
ONE STEP TOWARDS CLEAN AND GREEN PLANET

# SBSI 2021 FINAL PROJECT REPORT

School Of Chemical Sciences

Goa University

Submitted by


| NAMES | ROLL. NUMBERS. |
|---|---|
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Under the guidance of


Dr. Savita Anup Kundaikar

Goa University

# DECLARATION

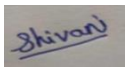
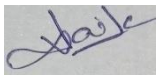
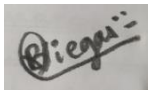
We have carried out the SBSI 2021 Internship under the guidance of –

Dr. Savita Anup Kundaikar

Assistant Professor in Analytical Chemistry

Goa University

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

| NAME | ROLL NUMBERS | SIGNATURE |
|---|---|---|
| Vaishnavi Pandurang Salkar | 21P049073 |  |
| Shivani Vallabh Samant | 21P049074 |  |
| Vaishnavi Naik | 21P049054 |  |
| Bernice Minoshka Viegas | 21P049095 |  |
| Elvy Rena Braganca | 21P049006 |  |
| Shanti Murari Mayekar | 21P049041 |  |

# CERTIFICATE

This is to certify that the following SBSI 2021 Intern/Interns –

Vaishnavi Pandurang Salkar– 21P049073

Shivani Vallabh Samant – 21P049074

Vaishnavi Naik – 21P049054

Bernice Minoshka Viegas – 21P049095

Elvy Rena Braganca – 21P049006

Shanti Murari Mayekar- 21P049041

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 –

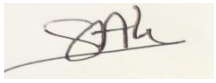
1. We have developed the skill of how to confidently face huge crowd and stand up to their expectations.

2. We also have learnt that any task can be completed when it's a team work and how easily we can distribute our duties and captivate more work into consideration.

This report is being submitted to SBSI 2021 University Nodal Officer, in partial fulfilment for the completion of the SBSI Course during the academic year 2021-2022

Name and Signature of SBSI Mentor

(Dr. Savita Kundaikar)



Name and Signature of SBSI Co-ordinator

Dr. Sandesh Bugde

# ACKNOWLEDGEMENT

The dissertation entitled “Swachh Bharat Student Internship” has been successfully completed and have covered up 100 hours under the guidance of our SBSI mentor, Dr.Savita Anup Kundaikar. We would like to thank Dr.Savita Anup Kundaikar for her constant support and guidance .We extend our sincere gratitude to our SBSI co-ordinator Dr. Sandesh Bugde for giving us an opportunity to understand research work and enhance our skills. We would also like to thank Mr. Leo, the SBSI champion for motivating us.I would like to thank school of chemical sciences for providing us with the necessary infrastructure. Lastly we would like to convey our sincere thanks to all those who have helped us in our project in a direct or indirect manner in completion of our internship.

# CONTENTS

# INTRODUCTION

In an effort to take a step towards clean and green planet, we enrolled as SBSI interns. Our team tried making people aware about the importance of cleanliness and the measures one can take to ensure a safe and healthy environment not only for themselves but for every living organism in the vicinity. Even though cleaning and hygiene are considered important pillars of our existence they aren't followed as strictly as one should especially in our country. A clean environment not only keeps us physically safe but it also provides mental relaxation. The occurrence of covid pandemic has been a lesson to mankind , bringing into forefront not just environmental but also personal hygiene. On one hand it taught us how even our small negligence can have a devastating impact on others, on the other hand it also showed us how a small action of kindness and our awareness can help a community. Keeping this thought in our mind, our team has tried their best to make people aware about the importance of their personal hygiene along with environmental hygiene. Survey was conducted to determine women's awareness regarding various menstrual products and the various disposal methods followed. Since june is 'Dengue awareness month' we tried educating people from rural and urban areas about the rising dengue cases and the preventative measures to be followed.Furthermore we also synthesized charcoal from coconut shells in our lab to use it as a raw material in our experiment. On account of world environment day our members carried out tree plantations in their respective localities. Along with the group efforts, individual activity such as composting was carried out. Lastly street play was also performed by our members to educate people about the plastic problem in an entertaining way. These activities not only helped us to do our share for the environment but also helped us in understanding our respective skill set.

# LIST OF ACTIVITIES CONDUCTED FOR SBSI INTERNSHIP

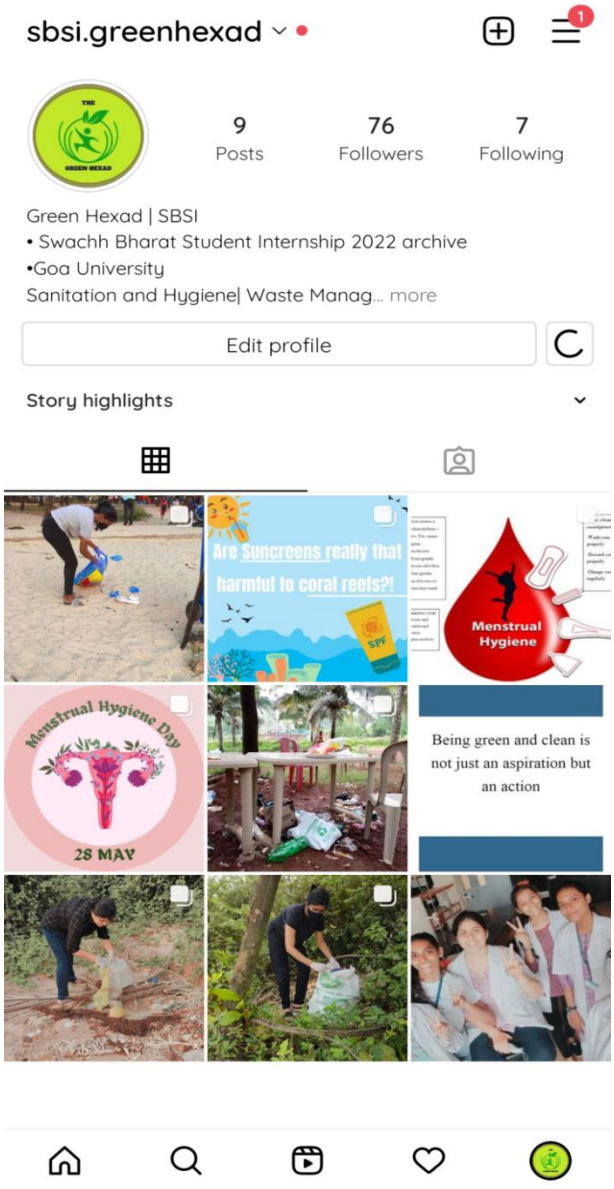
**List of activities conducted for SBSI internship**

| Sr.No. | Activities | Number of hours taken |
|---|---|---|
| 1 | Instagram Page Creation | 9 hours (Writing poem, drawing, awareness posts) |
| 2 | Beach cleanup at Colva and Cacra | 11 hours (It was done at Cacra,Colva for 2-3 times) |
| 3 | Project Work | 16 hours (3 days) |
| 4 | Survey and awareness on Menstruation among people | 18hours (Background research, framing of questions, form distribution, collecting data and preparing survey report.) |
| 5 | Article on a)clay incinerator b) Tetra Pak recycling c) Sunscreen d) Zero Movement e) Rainwater Harvesting f) Disposal of Chemicals in lab | 15 hours(Writing article and preparation of post to upload it on Instagram) |
| 6 | Street Play | 7 hours (Writing street play,performing it) |
| 7 | Environment Day | 1 hour ( Planting trees) |

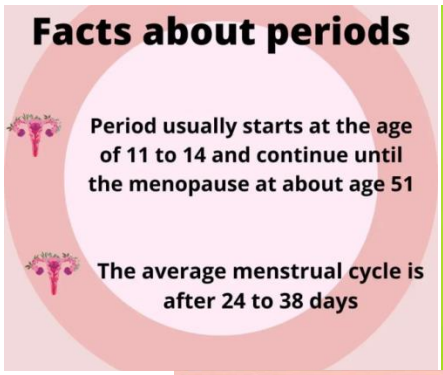
| | | |
|---|---|---|
| 8 | Composting | 5 hours (Preparation of pit, collection of waste, creating awareness among people) |
| 9 | Best out of Waste | 11 hours<br>(Tissue flowers, CD painting, wood painting, bottle craft, jute vase, wall hanging, key holder) |
| 10 | Dengue Awareness | 10 hours (Creating awareness among people and spreading awareness through Instagram post) |

# 1) INSTAGRAM ACCOUNT

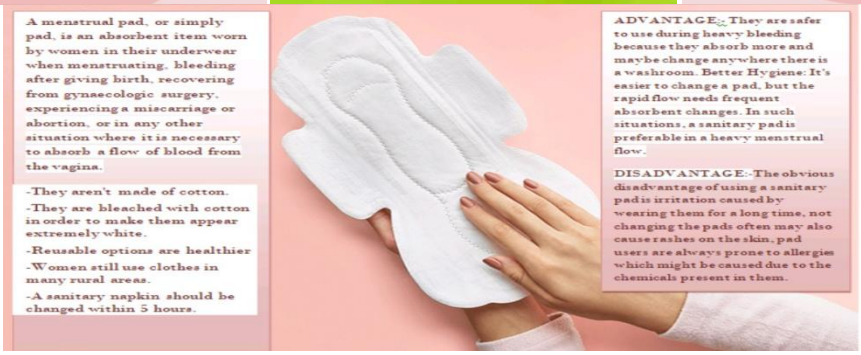
We have created awareness about different aspects through **our instagram page (@sbsi.greenhexad)** to spread awareness about sanitation and hygiene, waste management, water management, energy management and greenery.



# Awareness on Menstrual Hygiene



# 2. BEACH CLEANUP

Members contributed towards beach cleanup on Colva Beach, and Cacra beach.

Students Engaged in Cleanliness Drive at Colva and Cacra Beaches

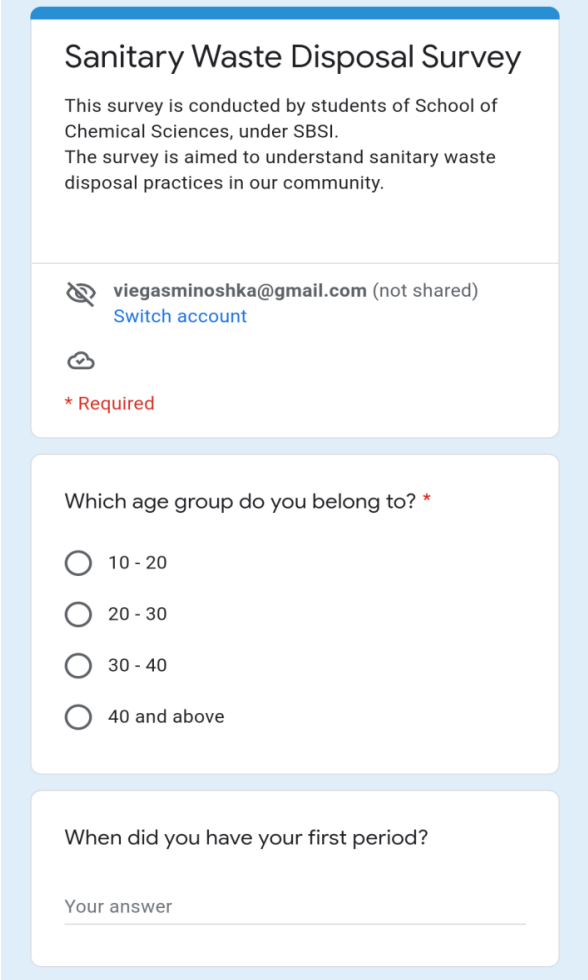
# 3. PROJECT WORK

Preperation of actrivated carbon from waste coconut shell.We crushed coconut and burnt it in the incinerator.


Burnt pieces of coconut shell were crushed into amorphous powder. 3M solution of $H_3PO_4$ was prepared and boiled. It was then added to the crushed sample. It was then kept for stirring on magnetic stirrer for 3 hours.It was filtered using Buckner funnel and was washed with hot boiling water till it became neutral. Once filteration was complete, sample was kept in furnace for 2hrs at 450 degrees. After 2hrs furnace was allowed to cool and then sample was taken out from it and was washed again and then dried in oven, after drying activated carbon from coconut shell was ready to use.


The goal was to use the prepared activated charcoal for use in the incenerator. The harmful/ toxic gases like furan and dioxins were to be adsorbed onto the charcoal bed and further analyse its efficiency. Due to time constraints we couldn't go on further with the experimental work

# 4a. ONLINE SURVEY ON DISPOSAL OF MENSTRUAL WASTE



Sanitary Waste Disposal Survey

This survey is conducted by students of School of Chemical Sciences, under SBSI.
The survey is aimed to understand sanitary waste disposal practices in our community.

viegasminoshka@gmail.com (not shared)
Switch account

* Required

Which age group do you belong to? *

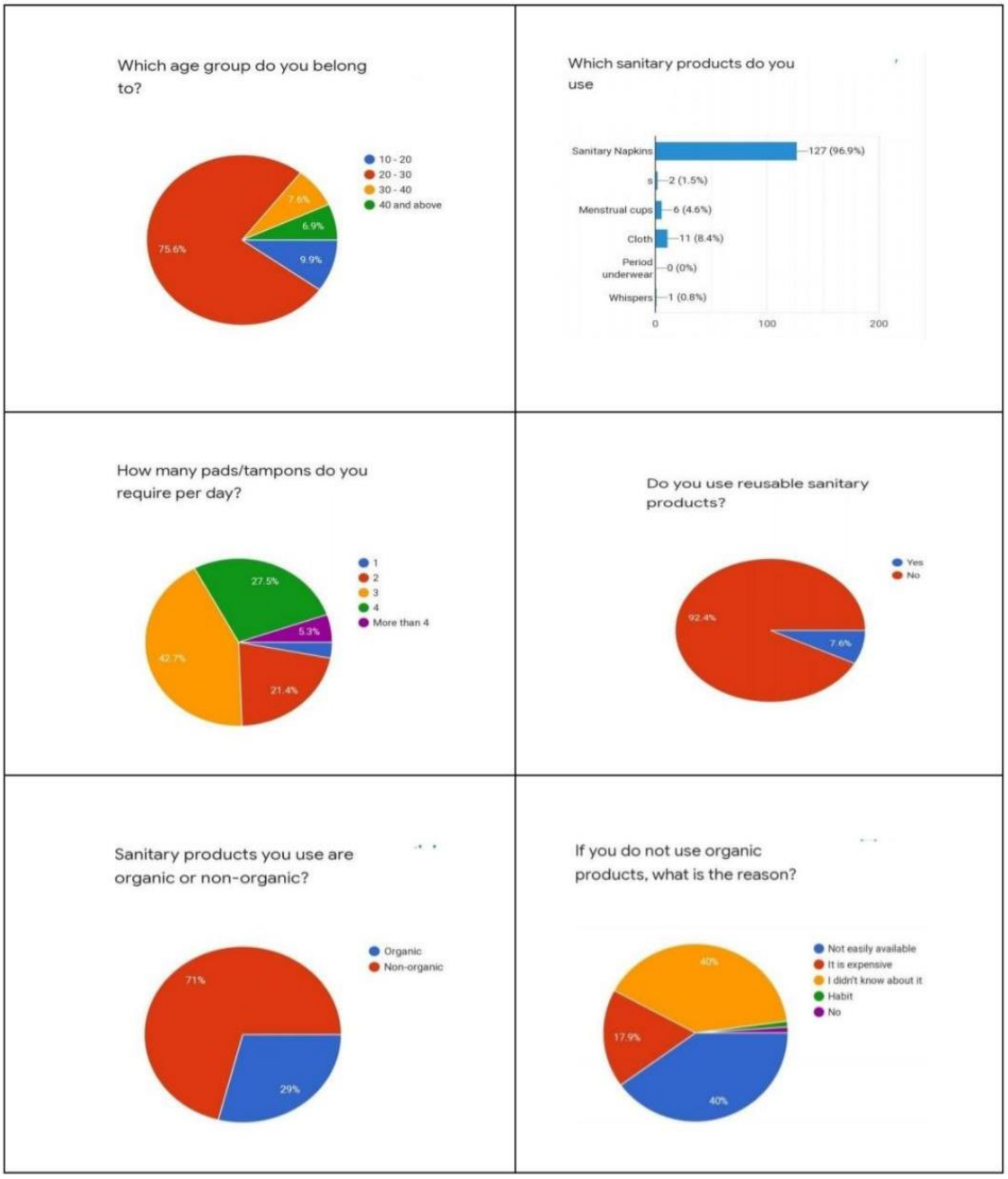
- 10 - 20
- 20 - 30
- 30 - 40
- 40 and above

When did you have your first period?

Your answer

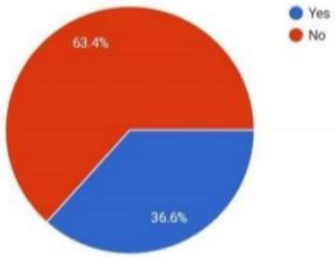
**LINK: https://forms.gle/reXr9FBpSzUXnGSZA**

## MENSTRUAL WASTE DISPOSAL PRACTICES IN OUR COMMUNITY

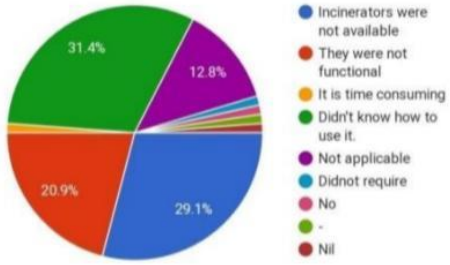



**b.**

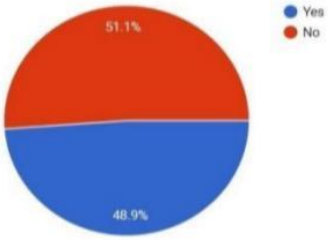
Have you ever used incinerators provided in school/workplace?



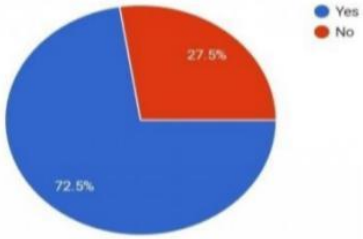

If you answered no to the above question, what is the reason?



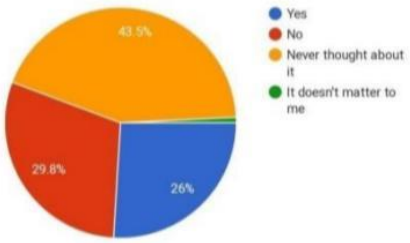

Did you know that it takes 80-200 years for decomposition of a single pad?!



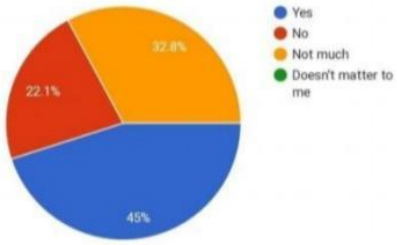

Are you aware of toxins released in the environment on burning of sanitary products?



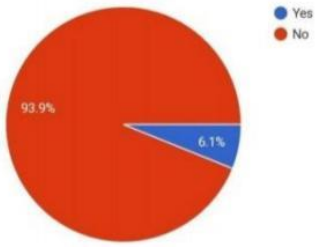

Have you ever tried to learn about the chemical composition of sanitary products you use?



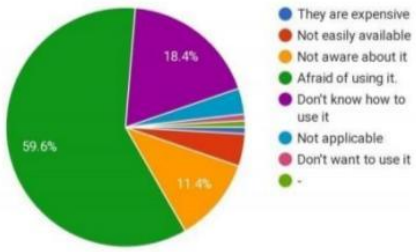

Do you know about the harmful effects of chemicals present in the sanitary products on your health?



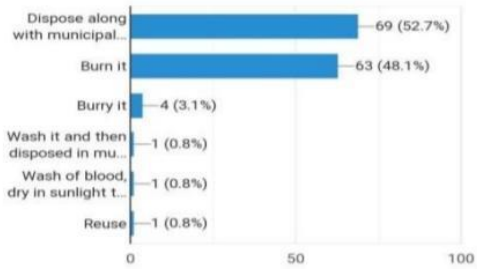
Have you ever used menstrual cup?



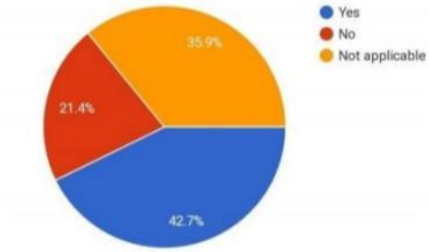

If you answered no to the above question, what is the reason?



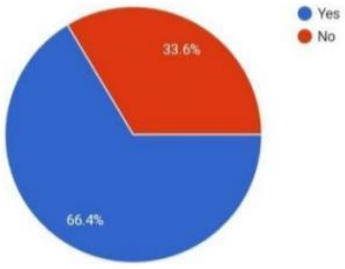

How do you dispose sanitary products?



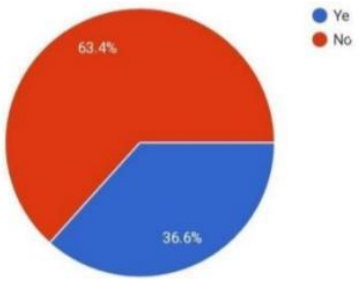

Do you segregate sanitary napkins separately under medical waste while handing it over to the waste collector?




Were there "feminine hygiene bins" available in your school/workplace?




Have you ever used incinerators provided in school/workplace?



# b.SURVEY REPORT

As an initiative under SBSI, we conducted an online survey among women across various age groups to understand menstrual waste disposal practices in our community, under which we highlighted topics such as awareness regarding the range of sanitary products available, their composition and their effect on health and environment.

Our survey considered women of age ten and above who have achieved menarche. A total of 131 women responded to the survey conducted for four days. Out of the 131 women, 75.6% of respondents were between the age of 20-30; 9.9% were between the age of 10-20, about 7.6% were between the age of 30-40, and about 6.9% were 40 and above.

Among the 131 respondents, about 128 women use sanitary napkins; about 11 women use cloths, 6 use menstrual cups, and only 2 use tampons. None of the women surveyed use period underwear. It was also observed that 42.7% of women use three sanitary napkins/tampons per day, followed by 27.5% who use four pads and 21.4% who required two pads. Just 5.3% of women needed more than four pads per day, and 3.1%women required only one pad per day.

Out of 131, only ten women were aware of reusable sanitary products and were using them actively. According to our survey 71% of the total women opted for non-organic products over organic products. The reason stated by 40% of these women was the lack of awareness regarding the existence of organic menstrual hygiene products. Other 40% said that the reason was the limited availability of organic products. Out of the total women surveyed 17.9% opined that such organic products are expensive. One respondent believed she couldn't switch to organic products as she is habituated to using non-organic products.

It was observed that 93.9% of the women surveyed have never used menstrual cups. The reason stated for this by 59.6% of women was that- "they were afraid of using it". Around 18.4% didn't know how to use it and 11.4%were not even aware of menstrual cups. Around 4.4% of them opined that menstrual cups were not easily available.

When questioned about the disposal of sanitary products, it was found that 69 of the total 131 women disposed of the menstrual waste along with the municipal waste. Out of these, 42.7% segregated their menstrual waste as medical waste. Some also practiced washing off the blood, drying it and then disposing it off. On the other hand, 63 women out of 131 women burnt their menstrual waste products, followed by 3.1% who buried them. When inquired about the availability of feminine hygiene bins in school/workplace, the majority of the women answered yes. About 33.6% answered that no such bins were available.

When inquired about the usage of incinerators provided in schools and workplaces, 63.4% of women said they never used one. The reason for the same given by 31.4% of women was that "they didn't know how to use it".29.1% said that "the incinerators were not available".20.9% of women pointed out that the incinerators available were not functional. One woman considered the process to be time-consuming.

To gauge the awareness among women regarding pollution caused by menstrual waste products, we questioned them regarding the decomposition of sanitary pads;51.1% of the women weren't aware that it takes 80-200 years for the decomposition of a single pad.72.5% were aware of the toxins released in the environment upon burning of these sanitary products. When asked if they have tried to find out about the composition of sanitary pads, 43.5% of women had never given it a thought.29.8% didn't know anything about it.26% were aware of the composition. One respondent believed that it didn't matter. When asked about their awareness of the harmful effects of sanitary products on health, 45% of women were aware of them, 32.8% had a rough idea, and 22.1% of women had no idea about it.

Through the survey conducted it was observed that the majority of the women used non-organic sanitary pads over other menstrual hygiene products available in the market. The reason stated by many was the lack of awareness about the organic/biodegradable alternatives of such products. Over the years, menstrual cups have stood out as the most viable, economical and eco-friendly option among the various menstrual hygiene products. One menstrual cup, when used with proper care, can easily last for 2-3 years. In this time frame, more than 360 sanitary napkins are utilized by a single woman. So, if all the 131 women surveyed were to use a menstrual cup, we could prevent around 51000 pads/ tampons from being disposed in landfills over two years. However, majority of the women showed reluctance towards using cups due to unavailability, unawareness, fear and misconceptions regarding its usage. For those abstaining from using menstrual cups out of fear, there are other options such as reusable sanitary pads and tampons. However such products hardly make it to mainstream media or general market. Thus majority of these products never reach people who are on lookout for the environment friendly options. And for those aware, the myths and taboos stop them from choosing such products over others.

From the findings of our survey, it is evident that the reason for women gravitating toward non-organic products is unavailability and unawareness of organic/ biodegradable products, which both stem from a lack of advertisement for such products on a large scale. The government should therefore support manufacturers of such biodegradable products and promote them extensively. Government initiatives such as the distribution of 100% biodegradable "My Suvidha sanitary napkins" should reach a wider population, especially in the underprivileged sections of society. Also, steps should be taken to curb the spread of misinformation and educate women from an early age about eco-friendly menstrual hygiene products.

When questioned about disposal of menstrual waste, it was observed that majority of the women either dispose it along with municipal waste or burn it. Many households even separated menstrual waste as medical waste. Sadly, this small effort is in vain since the government has no proper means to dispose this waste. According to an article published in the Times of India on 3rd February 2021 around 2,500 kg of Biomedical Waste is generated in Goa daily. But, due to a lack of a common treatment facility, most of it is left untreated. Another similar article named "Government clueless on disposal of sanitary waste" published in The Navhind Times stated that years of sanitary waste has been waiting for disposal. On that, The State Advisory Committee suggested the disposal of sanitary waste through the Biomedical Waste facility at Kundaium. However, due to high charges, the treatment becomes unaffordable to the Goa government. This

has lead to sanitary waste being either dumped in godowns or dumped in open air, which over a period of time can turn into a health and environmental hazard.

Disposable sanitary pads consists super absorbent polymers which do not decompose easily. On disposal, they gradually break down into microplastics which contaminate soil, water and air. They also enter the food chain by injecting toxins into food, humans and animals. Menstrual waste in particular comprises of menstrual absorbents soiled with blood and human tissue remnants. Thus when disposed openly, it has chances of becoming highly pathogenic and favour growth of various bacteria which can spread harmful diseases.

When open burning or incineration of menstrual waste is concerned, WHO has laid guidelines which suggest that the incineration of sanitary waste should be done at a temperature above 800°C to ensure that the gas released from the process is close to harmless; However in India the technology available cannot handle such high temperatures and there is no provision for monitoring emissions from these incinerators.

From our survey we observed that 63.4% of the total women surveyed have never used an incinerator. Most of them pointed out that incinerators were not available. Others stated that the incinerators available were either not functional or they didn't know how to use one. This clearly highlights the issues such as negligence towards the maintenance of the equipment and a need for education and demonstration regarding usage of such equipments.

In general, incineration is viewed as a better alternative over disposal of sanitary waste. But this method too has a few cons. In case of incomplete incineration, there are chances that gases like dioxins and furan can be released in the atmosphere. These gases when inhaled can even cause lung cancer. The various causes for improper incineration are not only attributed to low burning temperatures but also the poorly constructed structures, insufficient waste volume or improper segregation. Since inhalation of harmful gases is highly injurious, the incinerator should be located outside the toilet complex away from the student areas, which is not strictly followed in our country.

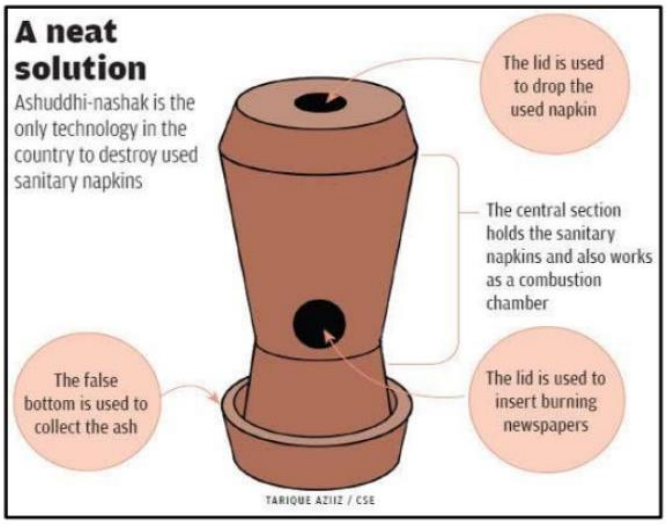
Through this survey, we can conclude that most women are aware of the environmental and health impacts of menstrual hygiene products but they have no means to practice green menstruation in their day to day life. The eco-friendly alternatives are not easily accessible nor are they economical for the general population. Therefore there is a burning need for the government to take initiatives to educate people about the eco-friendly alternatives, address the misconceptions about such products and make them available to a wider population at an economical price.

## 5.ARTICLES

In an effort to spread awareness among people our group members penned down articles which were then posted on instagram for better reach.

### A. CLAY INCINERATORS

In the article we are focusing on menstrual hygiene Management. As it is equally important to that of the other environment pollution control management. Today in this 21$^{st}$century use of sanitary napkins are commonly used alternative during menstruation among most of the womens. But still there are thousands of womens across our country who do not use sanitary napkins due to improper knowledge.The Swati Bedekar founder of Vatsalya Foundation Gujarat came across the issue during her talks on menstrual hygiene in different villages and she took initiative to



make low cost sanitary napkins for just Rs.2.50 per napkin under programme Sakhi. She got great response for this programme but still there was some problem forthe rural womens to choose this option as there was issue with the disposal of the soiled sanitary napkins.She talked about the problem with her husband Shyam sunder Bedekar who works in manufacturing unit of textile and dye stuffs .He then came up with the idea of a clay incinerator and named it as“Ashuddhinashak”

.It is made up of terracotta. It is not just eco-friendly but along with that it is economical, easy to handle, easy to install. It cost just around 2000 per incinerator.It is made by taking in consideration all the aspects such as its use, maintenance and protection from the rodents and ants. 5 to 20soiled sanitary napkins can be burnt at a time in the incinerator. Thetop lid present is to insert the sanitary napkins which are then collected into the middle accumulation chamber. There is subcompartment in the accumulation chamber. This accumulation chamber rests on mesh. The mesh is big enough to allow the ash to fall down, but small enough to restrict entry of rodents. This compartment aids the ignition process. Pieces of paper are ignited and put inside the chamber from the hole provided. The hole alsoallows oxygen to enter the chamber to sustain burning. The soiled sanitary napkins are converted to ash once they are fully burned. The. ash is collected at the base of the chamber which should be removed manually. This ash can be used by mixing with soil to nourish the plants. The base of the incinerator is often filled with water to keep ants away from it.The incinerator do give out smoke but it has lower risk. It is like burning chulha in the house. The temperature in the incinerator doesn’t go beyond 300 degree Celsius. At that temperature the 15%of polypropylene that is present just shrinks. It does not get converted into any harmful matter which it will if the temperature is more than 470 degree Celsius.

The best of this incinerator is that it does not require electricity fuel to work. It is also made very simple and least interesting so that it does not seek attention and get robbed away.Today, Purpose of putting forward this article is to make awareness about how easily menstrual hygiene management can be done atlower level. We think this is very useful and handy solution for the womens across the villages where there is no daily waste collection and its segregation. Because in such cases people are left with no option rather than throwing the waste either in water bodies or in open surrounding areas. So we think that Government should take a step forward and lookout for this option to be provided to women in need across the state. Adding this as a scheme. Because this will be surely helpful in saving our environment from pollution.

## B. TETRAPACK RECYCLING

Tetra Pak India Pvt. Ltd. launched 'Go Green with Tetra Pak' on World Environment Day 2010 to raise awareness and ensure safe and effective recycling of Tetra Pak cartons. The aim was to raise customer awareness and educate them on how to recycle Tetra Pak cartons in simple steps and the environmental benefits of recycling.Tetra Pak boxes are largely comprised of paperboard that has been processed from wood fibre. Polyethylene and aluminium protection layers are put to this. Using heat and pressure, these materials are placed together to make a six-layered container that protects its contents from light, oxygen, air, dirt, and moisture. The cartons can be recycled into paper, panel boards, industrial pallets, roof sheets, school desks, and autorickshaw seats and more.



You too can lend support by depositing used Tetra Pak cartons at the nearest carton collection centre.Through recycling, we can give the cartons a new life, protect natural resources and reduce the impact of climate change.


How can you contribute?
1. Lift the flaps and flatten the empty carton.
2.If the carton comes with a straw, push the straw back in.
3.Now deposit the carton in the recycling bin.


How is a Tetra Pak carton recycled?
1. Deposited cartons are collected from the centre and delivered to the factory.
2. They are shredded into smaller bits at the factory.
3. These pieces are then spread out in a press according to the thickness of the sheet.
4. After that, the sheets are compacted under high pressure and temperature.
5.Recycled sheets are ready to make different things.

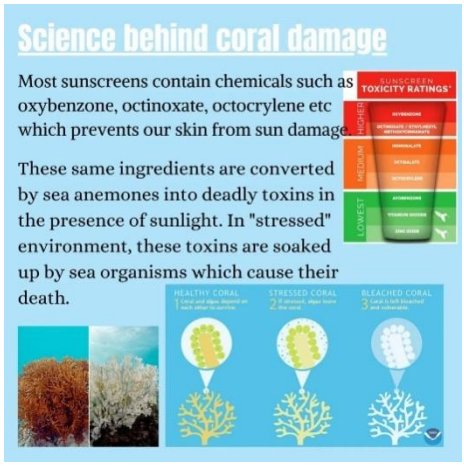

Things made from recycled Tetra Pak

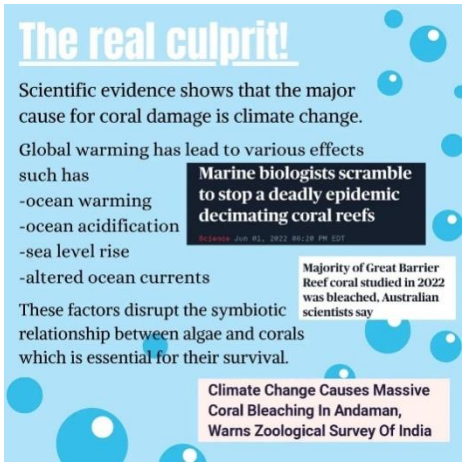
C. ARE SUNSCREENS REALLY THAT HARMFUL TO CORAL REEFS?

In recent years, sunscreens have been highly criticized by scientists, government and media for being harmful to coral reefs. A study conducted by Danovaro in 2008 showed that sunscreens contain chemicals which on interaction with coral reefs can cause their bleaching. Other notable studies proved that, these ingredients can have serious impacts like stagnant growth, tissue accumulation, DNA damage etc. Thus places like Hawaii, U.S. Virgin Islands, Palau, Thailand and many others have even banned swimmers from using sunscreens in specific water bodies.

Common sun blockers like oxybenzone are absorbed by sea anemones and converted into deadly toxins in presence of sunlight. In coral reefs however, these toxins are usually absorbed by the symbiotic algae (zooxanthellae) which resides on their surface. But when the oceans are warmed, corals expel these algae, leaving them vulnerable to the potent toxins which cause their bleaching and eventually death.

Apart from this, a notable point is that, all of these studies are conducted in labs at ppm or ppb concentrations. These concentrations might appear low but when compared to the massive oceans, they are still too high. Thus there's an ongoing debate whether the sunscreens are really as harmful as they are deemed to be.However, climate change is undeniably a huge reason for coral loss. Thus it's the need of the hour to work towards undoing the damage that has been done and prevent it in the future.




D. LETS TALK ABOUT ZERO MOVEMENT!

The zero waste movement is an ecofriendly way of life that aims to reduce the amount of waste produced by individuals on a daily basis. The primary goal of this lifestyle is to send as little waste to landfills as possible.

Individuals prioritise recycling and reusing products and goods over purchasing singleuse items that clog landfills and contribute to climate change and global warming.

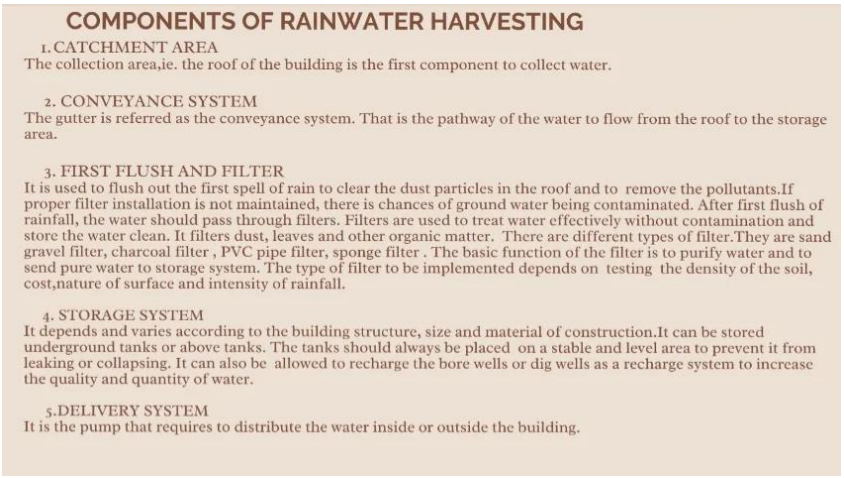
Trying to adopt a zero-waste lifestyle can be difficult since you must unlearn wasteful habits while learning to consume mindfully. One can start their zero-waste journey by making small gradual progress such as starting a compost pile, recycling, and repurposing household items rather than purchasing new single-use items.

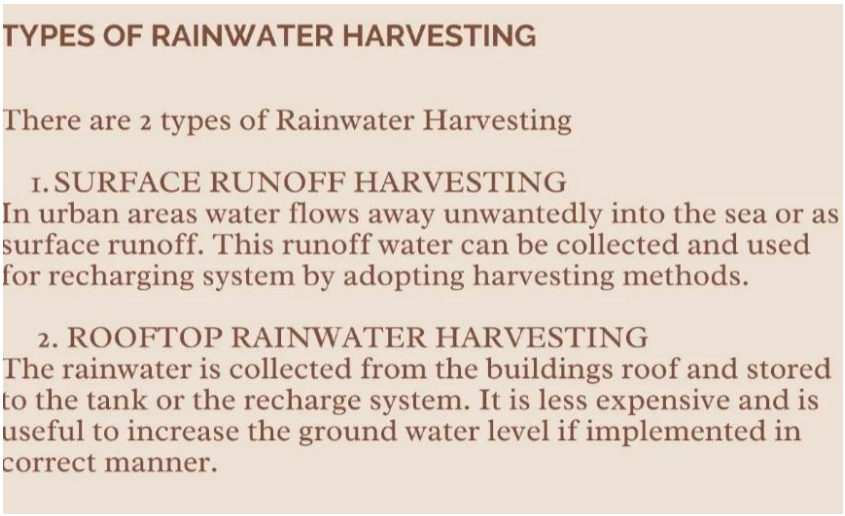



E. RAINWATER HARVESTING

Water is natural resource which is necessary for all the living beings to survive in the word. Even though our planet is surrounded by 3/4 parts of water, only 1% of it can be utilised for human use. Water is necessary not only for drinking but also for day to day usage, agriculture, industrial & commercial purposes. Due to the globalisation, contamination and other reasons, water scarcity is developed all over the world. Water is important for the existence of all the organisms in the world. So, it is necessary to conserve water for our self and the future to come.

With the rainy season coming in here are some ways you can practice at home and contribute to save water by rainwater harvesting.



## NATURALLY RECHARGE YOUR WELLS AND BOREWELLS

Rooftop rainwater is led through pipes with filter at the end to open dug wells for replenishing underground aquifers. A recharge pit for borewells is a good idea as it pushes back the surface water to the groundwater system.Usually a recharge pit is 1 metre in diameter and 6 metres deep, lined with concrete rings having perforations. These perforations let filtered and desilted water seep from the sides increasing groundwater table.

## CREATE A RAIN GARDEN

A rain garden is a sunken landscape that uses native plants, local soil, and mulch to remove pollutants from water, and allows it to percolate into the ground. It's easy to create, looks good all year round and has positive impact on the environment.

## INSTALL A RAIN BARREL

The easiest way to harvest rain is through a rain barrel (make your own from large trash can or an old drum) linked to a pipe fitted to collect rainwater from the rooftop and verandah of the house. To prevent the barrel from becoming a mosquito breeding ground, fasten a tight fitting top to it and screen the ends of the downspouts leading into the barrels. Or simply add a tablespoon of vegetable oil to the stored rainwater. It coats the waters surface and kills larvae by depriving them of oxygen

## SET UP A SPLASH BLOCK

Setting up a splash block is a great idea to divert the flowing rainwater away from the structures foundation. It is a piece of concrete or plastic of a roughly rectangular shape, and is placed below the downspouts that carries rainwater from the roof of the house during rainfall. It absorbs the force of the water that is getting diverted from the roof, and also prevents holes from being dug in the garden due to the eroding force of the pouring water.

## A RESERVOIR OF RAIN

Rainwater that falls on the rooftop, be it flat or slanting,can be made to run through a pipe to a storage facility like a sump or a tank. This water can be filtered to purify the larger particles before being stored in rainwater harvest tanks . By using stored rainwater for washing cars and watering gardens, the use of underground water can be minimised,this also helps in saving energy and keeps the energy bill to a minimum

## F. IMPROPER DISPOSAL OF CHEMICALS IN LABORATORY

You perform an experiment in the lab; you get the results, what do you do with the leftover chemicals and the solutions prepared?
Throw it in the assigned container or dump it in the drain? Even though each lab has a set of guidelines for chemical disposal,the thought of exiting the lab is so exciting that majority of the students just throw the Chemicals down the drain as it is the easiest and the quickest way to dispose off the chemicals. But when you dispose substances that are even remotely hazardous, you can directly cause a great deal of harm to the environment and indirectly to yourself.

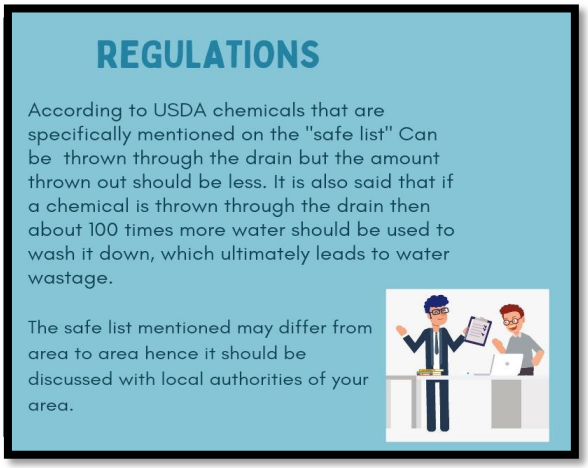
Chemicals used in the lab can exhibit toxicity, corrosivity,reactivity,flammability. All the chemicals used are not always harmful but when exposed to certain environmental components they can react to produce toxic byproducts which ultimately form hazardous waste. A good example that most people are aware of is ammonia and bleach—they form a highly toxic gas when combined.

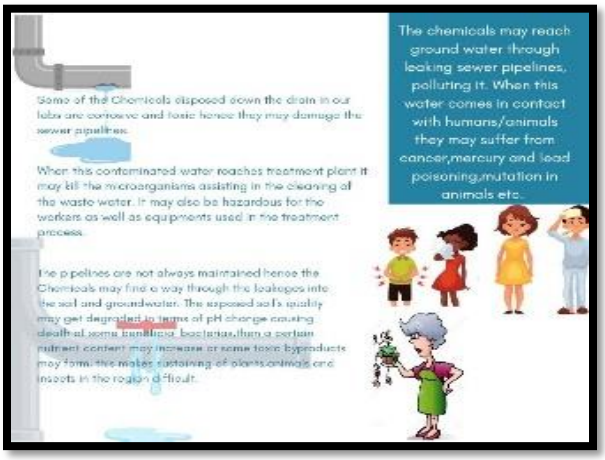
When Chemicals are poured down the drain it reaches the sewer system where if not undergone a proper treatment and then released in the sea causes harm to aquatic life. Some of these Chemicals are corrosive and toxic hence they may damage the pipelines. When this contaminated water reaches treatment plant it may kill the microorganisms assisting in the cleaning of the waste water. It may also be hazardous for the workers as well as equipments used in the treatment process. The pipelines are not always maintained hence the Chemicals may find a way through the leakages into the soil and groundwater. The exposed soil's quality may get degraded in terms of pH change causing death of some beneficial bacterias,then a certain nutrient content may increase or some toxic byproducts may form, this makes sustaining of plants,animals and insects in the region difficult.The chemicals may further reach ground water, polluting it. When this water is used by humans they may suffer from cancer,mercury and lead poisoning,mutation.

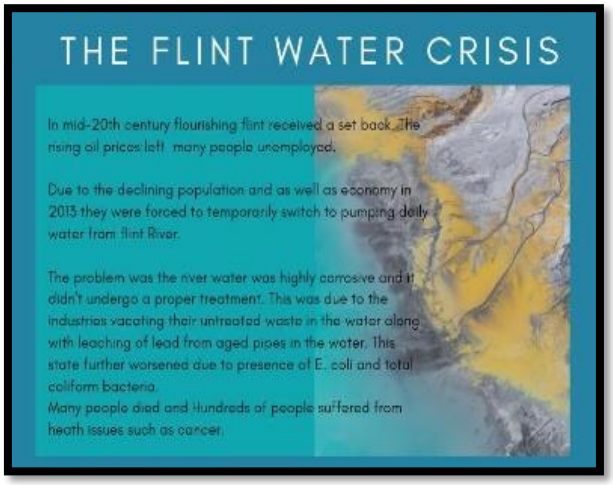
According to USDA chemicals that are specifically mentioned on the "safe list" Can be thrown through the drain but the amount thrown out should be less. It is also said that if a chemical is thrown through the drain then about 100 times more water should be used to wash it down, which ultimately leads to water wastage. The safe list mentioned may differ from area to area hence it should be discussed with local authorities of your area. Some of the chemicals mentioned as unsafe by USDA are ether (both ethyl and methyl ethers), Halogenated, hydrocarbons,Nitro compounds,Mercaptans,Flammables (immiscible in water), Explosives such as azides and peroxides, Water-soluble polymers that could form gels in the sewer system,Water-reactive materials,toxic chemicals such as carcinogens, mutagens, or teratogens,chloroform,substances that boil below 50° C,mixtures that have a component not found on the safe list etc.

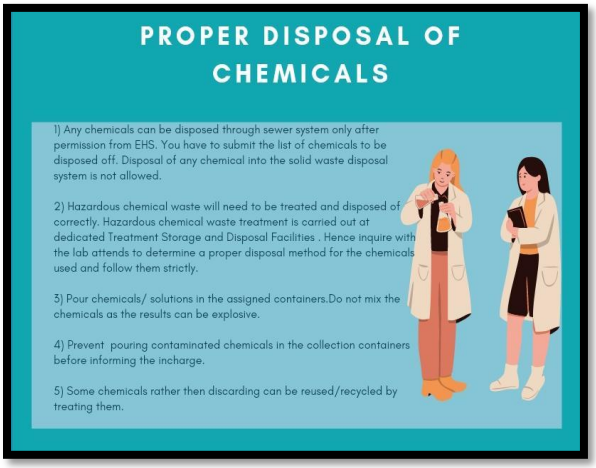
Any chemicals can be disposed through sewer system only after permission from EHS. You have to submit them the list of chemicals to be disposed off. Disposal of any chemical into the solid waste disposal system is not allowed.Hazardous chemical waste will need to be treated

and disposed of correctly. This waste treatment is carried out at dedicated Treatment Storage and Disposal Facilities .Hence inquire with the lab attends to determine a proper disposal method for the chemicals used and follow them strictly. Pour chemicals/ solutions in the assigned containers.Do not mix the chemicals as the results can be explosive. Prevent pouring contaminated chemicals in the collection containers before informing the incharge. Some chemicals rather than discarding can be reused/recycled by treating them appropriately.It is about time students start taking the guidelines set by the labs as well the government seriously and understand the impact their small actions have on the environment.



## REGULATIONS

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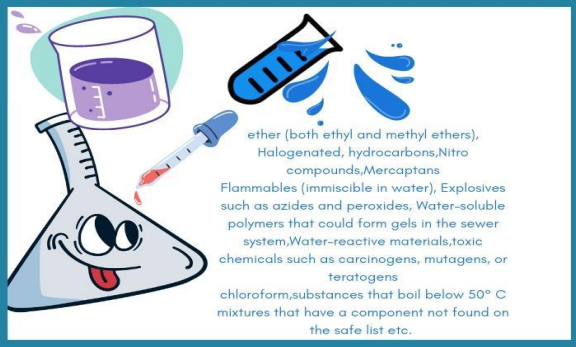
## EXAMPLES OF UNSAFE CHEMICALS



ether (both ethyl and methyl ethers), Halogenated, hydrocarbons,Nitro compounds,Mercaptans
Flammables (immiscible in water), Explosives such as azides and peroxides, Water-soluble polymers that could form gels in the sewer system,Water-reactive materials,toxic chemicals such as carcinogens, mutagens, or teratogens
chloroform,substances that boil below 50° C
mixtures that have a component not found on the safe list etc.

# 6. STREET PLAY

Plastic pollution has become one of the most serious environmental issue and the severity continues to rise because people are using plastic endlessly as it is cheap and easily available. It has an impact on everyone on the planet.

Furthermore, plastic does not disintegrate in the soil or water; it persists for over a century, making the issue more severe and urgent. Plastic is spreading like a disease with no cure. It kills millions of creatures every year, including birds, fish and other marine creatures. It has been known to have harmed nearly 700 species, including endangered species. Plastic is eaten by nearly every seabird species. Even our water is also contaminated by it. Tons of plastic is poured into the ocean every year. This means that in future years, we will be without pure water as microplastic will be present everywhere. The soil is no exception to this. when humans dump plastic waste into the land fills it stays there for a long period of time. It depletes the soil's fertility. Furthermore, many diseases carrying insects congregate in that location, resulting in severe infections.

To bring people's attention to the issue of rising plastic pollution our group decided to perform a street play .So that the people are more aware about the harmful effects of plastics in the environment. In this effort of spreading awareness one of our members penned a street play which was performed by our members at two different places. Through the street play we tried our level best to explain people that we must all recognise the negative influence plastic has on our life and limit it's use in our daily life. We Also tried to make people understand the importance of recycling.

Street Play on Plastic Pollution by SBSI Project Students of Goa University

# 7. WORLD ENVIRONMENT DAY

Every year on June 5th, the world environment day is celebrated. The aim is to urge people to take positive environmental actions to protect nature and our planet along with creating awareness among people of the deteriorating plant population. It is a day that encourages people all over the world to participate in environmentally beneficial activities. On this occasion all the members of our group decided to plant saplings and take a small step to save mother earth.

## 8. COMPOSTING

It is a popular practice of using pesticides, insecticides and chemical fertilizers in plantations for better yield but it is observed that on excessive use of these fertilizes over time soil starts to lose its quality and texture. As an alternative to these harmful chemicals one of our members took an initiative to convert the waste generated by plants and trees along with other households waste generated in her house as well as her neighbourhood as a natural organic fertilizer for plants which will not only help soil retain its quality but also convert household waste into something useful. Another benefit is that as we are using waste from trees like leaves, coconut husks, spathe and guinit, dry weeds, etc for the compost which is resulting in the cleaning of our surrounding environment. The process of making the fertilizer from organic matter took about 3 to 4 months. You should take care that the compost components have sufficient water in them still it shouldn't be excessive. You can also use earthworms which will enhance the quality of the fertilizer made. .





## 9. BEST OUT OF WASTE

There are lot of things in our surrounding which can be reused.It not only helps us to reduce the amount of waste our household produces but also encourages us to test our creativity. On 7th June 2022 we carried out an activity within our group members “Best out of waste". Wherewe utilized waste items available in our houses like plastic bottles, CD's etc to make articles of décor.








# 10. DENGUE AWARENESSS

Dengue fever is a mosquito borne disease caused by the dengue virus. It is spread through bite of Aedes mosquito. Almost 4 billion people live in areas with risk of dengue. An infection of dengue virus can cause mild to severe illness to the individual. The common symptoms of dengue virus are fever along with vomiting, eye pain, muscle pain, joint pain, headache, skin rash etc. In few cases severe fever occurs known as dengue haemorrhagic fever, which results in bleeding, low levels of blood platelets, blood plasma leakage, or dengue shock syndrome.

Therefore it is very important to take all precautions to stay safe from dengue virus. Since dengue is caused by mosquitoes, it is necessary to stop breeding of mosquitoes in the surrounding areas. Especially in the monsoon season as this is main mosquito breeding season .Also personal care should be taken to avoid mosquito bite.

One should take following measures to avoid mosquitoes:

- Do not allow rainwater to get stored in tyres, open barrels or containers.
- Clear all the stagnant water areas.
- Avoid rotting of leaves in Kulagars.
- Use screens on windows and doors.
- Wear cloths with long sleeves.
- Make use of mosquito repellents.

Dengue Awareness Campaign by Students Under SBSI Project Extension Activities

# IMPACT OF SBSI COURSE 2021-2022

Our team had a great experience getting involved into different activities under SBSI programme. Firstly this helped us to be more confident. It also helped us to improve our communication skills and environmental knowledge. It made us learn the importance of co-operation within our group members while going ahead with different activities. We also learnt how to be positive in different scenarios. Through this programme we got a chance to interact with Many people and got to know about their opinions. Overall it was a wonderful experience working together. We are looking forward to participate in such programmes in the future.

Regards from,

Vaishnavi Pandurang Salkar

Shivani Vallabh Samant

Vaishnavi Naik

Bernice Viegas

Elvy Rena Braganca

Shanti Murari Mayekar