FEASIBILITY STUDY

FOR

MODERN RECYCLES PRODUCTION LIMITED

Project for

Manufacturing Facilities for the Recycling
Of
Plastic wastes to produce Various stripes products

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1.0 EXECUTIVE SUMMARY

1.1 Preamble:

Plastic waste has been on the raise since it was started to be manufactured in the 1950 of which the world produced only 2 million tonnes per year. By 2015, annual production had increased nearly 200-fold, reaching 381 million tonnes.[1] Over the period from 1950 to 2015, cumulative production reached 7.8 billion tonnes of plastic — more than one tonne of plastic for every person alive today. The situation has been complicated as many plastic materials (for example, plastic items in construction, furniture, transport etc. used over several years) can enter the waste stream.

In 2010, primary plastic production was 270 million tonnes, yet plastic waste was 275 million tonnes (since plastics produced in previous years entered the waste stream). As a result of these massive production Plastic waste is becoming extremely threatening to the environment due to their high quantities generated which pose serious harm to both the environment and its inhabitants. A major victim of this menace is the marine environment. Plastic wastes generated on land find their way to water bodies where they cause detrimental effects such as flooding and poisoning of the animals in the marine ecosystem. (*From Internet*).

Due to some limitations posed by Plastic waste product, **Modern Recycles Production Limited** aim to utilize its strong production capabilities, service delivery, skilled labour and market knowledge to take advantage of the growth in market opportunities, to become one of major manufacturers of various stripes using plastic waste products.

1.1 The Project:

The project entails importation of Plastic stripes making plant with installed capacity to manufacture 360 tons of Plastic stripes P.A. Other activities will include importation of trucks, and 4WD cars for administrative and sales supervision operations. The aim is to produce quality Plastic stripes for sale to local and for export to the regional market.

1.2 The Sponsors:

The project is sponsored Modern Recycles Production Limited. of Dar es Salaam. The project will be carried by Modern Recycles Production Limited which is a registered company registered under the Tanzania Companies ACT 2002 and under Certificate of Incorporation No **140997498 dated** 10th February 2020.

Shareholder	**Shares %**
Sayona Fruits Limited	98
Pawan Subhash Patel	1
Veer Ramanlal Patel	1

1.3 Capital Investment Plan

Modern Recycles Production Limited proposes to **invest US$1.2 million** for this project. It is planned that some investment cost will be financed by shareholder's contribution and also loan which will be sought from various Banks.

	Total
Land & Buildings	100,000
Plant, Machinery & Equipment	300,000
Vehicles	200,000
Furniture & Fittings	50,000
Others	350,000
Pre operational Expenses	50,000
Initial Working Capital	200,000
Grand Total	1,250,000

1.4 Financial Profitability:

Based on a set of assumptions given here-in the projects demonstrates a profitable trend in its future operations. The project's Income Statement and Cash flow indicate the Modern Recycles Production Limited would be able to recoup the planned investment funds within the first four years. This indicates that the project is financially and economically viable.

1.5 The Implementation Plan:

It is planned that the project will take 3 years from the time Modern Recycles Production Limited commences implementation of the project to the time the plant commences commercial services. Modern Recycles Production Limited shall appoint a team comprising of a competent building contractors, mechanical engineers and chemical engineers in order to achieve the set implementation time.

1.6 Developmental Linkages:

Upon completion of the Implementation programme the stripes Products manufacturing plant shall be capable of creating the following:

- Promote increased availability of quality stripes to the Tanzanian market and also to the neighbouring countries of which the firm will be exporting to;
- Generating foreign exchange through exports of at least 40% of its annual production;
- Create employment of 50 people
- Promote inter-regional trade through exports to neighbouring East African countries and Democratic Republic of Congo, Uganda and Burundi just to mention a few.

2.0 THE SPONSORS

Introduction

The project is promoted by Modern Recycles Production Limited of Dar es Salaam. This is a limited liability company that was incorporated and registered in Tanzania under the Companies Act 2002 with a Certificate of Registration no **140997498 dated** 10th February 2020.

Shareholders	**Shares %**
Sayona Fruits Limited	98
Pawan Subhash Patel	1
Veer Ramanlal Patel	1

The shareholders have proven performance and extensive in managing a range of commercially projects in Dar es Salaam Region. Modern Recycles Production Limited mission is to operate its dedicated assets and capabilities as to offer a safe, reliable and cost-efficient source of quality stripes products in the country to its own company, its corporate and retail customers. In this case business development would focus on growing with these clients by providing active participation into planning and distribution strategies.

3.0 THE PROJECT

3.1 Project Description

The project aims at manufacturing stripes Products estimated at 360 tons of Plastic Products p.a. for sale to local market and for export to the regional market. In summary the project entails the following:

- Construction of additional factory building;
- Importation of Stripes making plant
- Importation of trucks, and 4WD motor vehicles for administrative and sales supervision operations.

3.2 Location

The project will be located at plot no 1 block A, Mboga, Bagamoyo, Coast Region. The site is well accessed by a tarmac road making it reachable throughout the year. The site is served with electricity, water and telephone. It has a large factory compound that can allow extensive future expansion of factory buildings.

3.2 Plant Production Capacity

On completion shall be able to produce stripes products of 30 tons per month or 360tons P.A.

3.3 Source of Raw Materials:

Raw material inputs comprise of plastic waste materials, master batch colouring and inks for labelling. Waste products can be procured from a variety of sources including all waste materials from sister companies in the city of Dar-es- salaam

and Coast. Master batch is also readily available from sources in Kenya, Europe, the Middle East and South Africa. Printing inks are available locally from a range of sources. All inks are procured locally.

3.4 Recycled plastic waste processing

Introduction

Plastic was supposed to be the wonder product of the 20th century, but the toxic waste created by it is has been dangerous. Therefore, it has become imperative that all plastic waste be recycled . Plastic recycling is the process of recovering different types of plastic material in order to reprocess them into varied other products, unlike their original form. An item made out of plastic is recycled into a different product, which usually cannot be recycled again.

The goal of recycling plastic is to reduce high rates of plastic pollution while putting less pressure on virgin materials to produce brand new plastic products. Because of the above reason the company has decided to use this approach to help conserve resources and diverts plastics from landfills or unintended destinations such as oceans.

Plastics are durable, lightweight and inexpensive materials. They can readily be moulded into various products which find uses in a no of applications. Every year, more than 100 million tons of plastics are manufactured across the globe.

Around 200 billion pounds of new plastic material is thermoformed, foamed, laminated and extruded into millions of packages and products. Consequently, the re-use, recovery and the recycling of plastics are extremely important.

3.5 Types of recycling waste

There are six common types of plastics. Following are some typical products you will find for each of plastic:

PS (Polystyrene) – Example: foam hot drink cups, plastic cutlery, containers, and yogurt.

PP (Polypropylene) – Example: lunch boxes, take-out food containers, ice cream containers.

LDPE (Low-density polyethylene) – Example: garbage bins and bags.

PVC (Plasticised Polyvinyl chloride or polyvinyl chloride)—Example: cordial, juice or squeeze bottles.

HDPE (High-density polyethylene) – Example: shampoo containers or milk bottles.

PET (Polyethylene terephthalate) – Example: fruit juice and soft drink bottles.

Currently, only PET, HDPE, and PVC plastic products are recycled under curb side recycling programs. PS, PP, and LDPE typically are not recycled because these plastic materials get stuck in the sorting

equipment in recycling facilities causing it to break or stop. Lids and bottle tops cannot be recycled as well. "To recycle or Not to Recycle" is a big question when it comes to plastic recycling.

3.6. Waste recycling processing

Before any plastic waste is recycled, it needs to go through five different stages so that it can be further used for making various types of products. Some plastic types are not recycled because they are not economically feasible to do so. Production process will follow the normal production process.

- **Sorting:** It is necessary that every plastic item is separated according to its make and type so that it can be processed accordingly in the shredding machine.
- **Washing:** Once the sorting has been done, the plastic waste needs to be washed properly to remove impurities such as labels and adhesives. This enhances the quality of the finished product.
- **Shredding:** After washing, the plastic waste is loaded into different conveyer belts that run the waste through the different shredders. These shredders tear up the plastic into small pellets, preparing them for recycling into other products.
- **Identification and Classification of Plastic:** After shredding, a proper testing of the plastic pellets is conducted in order to ascertain their quality and class.

- **Extruding:** This involves melting the shredded plastic so that it can be extruded into pellets, which are then used for making types of plastic products.

3.7 Among the many processes of recycling plastic waste, the following two are the most popular in the industry.

Heat Compression: This type of plastic recycling has its ability to recycle all types of plastic at once. It takes unsorted and cleaned plastic waste and mixes it in huge tumblers that churn the entire mixture. The major advantage of this process is that it does not require matching forms of plastic to be recycled together.

Monomer: Through the elaborate and accurate monomer recycling process, major challenges of plastic recycling can be overcome. This process actually reverses the polymerization reaction in order to recycle the same type of condensed polymer. This process not only purifies but also cleans the plastic waste to create a new polymer.

Furthermore, the mechanical recycling of plastic waste involves the physical degradation of the waste by using processes such as grinding and/or shredding. In contrast, mechanical recycling is reported to be somewhat inefficient as a result of the complex nature of plastic waste mixtures, and instead, the majority of plastic wastes are incinerated. But it is clear from the literature that mechanical recycling is still the most used technique for plastic recycling. It is effective and rapid to execute.

For recycling chemically, plastic wastes can either be broken down into monomers or chemically modified, which, subsequently, may be

used in place of virgin raw materials in the production of new plastic materials. Thermally recycling waste plastics involves heating plastic waste at elevated temperatures to melt them followed by pouring into a mould to form new products.

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4 MARKETING ASPECTS

4.1 DEMAND FOR PRODUCTS FROM PLASTIC WASTE

Recycling is one of the businesses of the future that you must invest in now if you have the means. As the green awareness trend and eco-consciousness increases, the demand for recycled products or items will also increase. This opens an avenue for smart entrepreneurs to capitalize upon, make a living and amass wealth. Recycling is simply the process of making of new products from products that has been used and disposed as waste. As a green entrepreneur, your duty here is to get these assumed useless waste products, recycle it into useful products and resell it to the same people who disposed it.

Recycling business is not only for collecting soda cans, bottles, and old paper but it also focuses on other items and materials, such as the gold found in cell phones and computers, or re-selling household goods. Recycling requires a good knowledge of where to collect your trash goods and where to market or sell them, along with strong entrepreneurial skills and perseverance.

All sectors do benefit on the products resulting from recycled products but the construction and manufacturing industry are promising sectors where Plastic Waste can be beneficially used for various applications, mainly because it is the largest industry in different economies and the highest consumer of raw materials.

4.2 Market and Marketing aspects

An attempt has been already made to estimate the demand for recycled products from waste products in Tanzania as well as the supply of these products. It has been found that there is an ample supply of plastic waste and also there is also a huge demand of products from plastic waste

4.2.1 Marketing Strategies:

Modern Recycles Production Limited management team shall take proactive marketing and promotional strategy to ensure that the company achieves high turnover of sales through sales made to corporate customers. In order to achieve optimal business turnover management shall design and implement the following strategies;

i) Distribution of Sales

Distribution of brochures to wholesale agents.

ii) Door to Door Sales

Senior marketing staff of the company shall physically visit offices. With samples of the Plastic stripes Products for display to solicit big sales.

iii) Advertisement

These would include the local media namely; local television, Radio commercials and Newspaper advertisements etc.

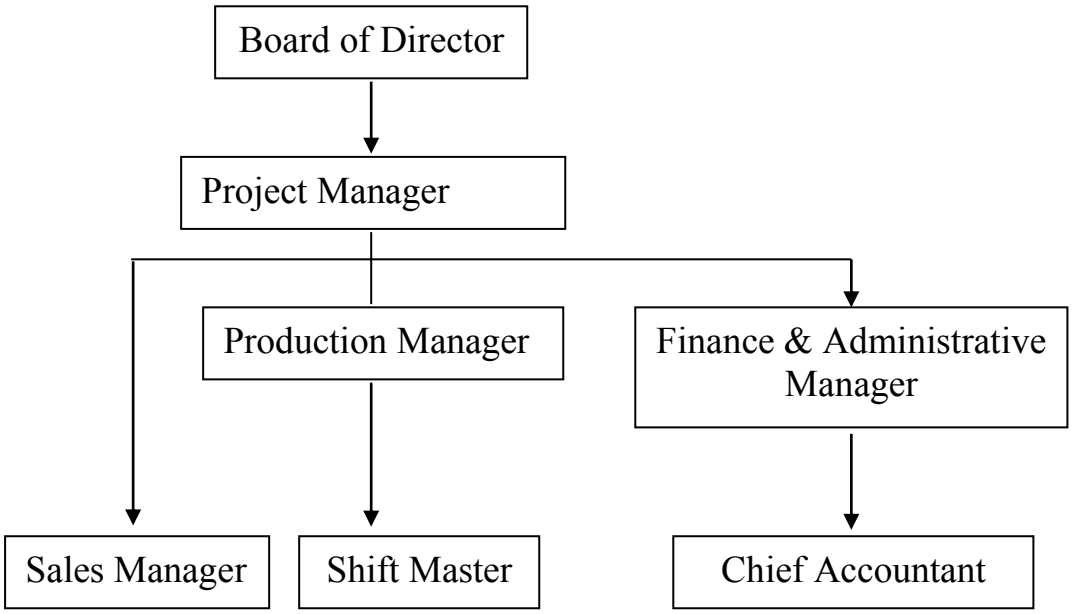
5.0 MANAGEMENT

5.1 Staff Recruitment Strategy

The strategy shall be to fill in key managerial positions with people who have extensive experience and sound qualifications in managing companies that produce various plastic products from waste. The staff would include a General Manager who will be assisted by 3 departmental managers namely the Finance and Administration Manager Production Manager and Marketing Manager.

5.2 Organisation Structure

The organisation structure of the project is proposal to be as follows:



5.3 Manpower Requirement

The company intends to employ 38 people.

6.0 **CAPITAL INVESTMENT COSTS**

Modern Recycles Production Limited. proposes to invest US$ 1.2 million for developing this project. It is planned that some investment cost will be financed by shareholders' contribution and other funds will be sought from Bank. Furthermore, the sister company's Self-Generated Funds shall be utilized at a later stage for working capital funds. Following is the projects investment plan and sources of financing:

6.1 The breakdown of the relevant costs is as shown below:

	Total
Land & Buildings	100,000
Plant, Machinery & Equipment	300,000
Vehicles	200,000
Furniture & Fittings	50,000
Others	350,000
Pre operational Expenses	50,000
Initial Working Capital	200,000
Grand Total	1,250,000

Machinery and equipment costs are based on quotation from supplier.

6.2 **Financing**

The total investment cost of the project is planned to be financed by the shareholders equity and loan from the overseas.

	Local	**Total**
Owners' Equity	1,250,000	1,250,000
Grand Total	1,250,000	1,250,000

7.0 PROJECT FINANCIAL VIABILITY

7.1 Assumptions and considerations

The financial analysis indicates that the proposed project would be a profitable venture;

7.2 Projected Profit and Loss Accounts

The project is expected to make a post tax profit of US$ 0.367M during its first year of operation rising to US$ 0.556M at the end of the 4th year.

7.3 Projected Cashflows

The projected cashflows show that the project would be able to honour its financial obligations as they fall due throughout the project's economic life and still remain with reserve of cumulative cash that could be re-invested in the project.

8.0 DEVELOPMENTAL ASPECTS

Upon completion of the Implementation programme the recycled Plastic Product manufacturing plant shall be capable of creating the following:

- Promote increased availability of quality recycled products for the local industries and for export:
- Recycling of plastic waste will prevent contamination of the environment and Reduce plastic waste products in the country
- Generating foreign exchange through exports of at least 40% of its annual production;
- Create employment for 38 local indigenous people;
- Promote inter-regional trade through exports to neighbouring Democratic Republic of Congo, Uganda and Burundi just to mention a few.

MODERN RECYCLES PRODUCTION LIMITED

CAPITAL INVESTMENT COSTS

USD

	Total
Land & Buildings	100,000
Plant, Machinery & Equipment	300,000
Vehicles	200,000
Furniture & Fittings	50,000
Others	350,000
Pre operational Expenses	50,000
Initial Working Capital	200,000
Grand Total	1,200,000

MODERN RECYCLES PRODUCTION LIMITED

Project Financing

USD

Source	Local	Foreign	Total
Equity	-	1,200,000	1,200,000
Total	-	1,200,000	1,200,000

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DEPRECIATION SCHEDULE

		Rates	1	2	3	4	5	6	7	8
Land and Building	100,000	4% S. L	4000	4000	4000	4000	4000	4000	4000	4000
Machinery and Equipment	300,000	12.50%	37500	37500	37500	37500	37500	37500	37500	37500
Motor Vehicles	200,000	25%	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000
Furniture and Fittings	50,000	10%	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000
Pre-operation Expenses	50,000	20%	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000
			106,500	**106,500**	**106,500**	**106,500**	**106,500**	**106,500**	**106,500**	**106,500**

MODERN RECYCLES PRODUCTION LIMITED

PROJECT PROFIT AND LOSS STATEMENT
US $'000'

	1	2	3	4	5	6	7	8	9	10
Percentage	70	80	90	100						
Sales Revenue	1,260	1,444	1,620	1,800	1,800	1,800	1,800	1,800	1,800	1,800
Cost of sales	630	722	810	900	900	900	900	900	900	900
Gross profit	630	722	810	900	900	900	900	900	900	900
Other Costs **Deprecition**	106	106	106	106	106	106	106	106	106	106
Operating profit	524	616	704	794	794	794	794	794	794	794
Profit before Tax	524	616	704	794	794	794	794	794	794	794
Taxes 30%	157	185	211	238	238	238	238	238	238	238
Profit after tax	367	431	493	556	556	556	556	556	556	556

MODERN RECYCLES PRODUCTION LIMITED

PROJECTED CASHFLOW

	0	1	2	3	4	5	6	7	8	9	10
Sources											
Profit before interest and depreciation		524	616	704	794	794	794	794	794	794	4,800
Loan											-
Equity	1,200										-
Total sources	1,200										4,800
Applications											
Capital expenditure	1,200										-
Tax		157	185	211	238	238	238	238	238	238	1,346
Sub-Total		157	185	211	238	238	238	238	238	238	1,346
Total Applications	1,200	157	185	211	238	238	238	238	238	238	1,346
Net Cash Flow	**-**	367	431	499	556	556	556	556	556	556	3,454
Accumulated cash	**-**	**367**	**798**	**1,297**	**1,853**	**2,409**	**2,965**	**3,521**	**4,077**	**4,633**	**32,524**