

# Pre-Feasibility Study

## (Trout Aquaculture)



### Small and Medium Enterprises Development Authority

### Ministry of Industries & Production

### Government of Pakistan

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## 1. DISCLAIMER

This information memorandum is to introduce the subject matter and provide a general idea and information on the said matter. Although, the material included in this document is based on data/information gathered from various reliable sources; however, it is based upon certain assumptions which may differ from case to case. The information has been provided on as is where is basis without any warranties or assertions as to the correctness or soundness thereof. Although, due care and diligence has been taken to compile this document, the contained information may vary due to any change in any of the concerned factors, and the actual results may differ substantially from the presented information. SMEDA, its employees or agents do not assume any liability for any financial or other loss resulting from this memorandum in consequence of undertaking this activity. The contained information does not preclude any further professional advice. The prospective user of this memorandum is encouraged to carry out additional diligence and gather any information which is necessary for making an informed decision; including taking professional advice from a qualified consultant/technical expert before taking any decision to act upon the information.

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## 2. EXECUTIVE SUMMARY

Trout Aquacultures proposed to be located at water sufficient areas with suitable land, water, and climatic conditions. The potential areas are the northern territories satisfying these conditions, especially, the Chitral, Madyan, Kaalam, and Skardu.

The proposed project will have the installed capacity of 7.5 Tons/ year. The same 7.5 tons will be the initial operating capacity with the capability of expansion through construction of new ponds.

The total Project Cost is **Rs. 7,464,438**, including the Capital Cost of **Rs. 7,024,534**, and the Working Capital of **Rs. 439,905**. Given the cost assumptions the IRR and payback are 55%, and 2.12 years respectively, hence making the project viable.

The most critical consideration or factors for success of the project are:

- Crystal clean water.
- Temperature range from 4C° to 15 C°
- Efficient Farm Management practices

### **3. PURPOSE OF THE DOCUMENT**

The objective of the pre-feasibility study is primarily to facilitate potential entrepreneurs in project identification for investment. The project pre-feasibility may form the basis of an important investment decision and in order to serve this objective, the document/study covers various aspects of project concept development, start-up, and production, marketing, finance and business management.

The purpose of this document is to facilitate potential investors in Trout Aquaculture by providing them with a general understanding of the business with the intention of supporting potential investors in crucial investment decisions.

The need to come up with pre-feasibility reports for undocumented or minimally documented sectors attains greater imminence as the research that precedes such reports reveal certain thumb rules; best practices developed by existing enterprises by trial and error, and certain industrial norms that become a guiding source regarding various aspects of business set-up and its successful management.

Apart from carefully studying the whole document one must consider critical aspects provided later on, which form basis of any Investment Decision.

### **4. INTRODUCTION TO SMEDA**

The Small and Medium Enterprises Development Authority (SMEDA) was established in October 1998 with an objective to provide fresh impetus to the economy through development of Small and Medium Enterprises (SMEs).

With a mission "to assist in employment generation and value addition to the national income, through development of the SME sector, by helping increase the number, scale and competitiveness of SMEs" , SMEDA has carried out 'sectoral research' to identify policy, access to finance, business development services, strategic initiatives and institutional collaboration and networking initiatives.

Preparation and dissemination of prefeasibility studies in key areas of investment has been a successful hallmark of SME facilitation by SMEDA.

Concurrent to the prefeasibility studies, a broad spectrum of business development services is also offered to the SMEs by SMEDA. These services include identification of experts and consultants and delivery of need based capacity building programs of different types in addition to business guidance through help desk services.

## 5. BRIEF DESCRIPTION OF PROJECT AND PRODUCT

The project is related to setting up Trout Aquaculture with following detail:

- **Technology:** The proposed farm will use the semi intensive fish farming technique by direct utilization of downstream river water.
- **Location:** The farm will be located at water sufficient cold areas with temperature ranging between 4C° to 15C°. These areas include, Chitral, Kaghan, Kalam, Madyan (Khyber Pakhtunkhwa), Murree (Punjab), Azad Kashmir, and Gilgit Baltistan.
- **Product:** The farm will produce the Mono-sex Rainbow trout Fish with an average 250 gm per Fish.
- **Target Market:** The areas with cold weather attract tourists throughout the summer, so the product can be sold locally during the season. During the winter, though the tourism decreases but the local people's habit of increased fish consumption during cold, keeps the product selling. Apart from this, the target markets are super stores and the fish restaurants of Abbotabad, Islamabad, Karachi, Lahore, and Peshawar.
- **Employment Generation:** The proposed project will initially provide direct employment to 02 persons.
- **Profitability:** The Financial Analysis shows the farm will be profitable from the very first year of the operation.

### 5.1) Production Process Flow

The proposed project is about establishing the raceways. While discussing the production process flow, some facts should be considered regarding the problems faced during operations.

The recirculation systems have many advantages. Per unit of space, raceway production is much higher. Raceways also offer a much greater ability to observe the fish. This can make feeding more efficient, and disease problems are easier to detect and at earlier stages. If disease signs are observed, disease treatments in raceways are easier to apply and require fewer chemicals than a similar number of fish in a pond (due to the higher density in the raceway). Raceways also allow closer monitoring of growth and mortality and better inventory estimates than ponds. Management inputs such as size grading are much more practicable in raceways

than they are in ponds, and harvesting is also easier<sup>1</sup>. may at the same time provide favorable conditions for disease occurrence or the reproduction of opportunistic microorganisms. Stressful conditions in recirculation systems, such as poor water quality or high stocking densities in the culture tanks, may contribute to disease outbreaks. Non-infectious problems, including high levels of ammonia, nitrites, carbon dioxide, suspended solids, or ozone residual levels have also cause mortalities in such systems.<sup>2</sup>

### Diseases

The diseases encountered in rainbow trout cultured in recirculation systems includes

- Bacteria (bacterial gill disease, furunculosis, bacterial kidney disease, fin rot)
- Parasites (Gyrodactylus, Chilodonella, Trichodina, Epistylis, Trichophrya, Ichthyophthirius, Ichthyobodo, proliferative kidney disease, amoebic gill infestation, Coleps)
- Fungi (Saprolegnia)
- Viruses (infectious pancreatic necrosis, viral hemorrhagic septicemia, and infectious hematopoietic necrosis).

### Treatment

- Whether the biofilter will be treated and how the chemicals could affect its function?
- Management practices designed to prevent the occurrence of diseases or the degradation of water quality.
- The introduction of known pathogens with infected fish should be prevented. In this type of project, by purchasing fingerlings from disease-free certified hatchery and by creating a quarantine period.

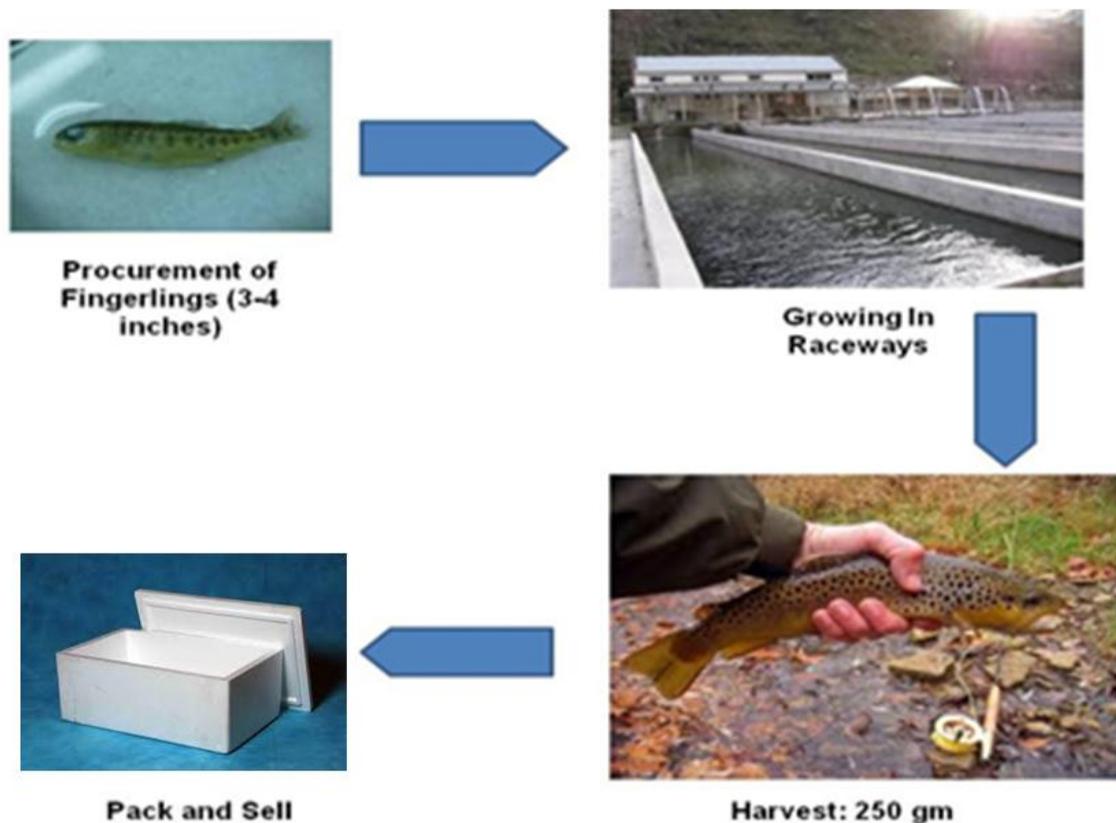
The experienced farmers start up with stocking 10,000 to 15,000, ½” fry during January and rearing in small ponds (H18”xW18”xL12’). After reaching the size of 2”, these are shifted to larger ponds (30’ x 6’x 4’). When the fingerlings attain a size 3-4”, these are shifted to largest ponds (80’ x 10’ x 4’).

The proposed project is about starting directly with the 3-4” long fingerling during April or May. The pond size will be 80’ x 10’ x 4’.

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<sup>2</sup> Alicia C. Noble\* and Steven T. Summerfelt



## 5.2) Installed and Operational Capacities

The farm will have installed capacity of 11 Tons/Year while starting with the initial capacity utilization at 9 Tons/Year. The farm will reach maximum capacity of 10.8 Tons in the third year of operation.

## 6. CRITICAL FACTORS

The following factors should be considered thoroughly:

Selection of proper location with water, equipment, and staff play very important role in ensuring the project to run successfully.

- Trout is a cold water fish, requiring the water temperature to be 4C° to 15C°.
- Crystal clean water, with abundant oxygen and continuous flow.
- Healthy Fingerlings with assurance of species to be purchased from reliable hatcheries.

- Efficient Feed Management

## 7. GEOGRAPHICAL POTENTIAL FOR INVESTMENT

The northern areas of Pakistan, like, Chitral, Haripur, Kaghan, Kalam, Madyan (Khyber Pakhtunkhwa), Murree (Punjab), Azad Kashmir, and Skardu possess trout farming potential. The temperature, water, and soil conditions are conducive for the project. In addition to this, the local consumption during summer will be considerable because in the season, tourists from warm areas of the country visit the mentioned areas.

## 8. POTENTIAL TARGET CUSTOMER/MARKETS

The tourists to the farm areas and local fish sellers and restaurants are the potential target customers. Apart from this, the superstores, well-reputed restaurants, and large hotels of the major cities are the target customers.

## 9. PROJECT COST SUMMARY

A detailed financial model has been developed to analyze the commercial viability of the Trout Aquaculture. Various cost and revenue related assumptions along with results of the analysis are outlined in this section.

### 9.1) Project Economics

All the figures in this financial model have been calculated for installed capacity of 11 Tons/Year with initial capacity utilization at 9Tons/Year.

The following table shows internal rates of return and payback period.

**Table 1 - Project Economics**

Description	Details
Internal Rate of Return (IRR)	55%
Payback Period (Yrs)	2.12
Net Present Value (NPV)	Rs.15,672,526

## 9.2) Project Financing

Following table provides details of the equity required and variables related to bank loan;

**Table 2 - Project Financing**

Description	Details
Total Equity (50%)	3,732,219
Bank Loan (50%)	3,732,219

## 9.3) Project Cost

Following requirements have been identified for operations of the proposed business.

**Table 3: Project Cost**

Description	Amount Rs.
<b>Capital Cost</b>	
Land (02 Kanal)	4,000,000
Infrastructure Development	2,748,034
Machinery and Equipment	90,000
Furniture and Fixtures	20,000
Office Equipment	1,500
Pre Operating Costs	165,000
<b>Total Capital Costs</b>	<b>7,024,534</b>
<b>Working Capital</b>	
Raw Material Inventory	350,928
Cash	88, 976
<b>Total Project Cost</b>	<b>7,464,438</b>

## 9.4) Space Requirement

This proposed project will be established on own land measuring 02 Kanal (9,000 Sq.Ft) having a worth of **Rs. 2 Million** per acre.

**Table 4: Space Requirement**

Space Requirement (in ft.)	Rs/Unit	Units (Sq.Ft)	Amount (Rs.)
Store for Raw Material (20x20)	800	400	320,000
8Grow out Pond (100'x10'x4')	375	6,400	2,406,024
Grounds	100	600	22,010
<b>Total</b>			<b>2,748,034</b>

The decision about the opportunity cost of land is at the discretion of the owner of the project and the prevailing rates of land varying from area to area. Though the raceway is measured in cubic feet but for ease of calculation the working is done in square feet.

### 9.5) Machinery and Equipment

Following table provides list of machinery and equipment. This type and scale of trout farm doesn't need the machinery, therefore the costs breakup is as under:

**Table 5: List of Machinery and Equipment**

Description	Units	Cost Rs/unit	Total Rs.
Net for Harvesting of Fish	01	50,000	50,000
Miscellaneous		40,000	40,000
<b>Total Cost of Machinery and Equipment</b>			<b>90,000</b>

### 9.6) Office Equipment

For such type of a farm only a cell phone worth **Rs. 1,500** is sufficient.

### 9.7) Furniture and Fixtures

The furniture and fixture includes a simple Cot and low cost wooden table, fans, and energy saver. It will cost **Rs. 20,000** in total.

## 9.8) Human Resource Requirement

**Table 6: Payroll For Financial Analysis**

Description	Unit	Monthly Salary/ Person	Months	First Year Salaries (Rs)
Farm Manager/CEO	01	30,000	12	360,000
Feeding Labor	01	15,000	12	180,000
<b>Total</b>	<b>02</b>	<b>N/A</b>	<b>N/A</b>	<b>540,000</b>

## 9.9) Utilities and Other Costs

Following table shows raw material requirement:

**Table 7: Cost of Material**

Description	Unit	Rate (Rs.)	Qty	Rs./Cycle
Fingerlings	Number	30	32,000	960,000
Feed	Kg	130	11,000	1,430,000
<b>Total Cost</b>				<b>2,390,000</b>

The feed quantity assumed for the working is on the FCR of 1: 1.5.

**Table 8: Miscellaneous**

Description	Rs./Cycle
Electricity (Administrative)	24,000
Travelling Expenses	36,000
Communication	6,000
<b>Total</b>	<b>66,000</b>

## 9.10) Revenue Generation

The selling price as per the government rate is Rs.850/Kg or 850,000/Ton. With initial capacity of 80% the farm will produce 7.94 Tons in the first year after the mortality of fish weighing 0.88 Tons.

**Table 9: Revenue Generation**

Product	Unit	Sales Price (Rs./Unit)	First Year Production (?)	First Year Sales Revenue (Rs)
Trout Fish (250 gm)	Ton	850,000	7.94	6,746,143
<b>Total Revenue</b>				<b>6,746,143</b>

## 10. CONTACTS

### **Fisheries Development Board (FDB)**

Contact Person: Mr. Faisal Iftikhar/Mr. Junaid Watoo

Contact Detail: Plot #12, Orchard Scheme, Murree Road Islamabad, Phone: +92 51 923 0348-9 Fax: +92 51 8365937

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Business: Fish Feed Supply.

Contact Person: Mr. Nabeel Chaudhry

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Cell No: +9249-400 1072

### **Mr. Omer Hayat**

Business: Consultancy

Cell No: 0346-5971718

### **Mr. Rasheed Khan,**

Director, FDB, (CEO, Madyan Trout Fish Farm),

Contact Detail: 0345-9456389

## 11. USEFUL WEB LINKS

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<b>Government of Pakistan</b>	<a href="http://www.pakistan.gov.pk">www.pakistan.gov.pk</a>
<b>Government of Khyber Pakhtunkhwa</b>	<a href="http://www.khyberpakhtunkhwa.gov.pk">www.khyberpakhtunkhwa.gov.pk</a>
<b>Government of Balochistan</b>	<a href="http://www.balochistan.gov.pk">www.balochistan.gov.pk</a>
<b>Government of Gilgit Baltistan</b>	<a href="http://www.gilgitbaltistan.gov.pk">www.gilgitbaltistan.gov.pk</a>
<b>Government of Azad Jamu Kashmir</b>	<a href="http://www.ajk.gov.pk">www.ajk.gov.pk</a>
<b>Security Commission of Pakistan (SECP)</b>	<a href="http://www.secp.gov.pk">www.secp.gov.pk</a>
<b>Federation of Pakistan Chambers of Commerce and Industry (FPCCI)</b>	<a href="http://www.fpcci.com.pk">www.fpcci.com.pk</a>
<b>State Bank of Pakistan (SBP)</b>	<a href="http://www.sbp.org.pk">www.sbp.org.pk</a>

## 12. ANNEXURES

### 12.1) Income Statement

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Rs. in actuals
Revenue	6,746,143	8,348,352	9,999,471	10,999,418	12,099,360	13,309,296	14,640,225	16,104,248	17,714,673	19,486,140	
Cost of goods sold	2,543,714	3,122,621	3,756,671	4,091,836	4,500,392	4,998,058	5,443,961	5,987,528	6,649,678	7,242,909	
<b>Gross Profit</b>	<b>4,202,430</b>	<b>5,225,732</b>	<b>6,242,800</b>	<b>6,907,582</b>	<b>7,598,968</b>	<b>8,311,238</b>	<b>9,196,264</b>	<b>10,116,720</b>	<b>11,064,994</b>	<b>12,243,231</b>	
<i>General administration &amp; selling expenses</i>											
Administration expense	360,000	395,050	433,513	475,720	522,037	572,863	628,638	689,843	757,007	830,710	
Rental expense	-	-	-	-	-	-	-	-	-	-	
Utilities expense	24,000	26,400	29,040	31,944	35,138	38,652	42,517	46,769	51,446	56,591	
Travelling & Comm. expense (phone, fax, etc.)	42,000	46,200	50,820	55,902	61,492	67,641	74,406	81,846	90,031	99,034	
Office vehicles running expense	-	-	-	-	-	-	-	-	-	-	
Office expenses (stationary, etc.)	-	-	-	-	-	-	-	-	-	-	
Promotional expense	-	-	-	-	-	-	-	-	-	-	
Insurance expense	-	-	-	-	-	-	-	-	-	-	
Professional fees (legal, audit, etc.)	-	-	-	-	-	-	-	-	-	-	
Depreciation expense	148,552	148,552	148,552	148,552	148,552	148,552	148,552	148,552	148,552	148,552	
Amortization expense	33,000	33,000	33,000	33,000	33,000	-	-	-	-	-	
Property tax expense	-	-	-	-	-	-	-	-	-	-	
Miscellaneous expense	-	-	-	-	-	-	-	-	-	-	
<b>Subtotal</b>	<b>607,552</b>	<b>649,202</b>	<b>694,924</b>	<b>745,118</b>	<b>800,219</b>	<b>827,709</b>	<b>894,113</b>	<b>967,010</b>	<b>1,047,036</b>	<b>1,134,887</b>	
<b>Operating Income</b>	<b>3,594,878</b>	<b>4,576,530</b>	<b>5,547,875</b>	<b>6,162,464</b>	<b>6,798,748</b>	<b>7,483,529</b>	<b>8,302,151</b>	<b>9,149,710</b>	<b>10,017,959</b>	<b>11,108,344</b>	
Other income	-	-	-	-	-	-	-	-	-	-	
Gain / (loss) on sale of assets	-	-	-	-	-	-	-	-	-	-	
<b>Earnings Before Interest &amp; Taxes</b>	<b>3,594,878</b>	<b>4,576,530</b>	<b>5,547,875</b>	<b>6,162,464</b>	<b>6,798,748</b>	<b>7,483,529</b>	<b>8,302,151</b>	<b>9,149,710</b>	<b>10,017,959</b>	<b>11,108,344</b>	
Interest expense	461,718	420,611	391,805	359,022	321,715	279,258	230,940	175,953	113,376	42,161	
<b>Earnings Before Tax</b>	<b>3,133,160</b>	<b>4,155,919</b>	<b>5,156,071</b>	<b>5,803,442</b>	<b>6,477,034</b>	<b>7,204,272</b>	<b>8,071,212</b>	<b>8,973,757</b>	<b>9,904,583</b>	<b>11,066,183</b>	
Tax	502,790	766,275	1,066,321	1,260,532	1,486,461	1,740,994	2,044,423	2,360,314	2,686,103	3,092,663	
<b>NET PROFIT/(LOSS) AFTER TAX</b>	<b>2,630,371</b>	<b>3,389,643</b>	<b>4,089,750</b>	<b>4,542,910</b>	<b>4,990,573</b>	<b>5,463,277</b>	<b>6,026,788</b>	<b>6,613,443</b>	<b>7,218,480</b>	<b>7,973,520</b>	

Rs. in actuals

	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
<b>Assets</b>											
<i>Current assets</i>											
Cash & Bank	88,976	2,370,794	5,581,600	9,483,230	13,777,480	18,448,501	23,476,131	28,969,782	34,935,602	41,371,889	51,296,956
Accounts receivable	-	-	-	-	-	-	-	-	-	-	-
Finished goods inventory	-	-	-	-	-	-	-	-	-	-	-
Equipment spare part inventory	-	-	-	-	-	-	-	-	-	-	-
Raw material inventory	350,928	477,701	629,398	761,572	921,502	1,115,017	1,349,171	1,632,496	1,975,321	2,390,138	-
Pre-paid annual land lease	-	-	-	-	-	-	-	-	-	-	-
Pre-paid building rent	-	-	-	-	-	-	-	-	-	-	-
Pre-paid lease interest	-	-	-	-	-	-	-	-	-	-	-
Pre-paid insurance	-	-	-	-	-	-	-	-	-	-	-
<b>Total Current Assets</b>	<b>439,905</b>	<b>2,848,495</b>	<b>6,210,998</b>	<b>10,244,801</b>	<b>14,698,982</b>	<b>19,563,518</b>	<b>24,825,301</b>	<b>30,602,278</b>	<b>36,910,923</b>	<b>43,762,027</b>	<b>51,296,956</b>
<i>Fixed assets</i>											
Land	4,000,000	4,000,000	4,000,000	4,000,000	4,000,000	4,000,000	4,000,000	4,000,000	4,000,000	4,000,000	4,000,000
Building/Infrastructure	2,748,034	2,610,632	2,473,231	2,335,829	2,198,427	2,061,026	1,923,624	1,786,222	1,648,820	1,511,419	1,374,017
Machinery & equipment	90,000	81,000	72,000	63,000	54,000	45,000	36,000	27,000	18,000	9,000	-
Furniture & fixtures	20,000	18,000	16,000	14,000	12,000	10,000	8,000	6,000	4,000	2,000	-
Office vehicles	-	-	-	-	-	-	-	-	-	-	-
Office equipment	1,500	1,350	1,200	1,050	900	750	600	450	300	150	-
<b>Total Fixed Assets</b>	<b>6,859,534</b>	<b>6,710,982</b>	<b>6,562,430</b>	<b>6,413,879</b>	<b>6,265,327</b>	<b>6,116,775</b>	<b>5,968,223</b>	<b>5,819,672</b>	<b>5,671,120</b>	<b>5,522,568</b>	<b>5,374,017</b>
<i>Intangible assets</i>											
Pre-operation costs	165,000	132,000	99,000	66,000	33,000	-	-	-	-	-	-
Legal, licensing, & training costs	-	-	-	-	-	-	-	-	-	-	-
<b>Total Intangible Assets</b>	<b>165,000</b>	<b>132,000</b>	<b>99,000</b>	<b>66,000</b>	<b>33,000</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>
<b>TOTAL ASSETS</b>	<b>7,464,438</b>	<b>9,691,477</b>	<b>12,872,428</b>	<b>16,724,680</b>	<b>20,997,309</b>	<b>25,680,293</b>	<b>30,793,525</b>	<b>36,421,950</b>	<b>42,582,043</b>	<b>49,284,595</b>	<b>56,670,973</b>
<b>Liabilities &amp; Shareholders' Equity</b>											
<i>Current liabilities</i>											
Accounts payable	-	-	-	-	-	-	-	-	-	-	-
Export re-finance facility	-	-	-	-	-	-	-	-	-	-	-
Short term debt	-	-	-	-	-	-	-	-	-	-	-
Other liabilities	-	-	-	-	-	-	-	-	-	-	-
<b>Total Current Liabilities</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>
<i>Other liabilities</i>											
Lease payable	-	-	-	-	-	-	-	-	-	-	-
Deferred tax	-	-	-	-	-	-	-	-	-	-	-
Long term debt	3,732,219	3,328,887	3,120,195	2,882,697	2,612,416	2,304,828	1,954,782	1,556,419	1,103,069	587,142	-
<b>Total Long Term Liabilities</b>	<b>3,732,219</b>	<b>3,328,887</b>	<b>3,120,195</b>	<b>2,882,697</b>	<b>2,612,416</b>	<b>2,304,828</b>	<b>1,954,782</b>	<b>1,556,419</b>	<b>1,103,069</b>	<b>587,142</b>	<b>-</b>
<i>Shareholders' equity</i>											
Paid-up capital	3,732,219	3,732,219	3,732,219	3,732,219	3,732,219	3,732,219	3,732,219	3,732,219	3,732,219	3,732,219	3,732,219
Retained earnings	-	2,630,371	6,020,014	10,109,764	14,652,673	19,643,246	25,106,523	31,133,311	37,746,754	44,965,234	52,938,754
<b>Total Equity</b>	<b>3,732,219</b>	<b>6,362,590</b>	<b>9,752,233</b>	<b>13,841,983</b>	<b>18,384,893</b>	<b>23,375,465</b>	<b>28,838,742</b>	<b>34,865,531</b>	<b>41,478,974</b>	<b>48,697,453</b>	<b>56,670,973</b>
<b>TOTAL CAPITAL AND LIABILITH</b>	<b>7,464,438</b>	<b>9,691,477</b>	<b>12,872,428</b>	<b>16,724,680</b>	<b>20,997,309</b>	<b>25,680,293</b>	<b>30,793,525</b>	<b>36,421,950</b>	<b>42,582,043</b>	<b>49,284,595</b>	<b>56,670,973</b>

**12.3) Cash Flow Statement (With 10 Years Projections)**

	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Rs. in actuals Year 10
<i>Operating activities</i>											
Net profit	-	2,630,371	3,389,643	4,089,750	4,542,910	4,990,573	5,463,277	6,026,788	6,613,443	7,218,480	7,973,520
Add: depreciation expense	-	148,552	148,552	148,552	148,552	148,552	148,552	148,552	148,552	148,552	148,552
amortization expense	-	33,000	33,000	33,000	33,000	33,000	-	-	-	-	-
Deferred income tax	-	-	-	-	-	-	-	-	-	-	-
Accounts receivable	-	-	-	-	-	-	-	-	-	-	-
Finished good inventory	-	-	-	-	-	-	-	-	-	-	-
Equipment inventory	-	-	-	-	-	-	-	-	-	-	-
Raw material inventory	(350,928)	(126,773)	(151,697)	(132,174)	(159,930)	(193,515)	(234,154)	(283,326)	(342,824)	(414,817)	2,390,138
Pre-paid building rent	-	-	-	-	-	-	-	-	-	-	-
Pre-paid lease interest	-	-	-	-	-	-	-	-	-	-	-
Advance insurance premium	-	-	-	-	-	-	-	-	-	-	-
Accounts payable	-	-	-	-	-	-	-	-	-	-	-
Other liabilities	-	-	-	-	-	-	-	-	-	-	-
<b>Cash provided by operations</b>	<b>(350,928)</b>	<b>2,685,149</b>	<b>3,419,498</b>	<b>4,139,128</b>	<b>4,564,531</b>	<b>4,978,609</b>	<b>5,377,675</b>	<b>5,892,014</b>	<b>6,419,170</b>	<b>6,952,214</b>	<b>10,512,209</b>
<i>Financing activities</i>											
Change in long term debt	3,732,219	(403,332)	(208,692)	(237,498)	(270,281)	(307,588)	(350,045)	(398,363)	(453,350)	(515,927)	(587,142)
Change in short term debt	-	-	-	-	-	-	-	-	-	-	-
Change in export re-finance facility	-	-	-	-	-	-	-	-	-	-	-
Add: land lease expense	-	-	-	-	-	-	-	-	-	-	-
Land lease payment	-	-	-	-	-	-	-	-	-	-	-
Change in lease financing	-	-	-	-	-	-	-	-	-	-	-
Issuance of shares	3,732,219	-	-	-	-	-	-	-	-	-	-
Purchase of (treasury) shares	-	-	-	-	-	-	-	-	-	-	-
<b>Cash provided by / (used for) financing</b>	<b>7,464,438</b>	<b>(403,332)</b>	<b>(208,692)</b>	<b>(237,498)</b>	<b>(270,281)</b>	<b>(307,588)</b>	<b>(350,045)</b>	<b>(398,363)</b>	<b>(453,350)</b>	<b>(515,927)</b>	<b>(587,142)</b>
<i>Investing activities</i>											
Capital expenditure	(7,024,534)	-	-	-	-	-	-	-	-	-	-
Acquisitions	-	-	-	-	-	-	-	-	-	-	-
<b>Cash (used for) / provided by investing</b>	<b>(7,024,534)</b>	<b>-</b>									
<b>NET CASH</b>	<b>88,976</b>	<b>2,281,817</b>	<b>3,210,806</b>	<b>3,901,630</b>	<b>4,294,250</b>	<b>4,671,021</b>	<b>5,027,630</b>	<b>5,493,651</b>	<b>5,965,820</b>	<b>6,436,287</b>	<b>9,925,068</b>

## 13. KEY ASSUMPTIONS

### 13.1) Operating Cost Assumptions

Description	Details
Hours Operational Per Day	24
Days Operational Per Month	30
Days Operational Per Year	360
Operating Cost Growth Rate	10%

### 13.2) Production Cost Assumptions

Description	Details
COGS Annual Growth Rate	10%

### 13.3) Revenue Assumptions

Description	Details
Sales Price Growth Rate	10%
Maximum Capacity Utilization	98%
Initial Capacity Utilization	80%

### 13.4) Economy Related Assumptions

Description	Details
Inflation Rate	10%
Electricity Price Growth Rate	10%
Wage Growth Rate	10%