

Optimizing the Planned Set-Up of Sukha, an Organisation Working Towards Providing Eco-Friendly Sanitary Methods, On-Toxic Sanitary Pads, as well as Working to Attain Menstrual Hygiene Awareness and Equity Across India

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Abstract - 'Sukha' meaning 'Joy' in Sanskrit aspires to solve the rather huge, but under highlighted environmental and social problems and dangers caused by huge the use of conventional, disposable pads and other sanitary/menstruation products, which is simply, nothing lesser than an eco-disaster.

We also recognize that the chemicals and materials used to manufacture sanitary products are harmful, but have been suppressed from public outcry, given the lack of media coverage, owing to the influential power of multinationals to suppress their misdeeds.

We name our initiative "Sukha" with much love,

for menstruation is a significant aspect and symbolism our nature and existence of humankind, and contrary to the way it is treated as a taboo, we hope to spread awareness through projects on menstrual hygiene and woman empowerment that, it is really natural, and something to comfortably speak out about.

Most significantly, it is our dedication to produce eco-friendly products that has led us to this business idea.

"Our mission is to sell our products to more privileged areas and markets for profit and give them out to the lesser privileged communities at our financial cost, providing a price which will strictly hold no profit for us and pledge to distribute free sanitary products during donation drives and other projects.

Key Words: Menstruation, Menstruation Hygiene Awareness, Menstrual Hygiene Equity, Eco-Friendly Sanitary Products

1. INTRODUCTION

A plastic, industrially manufactured, disposable sanitary pad requires about 500–800 years to decompose. Thousands of tons of disposable sanitary waste are generated every month all over the world.

A plastic, mechanically produced, dispensable sterile cushion needs around 500–800 years to decay. A great many huge loads of dispensable sterile waste are created each month everywhere in the world.

432 million sterile napkins are produced in India every year, the possibility to cover landfills spread more than 24 hectares.

This is perilous with harmful synthetics filtering the dirt, solid and brutal scents produced by the waste discarded in landfills or covered in the soil. This squander is poisonous and dangerous to human wellbeing also. The greater part of the synthetics from these cushions arriving at the dirt causes groundwater contamination, loss of soil fruitfulness.

Removal of this clean waste is likewise a tremendous question. There is no clearness or choice made on whether sterile napkins ought to be characterized under bio-clinical waste or dry waste, there is additionally no mindfulness with respect to the removal even among the individuals who remain in social orders, though in ghetto regions it is normally tossed in open channels. While burning is being proposed as a solution, it is exorbitant and discharges could cause respiratory damage and skin hypersensitivities.

Numerous ladies flush down expendable sterile napkins after use, obstructing underground depletes and manual foragers bearing the wellbeing cost for a similar poison and a cancer-causing agent.

Additionally, sterile items bring about numerous medical issues as they may contain dioxins (present in traditional Commercial Disposable Sanitary Pads or tampons) which cause substantially more genuine impact than just bothering or allergy. Even at 10 dosages, dioxin discovers its way into fat tissues - likewise an immunosuppressant (disturbs hormonal guidelines) and results in regenerative issues. Also, due to the utilization of plasticizers like BPA can cause vaginitis and pelvic incendiary infections at higher rates. While some may contend of tampons being a superior decision, may it be an update that it is a wellspring of numerous diseases, for example, Toxic Shock Syndrome and has numerous counterfeit synthetics which are clearly not useful for wellbeing.

Also, the use of tampons is not really celebrated popularly, especially in India and many other countries, not only because of the taboo surrounding it due to the mechanism of its use but also because of the fear of insertion into the vagina.

They are more prone to health hazards.

Also, eleven or thirteen-year olds or the now common number of girls with an early onset of menstruation may find difficulty locating and inserting, and elderly guidance is something which is not widely possible or something easy. Hence, majority of the population stick to the use of pads, owing to its reliability as the flow can be easily sensed.

Hence, we have decided to focus solely on sanitary pads.

The age at which menstruation starts has significantly decreased. For girls, puberty begins at about eleven years of age, however there is a lack of access to menstrual products. Steps are to be taken towards the development of low-cost environmentally friendly sanitary pads by utilizing inexpensive production materials, and by making the pads from locally sourced materials to support local communities' liability as the flow can be easily sensed. Hence, we have decided to focus solely on sanitary pads. Our products and services focus on providing

ECO-FRIENDLY biodegradable pads as well as reusable sanitary pads.

Our business also hopes to take on donation drives with the help of volunteers and staff members to distribute sanitary pads in rural areas and underprivileged communities for no price, but will be sold in the ordinary market with a reasonably ethical profit margin, with justified payment to the primary and other industries that contribute to our business, taking in the actions of businesses involved in fair trade.

We are also determined to spread the awareness of menstrual hygiene to communities, through talks and workshops.



Fig-1: Company Logo

1.1. Cultural Beliefs and Restrictions during Menstruation

Feminine convictions allude to misinterpretations and mentalities towards periods inside a given culture or religion. Feminine convictions, information, and practices were completely interrelated to the feminine hygiene.

By surveying writing and articles distributed in diaries and reports accessible on the Internet we discovered numerous social and strict convictions followed by individuals with respect to feminine cycles. These also include, the now existing, but illegal

practice of sending women off to menstrual huts where they face discomfort, pain, and nothing but grief through prejudice, not to forget the vulnerability to wild animals and rapists. These standards were the hindrances in the way of good feminine cleanliness practices.

Numerous ladies were restricted to the staple cooking, housework, sex, washing, revering, and eating certain nourishments. These limitations were because of the general impression of individuals viewing the monthly cycle as filthy and polluting. Something of disgust and to be kept far off. Menstrual cleanliness, a significant danger factor for regenerative parcel diseases, is an imperative part of wellbeing training for young adult young ladies. Instructive TV programs, prepared school medical attendants/wellbeing staff, persuaded teachers and proficient guardians can assume a significant function in communicating the fundamental message of right feminine cleanliness to the young adult young lady of today.

2. Mission and Vision:

Our products and services focus on providing ECO-FRIENDLY biodegradable pads as well as reusable sanitary pads.

Our business also hopes to take on donation drives with the help of volunteers and staff members to distribute sanitary pads in rural areas across India and underprivileged communities for no price, but will be sold in the ordinary market with a reasonably ethical profit margin, with justified payment to the primary and other industries that contribute to our business, taking in the actions of businesses involved in fair trade. We are also determined to spread the awareness of menstrual hygiene to communities, through awareness talks and workshops. Sukha hopes to provide the menstruators of India the finest menstrual hygiene products, that will bring them ultimate satisfaction, in terms of the woman's health and comfort which current products have chosen to turn a blind eye too.

We dream that through our cost-effective manufacturing process, and donation drives, sanitary pads will become THE RIGHT, and not A PRIVILEGE to the women, and eventually break the taboo around menstruation matters.

We also hope to invest in a robust infrastructure for segregation and collection of waste. It mandates that the end-users of products and waste collectors are very responsible while handling wastes. We also hope to expand on creating environmentally friendly recycling units for our products, to save resources and for the betterment of Mother Earth.



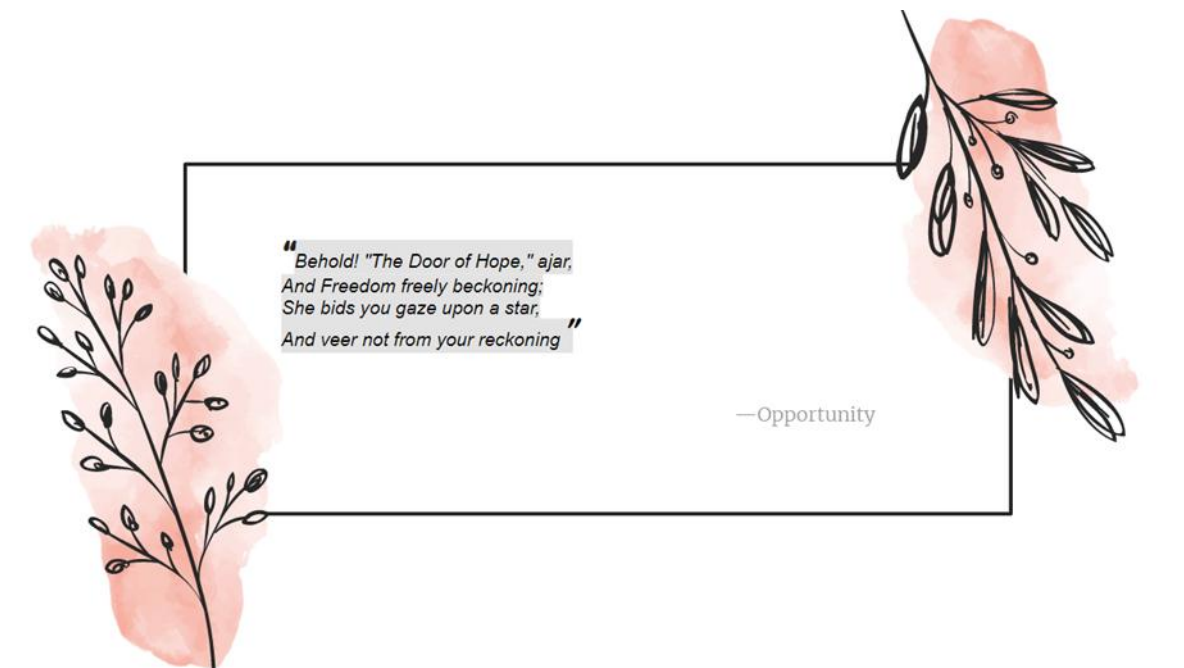


Fig-1.1: Company slogans

3. TARGET AUDIENCE AND INTERACTION

The target audience is mentioned in our tagline itself, 'Dedicated with the utmost passion, love and gratitude to the most amazing, beautiful souls of strength:

The Menstruators of India.'

Our target audience are the menstruators of India. We have decided to start focusing on popular shops across Chennai initially, since it is located near the office for this start-up and then spread to National shopping mall chains across the country.

Our mission is to sell our products to more privileged areas and markets for profit and give them out to the lesser privileged communities at our financial cost, providing a price which will strictly hold no profit for us and pledge to distribute free sanitary products during donation drives and other projects. The target audience will be interacted to in the following ways:

3.1. WEBSITE

Our website is an extension of our work towards this initiative and will provide our customers an all in one platform for activities such as Orders, Query Solving, A platform to connect to the people who have purchased our product. This will help the customers and guide them to the product that they desire and feel the most comfortable using.

- Ordering facilities
- 24x7 customer service management
- a Q&A section for all our customers' doubts and queries about the products
- A community of satisfied users who will help our new customers throughout the product choosing process
- An online shop for the customers to choose between the different products
- Detailed manual
- A complete refund channel for our customers to alter or return any of our products.
- Videos on menstrual hygiene procedures

VISIT our website at www.Sukha.com.in

SIGN-UP

My name is...

My E-mail is...

My password is...

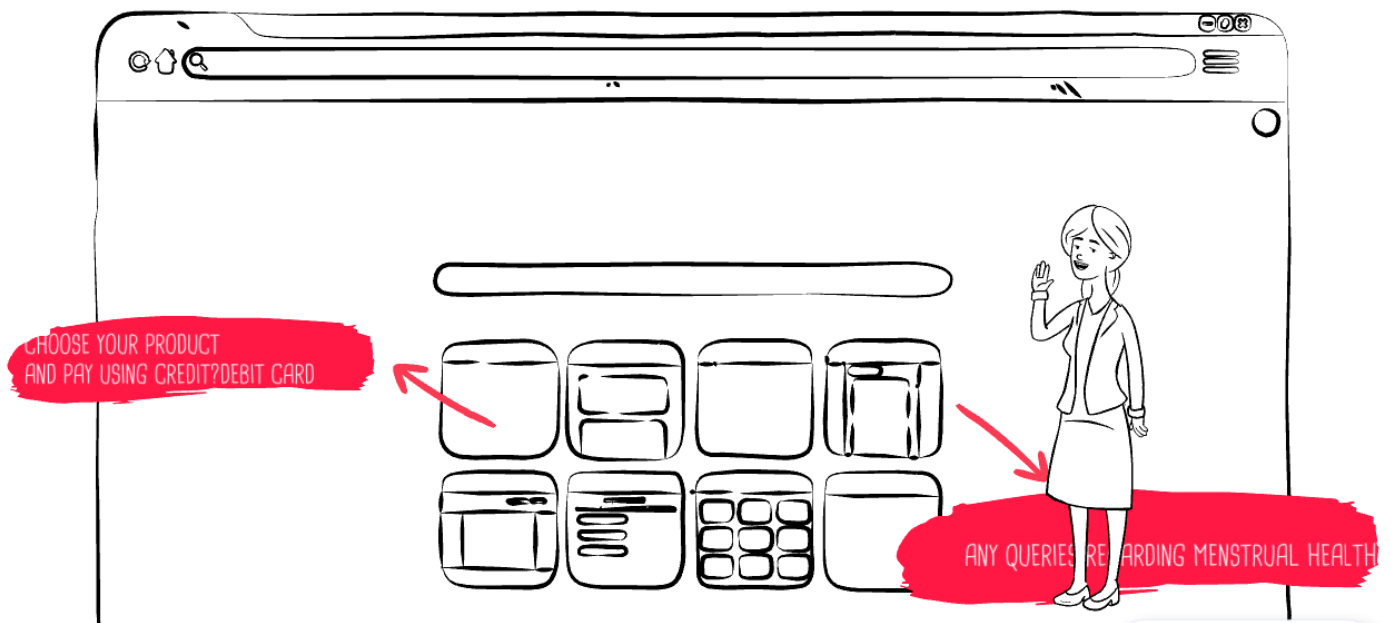


Fig-2: Website design

3.2. APP

Our app is aimed for the same purpose dedicated by our website and will be a handy and portable alternative for our customers to use.

The app will be fairly minimalistic in design keeping in mind the absolute priorities of the customers which include:

- Buying or returning products and services
- Questions about the products and services
- Payment methods and techniques



Fig-3: App Satisfactory Index

3.3. OTHER CHANNELS:

- Available on majority of the online shopping websites
- Nearby stores (Chennai region, since that is where our office will be located) and national supermarkets chains
- Call and order for BPL line mass”

4. Materials and Methods:

4.1. Questionnaires:

We made use of ‘Google Forms’ as it is the easiest way to get responses, being easy to share it amongst groups, easy to form and reply to.

Since forms are not something people are usually interested to fill for a long time or, reply to properly, we tried to make the questions as concisely answerable, while making the following eleven questions after much thought.

It was distributed amongst students of VIT who are very much at a menstruating stage and our sample size was large enough to be convincing as well as the accuracy was placed.

We used the responses as a method to identify our problem statement and improve our product prototype.

These questionnaires were distributed through means of WhatsApp Groups of students across the Vellore Institute of Technology.

The survey was a questionnaire answered by 74 women between the ages of 17 to 21

The questions were: Which sanitary hygiene product do you use most? (Options given: Pads, tampons, home cloth, other)

Why do you prefer the above-mentioned type? (Long answer type question)

Are they biodegradable or reusable? (A yes/no question)

- What would you like to improve about the product you currently use? (A long answer question)
- Do you think it is necessary to talk about menstruation in schools/villages/etc? (Long Answer type)
- How openly were you introduced to menstruation?
- Was it before or after you got your periods? (Long answer type)
- Is it expensive? (A yes and No question)
- Do you get a pattern heavy flow, moderate flow or light flow A long answer question)
- Does the sanitary pad you use cater for the above? (Yes/No/sometimes-given as options)

- How open is your family/friend circle in discussing menstrual hygiene? (scale of 1 to 5 is given where 5 is most open)
- What inconvenience do you face in terms of your health in the use of these products?

4.2. MATERIALS USED

“The following materials were chosen to suit the above problems:

BANANA FIBRE:

Banana fibre, is also referred to as musa fibre and takes place to be the world's most powerful herbal fibres. It is biodegradable, the natural fibre is made from the stem of the banana tree and is tremendously long lasting. The fibre consists of thick-walled cellular tissue, bonded collectively through natural gums and is specially composed of cellulose, hemicelluloses and lignin.

Banana fibre is just like natural bamboo fibre, however its spin capacity, fineness of satisfactory, and tensile strengths are said to be way better. Banana fibres had been used to make a number of different textiles with distinctive weights and thicknesses, depending on the part of the banana stem the fibre is extracted from. We can use this belonging for different flow styles of pads. The thicker, sturdier fibres are taken from the banana bushes outer sheaths, while the internal sheaths result in softer fibres.

BAMBOO FIBRE:

The banana fibre texture is around 50% more prominent permeable than compound items used in common sterile sanitary pads.

Indeed, even the contrary product shows to be higher in expressions of absorbance.

Since they involve no plastic or distinctive non-natural materials, the cushions biodegrade into fertilizer in only three months, or a half year in a landfill.

It should be tossed as wet garbage, and may be advantageous as nutrients in.

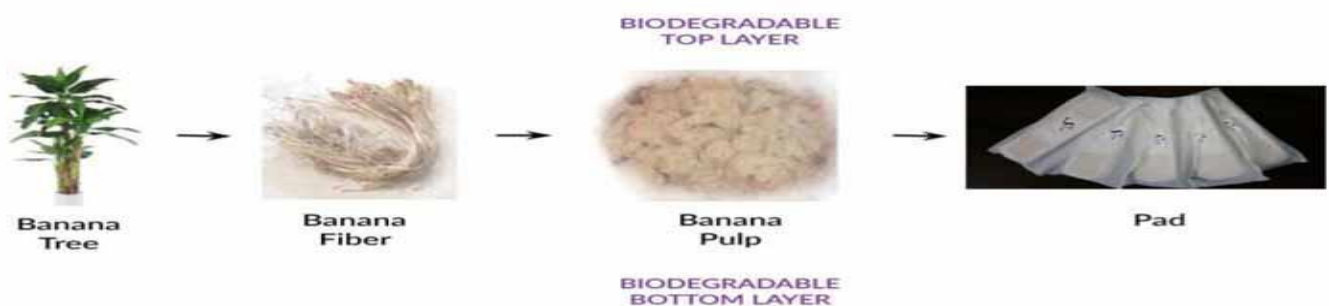


Fig-4: Detailed manufacturing process

Cotton (For reusable cloth pads)

Cotton fibres were found to be very absorbent. Cotton had the capacity to capture about 0.3 gallons of water, every pound of cotton and garments of cotton can carry up to 27 times their weight in water. The nature of cotton is what makes it feel so soft to the touch. Small amount of the cotton fibre extends from the surface of the fabric. ... The creation of this barrier is not the only way 100% cotton fabrics provides comfort to the people that wear it. Since cotton is a natural cellulose fibre, it also absorbs moisture. This makes it very appropriate to be used in reusable cloth pads.

Performance evaluations

Performance evaluations were made with respect to tests of maximum capacity, rate of absorption and moisture retention to determine the prototype.

All steps are to be repeated thrice.

The research will be carried out by performing absorbency tests on the prototypes using a blood substitute.

This substitute will be made using a saline solution with 896 g of water and 164 g of salt which will be heated up to 37°C using a water bath. A drop of RED colouring will be added to the solution to make it easy to observe runoff of the pad that gets soaked during testing. We decided to use 'Red' rather than the conventional 'blue' to break the taboo about the menstrual blood.

4.3. PERFORMANCE TESTS

The following tests were performed:

Maximum Capacity Test:

The maximum capacity is to be determined by weighing the dry pad, fully saturating it with blood substitute and then weighing it again. The difference between the final mass and the dry mass was perceived as the absorbed fluid mass at the pad's capacity.

Absorption Rate Test:

A vertical wicking test is done by dipping the pad in 3 cm of blood substitute for two seconds. The rate of absorption is perceived as the loss in beaker mass with time.

Moisture Retention Test:

Each dry pad was weighed. 30 ml of blood solution was added at 2 ml/s, and the pad is to be reweighed. The percentage of moisture left in the pad with respect to that initially added is calculated and used as an indication of moisture retention.

Score of Absorbance:

With the use of a dosing apparatus, each product was tested for its absorbency speed.

A specific amount of salt solution was soaked into the centre of the sanitary pad prototypes using the dosage pump. The amount of time it takes for the liquid to disappear was recorded and the process is repeated once more after waiting for five minutes.

The total time for both gushes to absorb is taken as the absorption speed.

Score of rewet:

The use of filter papers was done to measure the rewet or known as damp-feeling.

Five minutes after the last gush from the absorbency test, six pre-weighed dry filter papers are placed on the sanitary pad and held down for 30 seconds. The filter paper is then removed and immediately weighed. Ideally, the filter paper should remain relatively dry.

Score of Velcro strength:

We measure the force required to pull the pad from a cotton surface.

We also look for any leakages during testing and note if a leak was observed. This isn't scored.

Test criteria explained

The overall score is made up of:

Absorbency (70%),

Wet feeling (20%) and

Velcro strength (10%)

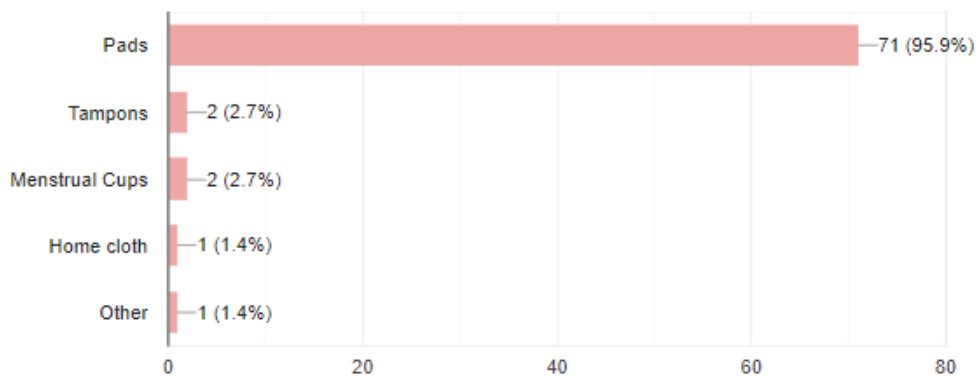
The results are strictly protected by company's policies and will be distributed to the knowledge of professionals seeking proof of ingenuity of experimentations."

4.4. OUTCOME OF SURVEY

Following are the results of our survey.

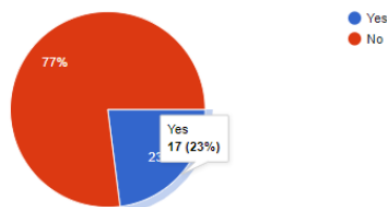
Which sanitary hygiene product do you use most?

74 responses



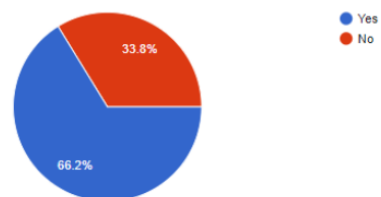
Are they biodegradable or reusable?

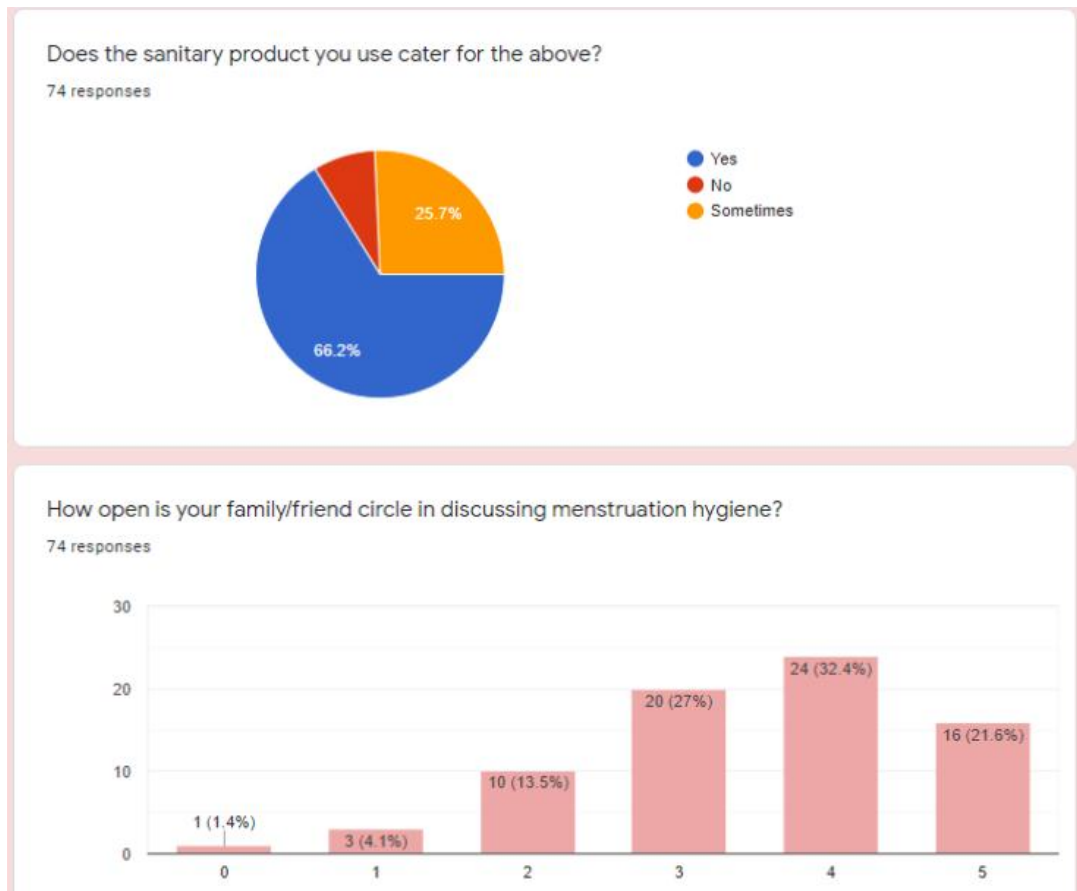
74 responses



Is it expensive?

74 responses





Why do you prefer the above mentioned type?
74 responses

Convenient	Easily available, my mom also used it in throughout her life.
Comfortable	Easily available
Pads	Easily available and usable
Comfort	It's easy to use, also never thought of giving something else a try! Also, tampons can cause toxic shock syndrome one needs to be careful and precautious using it.
Pads but am thinking of switching to menstrual cups	Preferred ig
Comfortable	It was introduced to me at the onset of my menstruation and thus, I have been using it
Comfortable and long lasting	Because that is hygienic and also I feel comfortable in this...
Easily available	It's the product which was introduced to me when I first got my period.
They're the most convenient and readily available	
No leakage problem	

- It is readily available and was introduced to me first.
- Easy to use according to me, can change anytime
- easily available
- Most easily availability
- I think it is safe
- Because Shradha Kapoor even uses it.
- They are comfortable
- Easily available in my city. Tempons & cups are not available.
- Easy to use and comfortable



Why do you prefer the above mentioned type?

74 responses

- They are quite comfortable
- It is more widely available and also seems safer to use
- As it's easily available
- It's general
- Easy to use and easily available
- It's cheap and most readily available in Indian markets UNLIKE any of the other products
- Its comfortable
- Menstrual cups are really good! They keep you dry day and night. Since the day I've started using menstrual cup, periods just don't feel like periods! And you don't face any problem regarding the odour like in pads. It's also reusable and eco-friendly. Overall, I feel 10x more fresh when I'm wearing a menstrual cup as compared to when I'm wearing a pad! Even apart from these, there are so many other benefits of it!
- They are comfortable and help in maintaining sanitation
- Convenience
- They are cheap n easy to use
- I'm comfortable in that and it's soft too.
- Easier to use, comparatively cheaper, easily available and lg more comfortable.
- It's comfortable and convenient.
- No toxic syndrome and easier to handle
- It is easy to use
- Most of the people around me use that only
- Affordability and availability

- Yes
- Comfort
- It's the easiest and most readily available.
- asehi
- No reason
- It is readily available and was introduced to me first.
- Easy to use according to me, can change anytime
- easily available
- Most easily availability
- I think it is safe
- Easily accessible and apprehensive of experimenting with any other alternative.
- Haven't tried the other products yet.
- Cause I haven't tried anything else. I was introduced to that.
- Available
- I don't know. Haven't tried the others though.
- Easily available, easy to use
- Comfort cleanliness
- They are comfortable
- It is more comfortable
- for its been so comfortable

What inconveniences do you face in terms of your health in the use of these products?

74 responses

- Carrying of pads and a little unhygienic
- itchy
- None
- It causes rashes
- Itching, Uncomfortable and have to regularly changed and disposed
- Artificial fragrances used in pads are not so good!
- Rashes and UTI
- Rashes and itches sometimes
- Bad odour and itchiness

- Sometimes rashes
- Skin sensitivity
- usually not at all.
- Not reusable, sometimes leakage
- I get rashes.
- Sometimes irritation and odour
- Nothing but sometimes the wings of the pad scratches the thighs.
- They have a high risk of causing infection
- Not much

- Not being able to Dispose them properly is an issue
- No such problem
-
- Itcheing and sometimes rashes
- Nothing.
- None specifically.
- Chaffing and constant changing throughout the day to maintain sanitation
- Long hours
- They may cause cancer



The thing that the product I use isn't biodegradable as it uses plastic and other synthetic materials is a thing that I would like to get changed. It should be more eco-friendly like the sanitary napkins made of cotton.

Nothing in particular

None

Nothing

No

Must be Biodegradable n skin friendly

It should be biodegradable and should be more soft

It would be great if the product becomes biodegradable

Pads are universal but they can get uncomfortable for the user overtime. Also the amount of waste

More softness

They should be designed with natural fibre like cotton, they should be not made of gel or any other non-biodegradable material. The use of non-biodegradable plastic is my top concern. So, every menstrual product should be made of biodegradable material.

There's this another problem of price which personally doesn't effects me but many people just can't afford these products. I think, they are made "luxury products" rather than of "basic use".

It's design and quality

Softer

More soft,more thin

The biodegradability, absorbability

Larger wings.

What inconveniences do you face in terms of your health in the use of these products?
74 responses

Rashes

Nothing

Rashes

Irritation sometimes

Nothing

They're really Uncomfortable

none

Alergies

None

What inconveniences do you face in terms of your health in the use of these products?
74 responses

Sometimes rashes, and littlefew

The sheer amount/quantity I use every cycle is worrisome. I produce so much un-biodegradable waste. Pads aren't the most comfortable to wear either.

Irritation if used longer than a certain period of time.

Rashes mostly

Irritation

The use of these are quite uncomfortable at times and it puts additional stress with regard to leakage and changing issues which results in a very irritable period

Rashes on inner thighs

Only when I don't sanitize my cup properly, I feel conscious about my health. Otherwise, there's no inconvenience as such!

What inconvenience do you face in terms of your health in the use of these products?

neavy use of perumes which can cause irritation

No inconveniences faced as such.

Not much impact, but long term usage of a single napkin can cause uteru:

Rashes and odour

Skin rashes and odour

Irritation rashes

It causes itching at times.

Itching staining

Rashes sometimes coz my skin is kinda sensitive.

Sometimes rashes



Do you get a pattern heavy flow, moderate flow or light flow?

-Because the answers were repetitive, we chose summarise instead, that mostly answers explained that the flows were mostly varied, heavy at times, moderate times and slow at times as is the case. However, the few who replied a single answer claimed there's to be of heavy flow. Although the words slow, moderate and heavy are greatly varied, and ambiguous, it is worth noting that there was no other choice, but the words were most probably based on how fast the flow fills regular sanitary pads.

Do you think it is necessary to talk about menstruation in schools/villages/etc?

-The answers were all predictably all in support of this since it is a high time menstrual awareness is spread

How openly were you introduced to menstruation? Was it before or after you got your periods?

-11 responses responded that they came to know it after they got their periods, and out of them only three had experiences where it was awkwardly discussed, that is, not very openly. The rest, including those who came to know it before they got their periods, were introduced in a very open way, and a lot of them gained insight from the workshops and talks held in school.

5. RESULTS AND DISCUSSION

Upon conducting the survey of 74 menstruators in Vellore Institute of Technology from the ages of 17 to 21, it was found that most of the women preferred environmentally friendly menstrual management methods.

95.9% of the women preferred the use of sanitary pads over other products and hence we decided that pads will strictly be our area of focus.

The women were also questioned what they would like to change about the products and our conclusions run down to: better, not toxic material that will not form rashes, by using natural materials such as cotton, banana fibre and bamboo. Most women also mentioned the need for environmentally friendly pads.

Our aim, hence, to develop a low-cost biodegradable sanitary pad to improve accessibility to menstrual management products.

We decided to see work previously done and to explore the possibilities for materials of construction for a low-cost biodegradable sanitary pad.

Based on the survey we decided to add in larger wings with better glue properties as well as the use of a more comfortable material is guaranteed due to natural products, so the issue of rashes will be avoided.

Further research through personal interviews by gynaecologists that we were able to contact, as well as through other research materials, we summarised the following current issues as primary and sought to deal with them.

The problems were:

5.1. DRYNESS:

Lots of women found the wetness more noticeable while using organic pads compared to the synthetic ones. It makes us think that the pad's not absorbent enough. But it's not that simple. It is because of the nature of organic cotton, the surface of a 100% organic cotton pad cannot be perforated like the synthetic fabrics. As we mentioned earlier, pads made with synthetic fibre have a perforated surface, which absorbs a little faster than the organic cotton pads. So even though a pad that's made with organic cotton can absorb a lot more flow, some women may feel the need of changing it a little more than the synthetic ones.

5.2. VAGINAL PROBLEMS

Increased vaginal infections and rashes (As in conventional pads or tampons) are caused due to the synthetic chemicals used, such as, but not limited to Dioxins and plasticizers. There are proper absorption issues, that leads to leaking of pads, which leads to serious discomfort and staining.

5.3 TOXIC CHEMICALS

This is hazardous with toxic chemicals leaching the soil, strong and harsh odours emitted by the waste disposed of in landfills or buried in the soil. This waste is toxic and hazardous to human health as well. Most of the chemicals from these pads reaching the soil causes groundwater pollution, loss of soil fertility. Fragrance chemicals are also known to have connections to dryness,

infertility, birth defects, cancer, to name a few of the disastrous chemicals. Pesticides are sprayed on cotton crops. Pads are mostly made of cotton, and will be tainted and so, the use of bleaching products is undertaken. The genital area is known for its thinness, sensitivity and permeability. Such chemicals have NO place near the vagina. These enter the bloodstream and cause illnesses and other disastrous effects.

Disposal of this sanitary waste is also a huge question.

There is no clarity or decision made on whether sanitary napkins should be classified under bio-medical waste or dry waste, there is also no awareness regarding the disposal even among those who stay in societies, whereas in slum areas it is usually thrown in open drains. While incineration is being proposed as a solution, it is costly and emissions could cause respiratory harm and skin allergies. Many women flush down disposable sanitary napkins after use, clogging underground drains and manual scavengers bearing the health cost for the same.

The above problems would, upon our further efforts to deal with them, conclude with a common solution: The use of Sukha sanitary pads.

Vaginal dryness, infection and the rashes have a common answer: The use of natural products. We have focused on 3 varieties, that is, cotton, bamboo fibre and banana fibre. These reusable pads are ultra-thin and are highly absorbent, leak-proof and rash-free, nulling all the problems regarding the use of products, hence it is high time we start doing so!

Pads have been designed to be larger, depending on the flow, and the wings will be made larger with better glue properties, unlike most commercial brands that turn a blind eye to proper pad wings, so that they can be wrapped effectively.

6. PROTOTYPES

The following prototypes have been planned:

Reusable cloth pads:

These are comfortable, affordable and well-made, and there is no need to dispose of and buy new ones month after month. All that needs to be done is to wash these products extremely well after use by placing them in soap water, or in washing machines, and then hang them out in the dry before they can be used again.

Banana Fibre Pads:

Bamboo fibre is an ideal choice for the top layer of a sanitary pad as it is naturally antibacterial, breathable, hypoallergenic, odour resistant and super soft. Conventional pads use perforated polypropylene plastic sheet as a fluid transfer top layer which is harmful to the environment. Other "premium" pads use cotton which is one of the world's most heavily pesticide sprayed crop.

Bamboo Fibre:

Bamboo fibre is the best choice for the top layer of a pad since it is naturally antibacterial, breathable, super odour resistant and soft.

Our products:

REUSABLE PADS

comfortable, affordable and well-made!

disappears underneath your clothes and lets you go about the day normally.

no need to dispose of and buy new ones month after month.

BAMBOO PADS

biodegradable and compostable

materials are friendly for sensitive skin and provide long-lasting comfort


readily available waste allows the pad to be reasonably priced!

no need for chemicals or super absorbent polymers

BANANA FIBRE PADS

an agro-waste converted into absorbent core for the sanitary napkins.

since there was no use for banana fibre, farmers would compost the banana trees after harvest. They now get extra income by selling the fibre!



All three would be offered in the following types: normal flow, heavy flow and night flow.

GENERAL PROTOTYPE:

(NOTE THAT THE HEAVY FLOW PAD WILL HAVE A LENGTH OF 23 CM INSTEAD AND BREADTH OF 8 CM AND WING LENGTH OF 5,3 CM)

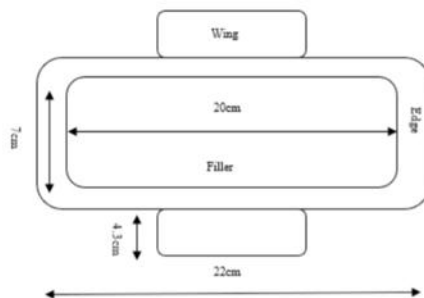


Fig-5: Basic prototypes

The banana fiber and bamboo fibre material is about 50 percent more absorbent than chemical products used in regular sanitary pads.

Even the other products prove to be better in terms of absorbance.

Because they contain no plastic or other non-organic materials, the pads biodegrade into compost in just three months, or six months in a landfill.

It should be thrown as "wet" garbage, and could be furthered on to add beneficial nutrients to the soil.

BANANA FIBRE AND BAMBOO FIBRE PROTOTYPE





Fig-6: Basic Prototypes

7. RECYCLING TECHNIQUES

The ways to deal with the issues of disposal system has been well planned of but a stronger capital is needed for the whole system to be started. We have initially hence, decided to go into partnership with garbage collection companies. We will be collecting all sanitary wastes, regardless of company but will require segmentation into biodegradable and non-biodegradable categories. Efforts will be taken on our part through media coverage to highlight the importance of segregation during disposal.

Recycling has been planned extremely well, as part of our future, but definite goal. Recycling Techniques we plan to take up, easily avoiding the huge extent of carbon emissions and environmental damage as incineration.

We will focus on both reusable, biodegradable and the non-degradable, conventional, plastic pads and tampons and menstrual cups. The ways are:

1. Thermal pressure hydrolysis – In this process, the used products are collected in a tank, heated to about 250 degrees C and pressurized with steam to 40 bars.
2. Recycling Pumps and Plastic: The technological process of recycling, developed from Fater patents, generates plastic granules and high quality and completely sterilized organic-cellulose material, using steam for eliminating all potential pathogens and odours.
3. Refuse Derived Fuel: It combines mechanical separation with chemical treatment and converts highly absorbent hygiene products into refuse derived fuel (RDF), which is then supplied to the alternative energy market both in the UK and in Europe. RDF is typically burned in biomass plants to produce electricity and hot water either for municipal power systems, the National Grid or individual companies.

8. BUSINESS MODEL CANVAS(BMC)

8.1. CUSTOMER SEGMENT:

Customers would include menstruators who wish to reduce their footprint on the environment and generate less non-biodegradable waste or waste in general.

This idea would especially appeal to the menstruators with sensitive skin that gets agitated by nylon, plastics and other non-organic elements present in conventional sanitary pads, and also those who may have experienced problems of rashes and may be concerned about the toxic chemicals entering through the use of conventional pads.

Our segments also include underprivileged areas like shanty towns, where menstruators who cannot afford to spend their budget on sanitary products every month will be targeted and hence donation drives or other opportunities of lower costs.

These communities are also likely to benefit from the easy recycling capacity of these sanitary pads, given the lack of sanitary disposal systems in these locations.

Environmentalists will also be encouraged to support this and would hence form a very enthusiastic customer base.

8.2. CUSTOMER RELATIONSHIP:

Strict guidelines shall be in place regarding the use of language and form in which customers may approach and receive follow ups of complaints.

Creation of Facebook, Instagram, phone number and own website for complaint portals and will be followed up closely within a period of 24 hours. Compensation should be provided in the case of faulty products. Customers will definitely and obviously be dealt with ethically, morally and with respect. If any staff member does not adhere to the set of guidelines, they may face strict disciplinary consequences that will be managed by the Human Resource Department. Each complaint is to be at least addressed, if not solved in less than 24 hours and compensation or feedback should be given in a week.

8.3. KEY PARTNERS

Key partners include delivery providers who will be responsible for farmers and cultivators (to obtain raw materials like bamboo and banana leaf) as well as human Rights organizations and NGOs for the purpose of distributing sanitary pads and providing employment benefits to transgender communities and women in shelter homes, from manufacturing, to research and development.

KEY RESOURCES

The resources include banana fibres from banana fiber extracting industries, bamboo from bamboo farms, cloth materials (ex: cotton) to be bought from cotton plants(wholesalers)

The resources will preferably be bought, preferably directly from farmers with well deserved return of profit through fair trade practises. Human resources department responsible to employ people in management, R&D, manufacturing etc. fields is one of the utmost importance.

8.4. KEY ACTIVITIES

Providing:

ECO-FRIENDLY biodegradable pads as well as reusable sanitary pads.

3 varieties:

1. Banana Fibre Pads
2. Bamboo Pads
3. Reusable pads (cloths)

In 3 further subcategories for each:

1. Heavy flow
2. Night flow
3. Normal Flow

Workshops and talks on menstrual hygiene:

It will come with justified charges from schools, but will be provided free to schools in rural and underprivileged areas.

Because they contain no plastic or other non-organic materials, the pads biodegrade into compost in just three months, or six months in a landfill.

-Waste collection for recycling:

Whenever the business grows and allows for the affordability of recycling plants as the capital needed is huge.

Recycled products will be sold to industries.

-Employing women of communities where the usage is still a taboo, and educating them on the needs and importance, to spread the word in theirs.

-Organisation of donation drives, with and without other companies being involved.

8.5. VALUE PROPOSITION

The value proposition includes turning the tide of reproductive health crisis, providing affordable and hygienic sanitary products, easy to dispose, eco-friendly that are beautifully designed and promises comfort

We also aim to promote the “Make in India” movement.

8.6. REVENUE STREAMS

What customers are willing to pay for

- Safe and biodegradable sanitary products without any worries of side effects and medical abnormalities
- We will be generating recurring revenues via both cash and cashless methods.

8.7. COST STRUCTURES

Cost structures involve:

- Business Development team
- Accounting team
- Manufacturing costs
- Misc. Management costs
- Rent and occupancy costs
- Public assistance costs

8.8 CHANNELS

- Available on majority of the online shopping websites
- Nearby stores and supermarkets
- Call and order for BPL line mass

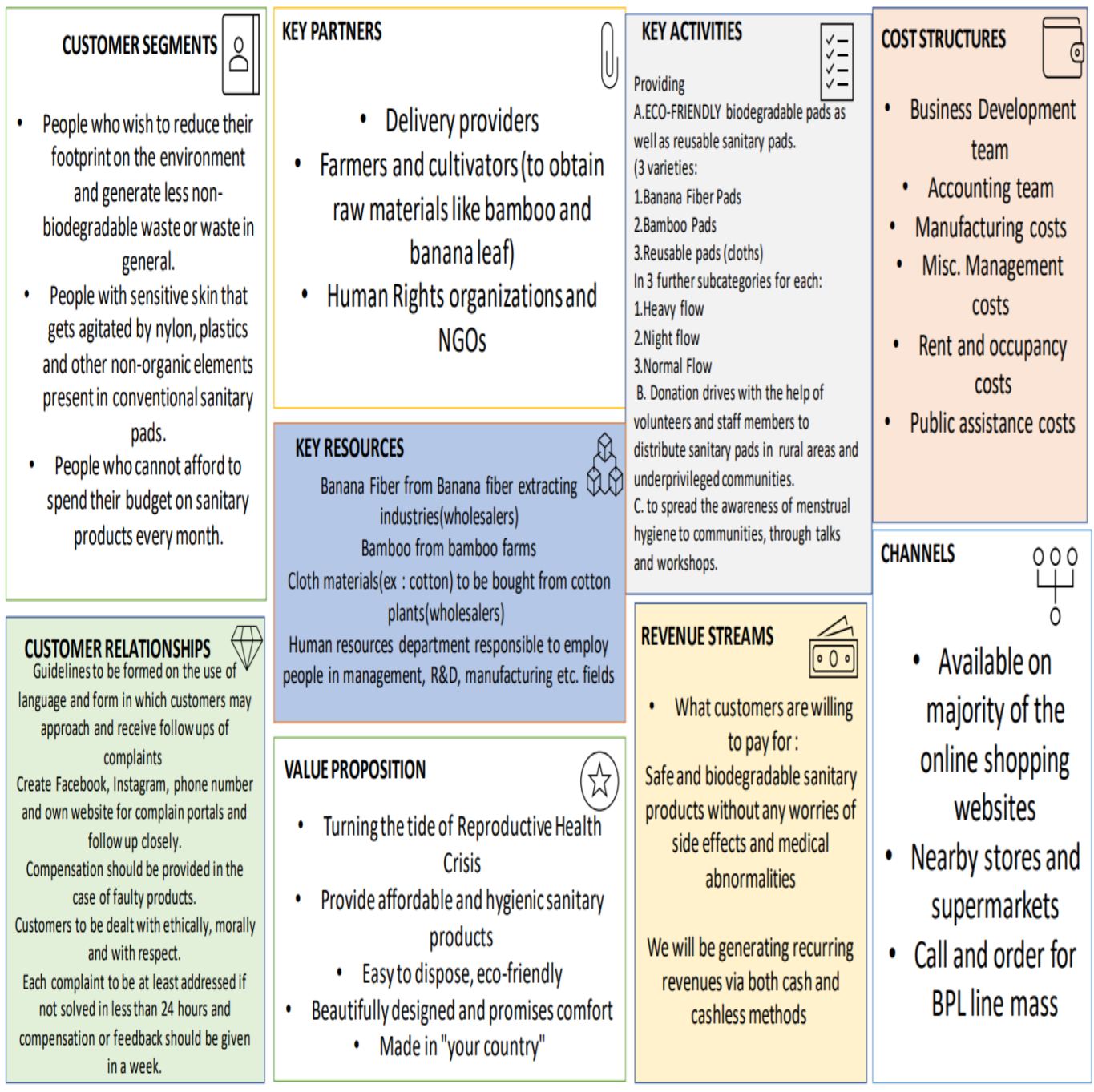


Fig-7: Business Model Canvas

9. LEGAL STANDARDS AND PROTOCOL

We have kept in mind to try and avoid any plagiarism that may occur in designing of our sanitary and have worked to make it innovative in terms of our products, but more importantly, our services, our intentions and global responsibility. The legal standards that we should ensure during development of this app and website is to ensure intellectual property rights. It refers to the elements we have used during the process of developing our app such as app designs, app name, app logo, source code. We have ensured that we have not infringed the IP of a third party. We have placed agreements with our developer such that we all own the resulting the IPR. We will ensure that there is privacy of app users and protection of data.

10. CONCLUSIONS

We live in a society where menstrual hygiene is not talked about enough. Due to the lack of proper education, the majority do not realize the correct way of dealing with this biological phenomenon. The plastic and non-biodegradable waste produced by conventionally used menstrual products makes a large impact. This is why we have introduced this venture because we believe maintaining menstrual hygiene does not need to be so expensive for the environment or the pocket.

There are many alternative options of producing these products in a more sustainable and responsible way but these methods are not adopted by consumers due to lack of awareness and by manufacturers to gain excess profit and increase dependency and product consumption of the buyer.

Therefore, we aimed to produce products that are safer for the environment, right from the production process to its disposal. Our products are also made responsibly keeping in mind that many of our customers are not given proper education about menstrual health. So, we try to instruct them properly and keep the toxic substances found in conventional products out of ours.

We aim to stick strongly to our focus on providing menstrual hygiene products hitting cost effective, anti-toxic and eco-friendly targets while making it a better world through funds, charities and employment of workforce from communities that have been disadvantaged.



Fig-8: Company slogan

REFERENCES

- [1] <https://www.choice.com.au/health-and-body/reproductive-health/womens-health/articles/how-we-test-sanitary-pads>
- [2] <https://thehivebulkfoods.com/product/thehive-reusable-sanitary-pads/>
- [3] <https://www.rutuchakra.org/>, owing to the involvement of the first author in the organization
- [4] <https://www.jeunesseanion.com/tips-and-tricks/5-toxic-sanitary-pad-ingredients/>