Pre-feasibility Study

DAIRY FARM (100 COWS) ENVIRONMENTALLY CONTROLLED HOUSING (ECH) SYSTEM

June 2023

"The figures and financial projections are approximate due to fluctuations in exchange rates, energy costs, and fuel prices etc. Users are advised to focus on understanding essential elements such as production processes and capacities, space, machinery, human resources, and raw material etc. requirements. Project investment, operating costs, andrevenues can change daily. For accurate financial calculations, utilize financial calculators on SMEDA's website and consult financial experts to stay current with market conditions."

Small and Medium Enterprises Development Authority
Ministry of Industries and Production
Government of Pakistan

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2. EXECUTIVE SUMMARY

This pre-feasibility study is based upon the business analysis of setting up a dairy farm where cows with proven pedigree[1] and genomics[2], hence having high genetic worth are kept primarily for milk production in dairy sheds constructed on Environmentally Controlled Housing (ECH) system. The dairy cows are fed Total Mixed Ration (TMR), which is a high energy and protein rich nutritionally balanced formulated feed. The cows are bred by pedigreed genetics (preferably sexed semen) through Artificial Insemination method to attain maximum genetic potential.

Dairy production is an all-inclusive activity, related to dairy animal housing and comfort, reproduction, feeding and farm management. It encompasses all aspects and activities related to raising dairy animals during various phases of life to get maximum productivity in terms of hygienic milk.

A dairy farm with 100 cows needs a total investment of approximately Rs. 186.64 million out of which, capital cost of the project is Rs. 183.81 million with working capital of Rs. 2.83 million. The project is assumed to be working on a 30:70 debt and equity ratio. It is assumed that starting from 100 animals in year 1, the herd will increase to approximately 1269 animals, out of which, 523 would be lactating cows of various age groups, 424 female calves and 322 heifers in 10th year of the project. The culling rate is assumed to be 20% per annum for adult cows below 7 years of age and 100% for cows above 7 years of age.

The Internal Rate of Return (IRR), Payback Period and Net Present Value (NPV) of the project, based upon stated assumptions, are 32%, 5.03 years and Rs. 156.35 million respectively. The farm will provide employment opportunity to 9 individuals initially which will increase to 35 at year 10, with the increase in size of the farm. The legal status of the project is proposed to be a sole proprietorship.

The project is proposed to be located in peri-urban areas around metropolitan cities like Karachi, Lahore, Islamabad, Faisalabad, Okara, Sahiwal, Sheikhupura, Sargodha, Multan, Bahawalpur, Hyderabad, Quetta, Ziarat, Peshawar etc. which are major markets of milk consumption. The rural and peri-urban areas around the major cities with abundant water and availability of feed make a better choice for farming; provided access to livestock markets and veterinary services is ensured. The milk may be sold at the farm gate or directly sold in the urban market.

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[1] *Pedigree: A registered record of sire (father) and dam (mother) of a cow for three generations.*
[2] *Genomic Selection: refers to selection decisions based on Genomic Estimated Breeding Values (GEBV). It allows farmers to identify genetically superior heifers at younger age through DNA test, hence an accurate GEBV is determined before they reach sexual maturity.*

Most critical considerations or factors for success of the project are background knowledge and related experience for application of Good Animal Husbandry Practices (GAHP), market / demand of milk, understanding of ECH dairy system, importance of feeding regimes for getting optimum results from good genetics, farm and labour management etc.

3. 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.

4. 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 setting up **Dairy Farm** with Environmentally Controlled Housing (ECH) system on commercial basis by providing them 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 it's successful management.

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

5. BRIEF DESCRIPTION OF PROJECT & PRODUCT

The proposed dairy farm will be established on owned land with shed constructed on Environmentally Controlled Housing (ECH) system. The farm will begin operations with 100 cows to achieve milk production of 766,500 litres in first year of the project. The initial capacity utilization of milk production for sales revenue is 75% increasing up to a maximum of 90%. Female calves will be raised on milk replacer for first three months of age. Upon weaning at 4th month of age, calves will be offered Total Mixed Ration (TMR) depending on their live body weights and different physiological phases of their productive life until culling.

Breeding of animals will be planned through 'Sexed-Semen Artificial Insemination' method allowing the farmer to breed their best animals giving 70% probability or chance to produce female calves, hence developing strong replacement heifers and future dairy herd with distinguished genomics.

Female calves will be given special attention and raised as 'Heifers' whereas male calves will be sold in the market around the age of two weeks. The milk will be sold primarily at farm gate to bulk buyers at the rate of Rs. 140 with 10% annual growth rate in selling price.

The subject business can be set-up at any appropriate location that ensures easy availability of feed, water and other related services. The development of urban or peri-urban commercial dairy farms is a relatively new concept in dairy production. Metropolitan cities like Lahore, Karachi, Multan, Rawalpindi and Faisalabad etc. are major markets of milk as dairy farms established around these cities fulfil their daily milk demand. There is a year-round market of milk, however, the demand increases in summer (April to November).

5.1 Dairy Farm Production Process

- Selection of dairy cattle breed such as Holstein Friesian with proven pedigree and high genetic worth from elite and renowned sires: Holstein cows are recognized by their distinctive color markings and outstanding milk production, having large body stature with typical color patterns of black & white or red & white. Holstein heifers can be bred at around 15 months of age as they gain 65% of their adult body weight (approx. 550 kgs). Gestation period of the animal is nine months with normal productive life of 6-7 years.

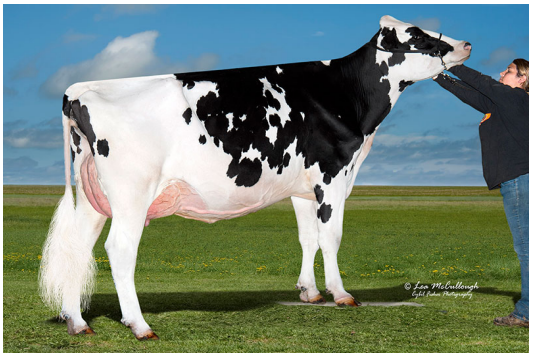

Figure 1: A typical Holstein Cow

- The pedigree and genetic worth of cows must be considered on top priority, i.e. proper pedigree paper and documentation containing all identifications and registrations of dairy cows by Holstein Aassociation from USA or EU. Pedigree is a document showing an animal's lineage, a record of their ancestry; a typical Holstein pedigree shows three generations - the animal itself, its sire and dam, along with their sires and dams. It may also list genetic and performance records for each animal, when applicable.

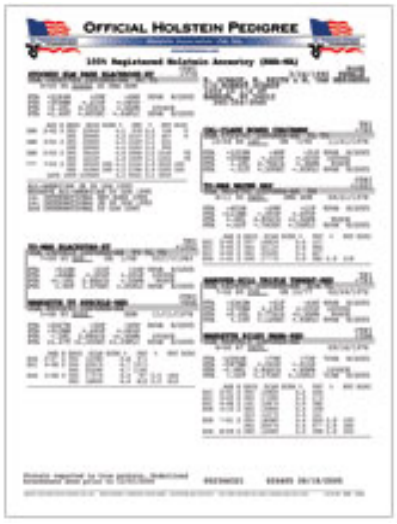

Figure 2: A typical Pedigree

The pedigree is very important as it can be useful to farmers and breeders in providing information about the cow's ancestors and thereby helping to predict how well that animal may perform later in life e.g. how much milk might be produced or how they will look in their body stature and conformation etc., based on the performance of their ancestors. Aside from providing owners and breeders with detailed information about their animals, official Holstein pedigrees also serve as a verified source of ancestry, performance and genetic information when selling animals, giving the buyer trusted documentation ensuring that information presented on the animal is accurate.

- Selection of animals with excellent body condition and udder health: average daily milk production of 35 litres or above for cows in first lactation, essentially with no disease history is desirable.

- Housing: Good housing leads to good management practices and ultimately optimum production. Generally, housing should be;

  I. Pre-engineered building
  II. Tunnel-type, ventilated, comfortable and dry with hygienic environment
  III. Designed with the probability of future expansion when required

  The housing should facilitate;

  - Easy drainage and removal of dung, urine and waste material
  - Apparent (or feels like) temperature not exceeding 27 °C
  - Minimum sun exposure: axis of length to be east to west
  - Availability of feed and water round the clock

- The Environmental Controlled Housing (ECH) system is a new and remarkable revolution in Pakistan's dairy sector by creating a self-sufficient temperature and humidity level in dairy house.

  Following are some of the features of this system which are quite different from traditional;

Figure 3: A typical ventilation system in ECH system

  - ✓ Concrete structure is preferred over steel with low roof height for easy maintenance and access.
  - ✓ Proper insulation to prevent heat from all sides. Optimum temperature of 26°C should be maintained inside the shed area. Temperature may be reduced up to 20°C at certain places if required.
  - ✓ Proper Heating, Ventilation & Air Conditioning Control (HVAC) designed and planned as per-engineering principles as such type of structure is designed to utilize minimum possible electricity. Electricity cost is much less than traditional fans barns as only 4 fans of 1.5 HP and 4 storm fans are used. Negative pressure fans utilize 18~20 fans of same capacity in the same size.
  - ✓ No gases, odor or smell inside the barn due to proper ventilation system, hence, animals are comfortable in cool breeze passing through them from all sides. In this way, the production efficiency of pedigreed Holstein cows

does not suffer in hot weather resulting in optimum productivity utilization in summers.

- ✓ May be self-sufficient if enery is produced from biogas produced from farmyard manure.
- ✓ The structure of the farm is designed in a way to allow natural flow of water resulting in minimum human efforts for cleanliness.
- ✓ There is limited need for extra lighting sources at the farm house in day light due to semi closed nature of the housing system.
- ✓ Electricity cost is markedly less than traditional fan barns.
- ✓ The animals should be dehorned, as they are easier to handle in barns, causing less accidental injuries to other animals and attendants.

- Feeding: The lactating Holstein cows are fed 1 kg of Dry Matter (DM) feed per 1.75 litres of milk produced. The ration allows nutritionally balanced feed in 24 hours. It includes dry matter derived from 60% roughages and 40% concentrate containing 17-18% Crude Protein (CP) and energy to increase animal productivity. This prefeasibility study suggests to offer cows with commercially prepared and formulated TMR to sustain the protein and energy levels required to maintain milk yields.
- Watering: Supply of clean drinking water in clean troughs i.e. 50 to 80 litres of water consumption per adult animal per day, round the clock, maintains milk production capacity of the animal.
- Breeding: Efficient and timely Artificial Insemination (AI) of good genetic worth preferably sexed-semen is a key to success in good breeding programs of herd.
- Calving: Pregnant animals should be given special attention in third trimester of pregnancy and should be separated in pregnancy pens. Veterinary assistance should be sought out in case of emergency. Calf care and heifer management is very important in maintaining dairy farm production. The farmer will raise female calves as future breeding heifers which will replace culled dairy animals. The first generation (F1) will be capable of breeding at age of 14 months; hence producing milk at about 23-24 months of age.
- Lactation Period: lactation period is the period during which animals yield milk after calving. The animals producing milk are called 'Wet Animals'. Generally standard lactation and dry period are taken as 305± 5 and 60 days respectively. This pre-feasibility study has taken 80% of the total number of animals as wet cows. The calving interval (interval between two calving) in Holstein cows is 12-14 months. The average daily milk yield of a cow is 35 litres.

- Udder health: Hygienic and clean milking three times a day (morning/afternoon/ evening) lowers chances of mastitis as udder health and hygiene is most important in dairy animals.
- Proper storage of milk should be done preferably at temperature of 4 ^{0}C.
- Disease management: Vaccination & medicine is required to prevent any disease outbreak in the dairy herd. Each animal will be vaccinated before entering the farm. Procurement of vvaccines from reliable sources should be sought.

  Following is a tentative vaccination schedule;

Table 1: Tentative Vaccination Schedule

Disease	Vaccine	Time for vaccination	Dose/ Administration
Foot & Mouth Disease	FMD	February/March & September/October	5 ml sub cut.
Black Quarter	BQ	March/April	5 ml sub cut.
Haemorrhagic Septicemia	HS	May/June & November/December	5 ml / 300 kg body wt. sub cut.
Anthrax	Anthrax	August	1 ml sub cut.
Brucella Abortus	BA	Once in life for heifers (4-12 months of age)	1ml sub cut.

- Record keeping: The animals should be ear-tagged with essential information of animal such as date of birth/ purchase. The records for daily milk yields, number of lactations, vaccination, body weight, Artificial Inseminations (AI), calving, vaccination and medication etc. are also important.
- Culling: Good productive animals should be selected and uneconomical animals should be culled. Low yielding culled animals may be sold in the regular livestock market. On an average, cows are productive for 7 to 8 years. The culling rate of 20% per annum in the total herd is desirable for a successful dairy farm. However, all cows above 7 years of age should be culled.
- Regular technical assistance from dairy and livestock professionals, experts and technical consultants is advised.

Returns on the proposed business and its profitability are highly dependent on the efficiency of above mentioned factors. In case a dairy farm is not able to attain its target milk production or implement effective husbandry practices, it will not be able to cover the potential market and recover payments; hence, cost of operating the business will increase.

5.2 Installed and Operational Capacities

In the proposed study, initially, 100 cows are recommended to obtain optimum milk production in first year of project. It is assumed that on average, 80 % of total animals present at farm would be 'Wet' i.e. in lactation on farm. The female calves born at farm will be added to the milking herd through heifer management; hence total number of animals to be 1269, among which, 523 animals will be in lactation, 424 female calves and 322 heifers in 10th year of project. The male calves will be sold in open market within two weeks of age. Average milk production of cows during one lactation period is estimated to be 11,000-12,000 litres. The dairy farm will have the capacity to generate revenues at 75% capacity utilization of total milk produced at farm i.e. 766,500 litres in its first year of operation.

The annual mortality rate is assumed to be 5% for new born calves, 1% for heifers and 1% for adult cows. The project will attain 90% of its installed capacity till 10th year of operations.

6. CRITICAL FACTORS

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

- Background knowledge and related experience of the entrepreneur in dairy farm operations.
- Application of good husbandry practices such as housing, breeding, feeding, watering, vaccination and medication to ensure animal's health and disease-free environment.
- Awareness about supply and demand of milk in the market as demand of milk is relatively higher in summer as compared to winter season.
- Efficient marketing of the project and bulk supply to wholesalers.

Commercial dairy farmers depend on land, labor and animals as the major resources. Modern dairy farming practices emphasize increased yet focused use of capital and management which harness all available resources for productive and profitable unit. The judicial use of resources to achieve clearly defined goals is the key success factor in modern dairy farming.

Low yield animals are uneconomical to keep; hence they should be culled efficiently as early as possible. Overall genetic improvement of dairy animals is necessary for improved milk production on farm hence, milking records of all lactating cows at equal intervals is very important.

The selection of best sources for continuous supply of sexed-semen from elite bulls for well-organized Artificial Insemination (AI) program is an essential part of herd improvement and planning a replacement heifer program at farm.

Feeding dairy animals on nutritionally balanced ration having high energy forages and good quality protein sources along with vitamin supplements should be adopted. Total Mixed Ration (TMR) serves best example of balanced ration for all types of phases in a cow's productive life.

The important farm management practices include feeding for growth, lactation, pregnancy or maintenance, hygienic milk production, comfortable and ventilated barns, temperature and relative humidity level maintenance in sheds during hot and humid summer months, timely detection of heat within 60-90 days after calving and AI service with sexed-semen. If animals are bred within the 60-90 days of calving, overall performance of herd can be improved.

Timely vaccination against mentioned diseases such as Rinder pest, Black Quarter, Foot and Mouth Disease, Brucellosis along with the prevention of mastitis and parasitic control will also improve overall performance of the dairy herd.

7. GEOGRAPHICAL POTENTIAL FOR INVESTMENT

Commercial dairy farming is a viable business proposition for peri-urban areas of Pakistan. There is higher demand for milk in peri urban areas around the major cities such as Karachi, Hyderabad, Sukkar Lahore, Faisalabad, Sheikhupura, Bahawalpur, Multan, Jhang, Sahiwal, Pakpattan, Okara, Jehlum, Peshawar, Charsadda, D.I. Khan, Quetta, etc. across the country; hence, the said project offers good investment opportunities for potential investment in all provinces of country. The peri-urban areas around major cities with abundant water and availability of fodder make a better choice for farming; provided there is ready access to livestock related marketing and veterinary services.

8. POTENTIAL TARGET CUSTOMERS / MARKETS

This pre-feasibility study suggests that milk will be sold at the farm gate directly to the consumers or milk contractors. It can also be sold directly to milk centers in the urban market or may be pasteurized at farm by the farmer and delivered to the nearest city, however it involves extra investment which is not included in this prefeasibility study. Milk contractors collect milk from farmers and deliver it to the consumer's doorstep. Milk collection networks of different processing companies also collect milk directly from the farm and transport it to the processing facilities.

Although metropolitan cities like Lahore, Sialkot, Kasur, Gujranwala, Bahawalpur, Okara, Quetta, D. I. Khan etc are considered major markets for the sale of milk, yet commercial dairy farming in peri-urban locations takes place around all major cities.

Following are some of the target clients for a dairy farmer;

- Domestic consumers
- Milk contractors and suppliers
- Milk collection and processing companies
- Dairy products manufacturing companies
- On-farm Processing by farmer (however, it requires minimum viable capacity of 40,000 liters of milk daily)

The cost of production per litre of raw milk should be lower than its sale price so that the farmer finds it economical. The daily milk intake of Lahore & Karachi is 3 million litres and 5 million litres respectively. The demand for milk increases during summers as consumption of whey (lassi) increases due to hot weather. Yogurt or curd is another popular product. These are high value products however with relatively short shelf life.

Milk processing companies use milk as a raw material to formulate different types of milk i.e. pasteurized milk, UHT treated milk, condensed milk, skim milk & milk powder, etc. Different value added products like ghee, khoya, yogurt, ice cream, butter and cheese are also prepared from raw milk. Processed milk market has increased its share in quality conscious consumers. Processed milk has achieved 4% share in Lahore milk market during the last two decades. Milk supply is increasing at the rate of 4% annually, however demand is increasing at 15% annually.

9. PROJECT COST SUMMARY

9.1 Project Economics

The financial model for this pre-feasibility study indicates estimated revenue of Rs. 80.48 million in first year of the project. The capacity utilization during year one is 75%, which will be increased to 90% as the project proceeds.

The following table shows Internal Rate of Return, payback period and Net Present Value of the proposed venture.

Table 1: Project Economics

Description	Details
Internal Rate of Return (IRR)	32%
Payback Period (Years.)	5.03
Net Present Value (Million Rs.)	156.35

9.2 Project Financing

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

Table 2: Project Financing

Description	Details
Total Equity (70%)	Rs. 130.64 M
Bank Loan (30%)	Rs. 56.0 M
Markup to the Borrower (% per annum)	26%
Tenure of the Project (Years)	10

9.3 Project Cost

Following fixed and working capital requirements have been identified for operations of the proposed business.

Table 3: Project Cost

Description	Cost (Rs.)
Capital Cost	
Land	20,089,331
Building and Infrastructure	34,436,000
Machinery and Equipment	28,240,000
Cows	99,750,000
Furniture & Fixture	301,520
Office Equipment	80,000
Office Vehicles	105,000
Pre-operating Cost	810,000
Total Capital Cost	**183,811,851**
Working Capital	
Raw Material Inventory	1,209,129
Cash	1,620,856
Total Working Capital	**2,829,985**
Total Project Cost	**186,641,836**

The proposed pre-feasibility is based on the assumption of 30% debt and 70% equity, however this composition can be changed as per requirements of the investor.

9.4 Space Requirement

Space requirement for the proposed dairy farm is calculated considering requirements for management office, sheds for cows, calves and dry animals, milk chiller rooms, storage, open paddocks etc.

Details of space requirement and cost related to land & building are given below;

Table 4: Space Requirment in Year 1

Description	Unit Area (Sq.ft.)	Est. Area (Sq.ft)	Unit Cost (Rs.)	Total Cost (Rs.)
Shed for Wet Cows	80	8,000	1,500	12,000,000
Open Paddock for Wet Cows	160	16,000	100	1,600,000
Shed for Dry Cows	80	8,000	1,250	10,000,000
Open Paddock for Dry Cows	160	16,000	100	1,600,000
Shed for Calves	40	4,000	1,250	5,000,000
Open Paddock for Calves	80	8,000	100	800,000
Stores (fodder, TMR & machines)		400	2500	1,000,000
Room (chillers, utensils & milk storage)		144	2,500	360,000
Residence (Manager)		120	4,000	480,000
Admin / Accounts Room		120	4,000	480,000
Washroom (Executives)		24	4,000	96,000
Rooms (Workers)		360	2,500	900,000
Washrooms (Workers)		48	2,500	120,000
Total Infrastructure		**61,216**		**34,436,000**

Total investment in building and infrastructure is approximately Rs. 34.44 million. Shed space has been increased with the increase in number of animals in the herd; hence an expansion is suggested in year 4, 7 and 9.

The housing of labor & management staff and room for chiller utensils and milk storage would be constructed on the first floor.

Land is to be purchased as per maximum space requirements of the farm for 10 years. Total land requirement is approximately 7 acres at an average price of Rs. 3 million per acre.

9.5 Machinery & Equipment Requirement

Following farm machinery and equipment are needed to run daily farm operations in year 1;

Table 5: Machinery & Equipment

Description	Quantity (Nos)	Unit Cost (Rs)	Total Cost Year 1 (Rs.)
Calf Feeder (New born calves)	43	4,000	172,000
Calf Cages	7	50,000	350,000
Cooling System: Cone Fans	4	150,000	600,000
Cooling System: Storm Fans	6 or 7	300,000	2,000,000
Cooling System Pads (6 Pads/cone fan)	24	3,000	72,000
Water Turbine (6" bore, 15HP Motor)	1	500,000	500,000
Milking Line (Buckets)	4	200,000	800,000
Transformer (100 KVA) Incl. price, wire, connection, installation	1	2,005,000	2,005,000
Generator (50 KVA) Hyundai	1	1,500, 000	1,500,000
Solar Energy System (75KW) on-grid	1	10,500,000	10,500,000
Solar Back up System (20KW)	1	8,000,000	8,000,000
Milk Chiller (3000 litres)	1	1,400,000	1,400,000
Milk Testing Machines	1	40,000	40,000
Velocity Meter	1	10,000	10,000
Surgery Kit	1	75,000	75,000
AI Equipment	1	50,000	50,000
Dystocia Kit	1	50,000	50,000
Energy Savers-Farm (50 W)	16	1,000	16,000
Miscellaneous	1	100,000	100,000
Total Machinery & Equipment			**28,240,000**

It is assumed that electricity infrastructure such as transformer of 100 KVA power along with connection, wires and installations are included. A 'Solar on Grid System' of 75KW with Net Metering facility is suggested in this pre-feasibility study. Cost of this system may vary according to selection of equipment (e.g., type of solar panel, type of batteries for backup or customized mounting structure). The solar energy system will produce an average 4 KWH /day which may vary due to

inappropriate system design, selection of solar panels, inverter and climate conditions.

In case of load shedding, solar backup system including 24 dry cell batteries with sufficient storage capacity (1600Ah, 2V) will operate to generate 20KW load (for essential equipment such s chiller, cooling system etc.) for 3 hours. Furthermore, a diesel generator set (50 KVA) is also suggested for emergency such as in the event of long duration load shedding, power break down or weather conditions affecting the efficiency of solar system.

9.6 Office Vehicle

Following office vehicle is needed for the farm;

Table 6: Office Vehicle

Description	No.	Cost / Unit (Rs.)	Total Cost (Rs.)
Motor Cycle	1	100,000	100,000
Registration fee*			5,000
Total cost			**105,000**

**5 % of office vehicles cost*

It is assumed that Rs. 20,000 per month will be spent on running of this vehicle in a radius of 50 km around farm premises i.e. Rs. 240,000 per annum. However, an additional expense of Rs. 25,000 per month will be required to cover long distance travelling expenses to carry out essential operations of farm, translating to an expense of Rs. 300,000 per annum.

9.7 Furniture & Fixtures Requirement

Details of furniture and fixtures required for the project are given below;

Table 7: Furniture & Fixture

Description	Quantity	Unit Cost (Rs.)	Total Cost (Rs.)
Tables	2	12,000	24,000
Chairs	4	5,000	20,000
Fans (75 W)	4	7,500	30,000
Electric Wiring & Lighting	Lump Sum	100,000	100,000
Energy Savers	6	350	2,100
Miscellaneous Furniture for Workers	1	125,000	125,000
Total Furniture & Fixtures			**301,100**

9.8 Office Equipment Requirement

Following office equipment will be required for the dairy farm;

Table 8: Office Equipmen			
Description	**Quantity**	**Unit Cost (Rs.)**	**Total Cost (Rs.)**
Computer	1	60,000	60,000
Cell Phone	1	20,000	20,000
Total			**80,000**

9.9 Human Resource Requirement

In order to run operations of the farm smoothly, following human resources along with number of employees and monthly salary are recommended;

Table 9: Human Resource Requirements in Year 1			
Description	**No. of Employees**	**Monthly Salary (Rs.)***	**Total Salary Year 1 (Rs)**
Farm Owner/ Manager	1	100,000	1,200,000
Farm Supervisor	1	35,000	420,000
Farm Labour (Cows)	4	25,000	1,200,000
Farm Labour (Calves)	2	25,000	600,000
Security Guard	1	25,000	300,000
Total	**9**		**3,720,000**

* Note: The salary growth is assumed to be 10% per annum.

It is recommended that the farm supervisor be categorized as 'NVQF Certificate Level-3 OR Level-4' having comprehensive practical and theoretical knowledge within dairy farming with the responsibility for supervision of various critical activities at farm related to improvement of farm productivity. He should also provide inputs to review and develop targets for sub-ordinate farm workers. (For further details on qualifications, please visit Pakistan National Vocational Qualifications Framework (NVQF), National Vocational and Technical Training Commission (NAVTTC), www.navttc.org).

9.10 Raw material Requirement

Following tables show raw material requirement for individual animal at different stages on the proposed dairy farm during first year of project;

Table 10: Daily Feeding Requirements (CP 17.5%) for One Wet Cow*

Description	Daily Feed Allowance (Kgs)	Rate Rs./ Kg.	Feed Cost (Rs./Day)	Milk Days (No.)	Total Cost (Rs./ Cow)
Total Mixed Ration (TMR)	21 (@ 3 % of Live BW)	74	1,554	305	473,970

**Average adult Live Body Weight (BW) of cow is assumed to be 700 kg. One lactation period of cow is estimated to be 305 +_ 5 days and dry period is 60 days.*

Table 11: Daily Feeding Requirements (CP 12%) for One Dry Cow*

Description	Daily Feed Allowance (Kgs)	Rate Rs./ Kg.	Feed Cost (Rs./Day)	Dry Days (No.)	Total Cost (Rs./ Cow)
Total Mixed Ration (TMR)	17.5 (@ 2.5 % of Live BW)	47	822.5	60	49,350

**Average adult Live Body Weight (BW) of cow is assumed to be 700 kg. One lactation period of cow is estimated to be 305 +_ 5 days and dry period is 60 days.*

Table12: Daily Feeding Requirements of One Female Calf (birth till One Year age)**

Description	Daily Feed Allowance	Rate Rs./ Kg	Feeding Days (No.)	Feed Cost (Rs./Day)	Total Cost in Year 1 (Rs./ Calf)
Milk Replacer (1-90 days age)	6 litres	80	90	480	43,200
TMR (4-12 months age)	8.25 Kgs (3 % of Live Body Wt.)	59.2	275	488.4	134,310
Total					**177,510**

***Average birth weight of the new born calf is 35-40 kgs. At the time of weaning at three months of age, it is 150 kgs which increases up to 400 kgs at the age of one year.*

Table13: Daily Feeding Requirements of One Heifer (One Year+ Age)***

Description	Feed Allowance (Kgs/ Day)	Rate (Rs./ Kg)	Days (No.)	Feed Cost (Rs./ Day)	Total Cost in (Rs./ Heifer)
TMR	16.5 (@3% of Live BW)	59.2	365	977.6	356,833

****Average Live body weight (BW) of heifer, older than one year is assumed to be 550 kgs.*

When planning on herd basis, following table shows the maximum expenses on nutritionally balanced feeding preferably Total Mixed Ration (TMR). The Crude Protein (CP) content of feed would vary depending upon wet and dry status of cows as well as live body weights.

Table14: Total Cost of Feeding (Year 1 & 2)

Description	Total Cost (Rs.)*****			
	No. of Animals	Year 1	No. of Animals	Year 2
Lactating Cows (80% of herd)	80	45,376,800	79	49,290,549
Dry Cows (20% of herd)	19	5,704,038	19	6,274,441
Female Calves Younger than 1 Yr (for 3 months of age)	67	2,872,800	62	2,963,822
Female Calves Younger than 1 Yr (for 4-12 months of age)		8,931,615		9,824,777
Heifers-Female calves older than 1 Yr age	0	0	63	24,776,300
Total	**166**	**62,885,253**	**223**	**93,129,889**

*****Prices are rounded off to near decimal point for 365 days of feeding. The number of animals are calculated after mortality count which is 5% in new born, 1 % in female calves older than one year and 1% in adult cows.*

Table15: Total Cost of Vaccination, Medication and AI in Year 1

Description	Rs./ Animal/ Year	Total Cost in Year 1 (Rs.)
Vaccination and Medication	1,000	162,175
Artificial Insemination (AI)	10,000	990,000
Total	**11,000**	**1,152,175**

9.11 Utilities and other costs

An essential cost to be borne by the project is the cost of electricity. The electricity expenses of the dairy farm will be met by solar energy system with back up system. One-time cost of transformer (100 KVA) including price, wires, connection and installation is Rs. 2,005,000 in first year of operation. The direct electricity cost is estimated to be around Rs. 18,000 per month during first year of operation

It is further assumed that within the cooling system, the cone fans and storm fans with water motor will operate for 12 hours per day. The milk chiller and energy savers will operate for 12 hours per day (average) throughout the year. The water turbine will operate for 2 hours daily (average). The milking line with buckets will operate for 6 hours daily (average) to carry out three milking sessions daily.

The project is supported with solar energy system of 75KW, with a back up system of 20 KW. In addition, a generator of 40 KW is also installed for back up support for smooth running of farm operations through out the year

Machinery maintenance expense is assumed to be Rs. 20,000 per month or Rs 240,000 in year one.

Monthly expenses related to long distance official travelling, communication and office vehicle running are Rs. 25,000, 15,000 and 20,000 respectively.

Similarly, monthly expenses related to business promotion and office routine tasks are Rs. 13,500 and Rs. 900 respectively. The administration expenses are Rs. 30,000 per month. Professional fees related to any legal, audit or technical consultation is assumed to be Rs. 3,500 per month.

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9.12 Revenue Generation

Based on capacity utilization of 75% for revenues from milk production from 100 cows, sales revenue during the first year of operations are shown in the following table. However, capacity has been increased at 10% for a maximum utilization of 90% till year 10.

Table16: Revenue Generation – Year 1

Description	Unit	Annual Production	Price (Rs./Unit)	Total Revenue in Year 1 (Rs.)
Sale of Milk	No. of Liters	766,500	140*	107,310,000
Sale of male calves	No.	26-27	10,000	270,750
Total				**107,580,750**
The annual culling rate is 20% applicable to all adult cows and heifers below 7 years of age. However, there will be zero culling of adult lactating cows during first and second year of the farm operation.				

10. CONTACT DETAILS

In order to facilitate potential investors, contact details of private sector Service Providers relevant to the proposed project are given hereunder.

10.1 Machinery Suppliers

Happy Cattle Dairy Farm Pvt. Ltd. Address: C-2 Building, 3rd Floor, D-Block Commercial Market, Valencia Town, Lahore. Ph: 0307-6664300, 0300-5553699
Profarm Pakistan Pvt. Ltd. Address: Plot No. 52, Block R-1, M. A. Johar Town, Lahore. Ph: 042 35291992-4 (3 lines) Customer Service (24/7): 0323-8888211
Dairy Solution Pvt. Ltd. Address: 177/B, Johar Town, Lahore. Ph: 042-35169450 +92-42-35169451 Fax: 042-35169449
Cattle Kit Pvt. Ltd. Pakistan Address: 104-A, Punjab Govt. Servants Housing Society, Mohlan Waal, Lahore Ph: 042-35978500-3 Email: Info@cattlekit.com.pk, Web: www.cattlekit.com.pk

10.2 Raw Material Suppliers

Feed Suppliers
Hi-Tech Feeds Pvt. Ltd. (for TMR) Address: 1-A, Shadman Chowk, Jail Road, Lahore. Ph: 042-37564503
Panjnad Feeds (TMR Supplier) Address: Head Office: 171 Shadman II, Lahore. Ph: 042-35961021-28
Maxim Agri Address: 7-B, Aziz Ave, Gulberg V, Lahore Ph: 0323-4007000
ICI Corporate Office Address: 63-Mozang Road, Lahore UAN: 042-111-100-200
Shareef Feeds Pvt. Ltd. Address: 7-A, New Muslim Town, Lahore. Ph: 04235758233-5
Dairy Lac Pvt. Ltd. Head Office: Plot No. 317, Road No. 5, Landhi Cattle Colony, Bin Qasim Town, Karachi Feed Mill: Chak 112, Wangay Wala Pull, Jaranwala, Faisalabad. Ph: 0334-3433333, 0300-8274874

National Feeds Pvt. Ltd. Address: 171- Shadman – II Lahore. Ph: 042 37551405-8
AI / Semen Suppliers
Ghazi Brothers Address: B-35 KDA Scheme No 1, Mian Muhammad Shah Road, Karachi. Ph: 021-4543579
World Wire Sires by Maxim International Pvt. Ltd. Address: 69-A, Sector-XX, Khayaban-e-Iqbal, DHA, Lahore. Ph: 042-35693993
DRDF/ Prime Genetics Pvt. Ltd. DHA Phase VIII, Lahore. Ph: 0344-4472155
Matra Asia Pvt. Ltd. Address: 4th Floor, Plazo 100, Block B-II, MM Alam Road, Gulberg III, Lahore. Ph: 042-35790031
Milk Contractors/ Processors
Engro Foods Pvt. Limited Address: 5th, 6th Floor, Harbor Front Building Marine Drive, Block 4, Clifton, Karachi. Ph: +92 21 3529-6000 (10 lines)
Nestle Pakistan Address: 308, Upper Mall, Lahore, Ph: 042-35757082-95, UAN +92-42-111637853
Millac Foods Address: 309-310, 3rd Floor, Beaumont Plaza, Beaumont Road, Civil Lines Quarters, Karachi. UAN: 092-111-MILLAC (645-522)
Adams Milk Foods Pvt. Ltd. Address: 128/1-M, Quaid-e-Azam Industrial Estate, Kot Lakpat, Lahore Ph: 042-35117104
Accha Foods Pvt. Ltd. Address: C-1, Main Boulevard, Green Forts 2, Canal Road, Lahore Ph: 042-35451076
Holstein Cow Suppliers
The pedigreed Holstein breed cows with average daily milk production capacity of 35 liters of EU and USA origin may be found from following sources; 1. Holstein Association USA (www.holsteinusa.com) 2. United States Livestock Exporters Association (USLEA) *(www.livestockexportersusadotcom.wordpress.com)*
Holstein Cow Local Suppliers
Happy Cattle Dairy Farm Pvt. Ltd. Address: C-2 Building, 3rd Floor, Block-D, Commercial Market, Valencia Town Lahore.

Ph: 0307-6664300, 0300-5553699

Bovi Tech
Address: Property # W-95-R-16/1, Sheikh Abdul Qadir Jillani (Outfall) Rd, Lahore.
Ph: 0310-0508485

HRM Dairies Pvt. Ltd.
Address: HRM Dairies, Arifwala, Pakpattan
Ph: 0313-5220980

10.3 Technical Experts / Consultants

Dr. Sami Ullah.
Farm Manger
Infinite Dairy Farm, Sargodha.
Ph: 0323-4360006, 0300-4360453

Dr. Nasir Javed
Consultant
Lead Foundation, West wood Colony, Lahore
Ph: 0300-8432595

Dr. Sattar
Farm manager
JK Dairies, RYK
Ph: 0300-8416682

Mr. Waqas Khan
Pak Dairies, Sargodha
Ph: 0303-4444909

Dr. Abid
Mk dairies, Kassowal, Chichawatni
Ph: 0345-7634947, 0303-7431450

10.4 Solar Solution Companies

Beams Energy
Address: Plot No. 1508, Murad Colony, Samundri Road, Coca Cola Factory, Faisalabad
Ph: 03478666861

Solaris Engineering:
Address: Plot No. 164, Block D2, Phase 1, Johor Town, Lahore
Ph: 0312 6606309

Zi Solar
Address: Mezanian Floor, Block D, FTC, Shahrah-e-Faisal, Karachi Cantt., Karachi
Ph: 03459440202

11. USEFUL WEB LINKS

Links of Federal & Provincial Government, Semi Government and other (sector & Cluster based) Development organizations are given under to get benefit from the services offered.

Table17: Useful Web Links

Small & Medium Enterprises Development Authority (SMEDA)	www.smeda.org.pk
Government of Pakistan	www.pakistan.gov.pk
Ministry of Industries & Production	www.moip.gov.pk
Ministry of National Food Security & Research	www.mnfsr.gov.pk
Government of Punjab	www.punjab.gov.pk
Government of Sindh	www.sindh.gov.pk
Government of Khyber Pakhtunkhwa	www.khyberpakhtunkhwa.gov.pk
Government of Balochistan	www.balochistan.gov.pk
Government of Gilgit Baltistan	www.gilgitbaltistan.gov.pk
Government of Azad Jamu Kashmir	www.ajk.gov.pk
Trade Development Authority of Pakistan (TDAP)	www.tdap.gov.pk
Security Commission of Pakistan (SECP)	www.secp.gov.pk
Federation of Pakistan Chambers of Commerce and Industry (FPCCI)	www.fpcci.com.pk
State Bank of Pakistan (SBP)	www.sbp.org.pk
Punjab Small Industries Corporation	www.psic.gop.pk
Sindh Small Industries Corporation	www.ssic.gos.pk
Punjab Board of Investment & Trade (PBIT)	www.pbit.gop.pk
Sindh Board of Investment (SBI)	www.sbi.gos.pk
Pakistan Agricultural Research Council (PARC)	www.parc.gov.pk
Balochistan Agricultural Research Centre (BARC)	www.parc.gov.pk
Southern-zone Agricultural Research Centre (SARC)	www.parc.gov.pk
Arid Zone Research Institute (AZRI)	www.parc.gov.pk
Punjab Livestock & Dairy Development Board	www.plddb.pk
University of Agriculture, Faisalabad,	www.uaf.edu.pk
Lasbela University of Agriculture, Water & Marine Sciences, Lasbela	www.luawms.edu.pk
Sindh Agriculture University, Tondojam	www.sau.edu.pk
Gomal College of Veterinary Sciences, Dera Ismail Khan	www.gu.edu.pk
KPK Agricultural University, Peshawar	www.aup.edu.pk
Pir Mehr Ali Shah Arid Agricultural University, Rawalpindi	www.uaar.edu.pk

University College of Veterinary & Animal Sciences, Islamia University Bahawalpur (IUB),	www.iub.edu.pk
University of Veterinary & Animal Sciences (UVAS), Lahore	www.uvas.edu.pk
Bahauddin Zakariya University (BZU), Multan	www.bzu.edu.pk
Animal Husbandry In-Service Training Institute (AHITI), Peshawar	
Veterinary Research Institute (VRI), Punjab	
Agribusiness Support Fund (ASF), Lahore,	www.asf.org.pk
Livestock and Dairy Development Department, Punjab	www.livestockpunjab.gov.pk
Livestock & Fisheries Department, Sindh	www.sindh.gov.pk
Agriculture & Livestock Department, KPK	www.khyberpakhtunkhwa.gov.pk
Livestock & Dairy Development, Balochistan	www.balochistan.gov.pk

12. ANNEXURES

12.1 Income Statement

Statement Summaries — **SMEDA**

Income Statement

Rs. in actuals

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Revenue	107,580,750	132,386,881	217,789,550	252,458,510	376,066,815	452,287,712	644,186,918	903,703,580	1,223,124,682	1,730,916,210
Cost of goods sold	66,644,143	98,328,498	127,150,506	167,493,815	228,742,570	282,248,001	403,579,449	542,344,583	760,008,165	1,025,410,470
Gross Profit	40,936,607	34,058,383	90,639,045	84,964,695	147,324,245	170,039,712	240,607,469	361,358,997	463,116,517	705,505,740
General administration & selling expenses										
Administration expense	1,500,000	1,646,042	1,806,303	1,982,167	2,175,154	2,386,930	2,619,325	2,874,346	3,154,196	3,461,293
Rental expense	-	-	-	-	-	-	-	-	-	-
Utilities expense	-	-	-	-	-	-	-	-	-	-
Travelling & Comm. expense (phone, fax, etc.)	480,000	528,000	580,800	638,880	702,768	773,045	850,349	935,384	1,028,923	1,131,815
Office vehicles running expense	240,000	264,000	290,400	319,440	351,384	386,522	425,175	467,692	514,461	565,907
Office expenses (stationary, etc.)	45,000	49,381	54,189	59,465	65,255	71,608	78,580	86,230	94,626	103,839
Promotional expense	215,162	264,774	435,579	504,917	752,134	904,575	1,288,374	1,807,407	2,446,249	3,461,832
Insurance expense	-	-	-	-	-	-	-	-	-	-
Professional fees (legal, audit, etc.)	53,790	66,193	108,895	126,229	188,033	226,144	322,093	451,852	611,562	865,458
Depreciation expense	4,594,452	4,594,452	4,630,752	4,664,027	10,407,532	10,447,794	10,598,377	18,301,443	18,483,648	27,875,097
Amortization expense	162,000	162,000	162,000	162,000	162,000	-	-	-	-	-
Property tax expense	-	-	-	-	-	-	-	-	-	-
Miscellaneous expense	-	-	-	-	-	-	-	-	-	-
Subtotal	7,290,404	7,574,843	8,068,918	8,457,126	14,804,259	15,196,619	16,182,273	24,924,355	26,333,666	37,465,242
Operating Income	33,646,203	26,483,541	82,570,127	76,507,569	132,519,985	154,843,093	224,425,196	336,434,642	436,782,850	668,040,498
Other income	-	-	-	-	-	-	-	-	-	-
Gain / (loss) on sale of assets	-	-	-	-	-	-	-	-	-	-
Earnings Before Interest & Taxes	33,646,203	26,483,541	82,570,127	76,507,569	132,519,985	154,843,093	224,425,196	336,434,642	436,782,850	668,040,498
Interest expense	14,309,609	13,793,054	13,285,686	12,629,490	14,782,314	13,601,681	12,074,727	12,980,974	10,347,143	6,940,719
Earnings Before Tax	19,336,595	12,690,487	69,284,440	63,878,079	117,737,671	141,241,412	212,350,469	323,453,668	426,435,708	661,099,779
Tax	5,997,807	3,671,670	23,479,553	21,587,327	40,438,184	48,664,494	73,552,664	112,438,783	148,482,497	230,614,922
NET PROFIT/(LOSS) AFTER TAX	13,338,787	9,018,817	45,804,887	42,290,752	77,299,487	92,576,919	138,797,806	211,014,885	277,953,211	430,484,857
Balance brought forward		6,669,394	7,844,105	26,824,496	69,115,248	73,207,368	82,892,143	221,689,949	432,704,834	710,658,044
Total profit available for appropriation	13,338,787	15,688,211	53,648,992	69,115,248	146,414,735	165,784,286	221,689,949	432,704,834	710,658,044	1,141,142,901
Dividend	6,669,394	7,844,105	26,824,496	-	73,207,368	82,892,143	-	-	-	-
Balance carried forward	6,669,394	7,844,105	26,824,496	69,115,248	73,207,368	82,892,143	221,689,949	432,704,834	710,658,044	1,141,142,901

12.2 Balance Sheet

Statement Summaries — **SMEDA**

Balance Sheet

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
Assets											
Current assets											
Cash & Bank	1,620,856	13,210,363	18,216,747	39,172,455	44,555,665	55,256,064	67,156,841	141,973,087	356,595,033	510,851,729	1,010,417,214
Accounts receivable	-	2,058,000	2,533,570	3,809,975	4,519,677	6,734,318	7,606,616	11,539,187	15,941,578	21,704,608	30,498,945
Finished goods inventory	-	-	-	-	-	-	-	-	-	-	-
Equipment spare part inventory	-	-	-	-	-	-	-	-	-	-	-
Raw material inventory	1,209,129	1,969,759	2,812,170	4,062,340	6,130,336	8,298,812	13,070,889	19,339,747	29,705,265	44,178,618	-
Pre-paid annual land lease	-	-	-	-	-	-	-	-	-	-	-
Pre-paid building rent	-	-	-	-	-	-	-	-	-	-	-
Pre-paid lease interest	-	-	-	-	-	-	-	-	-	-	-
Pre-paid insurance	-	-	-	-	-	-	-	-	-	-	-
Total Current Assets	2,829,985	17,238,122	23,562,487	47,044,771	55,205,677	70,289,195	87,834,346	172,852,022	402,241,875	576,734,955	1,040,916,159
Fixed assets											
Land	20,089,331	20,089,331	20,089,331	20,089,331	20,089,331	20,089,331	20,089,331	20,089,331	20,089,331	20,089,331	20,089,331
Building/Infrastructure	34,436,000	32,714,200	30,992,400	29,270,600	68,809,800	65,024,950	61,240,100	112,373,641	105,842,871	165,763,355	155,910,023
Animals	99,750,000	89,276,250	144,617,550	180,576,385	257,654,699	356,146,270	448,658,938	644,065,637	873,986,227	1,230,859,723	1,666,900,939
Machinery & equipment	28,240,000	25,416,000	22,955,000	20,427,450	54,338,421	48,167,019	43,058,553	85,865,144	75,965,173	124,749,804	106,776,691
Furniture & fixtures	301,520	271,368	241,216	211,064	180,912	150,760	120,608	90,456	60,304	30,152	-
Office vehicles	105,000	94,500	84,000	73,500	63,000	52,500	42,000	31,500	21,000	10,500	-
Office equipment	80,000	72,000	64,000	56,000	48,000	40,000	32,000	24,000	16,000	8,000	-
Total Fixed Assets	183,001,851	167,933,649	219,043,497	250,704,331	401,184,164	489,670,830	573,241,530	862,539,709	1,075,980,906	1,541,510,865	1,949,676,985
Intangible assets											
Pre-operation costs	810,000	648,000	486,000	324,000	162,000	-	-	-	-	-	-
Legal, licensing, & training costs	-	-	-	-	-	-	-	-	-	-	-
Total Intangible Assets	810,000	648,000	486,000	324,000	162,000	-	-	-	-	-	-
TOTAL ASSETS	186,641,836	185,819,771	243,091,984	298,073,101	456,551,841	559,960,024	661,075,876	1,035,391,731	1,478,222,781	2,118,245,820	2,990,593,144
Liabilities & Shareholders' Equity											
Current liabilities											
Accounts payable	-	5,168,651	7,654,511	9,933,429	13,043,234	17,892,606	22,016,526	31,527,326	42,401,853	59,210,968	80,051,425
Export re-finance facility	-	-	-	-	-	-	-	-	-	-	-
Short term debt	-	-	-	-	-	-	-	-	-	-	-
Other liabilities	-	-	-	-	-	-	-	-	-	-	-
Total Current Liabilities	-	5,168,651	7,654,511	9,933,429	13,043,234	17,892,606	22,016,526	31,527,326	42,401,853	59,210,968	80,051,425
Other liabilities											
Lease payable	-	-	-	-	-	-	-	-	-	-	-
Deferred tax	-	-	-	-	-	-	-	-	-	-	-
Long term debt	55,992,551	53,806,191	52,076,532	49,839,506	58,614,210	54,589,332	49,383,820	53,851,259	44,872,308	33,259,525	18,240,318
Total Long Term Liabilities	55,992,551	53,806,191	52,076,532	49,839,506	58,614,210	54,589,332	49,383,820	53,851,259	44,872,308	33,259,525	18,240,318
Shareholders' equity											
Paid-up capital	130,649,285	130,649,285	130,649,285	130,649,285	157,874,449	157,874,449	157,874,449	184,007,560	184,007,560	184,007,560	184,007,560
Gain / Loss on Net value of Animals	-	(10,473,750)	44,867,550	80,826,385	157,904,699	256,396,270	348,908,938	544,315,637	774,236,227	1,131,109,723	1,567,150,939
Retained earnings	-	6,669,394	7,844,105	26,824,496	69,115,248	73,207,368	82,892,143	221,689,949	432,704,834	710,658,044	1,141,142,901
Total Equity	130,649,285	126,844,929	183,360,941	238,300,167	384,894,396	487,478,086	589,675,530	950,013,146	1,390,948,620	2,025,775,327	2,892,301,400
TOTAL CAPITAL AND LIABILITI	186,641,836	185,819,771	243,091,984	298,073,101	456,551,841	559,960,024	661,075,876	1,035,391,731	1,478,222,781	2,118,245,820	2,990,593,144

Note: Total assets value will differ from project cost due to first installment of leases paid at the start of year 0

12.3 Cash Flow Statement

Statement Summaries — **SMEDA**

Cash Flow Statement

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
Operating activities											
Net profit	-	13,338,787	9,018,817	45,804,887	42,290,752	77,299,487	92,576,919	138,797,806	211,014,885	277,953,211	430,484,857
Add: depreciation expense	-	4,594,452	4,594,452	4,630,752	4,664,027	10,407,532	10,447,794	10,598,377	18,301,443	18,483,648	27,875,097
amortization expense	-	162,000	162,000	162,000	162,000	162,000	-	-	-	-	-
Deferred income tax	-	-	-	-	-	-	-	-	-	-	-
Accounts receivable	-	(2,058,000)	(475,570)	(1,276,406)	(709,701)	(2,214,642)	(872,298)	(3,932,571)	(4,402,391)	(5,763,031)	(8,794,337)
Finished good inventory	-	-	-	-	-	-	-	-	-	-	-
Equipment inventory	-	-	-	-	-	-	-	-	-	-	-
Raw material inventory	(1,209,129)	(760,630)	(842,412)	(1,250,170)	(2,067,995)	(2,168,477)	(4,772,077)	(6,268,859)	(10,365,517)	(14,473,353)	44,178,618
Pre-paid building rent	-	-	-	-	-	-	-	-	-	-	-
Pre-paid lease interest	-	-	-	-	-	-	-	-	-	-	-
Advance insurance premium	-	-	-	-	-	-	-	-	-	-	-
Accounts payable	-	5,168,651	2,485,861	2,278,918	3,109,805	4,849,372	4,123,920	9,510,800	10,874,527	16,809,115	20,840,457
Other liabilities	-	-	-	-	-	-	-	-	-	-	-
Cash provided by operations	(1,209,129)	20,445,260	14,943,148	50,349,981	47,448,887	88,335,273	101,504,259	148,705,553	225,422,947	293,009,590	514,584,692
Financing activities											
Change in long term debt	55,992,551	(2,186,360)	(1,729,659)	(2,237,027)	8,774,705	(4,024,878)	(5,205,512)	4,467,439	(8,978,951)	(11,612,783)	(15,019,207)
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	130,649,285	-	-	-	27,225,163	-	-	26,133,111	-	-	-
Purchase of (treasury) shares	-	-	-	-	-	-	-	-	-	-	-
Cash provided by / (used for) financing	186,641,836	(2,186,360)	(1,729,659)	(2,237,027)	35,999,868	(4,024,878)	(5,205,512)	30,600,550	(8,978,951)	(11,612,783)	(15,019,207)
Investing activities											
Capital expenditure	(183,811,851)	-	(363,000)	(332,750)	(78,065,546)	(402,628)	(1,505,827)	(104,489,857)	(1,822,050)	(127,140,111)	-
Acquisitions	-	-	-	-	-	-	-	-	-	-	-
Cash (used for) / provided by investing	(183,811,851)	-	(363,000)	(332,750)	(78,065,546)	(402,628)	(1,505,827)	(104,489,857)	(1,822,050)	(127,140,111)	-
NET CASH	1,620,856	18,258,900	12,850,490	47,780,204	5,383,210	83,907,767	94,792,920	74,816,247	214,621,945	154,256,696	499,565,485
Cash balance brought forward		1,620,856	13,210,363	18,216,747	39,172,455	44,555,665	55,256,064	67,156,841	141,973,087	356,595,033	510,851,729
Cash available for appropriation	1,620,856	19,879,757	26,060,853	65,996,951	44,555,665	128,463,431	150,048,984	141,973,087	356,595,033	510,851,729	1,010,417,214
Dividend	-	6,669,394	7,844,105	26,824,496	-	73,207,368	82,892,143	-	-	-	-
Cash carried forward	1,620,856	13,210,363	18,216,747	39,172,455	44,555,665	55,256,064	67,156,841	141,973,087	356,595,033	510,851,729	1,010,417,214

13. KEY ASSUMPTIONS

13.1 Operating Cost Assumptions

Description	Unit	Details
Machinery Maintenance	Rs./ Month	20,000
Office vehicle running expenses	Rs./ Month	20,000
Total Administration Expense	Rs./ Month	30,000
Travelling Expense	Rs./ Month	25,000
Office Expenses (entertainment, janitorial, stationery etc.)	Rs./ Month	900
Communication Expenses	Rs./Month	15,000
Promotional Expenses	Rs./ Month	13,500
Professional Fee	Rs./ Month	3,500

13.2 Production Cost Assumptions

Description	Unit	Details
Annual Installed Capacity	No. of Cows	100
Initial Capacity Utilization	%	75
Maximum Production Capacity Utilization	%	90
Total Milk Production (One Lactation Cycle)	Litres/ Cow	12,000
Birth Ratio of Female: Male Calves	Ratio	70:30
Avg. Lactation Period (Individual Cow)	No. of Days	305±5
Avg. Dry Period (Individual Cow)	No. of Days	60
Purchase Price of Pregnant Cow (As of June 2023)	Rs./ Cow	997,500
Cost of Artificial Insemination (AI)	Rs/Cow/ Yr.	20,000
Cost of Vaccination & Medication	Rs./Animal/Yr.	1,000
Mortality- New Born Calves	% of Total Calves/ Yr	5
Mortality - Adult Cows	% of Total Cows/Yr.	1
Mortality- Heifers (Age 1 Year+)	% of Total Heifers/ Yr.	1
Shed Space per Cow	Sq. ft. per Cow	80
Open Paddock Space per Cow	Sq. ft. per Cow	160

13.3 Revenue Assumptions

Description	Unit	Details
Total Milk Production on Farm	No. of Liters/ Yr	766,500
Sale Price of Milk (Farm Gate)	Rs./ Litre	140
Sale Price Growth Rate	% per Annum	10
Capacity Utilization	%	75
Maximum Capacity	%	90

13.4 Financial Assumptions

Description	Unit	Details
Debt: Equity Ratio	Ratio	70:30
Interest Rate	% per Annum	12
Debt Tenure	Years	10

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