BuzzOnEarth India Hackathon 2023

Basic Details of the Team and Problem Statement

Problem Statement Title: Developing sustainable packaging solutions for consumer goods that reduce waste and minimize the environmental impact of packaging throughout its lifecycle.

Team Name: Earth-Guardians

Team Leader Name: Purushottam Varshney

Institute Name: Galgotias College Of Engineering and Technology , Greater Noida

Theme Name: Food and Agriculture

Idea/Approach Details

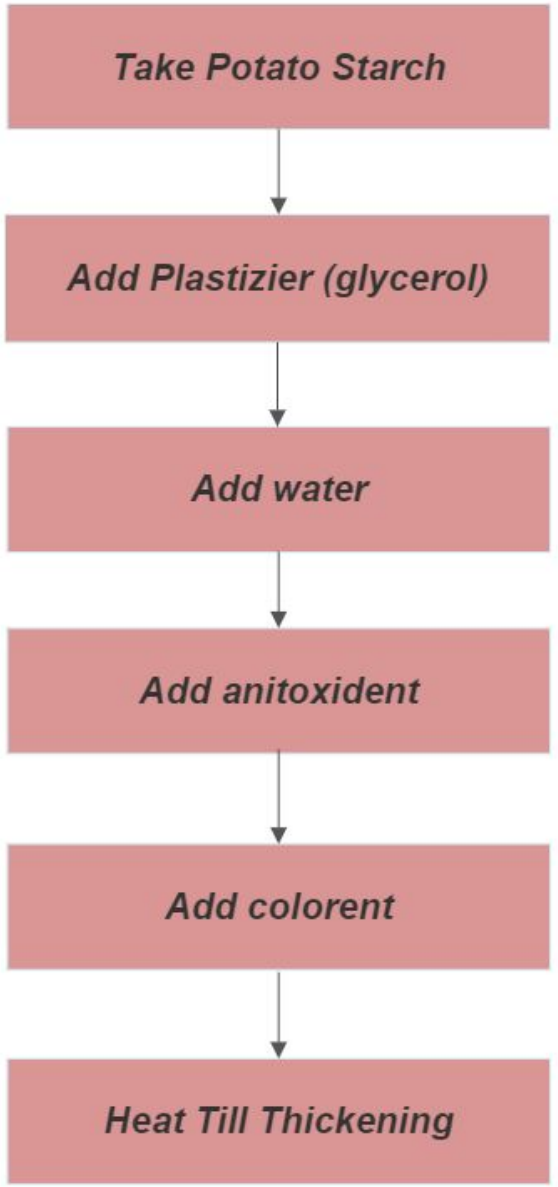
Describe your idea/Solution/Prototype here:

- Our Idea is to replace the prevailing use of the plastic with Bio-plastic which is **potentially** more environment-friendly compared to traditional **fossil fuel-based** plastics
- These types of the plastic have less life span than traditional plastic.
- Bioplastics can have a lower carbon footprint compared to traditional plastics.
- Bioplastics are typically made from renewable **raw materials** such as **corn, sugar cane and plant** materials **such as cellulose and** can be grown and harvested in a relatively short period of **time.**

Describe your Technology stack here:

- Bio-Polymerization: -is the process of using biomolecules such as enzymes and microorganisms to synthesize polymers from renewable resources, usually derived from biomass and other organic sources.
- We are using Plasticizer, Antioxidant like Vinegar ,Glycerol,water,Colorants.

Flow Chart


Take Potato Starch
Add Plastizier (glycerol)
Add water
Add anitoxident
Add colorent
Heat Till Thickening

Work Flow

1. Take potato starch

2. Add some water

3. Add colorent

4. Add acetic acid

5. Add glycerol

6. Heating

7. Final plastic

Idea/Approach Details

Describe your Use Cases here

- **Packaging**: Potato plastic can be used as a packaging material for various products such as food, cosmetics and electronics.
- **Disposable Cutlery**: Potato plastic can be used to make disposable cutlery such as forks, knives and spoons.
- **Bags**: Potato plastic can also be used for shopping bags and other types of bags such as garbage bags.
- **Agricultural Uses**: Potato plastic can be used in agriculture as a biodegradable mulch film.
- **Medical Uses**: Potato plastic can be used in medical applications such as making biodegradable sutures.

Describe your Dependencies / Show stopper

- **Potato Starch Availability**: The availability and cost of potato starch can affect the production and cost of potato plastic
- **Limited strength and durability**: Potato-hi plastics are not as strong and durable as conventional plastics, which can limit their use in certain applications.
- **Moisture Sensitive**: Potato plastic is moisture sensitive and can degrade when exposed to high humidity or water.
- **Limited Recycling Opportunities**: Although potato plastic is biodegradable and compostable, it may not be recycled through traditional plastic recycling methods.
- **Land use and energy inputs**: Potato plastic production requires land, water and energy inputs that impact sustainability.

Go To Market Strategy

Describe your Business Plan

- First of all we will associate with all the leading e-commerce companies and develop our association with them.
- As these companies are using a large amount of plastics ,so we will introduce them with our bio-plastic (PotaGreen) which is eco friendly and causes less damage to the climate.
- Our business model could include developing and selling products such as kitchen utensils, food containers , shopping bags, straws and cutlery.
- Our Team focuses on marketing the environmental benefits of using bio-plasitc products.

List down Your Market Competitors

- **NatureWorks LLC**
- **BASF SE**
- **Corbion NV**
- **Novamont SpA**
- **Braskem SA**
- **Arkema SA**
- **Danimer Scientific Inc.**
- **Mitsubishi Chemical Corporation**
- **Total Corbion PLA**
- **Biome Bioplastics**

SWOT Analysis

STRENGTH:-

- Our idea replaces the use of traditional plastics with the self made bio plastics which are more resistance to uv rays radiations and have better thermal stability.
- Easily Decompose, Use of Renewable resource, Less carbon footprints

WEAKNESS:-

- Limited Stock of materials present to make it.
- They may have lower mechanical strength, barrier properties, or thermal stability.

OPPORTUNITY:-

- Can work on increasing the strength of the of the plastic

THREATS:-

- Regulatory Challenges
- Social and Labor Issues
- Cost and Scale of Production
- High market competition

Road Ahead

Describe Your Next 1 Year Plan

- In the upcoming year we are going to implement this plastic at industrial level if it is a feasible solution to the market needs or not we will create surveys and testing in this year.

Describe Your Next 5 Year Plan

- In the next 5 years we are determined to make this plastic to completely replace the currently used harmful plastic and plastic products. If we will be using this plastic at a large level we can reduce the usage of

Team Member Details

Team Leader Name: **Purushottam Varshney**

Branch : B. Tech **Stream**:IT **Year** : III rd

Team Member 1 Name: **Abhijeet Tripathi**

Branch : B. Tech **Stream**:IT **Year** : III rd

Team Member 2 Name: **Shreyash Tiwari**

Branch : B. Tech **Stream**: CSE **Year** : III rd

Team Member 3 Name: **Sanyam Jain**

Branch : B. Tech **Stream**: CSE-DS **Year** : III rd

Team Member 4 Name: **Saksham Shwetank**

Branch : B. Tech **Stream**:CSE **Year** : III rd

Team Member 5 Name: **Ashi Bhagoria**

Branch : B. Tech **Stream**: IT **Year** : III rd

Future Scope

- Biodegradable plastic can be used for food packaging which can help to reduce the plastic waste and decrease the negative impact on the environment.

- Biodegradable plastics can be used in agricultural applications such as seedling trays, and crop protection nets. This can reduce the use of conventional plastics which can harm soil and water quality .