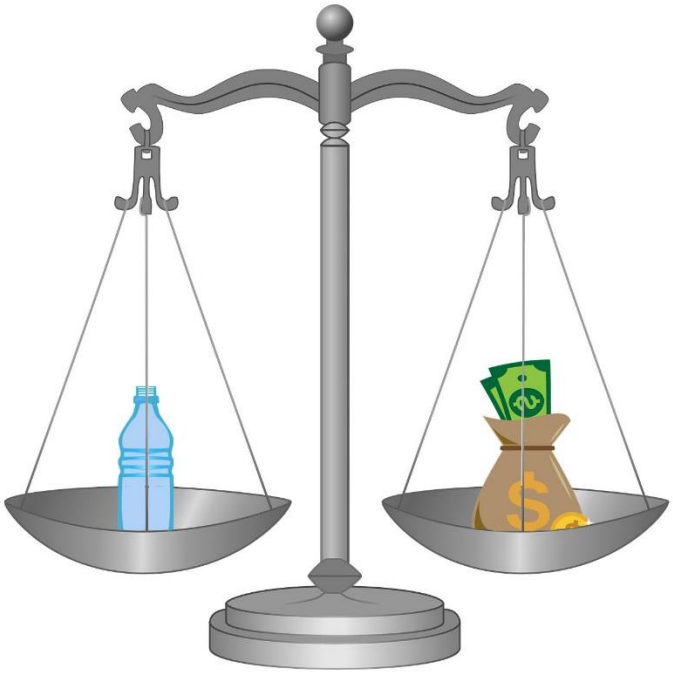

Bottle Economy

Proposed by

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N.B: See Appendix for situation assessment, business model, value proposition, collaboration and strategic alignment with SDGs

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0. GLOSSARY

COVID-19	Coronavirus Disease 2019
BBS	Bangladesh Bureau of Statistics
BTRC	Bangladesh Telecommunication Regulatory Commission
HAC	Humanitarian Activities Committee
HDPE	High-density polyethylene
IEEE	Institute of Electrical and Electronics Engineers
LDPE	Low-density polyethylene
NSU	North South University
PES	Power and Energy Society
PET	Polyethylene terephthalate
PS	Polystyrene
RAS	Robotics and Automation Society
RJSC	Registrar of Joint Stock Companies and Firms
SDG	Sustainable Development Goals
USSD	Unstructured Supplementary Service Data

1. EXECUTIVE SUMMARY

The COVID-19 pandemic has escalated the sufferings of the people, especially in the developing countries. With industries and income stopped the vulnerable communities in developing countries are going through massive food insecurity. In Bangladesh, 21.8% of the people live below the poverty line. The experts think that the ongoing crisis may cause this percentage to rise gradually. It may take up to several years to take these people back to the economic stage where they were before the emergence of this pandemic.

In this context, the project "Bottle Economy" aims to provide the poor people of Bangladesh with extra earning opportunities. The project will set up a platform to connect the scavengers, the local people with their nearest local wholesalers where they will be able to sell plastic wastes. The local wholesalers will then sell it off to the local recycling companies. The communication between the poor people and the wholesalers will be done through USSD networks of telecom companies. The USSD is the most effective mode of communication when dealing with people having inherent discomfort in handling technological devices.

In addition to that, the project aims to reduce pollution creating a behavioral change among the rural people of Bangladesh while providing monetary incentives. With the rise of plastic pollution, our environment especially the marine species are heavily penalized. The plastic debris ultimately ends in the oceans causing huge damage to our ecology. A major portion of the plastic wastes is not recycled and used in landfills. Our model will create value for this garbage ensuring reuse of recyclable plastic wastes. In the case of non-recyclable plastic wastes, the project partners with plastic scrap exporters of Bangladesh. These companies export scrapes of plastic grades which are expensive and hard to recycle in Bangladesh.

This document proposes an innovative project in two stages. In the pilot phase, the model will be implemented in the Gournadi Upazila of Barisal district for proof of concept and post proof of concept evaluation.

The project seeks funding at the initial stage from humanitarian organizations which support initiatives that promotes sustainable development goals. The proposed project aligns with SDG-1 (No Poverty), SDG-8 (Decent Work and Economic Growth), and SDG-14 (Life Below the Water).

Upon completion of this pilot project, we will have a comprehensive proven model that could be scaled up in entire Bangladesh as well as across the South Asian and African countries. To conclude, the project will open up new opportunities for the people to convert their local garbage to resources while contributing to building a pollution-free society.

2. PROJECT OVERVIEW

a. Project Title

Bottle Economy: It is a system where locals connect with their nearest wholesalers to sell plastic wastes. The model inculcates them to recycle thrown-away plastics by providing monetary incentives promising pollution reduction.

b. Project Goal and Strategy

Our goal is to build recycling mentality in the local communities of Bangladesh as well as reduce the amount of plastic discharge in the environment.

Our strategy is to create a system through which people can connect with their nearest traders or wholesalers to sell plastic wastes. We do this by using the USSD app of mobile networks. The model will focus on inculcating people to recycle bridging the gap between them and the local traders who will buy recyclable items.

c. Project Objectives

To fulfill the project goal of building recycling mentality among the rural areas of Bangladesh, empower them financially and to reduce the plastic discharge in the environment we have come up with the following objectives:

1. Inspire the end users i.e. poor people, scavengers and local traders not to throw-away plastics rather sell them for a fair price.
2. Reduce pollution caused by littering and dumping of waste in rivers and other waterbodies.
3. Prepare a customized curriculum analyzing the behavior of poor people of Bangladesh such that it can effectively educate them about recyclable and non-recyclable materials.

d. Plan of Activities

- ➔ At first we will build a prototype system which will explain the relation among all the actors and the functionalities of each group of actors.
- ➔ Secondly, after the draft plan has been formalized, we will present it to government and non-government bodies for sponsorship and funding.
- ➔ After ensuring proper funding opportunities, we will apply for Project Licensing and USSD permission from BTRC and other affiliations.
- ➔ Next, we will go for training that is we will try to deploy the project on a limited scale. This will be the pilot stage.
- ➔ After successful implementation of the pilot stage, we will work on the drawbacks from our experimentation and later implement it on a large scale and then gradually we intend to spread it out.

e. Organizations & responsibilities

The whole process of waste recycling takes place by involving a certain number of stakeholders. We can look into the following cycle which depicts the usual scenario:

While explaining this scenario, a group of researchers [0] have found that although the number of waste recycling keep increasing day by day due to the huge number of waste production here in Bangladesh, both the buyer and seller groups are being profitable but the scavengers that is the waste collectors are being deprived of their share of profit because of their unawareness of the market pricing. Hence, the waste pickers remain ignorant of their role and fail to grow the positive attitude towards their role in building a greener environment.

Hence, with the view to improving the socio-economic condition of below the poverty line people who are involved in this procedure, we Green Beans are aiming to play the Administrative role in the above cycle. So, the improvised cycle would include the following stakeholders:

1. The scavengers affiliated in the waste collection procedure. Example: street kids, local families etc.

2. The local shopkeepers or wholesalers involved in buying the waste from the poor by giving a small incentive.

3. Waste recycling companies or industries, example: Adnan PSF Industries Ltd, Eco Plastic Solution, Geocycle Bangladesh etc.

Waste recycling company details:

- **Adnan PSF Industries Ltd:** This company exports scrapes of plastic wastes.[1] They will be purchasing mostly LDPE and PS grade plastics which are non-recyclable in Bangladesh.
- **Eco Plastic Solution:** This company produces varieties of domestic and industrial products from plastic wastes. They will be purchasing mostly PET and HDPE grade plastics which are recyclable in Bangladesh.[2]

4. The Telecommunication companies with community engagement initiatives like: Robi, Grameenphone for their help with free USSD application.

5. Green Beans for Administrative role and to ensure establishment of proper communication among the involved parties.

Therefore, the improvised cycle would look like:

Besides, for Sponsorship and funding, we will be approaching organizations involved with humanitarian activities which will initially fund the pilot project of this model. Example:

- **IEEE Humanitarian Activities Committee (HAC):** The project might be partially or fully funded by IEEE HAC. This organization provides IEEE volunteers with support to launch impactful initiatives at the local level which promotes humanitarian activities and sustainable development goals.[3]

- **Startup Bangladesh:** The project could be also funded by Startup Bangladesh, an initiative of the government of Bangladesh which funds projects at idea stage as well as in implementation stages.[4]

We also plan to involve the next generation youth (example: local student chapters) in this whole system who will be able to help us to reach out to the local people and to convey the proper motto of building a green and safe future.

f. Location & Scale

At the very initial stage we will invest a big amount of time to study and determine the most suitable location for the first deployment of the project in a short scale. The factors that will work as determinants are:

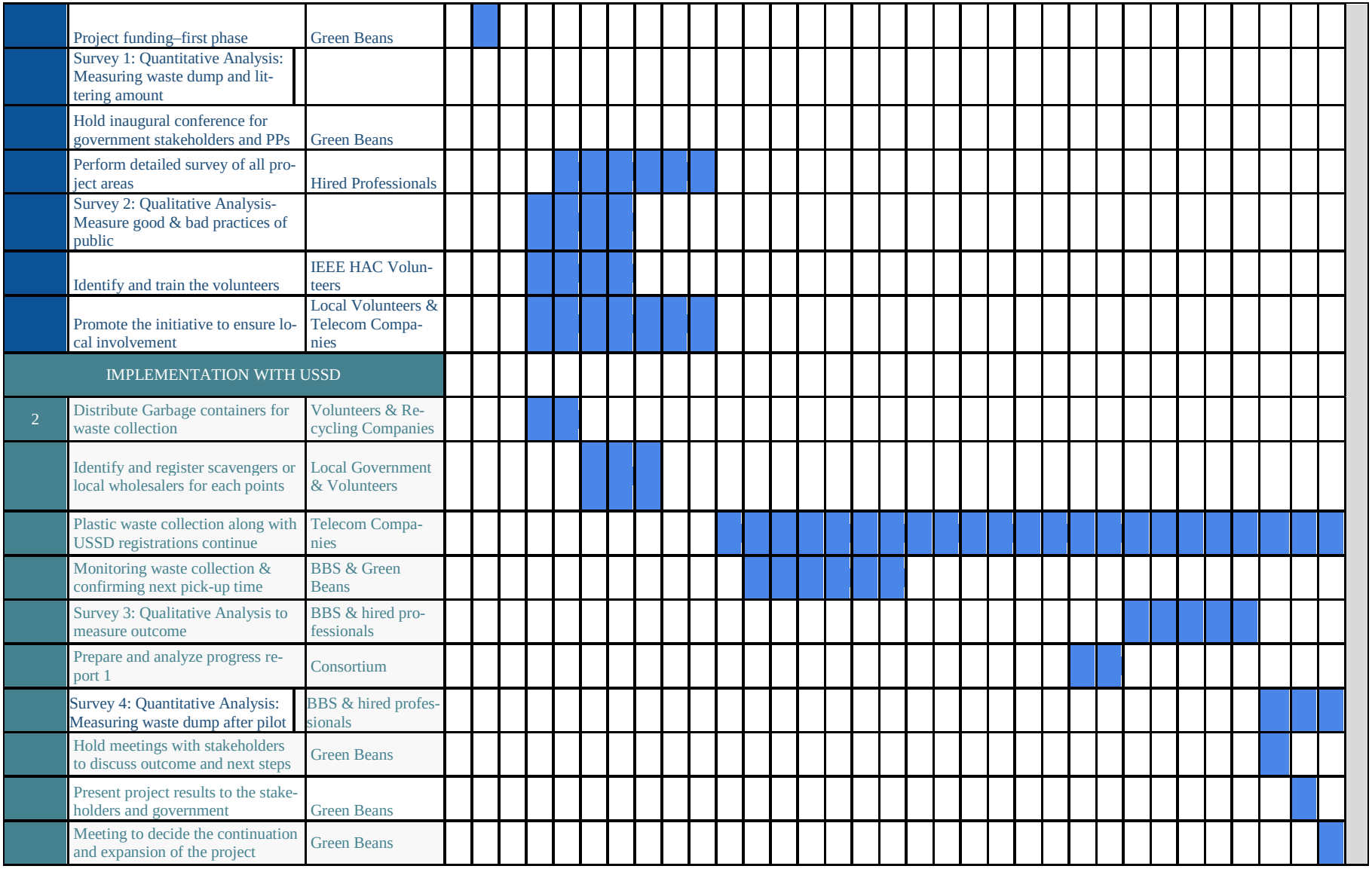
1. Number of scavengers or potential waste collectors per village.
2. Number of available local shops involved or interested to get involved in the buying of wastes.
3. Nearby wholesale waste buyers.
4. Number of industries or companies affiliated in the work of waste management.
5. Water bodies and landfills present nearby to keep track of the change in amount to perform quantitative analysis

Considering these factors, primarily we will try to initiate our pilot program in one specific union.
One specific location that we have in mind is the **Gouronodi** of the **Barisal District** which is very close to water bodies and has got seven unions. We will finalize the location after conducting several studies in near future.

After the initial deployment, we gradually want to scale the project up to the entire Bangladesh so that it can play a major role in the overall economic development of the country.

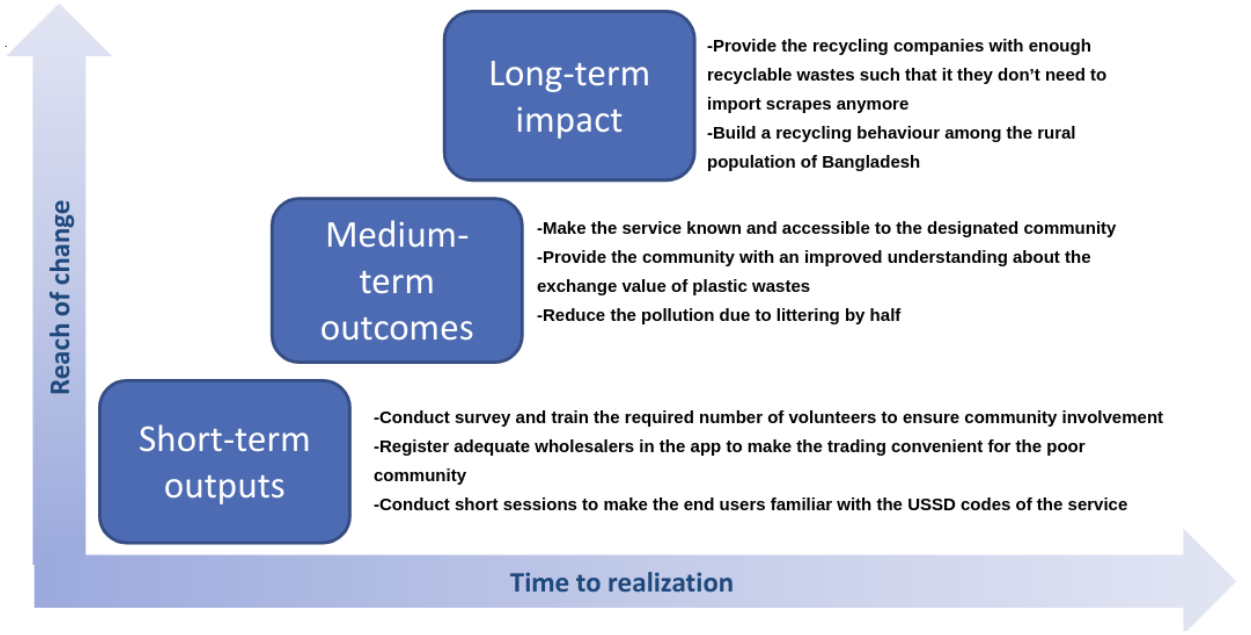
g. Timeline of operations

PHASE	DETAILS	RESPONSIBLE OU	FIRST 3 MONTHS															SECOND 3 MONTHS																		
			NOVEMBER					DECEMBER					JANUARY					FEBRUARY					MARCH					APRIL					MAY			
			05	10	15	20	25	01	05	10	15	20	01	05	10	15	20	01	05	10	20	30	10	15	20	25	30	05	15	20	25	30	05	10	15	
SETUP PHASE																																				
	Pre-Test Phase & Data Collection	Green Beans	■	■	■	■	■	■																												
1	Finalization of proposal & Management	Green Beans	■																																	
	Meeting with stakeholders	Green Beans		■																																
	Signing of agreements for partnerships & proposals	Green Beans		■																																
	Formation of Joint Venture Company under RJSC	All			■																													
	Obtain approvals from the regulatory boards (BTRC)	Telecom Companies				■																												
	Project Licensing	Consortium																																		
	Hiring required personnel for logistics support & on-site management	Recycling Companies & Green Beans		■																																


Project funding–first phase
Green Beans
Survey 1: Quantitative Analysis: Measuring waste dump and littering amount
Hold inaugural conference for government stakeholders and PPs
Green Beans
Perform detailed survey of all project areas
Hired Professionals
Survey 2: Qualitative Analysis- Measure good & bad practices of public
Identify and train the volunteers
IEEE HAC Volunteers
Promote the initiative to ensure local involvement
Local Volunteers & Telecom Companies
IMPLEMENTATION WITH USSD
2
Distribute Garbage containers for waste collection
Volunteers & Recycling Companies
Identify and register scavengers or local wholesalers for each points
Local Government & Volunteers
Plastic waste collection along with USSD registrations continue
Telecom Companies
Monitoring waste collection & confirming next pick-up time
BBS & Green Beans
Survey 3: Qualitative Analysis to measure outcome
BBS & hired professionals
Prepare and analyze progress report 1
Consortium
Survey 4: Quantitative Analysis: Measuring waste dump after pilot
BBS & hired professionals
Hold meetings with stakeholders to discuss outcome and next steps
Green Beans
Present project results to the stakeholders and government
Green Beans
Meeting to decide the continuation and expansion of the project
Green Beans

h. Short, medium and long term impact

The project aims to generate these short, medium and long-term impacts.



3. PROJECT BUDGET

The project pilot phase will be an extensive research program where data will be collected to prepare customized learning materials for the poor community, to conduct qualitative and quantitative analysis and to find how the project will impact the lives of the people in reality.

Program Budget for the Project Setup Phase (First 3 months)			
Particulars	**Unit**	**Total (BDT)**	**Total (USD) (1 USD= 85 BDT)**
Staff	10	10000	117.64
Software for the recyclers (One time expenditure)	1	80000	941.18
Application Procedure-Additional	1	4000	47.05
Inaugural conference for government stakeholders and affiliated partners	1	10000	117.64
Field Worker Fees (1 week= 2000 BDT)	10	240,000	2825
Promotional Cost	-	25,000	294
Total Cost		**369,000**	**4342.51**

APPENDIX

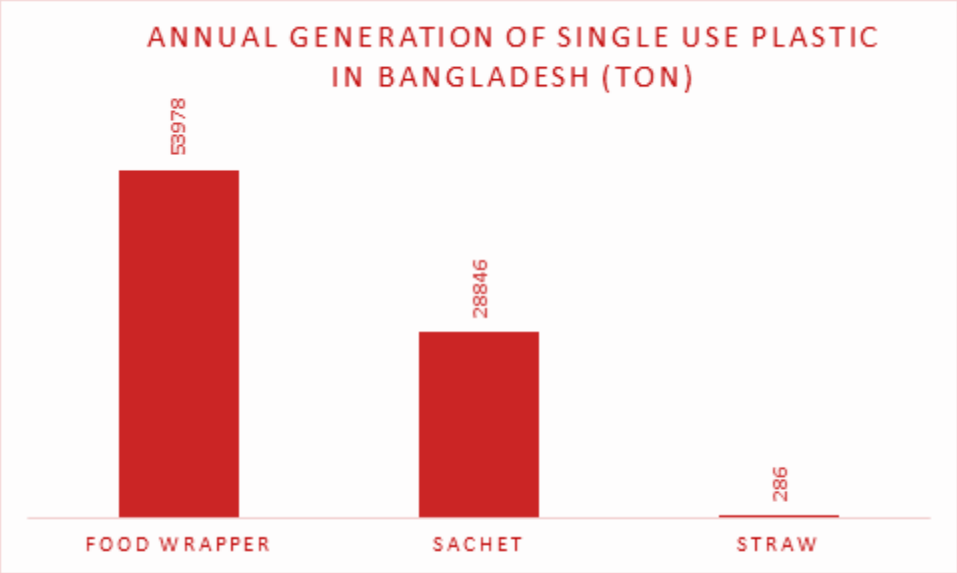
i. SITUATIONAL ASSESSMENT

- **Current economic crisis due to COVID-19**

The COVID-19 pandemic has coerced us to adopt stringent lockdown policies that would leave a long-term socio-economic impact in Bangladesh. With 21.8% of the total population living below the poverty line, the country has a higher chance to see an upsurge in the poverty percentage.[5][6] As the lockdown continues, 100.22 million people are placed at serious financial, social and health risks.[6]

In Bangladesh, only 15% of the population earns above $5.9 per day.[7] While 87% of employment generated by the informal sector; the majority living off their daily wages; the country's vulnerable population is going through massive food insecurity.[8] It may take up to several years to get these people back to the economic stage where they were before the emergence of this crisis.

- **Throwaway culture of the people of Bangladesh**



Source: Environment and Social Development Organization

Our reluctant nature toward not using the same material more than once gave birth to this consumerism inspired culture. The world's plastic pollution crisis is the consequence of our interest in single-use products. With an estimated 312 tons of single-use plastics produced every month, Bangladesh stays high in the list of single-use plastic producer counties.[9]

About 78% of it coming from urban and 22% from the rural locality, the use of plastics has flourished throughout the country.[10] Starting from single-use plastic shopping bags to single-use plastic cups; this

durable and cheap plastic economy is substantially driving this country away from an eco-friendly circular economy.

- **Discharge and dumping of plastic wastes in the environment**

Food contamination and biodiversity loss are the consequences of poor management of plastic wastes. The plastics wastes which are not recycled can end up in the ocean in many ways. From landfills it is washed away by rain through canals and drains; it could clog the drainage system creating flash floods as well as increase the duration of floods. Bangladesh once faced disastrous floods that resulted from drain clogs due to plastic wastes.[11]

Plastics are broken down into microscopic fragments which are then consumed by the marine species; ultimately entering our food chain. With 0.8 million tons of plastic waste per year, most of it ending up in the ocean or used as landfills; the country remains one of the top in plastic pollution.[12] [13]

- **Plastic waste import from foreign countries**

Every year thousands of metric tons of plastic scrapes are imported in Bangladesh from foreign countries to make recycled products. One of the biggest recycling company of Bangladesh, Adnan PSF Industries has a license to import fifty thousand metric tons of plastic scrapes.[14]

ii. PROPOSED SOLUTION

a. Business Model Canvas

The business model underlying the initiative is can be understood from the business model canvas provided below.

The Business Model Canvas

Bottle Economy | **Green Beans**

Key Partners

-The recycling companies who buy the plastic waste products.

-The telecom companies who provide us with their USSD service.

-The local wholesalers who act as the middleman.

Key Activities

-Systematic management of plastic waste.

-Administrative bridge among all the stakeholders.

Key Resources

-Locally available plastic wastes.

-People's will to trade waste for monetary incentives

Value Propositions

-An unique opportunity for the poor people to earn extra money with minimum labour.

- A human centred design communication platform.

-An opportunity to connect with the local wholesalers.

-Creating the way to building a Greener World.

Customer Segments

-The poor scavengers: key concern of the whole economy.

-The local shopkeepers.

-Recycling Companies.

Channels

-The end users i.e the scavengers & local wholesalers connect via USSD.

-The recyclers & partners use an improved software to communicate.

Customer Relationships

-The telecom companies expect to see positive results using their services, earning them reputation in the society.

-The recyclers want to avail the local wastes instead of importing scrapes.

-The poor people want to improve their financial conditions.

Cost Structure

Software development (One time expenditure)-
Field level staff salary-
Promotion-

Revenue Streams

Commission paid by the recyclers based on waste collection-

b. What's the Innovation?

Waste management has been a global concern throughout the years. While people mainly focused on joining hands with big recycling companies and to bring out huge profits in between, we believe it is high time for a developing country like ours to focus on bringing a change in the lives of the local waste collectors.

Hence, Green Beans is willing to define innovation by focusing on two main points:

1. **Economic Stability for people below the poverty line:**

Our primary goal is to involve the very poor people who are deprived from proper wages of waste collection. We want to also include the local shopkeepers who can play the role of an agent to buy wastes from the poor people by giving the proper incentive.

2. **Focus on Human-Centred Design System:**

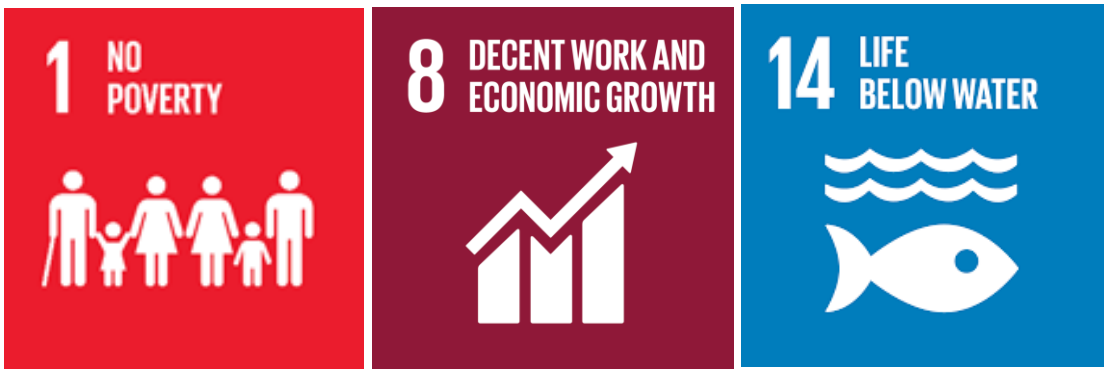
Being the vulnerable part of the society, most of the rural people are not aware of the functionalities of technological devices and possess inherent discomfort in handling them. They often become uninterested towards learning modern tech-advancements and hence we will be adapting the USSD method which will provide a unique design which will be entirely in favor of them.

c. Alignment with Sustainable Development Goals:

Over the years, the world population has been increasing exponentially which has given rise to numerous problems every year. New approaches have been considered for solutions to new problems and that is the only way the world has been going forward and not backwards. But, one problem which has been consistent all throughout is the economic condition of the people living on and below the poverty line.

The project aims to alleviate poverty and fulfill SDG-1 (No Poverty) by providing the impoverished people with an opportunity to generate extra side income. This will provide them with productive self-employment opportunities and take the society forward through sustainable economic growth and so SDG-8 (Decent Work and Economic Growth) aligns with our goals.

Today, proliferation of plastics and other waste materials has made both life on land and life below water unbearable with its adversity. Hence, it is inevitable to say that both SDG-15 (life on land) and especially SDG-14 (life below water) are under the threats of immense waste production as from throwing excessive plastic wastes in the water bodies, a huge up rise of micro-plastics is taking place.



Keeping the threats of the above SDGs in mind, we want to address **SDG-1 (No Poverty)**, **SDG-8 (Decent Work and Economic Growth)** and **SDG-14 (life below water)**. Accordingly, our goals are:

- To ensure proper wage for the local waste collectors and to ensure economic stability for them.
- Reach out to policy makers, industrialists, entrepreneurs and every government and non-government body to facilitate the 3Rs-Reduce, Reuse and Recycle.
- Reduce the dumping of plastics in the oceans to save the lives below water.

iii. TEAM

"Green Beans" is a group of engineering students who work for the betterment of the community. This small group of volunteers is led by Mohammad Rayed and Asma Arisha. The team is passionate about designing user-centric solutions and have experience in developing technological solutions that help to empower the vulnerable community of Bangladesh. During this pandemic, the team developed a Blockchain based solution for relief distribution and verification using USSD. The project is under testing and review phase, and once approved it will be soon integrated in the relief distribution system of Bangladesh.

Team leader profiles:

Mohammad Rayed

Mohammad Rayed is studying Computer Science and Engineering at North South University (NSU) in Bangladesh. He is serving as the Chair of IEEE NSU Robotics & Automation Society (RAS) Student Branch Chapter. His policy proposal on reducing pollution in Ganges river of India was recognized as one of the top 5 proposals at Youth Innovation Competition on Global Governance 2019, Jakarta, Indonesia. He has lead the local student chapters of IEEE Computer Society as well as represented Bangladesh in global arena several times being the ambassadors of several flagship initiatives of IEEE. He enjoys travelling, photography and creative writing. He has always been concerned in improving the economic condition of the people suffering under the poverty line and with this goal he initiated Green Beans.

Asma Arisha

Asma Arisha is a student at North South University (NSU) in Bangladesh. She is majoring in Computer Science and Engineering. She's served as the Chair of the award winning Region 10 Exemplary IEEE NSU Student Branch. She's played an active role in IEEE Bangladesh Section providing mentorship and support to student chapters at local level. Her project was recognized at IEEE YESSIST 12 at Bangkok, Thailand. She's represented Bangladesh at global arenas many times through her strong leadership qualities. She was recognized as the "Honorable mention" for best section student volunteer for her dedication towards IEEE. She enjoys travelling, dancing and is often found baking in her free time. Being a policy enthusiast and with an aim of brining a change in the lives of people, she joined Green Beans as a core member.

iv. PROPOSED STAKEHOLDERS

The goals our project aligns with the visions and interests of the following organizations. Hence we want to partner with these and other organizations who are willing to support our cause to bring a change in the lives of the impoverished people while creating a greener world.

a. Sponsors

IEEE Humanitarian Activities Committee

STARTUP BANGLADESH

b. Telecom Companies

রবি

grameenphone

TeleTalk আমাদের ফোন

c. Recycling Companies

Adnan PSF Industries Limited

d. Volunteering Organizations

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