# *Detailed Project Report*

## *On*

## *Commercial Shrimp Farming*

## *(10 Nos of 0.5 Acre WSA*

## *5 Acre WSA )*

**Under MKUY**

**Name of the Entrepreneur/Entity:**
**Address:**
**Mob No.**

# Contents

## 1. Project Summary

| | | |
|---|---|---|
| 1 | Name of the Enterprise<br>(as per the Illustrative List of Enterprises) | |
| 2 | Sector<br>(as per the Illustrative List of Enterprises) | Fisheries |
| 3 | Project Capacity[1] | 5 acres WSA (10 nos each 0.5 ac WSA) |
| 4 | Key components of the project | Commercial Shrimp Farming |
| 5 | Project Address<br>(Village/Ward, Gram Panchayat/Municipality, Block, District) | |
| 6 | Products/Output from the project | Shrimp |
| 7 | Total Project Cost | Rs. 42,76,000 |
| 8 | Fixed Capital Cost | Rs. 40,56,000 |
| 9 | Working/Recurring capital | Rs. 2,20,000 |
| 10 | Bank Finance/ Self Finance | Bank Finance |
| 11 | Bank Loan Amount | Rs. 38,26,400 |
| 12 | Promoter Contribution (min 10% of the project cost in case of bank loan) | Rs. 4,49,600 |
| 13 | Assumed Rate of Interest | 11% |
| 14 | Subsidy Eligibility (40%, 50%) | |
| 15 | Repayment Terms<br>(Tenure, Moratorium, Frequency, Mode of Repayment: equal principal/equal instalment) | Equal Monthly Instalment |
| 16 | Key Financial Indicators:<br>1. Average Annual Net Profit<br>2. Debt Service Coverage Ratio (DSCR)<br>3. Internal Rate of Return<br>4. Break Even Year | <br>Rs. 17,97,364<br>2.68<br>40.13%<br>2 Years and 6 Months |
| 17 | Estimated employment to be generated (nos.) | 10 |

[1] Capacity can be in terms of area or quantity

# 2. Project Profile

## 2.1 Entrepreneur/Entity Profile

| | | |
|---|---|---|
| 1 | Name of the Entrepreneur/Entity | |
| 2 | Legal status<br>(Individual/ Group/ FPO/ FPC/ Proprietorship/ Partnership firm/ Company/ Cooperative/ Federation/ Society/ Trust) | |
| 3 | Name of Representative[2] in Ease of entity | |
| 4 | Gender (Male/ Female/ Third Gender/ Not Applicable) | |
| 5 | Date of Birth of Individual/Representative of Entity | |
| 6 | Date of Incorporation/Registration of Entity | |
| 7 | Category opted for<br>(Women/ ST/ SC/ Differently Abled/ Third gender/ Agri & Allied Graduate) | |
| 8 | Educational Qualification of Individual/Representative of Entity | |
| 9 | Passport size photograph of the Individual/ Representative of entity | |
| 10 | Local Address for Correspondence of the Individual/ Representative of entity | |
| 11 | Registered Address of Entity | |
| 12 | Main Office/Branch Address of Entity | |
| 13 | Phone no. of Individual/Representative of Entity | |
| 14 | Email Id of Individual/Representative of Entity | |
| 15 | AADHAR No. of Individual/Representative | |
| 16 | PAN of Individual/Representative of Entity, if available | |
| 17 | Farmer Id of Individual, if available | |
| 18 | Details of other Partner/Director/ President/Secretary | |
| 19 | Registration No./ CIN of the Entity[3] | |
| 20 | PAN/TAN of Entity | |
| 21 | GSTIN of Entity, if available | |
| 22 | Details of experience and exposure relevant to the proposed enterprise/project<br>(family business, work experience, e-learning/certificate courses, trainings undertaken etc.) | |

[2] Representative should be authorized by the board/governing body of the entity.

[3] Registration document:

Groups (SHG/PG/: FPO: Proprietorship firm: Registration Certificate under Shops & Establishment Act, Partnership firm: Registration Certificate from IGR of state, Company (Pvt. Ltd., Public Ltd., LLP, OPC, FPC): Certification of Incorporation, Cooperative/ Federation: Certificate of Registration from Registrar of Cooperative Societies, Society/Trust: Darpan Unique Id

## 2.2. Project Consultant Details

DPR prepared by: APICOL, Baramunda

## 2.3. Concept and Scope of the Project

**Introduction**

Shrimp farming in India, till 2009, was synonymous with the monoculture of tiger shrimp, Penaeus monodon. About 1,90,000 ha brackish water area have been developed for shrimp culture in the country. Since 1995 culture of P. monodon is affected by White Spot Syndrome Virus (WSSV) and the development of shrimp farming has become stagnant. Most of the Southeast Asian countries like Thailand, Vietnam, Indonesia were also culturing P.monodon and since 2001-02 onwards most of them have shifted to culture of exotic White leg shrimp, Litopenaeus vannamei because of the availability of Specific Pathogen Free (SPF) and Specific Pathogen Resistant (SPR) broodstock. In India, Pilot-scale introduction of L. vannamei was initiated in 2003 and after a risk analysis study large-scale introduction has been permitted in 2009. The biology of both the species differs in minor aspects and accordingly the culture practices are also different.

Biology

L. vannamei is native of pacific coast of Mexico and Central and South America as far south as Peru. It is mainly found on mud bottoms, down to a depth of 75 m. It is commonly known as white legged shrimp or Mexican white shrimp. It is greyish-white in colour. The maximum weight of females in the wild is about 120 g. The males are smaller at 60-80g. It lives in the column and prefers clayey loam soil.

For L. vannamei the growth at 30°C is much higher than at 25°C. The optimal range of temperature for the species is between 30 and 34°C. At 20°C growth virtually stops. It can tolerate salinity levels of 0 to 50 ppt. Growth is uniform within 10-40 ppt. They can grow in freshwater also but the growth is slower below 10 ppt. pH range of 7 to 9 is tolerated with optimal growth at pH8.0. Dissolved oxygen levels above 4.5 ppm is required for optimal growth. Turbid water with flocculated particles of more than 0.5 micron resulted in better growth than clean water mainly because of the presence of algae and bacteria. Ammonia -N and Nitrite – N levels should be less than 0.1 ppm and1 ppm respectively.

L. vannamei is an omnivorous scavenger and is less aggressive and less carnivorous than P. monodon. Food intake is more during evening and night. Retention time of food in the gut is 2.2 to 5 hours. Food is digested at modest acidities of pH 5.5-7. Growth of L. vannamei, under confined culture conditions was similar to P. monodon till they attain 20g size. Beyond that the growth rate was poor. The shrimps attained the size of 20g within a period of100-120 days depending on the stocking density.

**Susceptibility to viruses and Specific Pathogen Free stock**

L. vannamei is highly susceptible to a number of viral pathogens. White Spot Syndrome Virus (WSSV),Taura Syndrome Virus (TSV), Yellow Head Virus (YHV), Infectious Hypodermal and Haematopoietic Necrosis Virus (IHHNV), Lymphoid Organ Vacuolisation

Virus (LOV), Reo like Viruses (REO) are some of the viruses reported in the species. In order to eliminate the presence of the virus in the seed, Specific Pathogen Free (SPF) stock has been developed by producing a number of generations in highly bio secure facility with continued surveillance of pathogen presence. Although, SPF shrimp are, by definition, free of all the specifically listed pathogens, SPF shrimp may be infected with a known pathogen that is not included on the SPF list of the shrimp supplier, or with an unknown pathogen that has not yet been described. Offspring of SPF shrimp are not considered SPF unless they are produced and maintained an SPF facility. SPF status changes with the pathogen condition of the shrimp, as well as the type of environment within which they are cultured (i.e. the level of biosecurity). One of the main advantages of culturing L. vannamei is commercially available as high health animals from Specific Pathogen Free (SPF) stocks while P. monodon have very limited availability from SPF stocks.

**Bio-security requirements of shrimp farms**

Stocking pathogen free post larvae alone doesn't guarantee a disease-free culture since the pathogens could still enter the culture environment horizontally and infect the shrimps during the culture. Viral pathogens can still enter the culture environment through the following means and a better understanding of these can help in prevention of horizontal transmission

- By persisting in the soil
- Intake water
- Aquatic vectors introduced through intake water, by crabs and other animals.
- Besides the above-mentioned carriers, viral particles can also enter the farming system by mechanical carriers like:
    - Contaminated land animals and birds
    - Contaminated farm inputs through live feed, semi-moist feed
    - Contaminated farm implements, nets and vehicles etc.,
    - Contaminated personnel

Crabs are one of the carriers of viral pathogens and providing crab fencing in shrimp farms is considered as one of the important biosecurity requirements. Carriers like crabs could also move from pond to pond over land barriers. To prevent such movements fencing made of 0.5 m plastic sheet should be put around the culture pond.

Feed ingredients of aquatic origin used in aquaculture can be a source of pathogens (viruses, bacteria and parasites) to shrimp species. Pathogens in feed can infect the animals directly by means of consumption of feed or indirectly via environmental sources. Live feed and moist feed are more likely to contain pathogens because their ingredients are either in a raw state or subject to insufficient processing.

Birds such as crow/water crow pick up the dead and moribund shrimps affected with viral disease from ponds and may drop in unaffected ponds, thereby transmitting the virus mechanically. This could be avoided by using bird scares and bird fencing over the pond. Similarly land animals like dogs, cats and cattle can mechanically carry the virus from one pond to another. Preventing entry of stray animals and unauthorized personnel into the farming area through fencing is the only way to address this problem.

Use of tyre bath with disinfecting solution of calcium hypochlorite (200 ppm) and foot bath/ hand wash for the disinfection of farm personnel is essentially required to avoid contamination.

Pond to pond transmission of virus within a farm could easily occur through the use of farm implements and farm workers. Providing an independent set of implements for each of the ponds will be the best solution. Routine disinfection of the implements before every use should also be made a part of the SOP so that it becomes the routine practice with farm personnel. Similarly, disinfection of hands and feet of the farm personnel before entry into any pond should be made mandatory.

Workers move from pond to pond attending to their work. So, restriction on the movement of farm workers from pond to pond is necessary. Personal disinfection has to be instituted among the farm workers before they enter the pond and after they come out of the pond.

**Farm Design requirements**

L. vannamei lives in the column and hence increasing the depth of the pond will help in increasing the stocking density. Generally, shrimp farms which were culturing P. monodon had a water depth of about 1 m. But it is advisable to have a depth of 1.5 to 1.8 m water column for culturing L.vannamei.

Since mechanical aeration is one of the major requirements for L.vannamei culture, constant circulation water is expected in the pond. This will lead to the erosion of the soil in the dyke and bottom. To avoid this compacting of the pond bottom and the dykes is essential. In intensive culture ponds total lining of the pond HDPE sheets is done to avoid any erosion. In high density cultures, accumulation of sludge in the bottom is a major problem and provisions of central drainage or use of sludge pumps is essential. Positioning of paddle wheel aerators should aid in bringing the sludge to the centre of the pond from where they can be removed.

Bio-security requirements like reservoir ponds, fencing, crab fencing, bird fencing, and disinfection facilities are incorporated in the design. To avoid disease in most cases zero-water exchange system of farming is practiced with recirculation facilities. In such cases more than 40% of the water area in the farm is allocated for reservoirs and waste sedimentation ponds.

**Management of the farm:**

Drying and Liming

The sludge left in the pond, which might have had viral disease outbreak during the previous culture, may contain high organic load, bacteria, viral particles and DNA as well as many other viral carriers. All these should be removed to prevent the persistence of viral disease. This could be achieved by the application of burnt lime (CaO) @100 ppm, followed by exposure of the pond bottom to sunlight until it dries and cracks, removal of the top soil and compacting the bottom soil.

Water Management

White spot virus has been reported to survive as a free-living form in water up to seven days. Direct use of creek or sea water carries the risk of the virus into the system. Most of the aquatic crustaceans including the planktonic forms are reported to be carriers of WSSV virus. A number of other aquatic organisms could be mechanical carriers because of their filter-feeding habit. There is a need to eliminate these from water before use in culture ponds. Use of filter nets of 60-micron mesh/$cm^2$ in the delivery pipes/ inlet sluice should be strictly followed. Water should be taken in reservoir ponds and treated with calcium hypochlorite @30 ppm and aged up to seven days, to eliminate the viral pathogens.

Farmers should ensure that only treated water be used in the culture ponds for compensating the evaporation losses. Regular water exchange is not advised to avoid cross contamination of pathogens from source water.

Fertilization and addition of carbon source

Culture of L. vannamei can be done under two systems – with plankton as natural feed or with bacterial floc. The fertilization schedule with urea and superphosphate is followed for plankton method while provision of carbon source in the form of molasses and dolomite is used for the development of bacterial floc. The volume of bio-floc was controlled at 15 ml/liter.

Stocking

SPF shrimp seed from a reputed hatchery is used for stocking. PL8-PL9 is normally selected after ensuring the pathogen free status of the seed. The seed acclimatization is a very important requirement before stocking. Temperature, salinity and pH of the transportation water should be gradually brought to the level of pond water by gradual mixing of both over a period of 6-12 hours depending on the difference. Stocking densities of 40 to 60 no/m2 is preferred. Higher stocking densities above 60 no./$m^2$ is not permitted.

**Feed Management**

Protein requirement varied between 25 to 40% depending on the density. Marine source of protein was more effective than plant source. Lipid requirement was around 6-8% with 2% marine unsaturated fatty acids and0.25 to 0.4% of cholesterol. Feeding rate was between 6.6 to 16% for 1 shrimp which was reduced to 2% for 15g shrimp. Optimal feeding frequency was between 2 and 6 times in a day with maximum percentage of feed distributed in the evening and night rations. Check trays are used to monitor the feed consumption and the feeding ration is adjusted accordingly. The FCR levels of 1.1 to 1.3 are expected.

**Maintenance of water quality**

Regular monitoring of water quality is very essential. Water quality parameters like temperature, salinity, pH and alkalinity are monitored on daily basis. DO levels are recorded at least 2 times a day. Other parameters like ammonia, Nitrite, Ca, Mg are monitored on weekly basis. DO levels should be maintained above 4 ppm although and operation of paddle wheel aerators should be done to maintain the level. The number of aerators required is about1 HP per every 300 kg of biomass. The location of the aerators should be adjusted in such way the sedimentation occurs at the centre of the pond which will aid in its easy removal.

Most of the culture systems avoid regular water change for fear of introduction of viral pathogens into the pond system. In case water exchange is necessitated during extreme water quality conditions, treated water from the reservoirs only should be used for filling the pond. In high density zero water exchange systems bio remediators in the form of water probiotics is used to maintain the water quality. Calcium and Magnesium levels in the water play an important role in the moulting process of the shrimps. The desired levels are 200ppm of Ca and 200 ppm of Mg. Whenever there is a drop in this, regular supplementation in the water should be done.

Removal of sludge from the pond bottom during culture is essential in case of high-density cultures. Aerators are positioned in such a way that the sludge is accumulated in the centre of the pond and from there it could be removed through central drainage or using sludge pumps. To aid in the process, sludge settled at other places should be disturbed regularly. This is achieved through dragging of chains at the bottom at regular intervals on all sides of the pond.

**Health Management**

Weekly monitoring of shrimps for their growth and well-being is essential. L. vannamei normally grows at the rate of 0.2g/ day after the first 30 days. Weekly growth rate will range between 1.5 to 2.0g, depending on the stocking density. At 60 nos./$m^2$, the shrimps attain 20g size within 100 to 120 days.

**Harvest and post-harvest**

L. vannamei is a column living shrimp and hence maximum stock be harvested by either cast netting or drag netting and this will help in harvesting them without much overcrowding and stress. Final harvesting by draining the water should be done within 6 hours. Compared to P. monodon, L. vannamei discolourised faster if there is any delay in icing the harvested stock. Hence the stock should be 'ice killed' immediately on exposure and stored in ice.

**Cost of production**

The cost of production of L. vannamei in Indian conditions considering the industrial rate for electricity might work out to Rs. 100 to 120 for production levels of 8 to 10 tons per ha. The average size at harvest ranges from 18 to 22 g and the sale price is more or less same for both P. monodon and L. vannamei of similar size at Rs. 200 to 220. The profit margin is very high and even though only 50% of the area will be utilized for grow-out, it is beneficial than P. monodon culture.

**Conclusion**

L. vannamei is a very suitable species for semi-intensive culture with the availability of pathogen free seed. The major issues to be considered are bio-security and maintenance of water quality through constant monitoring. It also requires higher technical knowledge to achieve higher production in sustainable manner. Strict adherence to the guidelines of CAA is a must to ensure environment protection.

**Market Potential**

The global shrimp market size was USD 28.45 billion in 2020. The market is projected to grow from USD 33.81 billion in 2021 to USD 53.63 billion in 2028 at a CAGR of 6.81% during the 2021-2028 period. Innovations in the seafood sector have been continuously growing in the last few years. Advancements in newly invented technology and the entrance of market players in the commercial seafood farming sector would boost the growth of the industry. Moreover, sustainability and growth of the seafood supply are also being considered more than ever before. These trends are expected to create significant changes and offer lucrative opportunities in seafood.

Fisheries and aquaculture sector contribute around 1% to India's Gross Domestic Product (GDP) and over 5% to the agricultural GDP. Brackishwater aquaculture, the farming of shellfishes and finfishes along the coastal line of the country and in inland saline areas is a vibrant farming sector, under the aquaculture umbrella. Brackishwater aquaculture sector is dominated by the shrimp farming, is the economic engine of Indian aquaculture, when

consider the significant contribution of this sector in food production, employment generation and economic benefits.

## 3. Techno-commercial Assumptions

| Sl. No. | Parameter | Value | Unit |
|---|---|---|---|
| 1 | Increase in Rate of Product | 5 | % |
| 2 | Increase in Electricity consumption | 5 | % |
| 3 | Collection from Debtors (First Year) | 10 | Days |
| 4 | Collection from Debtors | 15 | Days |
| 5 | Payable to Creditors | 20 | Days |
| 6 | Drawing By Promoter | 40 | % |
| 7 | Increase in Staff Salary | 5 | % |
| 8 | Rate of Interest on TL | 11 | % |
| 9 | Rate of Interest on WC | 9 | % |
| 10 | Loan Repayment (in year) | 7 | Days |
| 11 | Raw Material in Stock ( on sales) | 5 | Days |
| 12 | Finished Goods in stock ( on sales) | 15 | Days |
| 13 | Promoter's Contribution (Term Loan) | 10 | % |
| 14 | Promoter's Contribution (Working Capital) | 10 | % |
| 15 | Working Capital Requirement | 15 | Days |
| 17 | Working Capital Utilisation | 100 | % |
| 18 | Total water Spread Area (WSA) | 20000 | sq mtr |
| 19 | PL /sq mtr | 50 | nos |
| 20 | Stocking density | 1000000 | nos |
| 21 | Total Production | 10000 | kg |
| 22 | Feed | 24000 | kg |
| 23 | Crop duration | 6 | months |
| 24 | No. of Crop | 2 | nos |
| 25 | No. of Ponds to be excavated (each 0.5 WSA) | 10 | nos |

## 4. Financial Details

| Sl. No. | Item | Amount | Amount |
|---|---|---|---|
| 1 | Promoter's equity | 4,49,600 | 4,49,600 |
| 2 | Bank Finance | | 38,26,400 |
| 2A | Term Loan | 36,28,400 | |
| 2B | CC Limit | 1,98,000 | |
| | | | |
| | **Total** | **42,76,000** | **42,76,000** |

### 4.1. Project Fixed Capital

| Details of Fixed Assets | | | | | |
|---|---|---|---|---|---|
| **Sl. No.** | **Particulars** | **Unit** | **Qty.** | **Cost per unit** | **Total** |
| **A** | **Land** | | | | |
| 1 | Land Development/ Grass Turfing | Sq. ft | 45000 | 0.60 | 27,000 |
| 2 | Fencing (Barbed/Solar) | LS | 900 | 70.00 | 63,000 |
| | **Sub Total** | | | | **90,000** |
| **B** | **Civil Construction** | | | | |
| 1 | Pond Excavation **5-acre** WSA including inlet and outlet (10 nos 0.5 WSA pond) | acre | 5 | LS | 17,50,000 |
| 2 | Office room & Laboratory | Sq. ft | 200 | 850.00 | 1,70,000 |
| 3 | Store room for feed and other accessories | Sq. ft | 200 | 350.00 | 70,000 |
| 4 | Pump House | Sq. ft | 50 | 350.00 | 17,500 |
| 5 | Labour Shed | Sq. ft | 200 | 350.00 | 70,000 |
| | **Sub Total** | | | | **20,77,500** |
| **C** | **Water Supply** | | | | |
| 1 | Water Supply with overhead tank, pump and pipeline | | | | **2,00,000** |
| **D** | **Electrification** | | | | |
| 1 | Electrical Installation | LS | | | 2,00,000 |
| 2 | Transformer/DG | LS | | | 5,00,000 |
| | **Sub Total** | | | | **7,00,000** |
| **E** | **Plant & Machinery (all equipment can be changed as per the requirement)** | | | | |
| **Sl. No.** | **Particulars** | **Specification** | **Qty** | **Unit Price** | **total** |
| 1 | Three phase 4 paddle Wheel aerator | 2 HP | 20 | 38,350 | 7,67,000 |
| 2 | BCH Three Phase (DOL) Starter (3.8-6A) | no. | 20 | 2,301 | 46,020 |
| 3 | Water and soil testing kit | LS | | | 20,000 |
| 4 | Bio-security Net | LS | | | 25,000 |
| 5 | Lab and farm equipment, pH meter, salinometer, chemicals, etc. | LS | | | 1,00,000 |
| 6 | Oxygen Cylinder | LS | | | 5,000 |
| | **Total Plant and Machinery Cost** | | | | **9,63,020** |
| **F** | **Miscellaneous Expenditure** | | | | |
| 1 | Insurance premium of assets | | | | 15,000 |
| 2 | Cost of DPR Preparation | | | | 5,046 |
| 3 | Miscellaneous Expenditure | | | | 5,434 |
| | **Total Miscellaneous Expenditure** | | | | **28,168** |

## 4.2. Project Variable Expenses

| Details of Recurring Expenditure | | | | | | |
|---|---|---|---|---|---|---|
| **A** | **Details of raw material (per annum @ 100%)** | | | | | |
| **Sl. No.** | **Items** | **Unit** | **Rate/Unit (Rs)** | **Qty/crop** | **Qty/annum (kg)** | **Total Cost (Rs)** |
| 1 | SPF Seed (PL20) | nos | 1 | 10,00,000 | 20,00,000 | 20,00,000 |
| 2 | Shrimp Feed | kg | 50 | 12000 | 24,000 | 12,00,000 |
| 3 | Lime/ RCD/ Urea/ SSP/ Medicine | LS | | | | 30,000 |
| | **Total** | | | | **20,24,000** | **32,30,000** |

| Details of salary and other benefits | | | | |
|---|---|---|---|---|
| **Sl. No.** | **Type of workers** | **No. of Worker** | **Salary Per Month/head (Rs)** | **Total Salary per annum (Rs)** |
| 1 | Unskilled | 5 | 8,000 | 4,80,000 |
| 2 | Skilled | 4 | 10,000 | 4,80,000 |
| 3 | Manager | 1 | 20,000 | 2,40,000 |
| | **Grand Total** | 10 | | **12,00,000** |
| | | | | |

## 4.3. Details of Sales

| Details of sales (Per annum @100% capacity) | | | | | | |
|---|---|---|---|---|---|---|
| **Sl. No.** | **Type of products** | **Unit** | **Rate/Unit (Rs)** | **Quantity/day** | **Quantity/annum** | **Total (Rs)** |
| 1 | Shrimp (20-25 gm each) | Kg/Crop | 400 | 10,000 | 20,000 | 80,00,000 |
| **Total** | | | | **10,000** | **20,000** | **80,00,000** |

## 4.4. Project Balance Sheet

| Liabilities | I | II | III | IV | V | VI | VII |
|---|---|---|---|---|---|---|---|
| **Opening Capital** | **-** | **11,62,610** | **14,48,757** | **18,02,398** | **21,00,969** | **23,78,977** | **28,86,063** |
| Add: Introduced | 4,49,600 | | | | | | |
| Add: Profit | 11,90,010 | 12,52,147 | 15,56,641 | 16,99,571 | 18,64,008 | 24,32,086 | 25,87,085 |
| Less: Drawing | 4,77,000 | 9,66,000 | 12,03,000 | 14,01,000 | 15,86,000 | 19,25,000 | 21,90,000 |
| **Closing Capital** | **11,62,610** | **14,48,757** | **18,02,398** | **21,00,969** | **23,78,977** | **28,86,063** | **32,83,147** |
| Term Loan from Bank | 32,63,990 | 28,57,411 | 24,03,784 | 18,97,663 | 13,32,974 | 7,02,941 | - |
| **Current Liabilities** | | | | | | | |
| Cash Credit from Bank | 1,98,000 | 1,98,000 | 1,98,000 | 1,98,000 | 1,98,000 | 1,98,000 | 1,98,000 |
| Sundry Creditors | 1,70,667 | 1,90,400 | 2,11,733 | 2,22,333 | 2,33,467 | 2,72,400 | 2,86,067 |
| Expenses Payable | 1,57,900 | 1,69,300 | 1,81,500 | 1,90,500 | 2,00,100 | 2,18,600 | 2,29,800 |
| Current Provisions | 2,42,147 | 2,68,777 | 3,99,275 | 4,60,530 | 5,31,003 | 7,74,465 | 8,40,893 |
| **Total Current Liabilities** | **7,68,714** | **8,26,477** | **9,90,508** | **10,71,364** | **11,62,570** | **14,63,465** | **15,54,760** |
| **Total Liabilities** | **51,95,314** | **51,32,645** | **51,96,690** | **50,69,995** | **48,74,521** | **50,52,469** | **48,37,907** |
| **Assets** | | | | | | | |
| Fixed Assets | 40,30,520 | 40,30,520 | 40,30,520 | 40,30,520 | 40,30,520 | 40,30,520 | 40,30,520 |
| *Less* Depreciation | 4,77,203 | 8,94,213 | 12,58,920 | 15,78,145 | 18,57,788 | 21,02,956 | 23,18,073 |
| **Net Fixed Assets** | **35,53,317** | **31,36,307** | **27,71,600** | **24,52,375** | **21,72,732** | **19,27,564** | **17,12,447** |
| **Current Assets** | | | | | | | |
| Sundry Debtors | 2,13,400 | 3,57,000 | 3,96,900 | 4,16,800 | 4,37,600 | 5,10,600 | 5,36,100 |
| Inventories | 3,62,700 | 3,67,600 | 4,10,000 | 4,52,500 | 4,75,150 | 5,05,700 | 5,82,150 |
| Cash and Bank Balance | 42,700 | 71,400 | 79,400 | 83,400 | 87,600 | 1,02,200 | 1,07,300 |
| Other Current Assets | 10,23,197 | 12,00,339 | 15,38,790 | 16,64,921 | 17,01,439 | 20,06,404 | 18,99,910 |
| **Total Current Assets** | **16,41,997** | **19,96,339** | **24,25,090** | **26,17,621** | **27,01,789** | **31,24,904** | **31,25,460** |
| **Total Assets** | **51,95,314** | **51,32,645** | **51,96,690** | **50,69,995** | **48,74,521** | **50,52,469** | **48,37,907** |
| **Current Ratio** | **2.14** | **2.42** | **2.45** | **2.44** | **2.32** | **2.14** | **2.01** |

## 4.5. Calculation of Depreciation

| Rates of Depreciation | | 10% | 15% | Total depreciation for the year (Rs) |
|---|---|---|---|---|
| Year | 1 | 2,27,750.00 | 2,49,453 | 4,77,203 |
| | 2 | 2,04,975.00 | 2,12,035 | 4,17,010 |
| | 3 | 1,84,477.50 | 1,80,230 | 3,64,707 |
| | 4 | 1,66,029.75 | 1,53,195 | 3,19,225 |
| | 5 | 1,49,426.78 | 1,30,216 | 2,79,643 |
| | 6 | 1,34,484.10 | 1,10,684 | 2,45,168 |
| | 7 | 1,21,035.69 | 94,081 | 2,15,117 |

## 4.6. Projected P&L

| Description | Year ending March 31st | | | | | | |
|---|---|---|---|---|---|---|---|
| | I | II | III | IV | V | VI | VII |
| No of Working months | 12 | 12 | 12 | 12 | 12 | 12 | 12 |
| Capacity Utilisation | **80** | **85** | **90** | **90** | **90** | **100** | **100** |
| **Revenue** | | | | | | | |
| Sales | 64,00,000 | 71,40,000 | 79,38,000 | 83,35,000 | 87,52,000 | 1,02,11,000 | 1,07,22,000 |
| Opening Stock of Finished Goods | - | (3,20,000) | (3,57,000) | (3,96,900) | (4,16,750) | (4,37,600) | (5,10,550) |
| Closing Stock of Finished Goods | 3,20,000 | 3,57,000 | 3,96,900 | 4,16,750 | 4,37,600 | 5,10,550 | 5,36,100 |
| **Total Income (A)** | **67,20,000** | **71,77,000** | **79,77,900** | **83,54,850** | **87,72,850** | **1,02,83,950** | **1,07,47,550** |
| **Expenditure** | | | | | | | |
| Opening stock of Raw Material | **-** | **42,700** | **47,600** | **53,000** | **55,600** | **58,400** | **68,100** |
| Purchase ( Net) of Material | 25,60,000 | 28,56,000 | 31,76,000 | 33,35,000 | 35,02,000 | 40,86,000 | 42,91,000 |
| Closing Stock of Raw material | **42,700** | **47,600** | **53,000** | **55,600** | **58,400** | **68,100** | **71,600** |
| **Raw Material Consumption** | **25,17,300** | **28,51,100** | **31,70,600** | **33,32,400** | **34,99,200** | **40,76,300** | **42,87,500** |
| Repair & Maintenance-Machinery (@1% of Cost) | 39,405 | 41,400 | 43,500 | 45,700 | 48,000 | 50,400 | 53,000 |
| Electricity expense | 5,12,000 | 5,71,200 | 6,35,100 | 6,66,800 | 7,00,200 | 8,16,900 | 8,59,900 |
| Insurance cost | 15,000 | 15,800 | 16,600 | 17,500 | 18,400 | 19,400 | 20,400 |
| Administrative salaries and wages | 12,00,000 | 12,60,000 | 13,23,000 | 13,89,200 | 14,58,700 | 15,31,700 | 16,08,300 |

| Description | Year ending March 31st | | | | | | |
|---|---|---|---|---|---|---|---|
| | I | II | III | IV | V | VI | VII |
| No of Working months | 12 | 12 | 12 | 12 | 12 | 12 | 12 |
| Other Misc Expenses [@1% of sales] | 1,28,000 | 1,42,800 | 1,58,760 | 1,66,700 | 1,75,040 | 2,04,220 | 2,14,951 |
| **Total Cost** | **44,11,705** | **48,82,300** | **53,47,560** | **56,18,300** | **58,99,540** | **66,98,920** | **70,44,051** |
| **Profit Before Depreciation, Interest and Tax** | **23,08,295** | **22,94,700** | **26,30,340** | **27,36,550** | **28,73,310** | **35,85,030** | **37,03,499** |
| Depreciation | 4,77,203 | 4,17,010 | 3,64,707 | 3,19,225 | 2,79,643 | 2,45,168 | 2,15,117 |
| **Profit Before Interest and Tax** | **18,31,092** | **18,77,690** | **22,65,633** | **24,17,325** | **25,93,667** | **33,39,862** | **34,88,382** |
| Interest on Term Loan | 3,81,115 | 3,38,946 | 2,91,897 | 2,39,404 | 1,80,836 | 1,15,491 | 42,584 |
| Interest on Working Capital Loan | 17,820 | 17,820 | 17,820 | 17,820 | 17,820 | 17,820 | 17,820 |
| **Total Interest Paid** | **3,98,935** | **3,56,766** | **3,09,717** | **2,57,224** | **1,98,656** | **1,33,311** | **60,404** |
| **Profit Before Tax** | **14,32,157** | **15,20,924** | **19,55,916** | **21,60,101** | **23,95,011** | **32,06,551** | **34,27,978** |
| Income Tax | 2,42,147 | 2,68,777 | 3,99,275 | 4,60,530 | 5,31,003 | 7,74,465 | 8,40,893 |
| **Profit after Tax** | **11,90,010** | **12,52,147** | **15,56,641** | **16,99,571** | **18,64,008** | **24,32,086** | **25,87,085** |

## 4.7. Projected Cash Flow

| Period Ending: | I | II | III | IV | V | VI | VII |
|---|---|---|---|---|---|---|---|
| Cash & Bank Balance at Beginning | - | 42,700 | 71,400 | 79,400 | 83,400 | 87,600 | 1,02,200 |
| **Cash Inflow during the Period** | 56,99,917 | 17,26,920 | 20,85,379 | 20,99,652 | 22,34,857 | 29,78,149 | 29,99,991 |
| **Cash Outflow during the Period** | 56,57,217 | 16,98,220 | 20,77,379 | 20,95,652 | 22,30,657 | 29,63,549 | 29,94,891 |
| **Closing Cash & Bank Balance** | **42,700** | **71,400** | **79,400** | **83,400** | **87,600** | **1,02,200** | **1,07,300** |

## 4.8. Projected Loan Repayment

| Year | Interest | EMI | Principal |
|---|---|---|---|
| 1 | 3,81,114.83 | 7,45,524.58 | 3,64,409.75 |
| 2 | 3,38,945.76 | 7,45,524.58 | 4,06,578.82 |
| 3 | 2,91,896.94 | 7,45,524.58 | 4,53,627.64 |
| 4 | 2,39,403.67 | 7,45,524.58 | 5,06,120.91 |
| 5 | 1,80,835.95 | 7,45,524.58 | 5,64,688.63 |
| 6 | 1,15,490.84 | 7,45,524.58 | 6,30,033.74 |
| 7 | 42,584.07 | 7,45,524.58 | 7,02,940.51 |
| **Total** | **15,90,272.06** | **52,18,672.06** | **36,28,400.00** |

## 4.9. Calculation of DSCR, IRR and BEP

| Year | I | II | III | IV | V | VI | VII |
|---|---|---|---|---|---|---|---|
| Net Sales | 64,00,000 | 71,40,000 | 79,38,000 | 83,35,000 | 87,52,000 | 1,02,11,000 | 1,07,22,000 |
| Net Profit | 11,90,010 | 12,52,147 | 15,56,641 | 16,99,571 | 18,64,008 | 24,32,086 | 25,87,085 |
| Depreciation | 3,98,935 | 3,56,766 | 3,09,717 | 2,57,224 | 1,98,656 | 1,33,311 | 60,404 |
| **Cash Accruals (a)** | **15,88,945** | **16,08,913** | **18,66,358** | **19,56,795** | **20,62,664** | **25,65,397** | **26,47,489** |
| Principal | 3,64,410 | 4,06,579 | 4,53,628 | 5,06,121 | 5,64,689 | 6,30,034 | 7,02,941 |
| Interest | 3,98,935 | 3,56,766 | 3,09,717 | 2,57,224 | 1,98,656 | 1,33,311 | 60,404 |
| **Total (b)** | **7,63,345** | **7,63,345** | **7,63,345** | **7,63,345** | **7,63,345** | **7,63,345** | **7,63,345** |
| DSCR | 2.08 | 2.11 | 2.44 | 2.56 | 2.70 | 3.36 | 3.47 |
| **Average DSCR** | | | | **2.68** | | | |

| Calculation of Break-Even Point (BEP) | | | | | | | |
|---|---|---|---|---|---|---|---|
| Sales | **67,20,000** | **71,77,000** | **79,77,900** | **83,54,850** | **87,72,850** | **1,02,83,950** | **1,07,47,550** |
| Variable Cost | 26,45,300 | 29,93,900 | 33,29,360 | 34,99,100 | 36,74,240 | 42,80,520 | 45,02,451 |
| **Contribution** | **40,74,700** | **41,83,100** | **46,48,540** | **48,55,750** | **50,98,610** | **60,03,430** | **62,45,099** |
| Fixed Cost | 26,42,543 | 26,62,176 | 26,92,624 | 26,95,649 | 27,03,599 | 27,96,879 | 28,17,121 |
| **BEP Sales** | **43,58,085** | **45,67,530** | **46,21,126** | **46,38,159** | **46,51,908** | **47,91,088** | **48,48,145** |
| **Average BEP sales** | **46,39,434** | | | | | | |

| Calculation of Internal Rate of Return (IRR) | | | | |
|---|---|---|---|---|
| **Sl. No.** | **Year** | **PAT** | **Depreciation** | **Cash Accrual** |
| | Cash outflow at beginning | | | -42,76,000 |
| 1 | 31-03-2024 | 11,90,010 | 4,77,203 | 16,67,213 |
| 2 | 31-03-2025 | 12,52,147 | 4,17,010 | 16,69,157 |
| 3 | 31-03-2026 | 15,56,641 | 3,64,707 | 19,21,348 |
| 4 | 31-03-2027 | 16,99,571 | 3,19,225 | 20,18,796 |
| 5 | 31-03-2028 | 18,64,008 | 2,79,643 | 21,43,651 |
| 6 | 31-03-2029 | 24,32,086 | 2,45,168 | 26,77,254 |
| 7 | 31-03-2030 | 25,87,085 | 2,15,117 | 28,02,201 |
| **IRR** | **40.13%** | | | |
| **Payback Period** | **2 Years 6 Months** | | | |

## 4.10. Summary of Project Cost

| Sl. No. | Name of Assets | Amount (Rs) |
|---|---|---|
| 1 | Land Development | 90,000 |
| 2 | Civil Construction | 20,77,500 |
| 3 | Irrigation/Water Supply | 2,00,000 |
| 3 | Electrification | 7,00,000 |
| 4 | Plant & Machinery | 9,63,020 |
| 5 | Insurance | 15,000 |
| 7 | DPR Cost | 5,046 |
| 8 | Miscellaneous Expenditure | 5,434 |
| | **Total Fixed Cost** | **40,56,000** |
| | **Recurring** | **2,20,000** |
| | **Cost of Project** | **42,76,000** |

**2 Working Capital Requirement**

| | Heads of Expenses | Amount/year |
|---|---|---|
| A | Raw Material | 32,30,000 |
| B | Salary | 12,00,000 |
| C | Utilities | 5,12,000 |
| D | Other Expenses | 1,28,000 |
| | **Subtotal per year** | **50,70,000** |

**Working capital requirement** **2,20,000**