INTEGRATED WASTE MANAGEMENT SYSTEM IN DIMAPUR CITY - INDIA

A proposal by PEKKORN International
INTERGRATED WASTE MANAGEMENT SYSTEM IN DIMAPUR CITY, INDIA

GROUP STUDY PROPOSAL

Group members: (from left to right)

Mr. Htoon Minn Than (Ko Minn - Myanmar)
Ms. Lopez Edilyn Gutierez (Edz - Philippines)
Ms. Nakseharach Dauenden (Pik - Thailand)
Ms. Niksungla (Nicky - India)
Ms. Nguyen Hoang Nguyen (Rosie - Vietnam)
Ms. Heang Omuoy (Omuoy - Cambodia)
Mr. Manichith Phonephet (Ko - Laos)
# Table of Contents

Executive Summary ................................................................................................................................. 3

1. About Us ........................................................................................................................................... 4
   1.1. Logo ............................................................................................................................................ 4
   1.2. Vision ...................................................................................................................................... 4
   1.3. Mission .................................................................................................................................... 4
   1.4. Core Values ............................................................................................................................. 4
   1.5. The Team ................................................................................................................................ 5
   1.6. Our Services ............................................................................................................................ 5

2. Background ...................................................................................................................................... 6
   2.1. India Context ........................................................................................................................... 6
   2.2. Area Selection - The State of Nagaland .................................................................................. 6
   2.3. Site Selection – Dimapur City ................................................................................................ 7

3. Stakeholders ..................................................................................................................................... 9

4. Problem Analysis ........................................................................................................................ 11
   4.1. SDG Progress Report of Japan, India and ASEAN .............................................................. 11
   4.2. India’s Solid Waste Management Crisis ............................................................................... 11
   4.3. The Waste Management Problems in Dimapur, Nagaland ................................................... 12
   4.4. Gaps between Ideal State and Current State ......................................................................... 14

5. Short term goals .......................................................................................................................... 15

6. Risks and external factors .................................................................................................................. 16

7. Project Organization and Implementation ............................................................................... 17
   7.1. Why Social Enterprise for Duncan Basti .............................................................................. 17
   7.2. Project Organization ............................................................................................................. 17
   7.3. Activities ............................................................................................................................... 18
   7.4. Business Process ................................................................................................................... 21
   7.5. Impact ................................................................................................................................... 22
   7.6. Simple Marketing Strategy ................................................................................................... 22

8. Budget & Finance ............................................................................................................................... 25

9. Sustainable Development ........................................................................................................... 29
   9.1. Philosophy............................................................................................................................. 29
   9.2. Value Positioning .................................................................................................................. 30
   9.3. Building sustainable community ........................................................................................... 31

10. Conclusion ....................................................................................................................................... 33

References: ........................................................................................................................................... 34
Executive Summary

Dimapur City is nestled in the State of Nagaland, one of the North-eastern States of Incredible India. The city, being the State’s most urbanised city as well as its commercial hub, is facing a dire situation with the voluminous waste generation and composition. Further, with no proper town planning, rise in urbanization, influx of migrants and no accurate data on the myriad of modern waste generated on a daily basis, the problems caused by waste have only elevated.

PEKKORN International is a social enterprise that is the first in the State of Nagaland that deals with solid municipal waste and gives research and consultancy services. It is the acronym of the founders’ names and is designed according to our respective flags. The left-most colourful rays express our desire to contribute in achieving the Sustainable Development Goals.

We aim to assist the local authority and communities of Dimapur City by looking into mid-to-long term solution for waste management by conducting research on the waste generation for accurate data, which will help in providing expert opinion on the most relevant waste streams, their characteristics and treatment options, including allocation of funds for proper management of the waste.

Our proposed site is Duncan Basti, a colony in Dimapur City, which has been selected based on the “Waste Assessment Report, 2019”. It is one of the most popular areas in the city and close to the commercial area, known for its social activities due to its active youth, Christian ministry and mother associations. Also, this area generates the most waste amongst all the residential areas.

The first year of full operation, PEKKORN International net profit is around 10,027$ and then keeps increasing year by year. In addition, its gross profit margin and net profit margin are 50% and 19%, respectively. The Return on Equity (ROE) and Return on Asset (ROA) show that its business is very efficient through 5 years. Also, part of our proceeds will go to the community as part of our “give back to the community” program.
1. About Us

Inspired by the IATSS Forum program and the Sustainable Development Goals (SDGs), Group Study B decided to create a social enterprise called PEKKORN International to help build sustainable communities.

This is the first social enterprise in Nagaland that deals with solid municipal waste and also offers research and consultation services.

1.1. Logo

PEKKORN is the acronym of the founders’ names and is designed according to our respective flags. The left-most colourful rays express our desire to contribute in achieving SDGs.

1.2. Vision

To be the leading social enterprise with a holistic and multifaceted approach towards sustainable community.

1.3. Mission

- To establish an area-wise collection & disposal services addressing community issues that will bring about social, economic & environment development;
- To create a community – based management system where all the households are involved;
- To promote & protect human rights to achieve SDGs; and
- To promote & educate the community on waste management.

1.4. Core Values

- Advocating trash to cash concept
- Promoting Sustainable Community
- Uphold better quality of life

1.5. The Team

- **PIK**, Thailand
- **EDZ**, The Philippines
- **KO MINN**, Myanmar
- **KO**, Laos
- **OMUOY**, Cambodia
- **ROSIE**, Vietnam
- **NICKY**, India

1.6. Our Services

- Research and Consultancy
- Training and Education
- Integrated Waste Management Services
PEKKORN International will focus on research, consultancy, training and education on waste management and also provide Integrated Waste Management Services. Part of our proceeds will go the community as part of our “give back to the society” program.

2. Background

2.1. India Context

India, the world’s sixth largest economy, continues with its phenomenal growth rate, both with its economy and population. This has however, led to an unprecedented problem in the form of unceasing generation of voluminous waste every day. The plethora of waste management rules and also, the “Swachh Bharat Abhiyan” initiative launched on 2nd October, 2014 to make a ‘Clean India’ have not been able to mitigate the mammoth waste woes.

2.2. Area Selection - The State of Nagaland

Nagaland, one of the Seven North-eastern States, is blessed with rich flora and fauna, and considered one of the biological hotspots of the world. It is home to Tragopan blythii (Jerdon), a bird, that is found only in Nagaland.

Nagaland and Waste – the Challenges

The State’s traditional method of waste management is unable to cope with the complexities of modern waste. Further, the lack of policies and by-laws on waste management only aids to the problem. Another recurring issue is the special status accorded to the State by virtue of Article 371A of the Constitution of India. This article recognises the Naga people’s right to follow their customary practices and traditions. This has led to the public to have a negative perception about the waste management rules and the presumption that the rules contravene Article 371A makes the issue more difficult to tackle. Also, earlier the municipal affairs was under the Urban Development Department but the former has been made into a separate department, which makes the implementation process more complicated due to lack of coordination between the two departments. As such, the Nagaland civic services lack manpower, resources, knowledge and technical expertise. This has resulted in their complete lack of awareness about waste segregation, recycle, reuse, reduction and proper solid waste management practices in the State.
2.3. Site Selection – Dimapur City

Dimapur City, the State’s most urbanised city as well as its commercial hub, is facing a dire situation with the voluminous waste generation and composition. Further, with no proper town planning, rise in urbanization and influx of migrants, the problems caused by waste have only elevated. In this state of affairs, the Dimapur Municipal Council, whose ambit and jurisdiction covers a population of 122,834 and an area of 18.13 km$^2$, divided into of 23 wards comprising of 96 colonies, has been managing the resultant waste problems.

2.3.1. Geography and Climatic Conditions of the Dimapur District

The area covered by the city and surrounding villages is an undulating plain, the only plain region in Nagaland, characterized by an acutely broken topography. It is surrounded by hills and highlands on three sides. The eastern portion of the town is covered by the flood plain of the River Dhansiri, and the area, east of Golaghat road, is subject to flooding almost every year. The major portion of the area between the road and Dhansiri river remains marshy and water-logged. The town is generally gradient towards the east.

It has practically two seasons: Dry Season (October – May) and Wet Season (July – September. Dry season may be sub-divided into Hot and Cold weathers. Hot weather begins from March whereas Cold weather begins from November. The climate in Dimapur district is hot and humid in the plains during summer reaching a maximum of 40$^\circ$C, with humidity up to 93%. South West Monsoon normally becomes active by the 2nd week of July, while heaviest rainfall occurs during the months of July and August. In winter, the weather is cool and pleasant.

2.3.2. Population of Dimapur City and its Projection

As per the provisional reports of Census India, population of Dimapur City in 2011 is 122,834; of which male and female are 64,300 and 58,534 respectively.

Population Projection

The Statistical Handbook of Nagaland, 2017 released by the Directorate of Economics and Statistics, shows the projected population of Dimapur District from 2011-2021 as:
<table>
<thead>
<tr>
<th>YEAR</th>
<th>POPULATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>2011</td>
<td>378811</td>
</tr>
<tr>
<td>2012</td>
<td>391314</td>
</tr>
<tr>
<td>2013</td>
<td>404229</td>
</tr>
<tr>
<td>2014</td>
<td>417571</td>
</tr>
<tr>
<td>2015</td>
<td>431353</td>
</tr>
<tr>
<td>2016</td>
<td>445590</td>
</tr>
<tr>
<td>2017</td>
<td>460297</td>
</tr>
<tr>
<td>2018</td>
<td>475489</td>
</tr>
<tr>
<td>2019</td>
<td>491183</td>
</tr>
<tr>
<td>2020</td>
<td>507395</td>
</tr>
<tr>
<td>2021</td>
<td>524142</td>
</tr>
</tbody>
</table>

2.3.3. **Demographics of Dimapur City (as per 2011 Census)**

**Literacy**

<table>
<thead>
<tr>
<th>Description</th>
<th>Total</th>
<th>Male</th>
<th>Female</th>
</tr>
</thead>
<tbody>
<tr>
<td>Literates</td>
<td>92,594</td>
<td>49,758</td>
<td>42,836</td>
</tr>
<tr>
<td>Average Literacy</td>
<td>86.03 %</td>
<td>88.05 %</td>
<td>83.79</td>
</tr>
</tbody>
</table>

**Religion**

<table>
<thead>
<tr>
<th>Description</th>
<th>Total</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Christianity</td>
<td>55,397</td>
<td>45.10 %</td>
</tr>
<tr>
<td>Hinduism</td>
<td>50,492</td>
<td>41.11 %</td>
</tr>
<tr>
<td>Muslim</td>
<td>13,765</td>
<td>11.21 %</td>
</tr>
</tbody>
</table>

**Slums**

10,275 number of people residing in slum areas. This is around 8.36% of total population of Dimapur city.

2.3.4. **Strength of the city**

Being the commercial hub, the by-laws on waste management can be actually implemented. Further, the city is moving towards a progressive society as evidenced by the proactive role taken to make the city clean. The DMC started the “Better Dimapur” initiative for making Dimapur Clean with active community participation. CSOs, NPOs and NGOs are coming together to address the waste issues like Team Clean which conducts cleanliness drive and install dustbins; Pro-Rural that is taking on organic waste; Team Green that plants trees and flowers in the commercial areas; E-Circle that deals with electronic waste, etc.
Informal sector

The rag pickers or informal sector are the scavengers that salvaged the waste for recyclables. In Dimapur city, the informal sector, being migrants, are ignored and as such, even their most basic human rights have been denied. They salvage for the waste in the whole city and from the dumpsite. If regulated, their services will greatly benefit the waste management system.

2.3.5. Proposed site for Pilot Project – Duncan Basti

Based on the said report, Duncan Basti, a colony in Ward 9, generates the most waste, i.e., 5880.3 Kgs per day (Dry waste – 1161 kgs; Wet waste – 1997.8 kgs and Mixed waste: 2721.2).

The proposed site is one of the most popular area in the city and close to the commercial area. It is known for its social activities due to its active youth, Christian ministry and mother associations. The area will not only benefit from having an integrated waste management system but can be the thrust required for implementing an effective waste management system in the city.

2.4. Objective of the Project

To mitigate the current waste problems in Dimapur City, PEKKORN INTERNATIONAL aims to assist the local authority and communities of Dimapur City by looking into mid-to-long term solution for waste management by conducting research on the waste generation for accurate data, which will help in providing expert opinion on the most relevant waste streams, their characteristics and treatment options, including allocation of funds for proper management of the waste.

The project will be conducted in 5 phases stretched over a period of 5 years. A detailed description of the project, its breakdown, the implementation and time-frame is provided in the chapter “Project Organisation and Implementation.”

3. Stakeholders

Collaborating with various stakeholders is of paramount importance in achieving our goals and building a sustainable community as a whole. A list of the stakeholders is as under:
### Local Community
This refers to approximately 7,000 residents of Duncan Basti, Dimapur City, India. They will play a vital role for they will be the forefront of this social enterprise.

### Local Authority
This refers to the Dimapur Municipal Council. They will be our partner in enforcing the by-laws, research, and provide support to the enterprise and the community.

### Civil Society Organizations
This refers to the organizations in the local community who can help us in all our activities especially on the training and education as well as raising public awareness, transparency and good governance.

### Private Organizations
This refers to India’s private companies and groups with corporate social responsibilities aligned to our vision and mission. They can be the source of resources or any kind of support.

### Recycling Plants
This refers to the recycling plants in India. Their role is to recycle wastes thereby, reducing the pollution in the area.

### Media
This refers to all print, broadcast, out of home, and digital media in India with of the same goals with our enterprise. They will help raise public awareness as well as documentation.
4. Problem Analysis

4.1. SDG Progress Report of Japan, India and ASEAN

The United Nations (UN) adopted a new set of 17 goals collectively called the Sustainable Development Goals (SDGs). This ambitious agenda is a call to action to end poverty, protect the planet, and ensure that all people enjoy peace and prosperity by 2030.

India and ASEAN countries have made significant progress in improving incomes and economic opportunities but currently facing challenges in ensuring a more inclusive and environmentally sustainable growth. In the SDG Index and Dashboards Report 2018, only Japan made it to top 20 most performing countries.

Recent reports of Chandrasekhar & Ghosh (2019) showed that India lags behind among South Asian nations. India, which is not only the largest and most diversified economy in the region but also prides itself on rapid income growth, performs very poorly even in relation to other South Asian countries.

4.2. India’s Solid Waste Management Crisis

As per 2017 reports, the current waste management practice in India involves a system whereby the collected waste are simply transported to a low-lying landfill. The open dumping practice is leading to various problems like pollution and health hazards. This is affecting surface and groundwater, with groundwater being in a critical state. Current procedures are not ideal, hence, the solid waste management crisis. One report also mentioned that in 2001 India generated 46 million tonnes of waste and by 2048, the number is predicted to reach an estimate of 125 million tonnes, making India the largest waste contributor of the world if measures are not taken. Recent data shows that on an average, India generates 62 million tonnes (MT) of municipal solid waste per annum. From there, only 43 MT of the waste is collected, 11.9 MT treated and 31 MT dumped in landfill or dumpsite sites. Most experts are of the opinion that India is following a flawed system of waste disposal and management.
4.3. The Waste Management Problems in Dimapur, Nagaland

The waste management in Dimapur falls short of the desired level as the present system is outdated and inefficient to tackle the modern waste generation. The city does not have a Solid Waste Management Plant nor a landfill but has an open dumpsite located really close to a river and residential area with vegetable farms.

The local authority estimated that the city generates 100 TPD of waste every day as on June, 2018. However, the data being insufficient to understand the waste problems, the DMC took the technical assistance of Living For Environment (LiFE), an environmental based NGO to conduct an exhaustive assessment of the waste generation. The Waste Assessment Report, 2019 gives a detailed account of the waste generated in Dimapur City, its composition and characterisation, along with an assessment of the prevailing waste management system. As per the report, Dimapur City generates 111124.56 Kgs/111.12 TPD as on February-March, 2019, which is 11124.56 Kgs/11.12 TPD more within 8 months.

Projection of the waste generation could not be ascertained; however, it can be assumed that in a year’s time the waste generation will increase by at least 15000 Kilograms/15 TPD.

Here are the top three problems based on the recent conducted assessment report:

- Poor understanding of the value and dire effects of waste on environment and health.
- Lack of accurate data/expert body.
- Local community still using the traditional and Unsystematic waste collection and disposal area.

Let us dig deeper on the problems for us to better view how we address the concerns.

4.3.1. Poor understanding of the value and dire effects of waste on environment and health.

The literacy rate in Dimapur, Nagaland, India is 86.03%. However, the local residents have poor understanding of the effects of wastes on environment and health, which leads to: (a) Improper disposal (b) Irresponsible consumption and production; (c) non-implementation of the existing laws;
(d) lack of public participation; and (e) lack of supportive mechanism.

4.3.2. **Lack of accurate data and expert body.**

Due to lack of comprehensive data, the local authority cannot take effective measures to address the current waste generation.

The Report mentions that the local authority does not keep abreast of the current data on the municipal area, viz., population, number of households, shops, institutions, hotels and restaurants, area size, etc., which is necessary to determine accurate waste generation data including per capita data. They are still referring to the 2011 data which is outdated. Also, although the local government desires to improve Dimapur in all aspects, they lack expertise especially in terms of environmental scientific studies. The good thing is, they are very supportive to a social enterprise or any groups that will help them build a better Dimapur.

4.3.3. **Local community still using the traditional and unsystematic waste collection and disposal area.**

Due to lack of data and concrete analysis not to mention poor understanding of the effects of improper waste disposal, local authority and the local community still stick to the following traditional methods of disposing wastes:

- Dumpsite emissions from decomposing organic matter mixed with other waste.
- Unsegregated and overflowing waste left piled up on receptacles.
- Burning of wastes including the construction and demolition waste, and the automotive waste from cars and workshops.
- Dumping of waste in water sources.
Burying of diapers or sanitary waste and animal feces.

When considering solutions, no matter how advanced the solution is, unless and until it is applied to the ground zero level, it will not be effective. Therefore, the role of the local community is very vital. Without their full participation, no programs will be that successful.

4.4. Gaps between Ideal State and Current State

Below shows the gaps between ideal state and current state of Dimapur City. This is also the basis of the proposed solution:
5. Short term goals

In 1 year, no littering and dumping of waste in Duncan Basti

The Waste Assessment Report 2019 revealed that there were large amount of waste in Duncan Basti. Therefore, all households in this targeted area need to understand clearly the negative effects of improper waste disposal. By conducting awareness raising campaigns, training and education, we expect that there would be no littering and dumping of waste among 600 households within one year from the date of implementation.

In 4 years, a MRF (Material Recovery Facility) will be set-up and utilized
As of now, there is no MRF available in the whole state of Nagaland. Utilizing the financial resource from our business activities during the first three years, we plan to set up a decentralized MRF in Dimapur City for sorting waste collected from certain areas of Dimapur City.

**In 5 years, 90% households will do segregation**

In five years, PEKKORN International expects that 90% of the households in Duncan Basti will practice segregation-at-source. This is the anticipated result from the collaborate between the local authorities, civil society organizations, private sector and local residents which is created through our business operation.

6. **Risks and external factors**

<table>
<thead>
<tr>
<th>Internal Risk</th>
<th>Risk Mitigation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Finance (Insufficient funds)</td>
<td>Allocate buffer fund for three years</td>
</tr>
<tr>
<td>Health (Employee’s sickness, injure)</td>
<td>Health Insurance</td>
</tr>
<tr>
<td>Human Resources (Ineffective management or leadership, lack of skills, staff turnover)</td>
<td>Regular staff training, staff retention strategy, encourage and motivate.</td>
</tr>
<tr>
<td>Technical (collecting and segregation of waste)</td>
<td>Use proper process with a standard guideline</td>
</tr>
<tr>
<td>Operation (Process and systematic working)</td>
<td>Create Standard Operation Procedure (SOP) with internal auditing</td>
</tr>
<tr>
<td>Physical (Location, safety)</td>
<td>Establish proper contract with safety</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>External Risk</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Amend Law and Regulation (Employment regulator, Safety regulations)</td>
<td>Designating an expert on law and ensure its compliance.</td>
</tr>
<tr>
<td>Country economy (Economic growth, employment policies, Inflation)</td>
<td>Keep updating information.</td>
</tr>
<tr>
<td>Natural disaster (Flood, Earthquake, Typhoon)</td>
<td>Select local area which is safe</td>
</tr>
<tr>
<td>Political (Stable and Instable)</td>
<td>Be flexible and be with situation (Be proactive)</td>
</tr>
</tbody>
</table>
7. Project Organization and Implementation

7.1. Why Social Enterprise for Duncan Basti

The phenomenon of social entrepreneurship had been in progressive discussion for a long time in India, due to the raising need and significance of rapidly changing economic, environmental, social and political factors. The need originates in the inability of governments in providing innovative solutions for sustainably meeting social challenges. Quite consequentially, policy-makers and practitioners have been attracted towards the phenomenon of social entrepreneurship, considering the potential of this movement to cause change sustainably.

The core factor differentiating social enterprises from the commercial ones is the goal to build solutions for social problems through the creation of business ventures, thereby marrying managerial efficiency and innovation with a passion for driving social change, whereas the commercial ones focus more on business or technology leadership.

There are many platforms that we have put into consideration in order to challenge the root causes of the problems we identified. Through deck researches, we came to realize the existence of different NGOs working around Clean and Green activities in Dimapur yet when it comes to the unceasing dumping of waste, the questions still remain unanswered. The key drivers in our approach to particular area like Duncan Basti is based on the Triple Bottom Line namely: 3Ps; People, Planet and Profit. The best possible platform to balance between these is; I must say by means of social-minded business that can create huge impacts not only for socially and environmentally but it can also sustain itself financially to be able to create more impacts in the longer run.

7.2. Project Organization

Location

PEKKORN International will execute its program in Duncan Basti, Dimapur city which is close to the commercial area. Duncan Basti has a population of 7000 with about 600 households.

Facility
The office of PEKKORN will be at the co-founder’s residence and the sheds for the waste will be constructed accordingly. The waste stores will be connected to the supply for lights and other utilities.

In order to collect the waste from the households and thereafter transport it to the shed, the facility will have at least one automobile at the disposal.

**Employee**

The management team at PEKKORN International will be responsible for the overall planning of the activities and organizational development for the initial five years of the process.

**Organization Chart**

![Organization Chart]

**7.3. Activities**

**7.3.1. Research & Consultancy**

Our advisory project has a number of standard phases, irrespective of the functional nature of the issue or the industry it is in. The first phase is the preparation phase, where project members plan the project in terms of client agreements, staffing, budgeting, planning, project structure and governance.

The problem definition phase follows where the project team analyses the client issue and, based on that, develops the requirement for the data gathering phase. Uncovering the real problem (‘root cause’), it often requires desk research, interviews and thorough analysis.
for it to surface. The data gathering phase subsequently ensures the required information is obtained, through, for instance, surveys, benchmarks, interviews, etc.

Once the data has been gathered the consultants will proceed to the analysis phase. Data is placed under scrutiny, analyzed, tested against hypotheses developed at the start of the project and checked with the client. Following the validation of data, options and solutions are developed, which stand at the basis of the final recommendation. A final deliverable, often in the form of a PowerPoint presentation, is developed to inform the stakeholders involved.

7.3.2. Integrated Waste Management

Collection and Segregation

At the initial stage, our two employees with an automobile will be there to collect the segregated recyclable waste from door-to-door or upon contact. After the collection at the households, offices or schools and the areas have been swept; the waste will be transported to the shed for segregation. The three staff will be in charge of segregating waste into the three categories: Papers, Plastics and Cans before sending them off to the customers.

7.3.3. Training & Education

Two types of training will be delivered: Internal and External trainings

Internal Training

All employees will undergo extensive awareness raising training, including the linkage between a deteriorating environment, waste, and human health, the treatment and management of waste, recycling, occupational hazards, health and hygiene, collection and transportation procedures etc.

External Training

Training for Youths

- One session for those interested young people for the potential job opportunity in waste management.
- One session for the Informal Sector (Rag-pickers) to get awareness in hygiene and hazardous substances.
- Deliver “Sustainable Integrated Waste Management Training” to CSOs and interested parties.

7.3.4. Awareness Raising Campaign
Influencing behaviors, attitudes and practices of concerned stakeholders is also fundamental to the successful implementation of our waste management strategy and action plan. The local Eco-clubs will be utilized as the venues for our campaigns where members of the public should be educated and encouraged to practice more sustainable lifestyles such as minimizing or avoiding the purchase of products that generate large quantities of waste. The campaigns will mainly encourage buying environmentally-friendly products in general with the 3 Rs – Reduce, Reuse and Recycle rather than discarding them; composting food wastes at home; carrying out source separation of waste as a part of the city’s waste recovery and recycling programs; and ensuring hazardous materials are not discarded with household waste.

Awareness raising and motivating the public to take action is imperative prior to the introduction of our services. If, for example, PEKKORN were looking to encourage a change in behavior or practice of the suppliers, such as perform segregation at their venues before making contact for sales for the first time, ensuring that waste generators are aware of this action in advance would be necessary for securing compliance. Therefore, we plan to conduct vast awareness campaigns every six years to enhance public understanding on waste segregation and proper waste disposal. The campaigns will engage various parties including local governments, civil society organizations, community leaders, and the media. Especially, the involvement of social media and influencers are of great importance in engaging young people to join environmental movements. The social media campaigns also help to raise the brand awareness for PEKKORN and secure some amount of our crowdfunding as well.

In addition, certain audiences are more receptive than others are when it comes to educational program or the delivery of targeted information. We are planning to conduct the education seminars at the local schools and university because we believe that educating children early about the importance of managing waste properly at the individual and household level, and subsequently reinforcing that message throughout the course of schooling, will yield returns over many years by instilling awareness about responsible waste behavior.
7.4. Business Process

How it works

Initially, our venture is based on the social problems that we wish to eradicate with the business approach. Being a start-up, we are going to engage the suppliers: Offices, Households, Schools and the Informal Sector in an innovative way via our mobile app or by simply receiving a missed call. At this point, our responsible staff will collect the waste and clean up the areas at the contact points using an automobile. After that all the waste will be transported to our own shed where the manager will ensure that our three staff perform the systematic segregation of the waste manually which are then sorted out into three main categories: Plastics, Papers and Cans. The recyclables or biodegradable waste will then be traded as our main products whereas non-recyclables will be transported to the decentralized MRFs. Refer to the flow chart below:

Project Work Flow
7.5. Impact

7.5.1. Economic Gain
- Trash to cash can rake in very attractive revenue
- The added surplus becomes the basis for the sustainability of the ongoing activities

7.5.2. Social Gain
- More job opportunities for the local youths
- No improper Disposal after 3 years of operation
- The Informal Sector will be aware of their personal hygiene and hazardous substances
- Students will get educated with waste management
- Students will have better sense of belonging and love for their environment
- Local communities will gain better quality of life

7.5.3. Environmental Gain
- Less dumping will assist in the decreasing of waste piles
- Proper disposal manner will cause less damage to the life below water
- Greener and cleaner environment for community
- Responsible consumption and production will assist in the reduction of CO2 emission

7.6. Simple Marketing Strategy

7.6.1. Marketing Strategy

PEKKORN International., shall exercise either Pull or Push marketing for both customers and suppliers. Push marketing is a promotional strategy where businesses attempt to take their products to the customers. The term push stems from the idea that marketers are attempting to push their products at consumers. Common sales tactics include trying to sell merchandise directly to customers via company showrooms and negotiating with retailers to sell their products for them, or set up point-of-sale displays. Often, these retailers will receive special sales incentives in exchange for this increased visibility. The goal of pull marketing is to get the customers to come to you, where marketers are attempting to pull customers in. Common sales tactics used for pull marketing include mass media promotions, word-of-
mouth referrals and advertised sales promotions. We are ensuring our messages are delivered through the marketing channels with AIDA model.

The AIDA Model, which stands for **Attention**, **Interest**, **Desire**, and **Action** model, is an advertising effect model that identifies the stages that an individual goes during the process of purchasing a product or service.

**Attention**

As for a start-up business, the awareness of our brand existence from the suppliers and customers are highly crucial. In order to achieve this we are going to post the sexy celebrity doing segregation of waste with our logo and catchy slogan near dumpsites, at malls and public places.

**Interest**

We understand that if our service and product have no meaning then they will not be persuaded to make a purchase. To ensure that the campaigns we are conducting will emphasize more on the impacts that our enterprise is creating and the changes we are seeing in a few years time. The media campaigns will feature our services along with local municipality and becomes a headline in the local newspapers.

**Desire**

Once we have got interests from the customers and suppliers, then we are trying to make sure that the customers will feel that they are not encouraging the dumping behavior
but instead helping the community through the engagement with us. Additionally, the suppliers will also be motivated as being a responsible person towards the environment.

**Action**

As for the ‘call to action’ part, we are making sure to add the ‘Call us today and get benefits’ portion to every advertisement and campaign slogans.

### 7.6.2. Action Plan and Time

<table>
<thead>
<tr>
<th>Targets</th>
<th>Timeline</th>
<th>M&amp;E Process</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Data collection, pitching and crowdfunding, awareness campaigns, training</td>
<td>Year 1</td>
<td></td>
</tr>
<tr>
<td>- Comprehensive data collection will take place to obtain concrete data in Duncan Busti</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Pitching and crowdfunding to receive the minimum working capital</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Public campaigns will be conducted every half-year to raise awareness on trash segregation and proper waste disposal.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Collaborate with local authorities and civil society organizations to implement door-to-door training for households.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2 Setting up office and launch operation</td>
<td>Year 2</td>
<td></td>
</tr>
<tr>
<td>- Purchasing of the necessary items to set up the office</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Set up a Shed to store waste</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Hire personnel</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Conduct internal awareness trainings</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Run operation</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Approach the potential suppliers</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3 Awareness raising campaigns continuing</td>
<td>Year 3</td>
<td></td>
</tr>
<tr>
<td>- Partner with the like-minded organizations</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Continue to conduct awareness campaigns on a regular basis to enhance public understanding on environmental issues</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Approach the corporates under CSR programme</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Deliver the ‘Integrated Waste Management Training’ to the interested parties to generate additional incomes and raise awareness.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4 Set up decentralized MRF (Material Recovery Facility) and</td>
<td>Year 4</td>
<td></td>
</tr>
</tbody>
</table>


Add Innovation
- Setting up a decentralized MRF (collection point) for segregated trash
- Conduct trainings for interested youths
- Deliver hygiene and hazardous waste education to Informal Sector
- Launch mobile app to create a platform for both suppliers and customers

5 Evaluation and business expansion
- Evaluate the business after the five year plan
- Conducting data research in other types of waste (ex. sanitary waste)
- Based on the data over five years span, another possible type of waste will be considered for future prospect

Year 5

PDCA Chart

<table>
<thead>
<tr>
<th>Strategy (Target)</th>
<th>Main Item</th>
<th>Achievement STD</th>
<th>Achievement Record/Result</th>
<th>Eva.</th>
<th>Gap Analysis/Concerning Item</th>
<th>Future Action</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

8. Budget & Finance

The estimated capital of PEKORN International (PEKORN) is US $ 15,741. The source of funding is from sponsors in India who are the top companies and have incorporated Corporate Social Responsibility (CSR) initiatives in their policies successfully. This includes:

- Tata chemical,
AMbuja cement, Infosys, Mahindra & Mahindar (M&M), ITC, Tata Motors, Hindustan Zinc Ltd, Bharat Petroleum corporation Ltd, Coca-Cola multinational, and Ultra Tech cement Ltd.

The total investment of US $ 15,741 will include fix capital (one-off capital cost) of US $ 11,820 and working capital of US $ 3,921. The fix capital will cover one truck, one computer, furniture and others. The working capital will cover expenses relevant to day-to-day operation as shown in the table below:

<table>
<thead>
<tr>
<th>Fix capital (One-off capital cost)</th>
<th>11,820</th>
</tr>
</thead>
<tbody>
<tr>
<td>Working capital</td>
<td>3,921</td>
</tr>
</tbody>
</table>

PEKORN will have full operation in 2021 (however, some activities may start in 2020). According to the initial data of the research team about Dimapur and Duncan, PEKORN estimates its financial projection as provided in the following tables. The estimated revenue and operating expenses are initiatively projected in monthly basis and then converted to yearly basis.

The revenue will come from three types of dry waste, such as paper, plastic and cans. For other economic waste will be subject to consider in the future. The first year of full operation or year 2021, PEKORN estimates to generate 51,759$ with the Cost of Goods Sold (COGS) of 25,869$. Thus, the gross profit will be 25,879$. Then the next four year, the revenue and COGS growth rates are expected to grow 5% per year. COGS is variable cost.
The total expenses will cover operating expenses and other expenses. It is the fix cost. The first year of full operation or 2021, PEKKORN estimates to expense for fix cost (including depreciation) of 15,852$. The first two years the office rent is free of charge because the co-founder will provide her place for the beginning of project. Then, third year, PEKKORN may pay for the office rent. That is why the projection includes the office rent from third year on.

<table>
<thead>
<tr>
<th>Expenses</th>
<th>2021</th>
<th>2022</th>
<th>2023</th>
<th>2024</th>
<th>2025</th>
</tr>
</thead>
<tbody>
<tr>
<td>Marketing, Advertising (Training, education, etc.)</td>
<td>1,740</td>
<td>1,740</td>
<td>1,740</td>
<td>1,740</td>
<td>1,740</td>
</tr>
<tr>
<td>Transporation, travel &amp; event</td>
<td>1,218</td>
<td>1,218</td>
<td>1,218</td>
<td>1,218</td>
<td>1,218</td>
</tr>
<tr>
<td>Office rent (Owner’s place)</td>
<td>-</td>
<td>-</td>
<td>1,740</td>
<td>1,740</td>
<td>1,740</td>
</tr>
<tr>
<td>Manager</td>
<td>3,481</td>
<td>3,481</td>
<td>3,481</td>
<td>3,481</td>
<td>3,481</td>
</tr>
<tr>
<td>Data collection &amp; analysis (Expert)</td>
<td>1,740</td>
<td>1,740</td>
<td>1,740</td>
<td>1,740</td>
<td>1,740</td>
</tr>
<tr>
<td>Receptionist</td>
<td>1,218</td>
<td>1,218</td>
<td>1,218</td>
<td>1,218</td>
<td>1,218</td>
</tr>
<tr>
<td>Driver</td>
<td>1,479</td>
<td>1,479</td>
<td>1,079</td>
<td>1,479</td>
<td>1,679</td>
</tr>
<tr>
<td>Other (internet, phone, website hosting, etc.)</td>
<td>2,611</td>
<td>2,611</td>
<td>2,611</td>
<td>2,611</td>
<td>2,611</td>
</tr>
<tr>
<td>Depreciation</td>
<td>2,364</td>
<td>2,364</td>
<td>2,364</td>
<td>2,364</td>
<td>2,364</td>
</tr>
<tr>
<td><strong>Total Expenses</strong></td>
<td><strong>15,852</strong></td>
<td><strong>15,852</strong></td>
<td><strong>17,592</strong></td>
<td><strong>17,592</strong></td>
<td><strong>17,592</strong></td>
</tr>
</tbody>
</table>

The first year of full operation, PEKKORN’s net profit is around 10,027$ and then keeps increasing year by year. In addition, its gross profit margin and net profit margin are 50% and 19%, respectively. The Return on Equity (ROE) and Return on Asset (ROA) show that its business is very efficient through 5 years.
Revenue, Expense, Net profit and key financial ratio

<table>
<thead>
<tr>
<th>Revenue</th>
<th>2021</th>
<th>2022</th>
<th>2023</th>
<th>2024</th>
<th>2025</th>
</tr>
</thead>
<tbody>
<tr>
<td>Revenue</td>
<td>51,759</td>
<td>54,347</td>
<td>57,064</td>
<td>59,917</td>
<td>62,913</td>
</tr>
<tr>
<td>COGS</td>
<td>25,879</td>
<td>27,173</td>
<td>28,532</td>
<td>29,959</td>
<td>31,456</td>
</tr>
<tr>
<td>Gross Profit</td>
<td>25,879</td>
<td>27,173</td>
<td>28,532</td>
<td>29,959</td>
<td>31,456</td>
</tr>
<tr>
<td>Expenses</td>
<td>2021</td>
<td>2022</td>
<td>2023</td>
<td>2024</td>
<td>2025</td>
</tr>
<tr>
<td>Total Expenses</td>
<td>15,852</td>
<td>15,852</td>
<td>17,592</td>
<td>17,592</td>
<td>17,592</td>
</tr>
<tr>
<td>Net Profit</td>
<td>10,027</td>
<td>11,321</td>
<td>10,939</td>
<td>12,366</td>
<td>13,864</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Key Ratio</th>
<th>2021</th>
<th>2022</th>
<th>2023</th>
<th>2024</th>
<th>2025</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gross Profit Margin</td>
<td>50%</td>
<td>50%</td>
<td>50%</td>
<td>50%</td>
<td>50%</td>
</tr>
<tr>
<td>Net Profit Margin</td>
<td>19%</td>
<td>21%</td>
<td>19%</td>
<td>21%</td>
<td>22%</td>
</tr>
<tr>
<td>ROE</td>
<td>18%</td>
<td>26%</td>
<td>24%</td>
<td>33%</td>
<td>42%</td>
</tr>
<tr>
<td>ROA</td>
<td>24%</td>
<td>35%</td>
<td>32%</td>
<td>44%</td>
<td>57%</td>
</tr>
</tbody>
</table>

In conclusion, the budget analysis shows that PEKKORN’s business is profitable and can be sustainable in long-term. Its Net Present Value (NPV) is 8,865$. This indicates that the projected earnings generated by the investment exceeds the anticipated costs. Thus, PEKKORN’s business will be profitable. In addition, its Internal Rate of Return (IRR) is 30%, this reaffirms that the investment is beneficial and higher the average banking deposit rate. In essence, the Payback Period is within three years. Hence, PEKKORN has high opportunities to invest more in its business in next three years. the Break-Even Point (BEP) is 57,865 kg per year or 31,794$ years. That means that if PEKKORN can collect and sell economic waste over BEP, PEKKORN will have more income.

Analysis

<table>
<thead>
<tr>
<th>Project analysis (Capital budgeting)</th>
</tr>
</thead>
<tbody>
<tr>
<td>NPV (USD)</td>
</tr>
<tr>
<td>IRR</td>
</tr>
<tr>
<td>Payback period (Year)</td>
</tr>
<tr>
<td>Break even (Kg)</td>
</tr>
<tr>
<td>Break even ($)</td>
</tr>
</tbody>
</table>
Notes:

The projection (capital, revenue, expense, etc.) is based on the initial information from our co-founder’s team in Dimapur, India (subject to the quality of research and data collection):

- The estimated volumes of raw material (paper, plastic, and cans) that supply to PEKORN each year are around 2%, 4.5% and 2% of total waste in Duncan (target area) respectively;
- The selling prices of paper, plastic, and cans are 0.36 US$/kg, 0.44 US$/kg and 1.02 US$/kg respectively;
- The costs of raw material of paper, plastic, and cans are 0.18 US$/kg, 0.22 US$/kg and 0.51 US$/kg;
- The Exchange rate is 1USD = 68.95 Indian Rupee;

9. Sustainable Development

9.1. Philosophy

Our philosophy is “contribute to the restoration of nature through our integrated waste management services, creating a greener, cleaner and healthier ecosystem for future generations to thrive on.”
9.2. Value Positioning

9.2.1. Trash to Cash

As of now, most of the residents in Dimapur are ignorant of the value of trash. They simply dispose all the garbage in the dumpsites. One of the key value propositions in our business is the economic benefit of trash. We offer to buy plastic, metal can, and paper from local residents, which can be an additional source of financial income.

In the later phrases of our business, we plan to establish community compost bin in a common space. This is where all the community members can dispose of their organic waste, and get free liquid fertilizer in return. By enabling local residents to directly witness the benefits from their trash, we aim to inspire them to extend their segregation activities to food and garden waste. Garden waste, as per the Report, accounts for more than 50% of the total wet wastes being disposed of, hence, composting it to manure will help to significantly lighten the burden on the local waste management system.

9.2.2. Public private partnerships

As of now, there have been a number of non-governmental organizations working to tackle environmental issues in Dimapur. However, PEKKORN International, choose a different approach. Our idea is to address this challenging problem while sustaining ourselves with the model of social enterprise. This is considered as the first organization of its kind in Dimapur City.

Our advantage is the mutual cooperation of local and international experts in various fields. The co-founders are united from diverse backgrounds and expertises, which help to provide extensive perspectives, global visions, and comprehensive solutions to the local problems. On top of that, our human resources include experienced experts based in Dimapur, who possesses local insights and up-to-date research data of the area.

One of the causes for the increasing environmental degradation in the city of Dimapur is the lack of a research or advisory expert to provide reliable data, consultancy and training services to the local authorities and organizations. PEKKORN is established to bridge that gap, creating public-private partnership for environmental initiative. Using the holistic method of collaborating with all of the relevant stakeholders, we aim to create comprehensive system to strive toward the balance between economic and environmental sustainability.
9.2.3. Better quality of life

The increasing amount of improper wastes can cause serious soil, water and air contamination, which will directly affect the human health. By providing research and consultancy services, integrated waste management system, and educational activities to local residents and organizations, PEKKORN International, helps to mitigate the environmental impacts of improper waste disposal, contributing to a greener, cleaner and healthier Dimapur.

9.2.4. Protecting human rights

Our business operation involves the engagement of informal sector. The situation is that most of the informal workers in Dimapur are illegal immigrants, who often suffer from prejudice and discrimination in the society. Their work also often fails to afford them basic necessities. By providing employment opportunities to them, we are enabled to not only utilize their skills and experiences in trash segregation, but also alleviate poverty among informal sector. Educating and employing these scavengers in some parts of our business would also contribute to developing their identities, protecting basic human rights.

9.3. Building sustainable community

9.3.1. Community development activities

Our future goals of trash segregation at household level and no improper disposal would not be actualized without the joint effort from local residents and organizations. Hence developing a self-supporting community is one of the most important tasks in our social responsibility. PEKKORN International, is committed to building sustainable community, parts of our profits will be given back to community development through various programs.

Apart from our business operation, we plan to build our organization as a community hub, not only in environment protection but also in promoting green and sustainable lifestyle. Below are some of our community activities:

- Monthly talk shows and workshops, inviting environmental activists, youth leaders, or community leaders to give inspirational talks on recycle – reuse – reduce ideas, zero waste lifestyle, or natural living (utilizing local churches, community halls or youth centers).
- Quarterly “trashtag challenge”, which is a viral movement to encourage people to clean up their neighborhoods. Beside positive environmental impacts, such movements help us to
connect with enthusiastic young people in the area and muster their support to create volunteer groups for other community activities.

- Half-year “green” competition to encourage recycling ideas among the households. Reward the best recyclers in the community.
- Voluntary training and education activities on waste segregation methods. This will be conducted from the beginning stage of our business. First we plan to connect with local civil society organizations such as Mothers Association, youth clubs, environmental NGOs, community leaders and implement workshops or training sessions for them. Having gained necessary skills and knowledge on the topic, they would play the roles of inspirers or motivators for proper waste disposal in their communities.
- Social media campaigns on recycling, no single-use plastics, eco-friendly sanitary products, engaging the government, influencers, youth leaders, the media and the general public. With the support of influential social forces and mass media coverage, our campaigns in raising awareness of the public on environmental issues can be widespread not only in Dimapur or Nagaland, but to other parts of India as well.
- Story-telling and sharing events from local people on topics green and sustainable lifestyle.
- Community potlucks with organic and environmentally-friendly products for local citizens to establish new relationships and enhance community bonds.

9.3.2. Responsible consumption and production

Waste management system can only mitigate the environmental effects to a certain extent, but cannot solve the problem radically, as waste is still be increasingly generated. If the general public is not aware of the negative effects of materialism and consumerism, the planet still continues to suffer. At PEKKORN, we utilize our competitive advantages to tackle waste problem, which is an urgent issue. However, we actively allocate a significant resource on advocating and supporting responsible consumption and production. Only through sustainable consumption and production, the society can bring about the transition to a green economy and sustainable development.
10. Conclusion

The current waste management system in Duncan as well as Dimapur is outdated and inefficient to tackle the unceasing waste generation. With no Solid Waste Treatment Plant nor a landfill, the city’s open dumpsite, which is located really close to a river and residential area with vegetable farms, poses a looming threat to residents’ life and property, environment and society. Hence, to mitigate the current waste problems in Duncan and Dimapur, PEKKORN International aims to assist the local authority and communities by providing solutions for waste management. It will be the first social enterprise in Nagaland that deal with these problems.

PEKKORN International will first educate community and work with relevant stakeholders to make them understand the value and also, the dire effects of waste on environment and health. Secondly, PEKKORN International will conduct and provide accurate data research on the waste generation, its characterization and composition. This will help in providing expert opinion on the most relevant waste streams, action plan, treatment options, including allocation of funds for proper management of the waste. In addition, PEKKORN International will provide consultancy service to authorities, organizations, etc. Thirdly, PEKKORN International will act as Waste and Recycling Collection and also, support the local authority in waste collection, buying economic waste from local community and encouraging them to segregate their trash. To provide these activities, PEKKORN International aims to have sufficient fund to run a fully operational business by 2021, such as collecting and selling economic waste in significant volume and generating sufficient income to sustain its business, reaching its objectives and contribute to building sustainable community.
References:

Reports:


Websites:
https://www.thehindubusinessline.com/opinion/columns/c-p-chandrasekhar/why-is-south-asia-performing-so-badly-on-the-sdgs/article26636204.ece


https://corporatefinanceinstitute.com/resources/knowledge/other/aida-model-marketing/

https://www.feedough.com/aida-model-explanation-examples-variants/

https://www.entrepreneur.com/article/244418

https://www.recyglo.com/

https://recyclemm.com/

https://smallbusiness.chron.com/difference-between-push-pull-marketing-31806.html
http://www.maximpact.com/waste-management-training/

Framework to build meaningful communities: https://community-canvas.org/

Institute for Local Self-Reliance: https://ilsr.org/