cultivation demonstration in 'Matruchhaya' orphanage

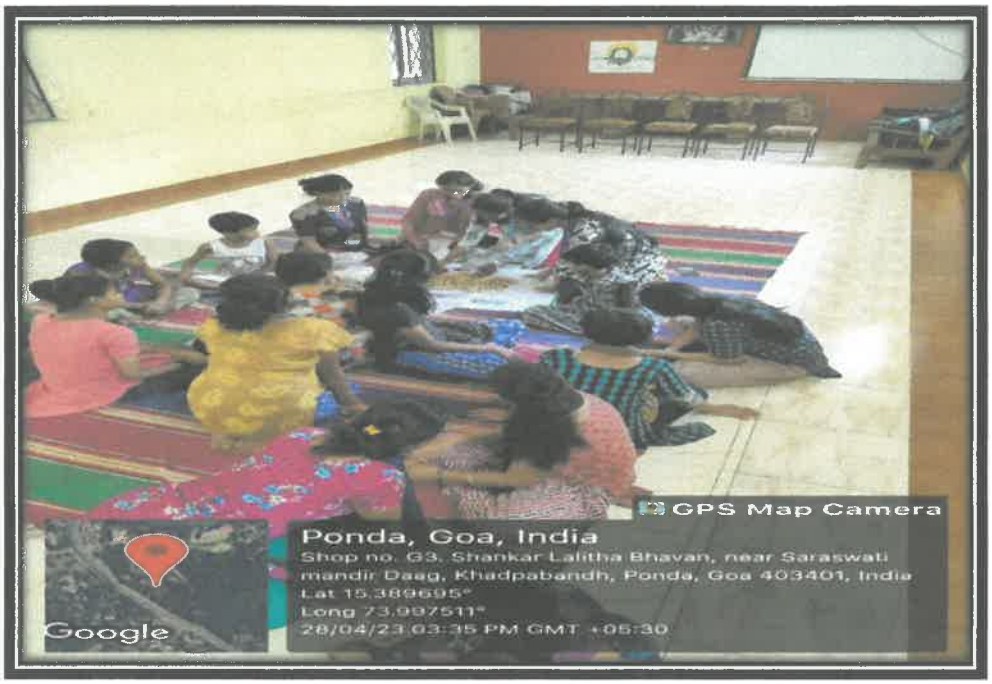
Date: 28 April 2023 *Hours contributed : 8 hours.*

The Kingdom Fungi which has more than 144000 recognized species and includes mold, and yeast, is where mushrooms belong. While some mushrooms are safe to touch or eat others carry a high risk of poisoning. The nutrients fibre, protein, and antioxidants in mushrooms are abundant and low in calories. They might also lower the chance of getting serious illnesses like diabetes, cancer, heart disease, and Alzheimer's.

On 28th April 2023, we carried out an outreach project on mushroom farming as part of the waste management and protein-rich food topic at Matrucchaya, Dhavali Ponda. We as a part of SBSI interns (Isha, Sampada, Rishwa, Varsha, and Yuvradnyee) demonstrated how to cultivate mushrooms safely and hygienically to the 'Matrucchaya' students.

We also had a brief conversation about hygiene and sanitation. It provided an introduction to the fundamentals of keeping our environment and selves clean.

We introduced ourselves before giving a quick overview of the Swatch Bharat Student Internship program and its goals. At twelve noon, the discussion began. We initially gave them a thorough explanation of the mushroom cultivation procedure. In order to prevent contamination, we showed them how to gather the substrate (paddy straw) and how to sterilize them. Substrates include sawdust, paddy straw, etc. To enhance the surface area, the substrates were chopped into smaller pieces (about 4 to 5 cm). Then we gave a demonstration of how to apply spawn and fill the bags. Alternating layers of the substrate and the spawn were added as it went on. Finally, we presented a PowerPoint presentation on mushroom farming and its harvesting, which helped them develop thoughts connected to entrepreneurship in mushroom cultivation.



•Mushroom cultivation outreach done at Matruchhaya

Activity 11

Plantation

Date: 26 June 2023 *Hours contributed: 6* hours

The plantation is important for the environment because it helps reduce the amount of carbon dioxide in the air. It also helps prevent soil erosion and provides habitats for wildlife. We should all do our part to plant trees and other plants to help the environment. Plantation is significant because it helps improve air quality, reduce soil erosion, prevent floods, provide habitats for wildlife, and contribute to the overall health of the environment.

In addition, planting trees and other plants can also help reduce the effects of climate change by absorbing carbon dioxide from the atmosphere. Plantation can also provide economic benefits by creating jobs in the forestry industry and providing resources such as timber and fruits.

Firstly, we started planting saplings in our gardens and after that, we planted saplings in the nearby local areas of our house. Additionally, we encouraged kids to plant trees.

•Planting of trees by SBSI interns and matruchhaya students

Activity 12

Outreach activity on winemaking in Old Goa

Date: 29 July 2023 *Hours contributed:12 hours*

The outreach activity on winemaking was held on 29th July 2023 at the old Goa Panchayat hall. We the SBSI interns along with our teachers of Goa University demonstrated how to create wine from pineapple at home. The purpose of this effort was to launch a personal company under Swayampurna Mitra 2.0. It attempts to provide locals with income at home.

Any fruit can be used to make the wine. Grapes are the most frequently utilized. Numerous health advantages include the fact that it is high in antioxidants, lowers bad cholesterol, lowers the risk of cancer, etc. We gave the villagers a demonstration on how to make pineapple wine. The first step in the procedure is to use a knife to scrape off the pineapple's rind. The pineapple was then divided into smaller pieces so that juice could be extracted from them. After using Smasher to smash the pineapple chunks, the pulp was put into a muslin cloth or sieve. The juice from the pressed cloth was gathered in a container. The juice was pasteurized at 80 degrees for 15 to 20 minutes. Through this procedure, any contamination picked up when cutting the pineapple will be eliminated. Sugar was added after this process. We added about 250 grams of sugar to 1l of juice.

Activated yeast was then added once the juice had been chilled. To activate the yeast, lukewarm water was combined with 1 teaspoon of yeast granules, and the mixture was left alone for 20 minutes. Afterward, this was added to the juice and mixed. the special airlock system-equipped carboy, into which this was afterward transferred. For 4 to 5 days, this juice was stored so that fermentation could take place. The juice must be stirred once or twice every day at the same time. To remove oxygen, the carboy was filled with juice while leaving a 4 to 5-cm gap at the top.

The yeast will settle to the bottom of the carboy after five days. The yeast layer is visible. After that, the fermented juice was siphoned into a colored bottle without removing the yeast layer. The colored bottle was retained for aging and was well-packaged. The entire process took between one and two months.

Learning

We greatly benefited from this activity. We discovered that wine can be made at home using any fruit and the bare minimum of tools, including fruit, a knife, a carboy, and colored bottles to store the finished product. The wine's antioxidants decreased the risk of heart disease and cancer. Red wine enhances gut flora, promoting gut health.

Pictures of the SBSI interns demonstrating the wine making process


GPS Map Camera
Velha Goa, Goa, India
GW25+8RC, National Hwy 4A Bypass Rd, Velha Goa, Ella, Goa 403110, India
Lat 15.500717°
Long 73.909392°
29/07/23 11:31 AM GMT +05:30
Google


GPS Map Camera
Velha Goa, Goa, India
GW25+8RC, National Hwy 4A Bypass Rd, Velha Goa, Ella, Goa 403110, India
Lat 15.500717°
Long 73.909392°
29/07/23 11:29 AM GMT +05:30
Google


GPS Map Camera
Velha Goa, Goa, India
GW25+8RC, National Hwy 4A Bypass Rd, Velha Goa, Ella, Goa 403110, India
Lat 15.500717°
Long 73.909392°
29/07/23 11:19 AM GMT +05:30
Google


GPS Map Camera
Velha Goa, Goa, India
GW25+8RC, National Hwy 4A Bypass Rd, Velha Goa, Ella, Goa 403110, India
Lat 15.500717°
Long 73.909392°
29/07/23 11:30 AM GMT +05:30
Google