

# Pre-Feasibility Study

## Dairy Farm (100 Cows)

### Environmentally Controlled Housing (ECH) System



## Small and Medium Enterprises Development Authority

### Ministry of Industries & Production

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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

This pre-feasibility study is based upon the business analysis of setting up a dairy farm where cows with proven pedigree and high genetic worth are kept primarily for milk production in an Environmentally Controlled Housing (ECH) system. The animals are fed Total Mixed Ration (TMR), which is a high energy and protein rich nutritionally balanced formulated feed. The cows are bred by proven pedigreed genetics through the Artificial Insemination method to attain maximum genetic potential ('Net Merit' in terms of profits).

Dairy production is an all-inclusive activity, related to dairy animal care, reproduction, feeding and 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. 70.55 million out of which, capital cost of the project is Rs. 68.55 million with working capital of Rs. 1.99 million. The project is assumed to be working on a 50:50 debt and equity ratio. It is assumed that starting from 100 animals in year 1, the herd of animals will increase to approximately 446 animals, out of which, 236 would be lactating cows in 10<sup>th</sup> year of the project. The culling rate is assumed to be 15% per annum.

The Internal Rate of Return (IRR), Payback Period and Net Present Value (NPV) of the project, based upon stated assumptions, are 35%, 4.55 years and Rs. 108.90 million respectively. The farm will provide employment opportunity to 9 individuals initially which will increase to 20 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. The rural and peri-urban areas around the major cities with abundant water and availability of fodder 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.

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 purpose built shed constructed on Environmentally Controlled Housing (ECH) system. The farm will begin operations with 100 cows to achieve milk production of 838,040 litres in first year of the project. The initial capacity utilization of milk production for sales revenue is 80% increasing up to a maximum of 95%. Female calves will be raised on milk replacer for first three months of age. Upon weaning at 4<sup>th</sup> month of age, calves will be offered Total Mixed Ration (TMR) for the rest of their productive life. Breeding of animals will be planned through 'Artificial Insemination' method. Female calves will be given special attention and raised as 'Heifers' whereas male calves are to be sold in the market around the age of one month. The milk will be primarily sold to bulk buyers at the rate of Rs. 60 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/ superior 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 live body weight). Gestation period of the animal is nine months with normal productive life of 4-5 years.

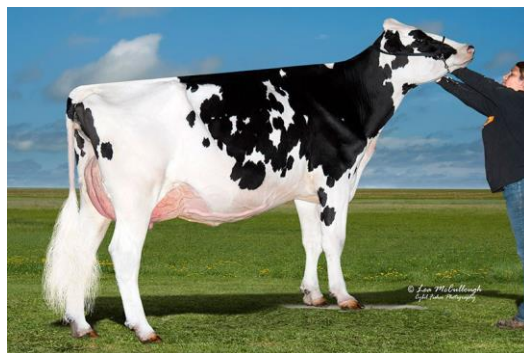


Figure 1: A typical Holstein Cow

- 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 Association 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. 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.
- 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) Dairy Farm is a new and remarkable revolution in Pakistan's dairy sector by creating a self-sufficient temperature in dairy house. Following are some of the features of this system which are quite different from traditional dairy housing;



Figure 3: A typical ventilation system in ECH system

- ✓ Concrete structure is preferred over steel with low roof height for easy maintenance and access.
    - ü 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 are used. Negative pressure fans utilize 18~20 fans of same capacity in the same size.
    - ü 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.
  - ✓ Self-sufficient to produce coal free electricity from manure of cows.
    - ü 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 with 60% concentrate and 40% roughages containing 16% Crude Protein (CP) and energy to increase animal



Figure 4: A Typical TMR wagon



productivity. It is better to use Total Mixed Ration (TMR) wagon for feeding the cows.

- **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 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 proposed 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 period is taken as  $305 \pm 5$  days. This pre-feasibility study has taken 50-65% 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  $4^{\circ}\text{C}$ .
- **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 vaccines 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 information of animal such as breed, age, date of birth/ purchase, number of lactations, vaccination etc. The records for daily milk yields, 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 15% per annum in the total herd is desirable for a successful dairy farm.
- 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, 60-65 % of total animals present at farm would be 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 446, among which, 236 animals will be in lactation in 10<sup>th</sup> year of project. The male calves will be sold in open market. Average milk production of cows during one lactation period is estimated to be 12,000 litres. The dairy farm will have the capacity to generate revenues at 80% capacity utilization of total milk produced at farm i.e. 834,040 litres in its first year of operation.

The annual mortality rate is assumed to be 7% for newborn calves, 3% for heifers and 2% for adult cows. The project will operate at 100% of its installed capacity from the first 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 timely feeding, watering and vaccination 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 use of capital and management. Successful dairy farming harnesses all available resources for productive and profitable unit. Dairy farming is highly complex as it includes breeding, management, feeding, housing, disease control and hygienic production of milk on farm. The judicious use of means and resources to achieve clearly defined goals is the key success factor in modern dairy farming i.e. the art of maximization and optimal utilization of resources and means for maximizing productivity and profits.

Low yield animals are uneconomical to keep; hence they should be culled as early and efficiently as possible. Overall genetic improvement of all dairy animals is necessary for improved milk production. It involves milking records at equal intervals, selection of semen from progeny-tested bulls from high producing dams (mothers) and then making its extensive use in well-organized Artificial Insemination (AI) program.

Feeding dairy animals on nutritious and high yielding hybrid varieties of forages can be adopted. Surplus forage should be preserved as silage or hay.

Other farm management practices include feeding for growth, lactation, pregnancy or maintenance, hygienic milk production, comfortable and ventilated barns, spraying of animals in summer, timely detection of heat and AI service. If animals are bred within the 60-90 days of calving provided, overall performance of herd can be improved.

Timely vaccination against mentioned diseases such as Rinderpest, 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, Sakkar Lahore, Faisalabad, Sheikhpura, 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.

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

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.

After gaining independence in 1971, **Bangladesh's agriculture sector emerged as the backbone of the nation's economy**. In its early years, agriculture accounted for around **60% of the Gross Domestic Product (GDP)** and provided livelihood and employment to the majority of the population. It played a crucial role in ensuring food security, reducing poverty, and stabilizing the economy. Over the decades, while agriculture's direct contribution to GDP has declined significantly, it remains a vital sector. By **2010**, agriculture's GDP contribution dropped to **17%**, and further to **12.6%** in **2020**. This decline reflects the structural transformation of the economy as the industrial and service sectors expanded.

## Population Growth and Its Impacts

From **147.6 million in 2010 to 164.7 million in 2020**, Bangladesh's population has grown rapidly. This increase puts immense pressure on agricultural resources, as the availability of arable land decreases while the demand for food rises. Despite these challenges, the sector has shown remarkable **resilience in profitability and productivity**, adapting to modern techniques and strategies.

### Role of Agriculture in Poverty Reduction and Food Security

Agriculture continues to play a central role in alleviating poverty and ensuring food security in Bangladesh. With about **40% of the labor force** engaged in agriculture, it provides a livelihood for rural communities and sustains millions of households. The production of essential food grains, particularly rice and wheat, has increased due to advancements in **high-yield crop varieties** and government support.

- **Rice production:** With efforts by institutions like the **Bangladesh Rice Research Institute (BRRI)**, rice varieties adapted to drought, flood, and salinity have significantly boosted production, ensuring food availability.
- **Self-sufficiency in livestock and vegetables:** Bangladesh has achieved remarkable milestones, such as producing vegetables domestically that were once imported and meeting livestock demand during festivals like **Qurbani**.

## Challenges Faced by the Agriculture Sector

While the sector has achieved many successes, several challenges persist:

- **Climate Change:** Rising temperatures, erratic rainfall, and increasing salinity have disrupted traditional farming methods, threatening productivity.
- **Urbanization:** The expansion of urban areas reduces arable land and shifts labor away from farming to industrial and service jobs.

- **Economic Vulnerabilities:** Farmers often struggle with fluctuating market prices and lack access to fair pricing mechanisms for their produce.

## Technological Advancements and Modernization

Despite these challenges, Bangladesh has embraced modernization in agriculture:

- **Mechanization:** Tractors, combine harvesters, and automated irrigation systems are increasingly being adopted.
- **ICT Integration:** Farmers use mobile apps and online platforms to access market prices, weather forecasts, and expert advice.
- **Innovative Research:** Institutions like **BARI (Bangladesh Agricultural Research Institute)** and **BINA (Bangladesh Institute of Nuclear Agriculture)** have developed climate-resilient seeds and advanced farming techniques.

## Economic Contributions of Sub-Sectors

Over time, the scope of agriculture has broadened, with sub-sectors becoming significant contributors:

1. **Livestock and Poultry:** These sub-sectors are now major sources of income and employment, driven by commercial farming.
2. **Fisheries:** Bangladesh is a leading producer of freshwater fish, supporting domestic consumption and export.
3. **Horticulture:** High-value fruits and vegetables are increasingly cultivated, with demand from local markets, restaurants, and export-oriented industries.

## Government Policies and Support

The government has been instrumental in driving growth in the agriculture sector:

- **Subsidies:** Fertilizer and irrigation subsidies have made farming affordable for small-scale farmers.
- **Infrastructure Development:** Initiatives like the establishment of **seed banks**, improved irrigation systems, and rural agricultural training centers have empowered farmers.

## Future Outlook

Looking ahead, agriculture will remain crucial for Bangladesh's sustainable development. Strategies to enhance its contribution include:

- Promoting **sustainable practices** like conservation agriculture and organic farming.

- Increasing investments in **climate-smart technologies** and mechanization.
- Ensuring fair market prices through improved supply chains and cooperative farming models.
- With continued innovation and policy support, Bangladesh's agriculture sector is poised to remain a cornerstone of its economy, contributing to both national growth and global food security.

In **2007-2008**, international organizations forecasted widespread food riots in Bangladesh, driven by rising global food prices and local shortages. However, Bangladesh defied these grim predictions, demonstrating remarkable resilience and adaptability. Through strategic government interventions, agricultural advancements, and the unwavering efforts of farmers, the country not only overcame the crisis but emerged stronger. A similar scenario unfolded during the **COVID-19 pandemic**, where agriculture once again played a pivotal role in supporting the nation. While industries and services faced disruptions, the agricultural sector sustained food supplies, employment, and economic stability, proving its indispensable role in Bangladesh's economy.

## Population Pressure and Agricultural Land Shrinkage

Bangladesh, one of the world's most densely populated countries, had a population density of **1,239.7 people per square kilometer** in 2018. Rapid population growth has exerted immense pressure on limited agricultural land, leading to its steady reduction. Despite this challenge, the sector has adapted through innovative practices, increasing productivity to meet growing demands.

## Transition from Mainstream Farming to Diversification

The hallmark of a modern economy lies in its shift toward industrial and service sectors, and Bangladesh has mirrored this global trend. Over the years, the contribution of mainstream farming to GDP has declined as rural populations migrated to cities in search of better opportunities. The **service and industry sectors** have integrated with agriculture, transforming it into a more diversified and robust contributor to the economy.

### Emergence of Sub-Sectors

While traditional farming's GDP share decreased, sub-sectors such as fisheries, poultry, livestock, and dairy witnessed significant growth. These sub-sectors evolved from small-scale operations to commercially viable enterprises led by **youth and progressive women entrepreneurs**. The transformation marked a shift from subsistence farming to business-oriented agriculture, contributing to economic diversification and employment.



- **Food Grain Production:** The development of high-yield rice varieties, supported by research from institutions like **BRRI**, has fueled a significant increase in food grain production.
- **Fisheries and Poultry:** These sectors have become key sources of nutrition, employment, and export revenue.
- **Livestock and Dairy:** Growing demand for milk and meat has turned livestock farming into a thriving industry.
- **Horticulture:** High-value fruits and vegetables have gained prominence, supported by export demand and domestic consumption.

## Value Addition and Agro-Industries

In addition to primary farming, the **value addition** of agricultural products has emerged as a significant economic driver. Companies like **PRAN** and **ACI** have leveraged agro-processing to boost productivity and expand exports. Small-scale agro-industries, ranging from food processing to packaging, have also played a crucial role in enhancing the value chain.

The rise of agro-industrial enterprises has created a **synergistic relationship between agriculture and the service sector**, fostering economic growth and providing employment opportunities. Value-added products like processed fruits, dairy items, and packaged food grains not only meet domestic needs but also contribute to export earnings.

## Agriculture as a Model for Self-Reliant Growth

Bangladesh's agriculture sector exemplifies a self-reliant growth model that has become a global inspiration. Despite facing land constraints, population pressure, and external shocks, the country has consistently adapted and innovated. The integration of modern techniques, diversification into sub-sectors, and emphasis on value addition have positioned agriculture as a key pillar of sustainable development.

This evolution underscores the resilience and ingenuity of Bangladesh's agricultural landscape, which continues to balance traditional practices with modern advancements, ensuring food security and economic prosperity for its people.

Former Finance Minister Abul Maal Abdul Muhith used to say that, including the service and industry engaged with the farming sector, the GDP contribution of it is nearly 40 percent. Agricultural production value has increased at 3.54 percent per year in the last two decades (1999-2019). The sector remains the main source of employment, as I have mentioned

earlier, providing livelihood to 40 percent of the labour force. Thus, agriculture remains the largest sector in terms of employment.

The other indirect contribution of agriculture is to provide basic raw materials for industrial processing. Immediately, jute comes to mind as an example of a product of the agro-processing industry. And at present, many agro-processing industries are fully dependent on agriculture for basic raw materials which include rice milling, sugar, tea, fruit juice, spices, etc. In the FY2020-21, the total production of grains was 455.05 lakh (45.505 million) metric tonnes, potato 106.13 lakh (10.61 million) metric tonnes, pulses 9.39 lakh metric (0.94 million) tonnes, onion 33.62 lakh (3.36 million) metric tonnes and jute 6.25 lakh (0.62 million) bales. BRRI (Bangladesh Rice Research Institute) must be credited for the grain production which has been quite remarkable. Alongside the production, the research didn't stop for a day and with responsibility, it moved ahead with the support of BARI (Bangladeshi Agricultural Research Institute). How can I not mention BINA (Bangladesh Institute of Nuclear Agriculture) as they are primarily mandated to make peaceful use of nuclear and advanced techniques to boost agricultural production and develop technologies that are environment-friendly as well as sustainable. Once upon a time, we used to import capsicum and today we're growing it here on our soil.

Now, the five-star hotels and many restaurants around the country collect foreign vegetables from inside the country, which is saving a lot of foreign currencies and many people are employed through producing such crops.

The same goes with the Qurbani season. We used to import livestock but today we're meeting this demand with our own efforts. Father of the Nation, Bangabandhu Sheikh Mujibur Rahman initiated subsidy support in farming, especially fertilisers, in his policy planning to ensure food security. It is still being followed. The infrastructure Bangabandhu built for seeds, irrigation and agricultural extension has helped us a lot. This is a huge service sector today. Most importantly BADC (Bangladesh Agricultural Development Corporation) has worked well with the high yielding variety seed, that is why Bangladesh is experiencing such crop diversity with huge productions. The question comes in, did the lifestyle or standard of the people involved with farming change? I would say, the farming sector has individually employed more than 40.6 percent people still, directly or indirectly. Previously, farmers were really poor, but today, their fates have changed with their relentless labour and definitely with quality seed support. The change has taken place because they are getting more production because of the seeds and more money than in the past. It means farmers' buying capacity has also increased. They can now feed themselves and their families, send their children to school. However, the question still rises: what is the quality of food they are

eating? What is the quality of clothes they are wearing? What is the quality of education their children are receiving? We have to bring these issues into focus. If only they could get a fair price for their produce, they could have good quality life, food and clothing. The media has also played a vital role in bringing out the real facts and figures and the causes and prospects of farming and farmers over nearly 50 years. Today, with the help of mass media and also digital media platforms, a lot of farmers can share, exchange and learn from the experts and replicate the best examples or learn about the new trends and crisis in farming.

Another aspect is the three driving forces of our economy, i.e., farming, RMG and remittance—in all these sectors, the sons and daughters of farmers are working. And they're sending money to their parents in the villages. And this money is being invested in farming, either at small scale or in large scale farming initiatives. This has not only strengthened our economy but has empowered the youth, especially the women. Moreover, agricultural tourism has opened a new door for us. I have seen in many European countries and USA the concept of the family farm. In Bangladesh, young entrepreneurs have started wonderful eco-resorts across the country and people from around Bangladesh are going to these beautiful places where they can come close to nature. There are many resorts very near to Dhaka even where you would find resorts being built, keeping the farming environment in mind so that the visitors can go and enjoy the rural setting. During the past decade, there have been so many resorts built in this manner and concept, which is really a positive approach

Climate change is a big challenge, which we have to face with the facilitation of new agricultural technologies and adaptability. Farmers have to be provided with technologies based on their local climate change scenarios. We must come up with new seeds based on salinity and other adversities. We can't make anyone a climate refugee, rather we must try to make their life accommodating with the given changes. We must follow global adaptation technology and concentrate more on new examples of climate adaptability which fit our settings. More emphasis on agricultural mechanisation and ICT in farming should be given. This will help us to fight climate change. In the same way, we should also focus on the weather-based index, crop insurance which will ensure real empowerment of farmers and will make them more resilient. We have to make sure that new technologies of the sub-sectors of farming are being adopted and used skilfully. The challenge of the government would be to ensure that these new technologies reach the farmers, as well as the subsidies.

As the prices of the fertilisers increased across the world, the amount of subsidy has now gone up to Tk 22,000 crore (USD 2569 million). If the prices increase further, then how would the government manage equality among farmers and industries? How would they make up the fiscal gap? The course curriculum of higher studies in agriculture should be organised keeping in mind the fourth industrial revolution (4IR). Those who would train the students and farm-level officers must be able to get global-standard training (ToT) so that

they can properly teach others. After completion of studies, I am sure this new generation of students could work more effectively in the field and assist the farmers with easy and handy solutions, with help of the best and most advanced technologies with government support. We must give importance to all the components of the fourth industrial revolution. Since building a "Digital Economy" is a must for implementing Prime Minister Sheikh Hasina's Vision 2041, Sheikh Hasina Institute for Frontier Technologies and hi-tech parks are being set up to develop the next generation with skills to face the 4IR. We must build our skilled human resources to handle these initiatives.

Explaining the importance of agribusinesses is like [explaining the importance of water](#),” states Jay Whitehead of consultancy the AgriBusiness Group. To back up his point, the World Bank reports that [agriculture alone employs 26.5% of the world’s workforce](#).

However, [agribusiness](#) entails much more than just agriculture – it is the entire value chain. It

is easy to just think of [agribusiness as the farm](#), but it is the whole chain and all the supporting services: consultants, fertilisers, transport companies and so on, explains

Whitehead.

According to data from the World Trade Organisation, in 2018 [agriculture exports accounted for an average of 17%](#) of total merchandise exports across 94 countries around the world. In countries such as [New Zealand](#), this figure goes up to 72.6%.

The Food and Agriculture Organisation (FAO) of the UN underlines the [importance of agribusiness through the following factors](#):

- It is often the main source of off-farm employment in rural areas of poor countries.
- It has positive effects on poverty reduction and [women’s empowerment](#) in countries where high-value agri-food exports are produced.
- It creates off-farm employment opportunities in agro-industrial companies located in rural areas, improving the income of rural households through wage employment and spillover effects that can increase on-farm agricultural productivity through greater liquidity to purchase inputs and increased capacity to adopt technologies.

- It helps to forge the necessary link between the agriculture and manufacturing sectors, which in turn can catalyse the development of broader [manufacturing](#) industries by providing material inputs for [food processing](#), [textiles](#) and [biofuels](#).

What is more, the world's population is expected to grow by about 25.9% in the next 30 years, reaching 9.7 billion in 2050, according to the UN.

Population growth adds pressure to reaching UN Sustainable Development Goal (SDG) number two – [achieving zero hunger by 2030](#). According to data from the FAO, [8.9% of the world population in 2019 was undernourished](#), and that is projected to increase to 9.8% by 2030. That equates to 841.4 million people without access to proper nutrition.

#### How consumer preferences shape agribusiness

An increase in the world's population will have a clear effect on [food systems](#), but the rise in urbanisation is also a defining factor. However, the shift from rural to urban population is expected to be concentrated in a few countries. The 2018 Revision of World Urbanisation Prospects produced by the population division of the UN Department of Economic and Social

Affairs predicted that [35% of the projected growth of the world's urban population](#) between

2018 and 2050 will take place in [India](#), [China](#) and [Nigeria](#) alone.

These changes come with shifts in dietary preferences. FAO Investment Centre senior economist James Tefft explains that this is starting to take place in [sub-Saharan Africa](#) and in parts of [South Asia](#).

“From the consumer side, there is a trend that moves away from a diet that has a [large percentage consumed on cereals](#),” he says. “Consumers are looking to diversify their diets, they are [adding proteins](#), they are adding more fresh fruits and vegetables, a lot of fats.” Sub-

Saharan Africa, [the Middle East and North Africa](#), and South Asia [have seen a steep increase in food production](#), as the World Bank's Food Production Index shows.

However, it is not only a matter of boosting food production. Tefft says there must also be efficient food systems and high-performing agribusinesses, and it is vital that these systems are more sustainable and resilient.

### Challenges facing agribusiness

As Whitehead states, the importance of agribusiness is clear to see, but it comes with its own set of challenges. As the world population increases and climate change looms, a report on the future of food and agriculture by the FAO identified ten [challenges the food and agriculture industry is facing](#):

- Sustainably improving agricultural productivity to meet the increasing demand.
- Ensuring a sustainable natural resource base.
- Addressing climate change and the intensification of natural hazards.
- Eradicating extreme poverty and reducing inequality.
- Ending hunger and all forms of malnutrition.
- Making food systems more efficient, inclusive and resilient.
- Improving income-earning opportunities in rural areas and addressing the root causes of migration.
- Building resilience to protracted crises, disasters and conflicts.
- Preventing transboundary and emerging agriculture and food system threats.
- Addressing the need for coherent and effective national and international governance. According to a study in the journal *Science*, the food supply chain is responsible for [approximately 26% of greenhouse gas emissions](#).

Rob Vos, director of the markets, trade and institutions division at the International Food Policy Research Institute, explains that climate change is going to be the main threat to food systems, and a game changer as adjustments to the food sector are made to both help halt [climate change](#) and adapt to the impacts that are already taking place.

“We already see a lot of impacts from climate change – more droughts, [more intense natural disasters](#)... that is affecting agriculture around the world, in different ways, but above all in developing countries,” he says. “This also happens because the agriculture there is much less resilient against the impact of climate change.”

Tefft adds that in addition to its role in making food systems efficient and sustainable, the importance of agribusiness is also linked to job creation.

“When you start looking across broader economic development, what agribusiness does is not just to do with agriculture or primary production, it also addresses the industrial aspects of the economy,” says Tefft. “And so in that way, it is addressing the jobs agenda, because when we have functional agribusinesses, there is job creation.”

In the context of sub-Saharan Africa, job creation ties in with value addition to agricultural products. Tefft explains that Africa is increasingly moving on from not just producing the raw products, but adding value to them. This links to the shifts in consumer preferences and the rise in urbanisation, and in the particular case of sub-Saharan Africa, local systems are not offering the more convenient, more nutritious products that are often being provided by imports.

To the challenges facing agribusiness cited above, 2022 has come with the added issue of [the Russian invasion of Ukraine](#). The problems for agribusiness stem from the fact that both [Russia and Ukraine are large global agricultural producers](#). This is coming combined with a [globally widespread cost-of-living crisis](#) that the conflict – coupled with the ongoing effects of the [Covid-19 pandemic](#) – has triggered across the world.



The role of FDI in agribusiness

Using a database developed by Dealogic of cross-border mergers and acquisitions (M&A), one of [the types of foreign direct investment \(FDI\)](#), Jibran J Punthakey analysed the role of FDI and [trade in agro-food global value chains](#) (GVCs) in an OECD paper.

Spanning a period of 21 years, from 1997 to 2017, Punthakey's study found evidence "of a positive and significant link between FDI and indicators of participation and domestic value-added creation in agro-food GVCs", which suggests that FDI is a key instrument for "stimulating productivity and the capacity of downstream industries to export".

In 2016, the UN Conference on Trade and Development in its [Global Investments Prospects Assessment 2016–18](#) identified agriculture, food and beverages, and utilities as the most promising industries for attracting FDI in developing and transition regions.

In Punthakey's analysis of cross-border M&A activity, North America, the EU-28 and Asia led cross-border investment in agriculture, with North America and the EU-28 accounting for 50% of outward FDI to the agricultural sector, while Asia (including China) was responsible for 35% of outward FDI to agriculture by deal value, and 32% of the total number of deals. When it comes to [FDI in food](#), [western Europe](#) was the leading region in 2021 – as well as in 2020 – according to our [FDI Projects Database](#), with Asia-Pacific in second place.

Country-wise, the [US](#) was the country that attracted the most projects in 2021, followed by [Germany](#) and the UK. At the same time, the US was also the top source country of FDI in food in 2021, followed again by Germany, while the Netherlands was in third place. The importance of agribusiness is clear, give the world's basic need to eat, but beyond these primary functions it is also vital for [job creation](#) in developing countries and it plays an important role in securing a more sustainable future.

Climate change and its repercussions are affecting developing countries the most, along with [food systems that do not have high levels of resilience to climate events](#). Agribusinesses are a crucial tool in managing the effects of global warming and helping to achieve the [UN's Sustainable Development Goals](#).

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. 52.97 million in first year of the project. The capacity utilization during year one is 100%, which will remain the same throughout the life of the project.

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)	35%
Payback Period (yrs.)	4.55
Net Present Value (Million Rs.)	108.90

### 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 (50%)	Rs. 35.27 M
Bank Loan (50%)	Rs. 35.27 M

Markup to the Borrower (%age / annum)	12%
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.)
<b>Capital Cost</b>	
Land	6,878,992
Building and infrastructure	17,230,938
Machinery and Equipment	3,523,900
Cows	40,000,000
Furniture & Fixture	228,900
Office Equipment	63,000
Office Vehicles	63,000
Pre-operating Cost	559,000
<b>Total Capital Cost</b>	<b>68,547,730</b>
<b>Working Capital</b>	
Raw Material Inventory	1,099,321
Upfront Insurance Payment	179,345
Cash	721,166
<b>Total Working Capital</b>	<b>1,999,832</b>
<b>Total Project Cost</b>	<b>70,547,562</b>

The proposed pre-feasibility is based on the assumption of 50% debt and 50% 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 Requirement**

Description	Estimated Area (Sq.ft)	Unit Cost (Rs.)	Total Cost (Rs.)
Shed for Wet Cows	8,000	1,000	8,000,000
Open Paddock for Wet Cows	16,000	10	160,000
Shed for Dry Cows	8,000	500	4,000,000
Open Paddock for Dry Cows	16,000	10	160,000
Shed for Calves	4,000	500	2,000,000
Open Paddock for Calves	8,000	10	80,000
Stores (fodder, concentrate & machines)	400	700	280,000
Room (chillers, utensils & milk storage)	144	1,000	144,000
Silage Bunker (sq.ft.)	3,422	500	1,710,938
Residence (Manager)	120	1,500	180,000
Admin / Accounts Room	120	1,000	120,000
Washroom (Executives)	24	2,000	48,000
Rooms (Workers)	300	1,000	300,000
Washrooms (Workers)	48	1,000	48,000
<b>Total Infrastructure</b>	<b>64,578</b>		<b>17,230,938</b>

Total investment in building and infrastructure is approximately Rs. 17.23 million in year 1. Shed space has been increased with the increase in number of animals in the herd; hence an expansion is suggested in year 4.

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 3 acres at an average price of Rs. 2 million per acre.

## 9.5 Machinery & Equipment Requirement

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

**Table 5: Machinery & Equipment**

Description	Quantity (Nos)	Unit Cost (Rs)	Total Cost (Rs.)
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Calf Feeder (New born calves)	12	1,200	14,400
Calf Cages	17	12,000	204,000
Cooling System	1	750,000	750,000
Water Turbine	1	350,000	350,000
Milking Line	6	150,000	900,000
Generator (50 KVA)	1	300,000	300,000
Milk Chiller (5,000 litres)	1	800,000	800,000
Milk Testing Machines	1	20,000	20,000
Velocity Meter	1	1,500	1,500
Surgery Kit	1	10,000	10,000
AI Equipment	1	50,000	50,000
Dystocia Kit	1	20,000	20,000
Energy Savers-Farm	10	400	4,000
Miscellaneous	1	100,000	100,000
<b>Total Machinery &amp; Equipment</b>			<b>3,523,900</b>

It is assumed that electricity infrastructure and installations along with a transformer are already available, hence calculations do not include these costs.

## 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	60,000	60,000
Registration fee*			3,000
<b>Total cost</b>			<b>63,000</b>

\*5 % of office vehicles cost

It is assumed that Rs. 5,000 per month will be required to cover travelling expenses in order to carry out essential operations of the farm, translating to an expense of Rs.60,000 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	10,000	20,000
Chairs	4	3,000	12,000
Fans (75 W)	4	4,000	16,000
Energy Savers	6	150	900
Miscellaneous Furniture for Workers	1	100,000	100,000
Air Conditioner (2 ton split)	1	80,000	80,000
<b>Total Furniture &amp; Fixtures</b>			<b>228,900</b>

**9.8 Office Equipment Requirement**

Following office equipment will be required for the dairy farm;

**Table 8: Office Equipment**

Description	Quantity	Unit Cost (Rs.)	Total Cost (Rs.)
Computer	1	60,000	60,000
Cell Phone	1	3,000	3,000
<b>Total</b>			<b>63,000</b>

**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 Requirement**

Description	No. of Employees	Monthly Salary (Rs.)	Total Salary Year 1 (Rs)
Owner/ Farm Manager	1	50,000	600,000
Farm Supervisor	1	25,000	300,000
Farm Labour	6	13,000	936,000
Security Guard	1	15,000	180,000
<b>Total</b>	<b>9</b>		<b>2,016,000</b>

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 (NAVTTTC), [www.navttc.org](http://www.navttc.org) ).

### 9.10 Raw material Requirement

Following tables show raw material requirement to run the proposed dairy farm in first year of production;

**Table 10: Daily Feeding Requirements for one Cow\* in Year 1**

Description	Daily Feed Allowance (Kgs)	Rate Rs./ Kg.	Daily Feed Cost (Rs.)	Total Cost in Year 1 (Rs./ Cow)
Total Mixed Ration (TMR)	24.5 (@ 3.5 % of Live BW)	30	735	268,275

\*Average adult Live Body Weight (BW) of cow is assumed to be 700 kg with 35 liters of daily milk production for one lactation. For the calculation purpose, the total milk production of 12,000 litres in one lactation period is distributed in 365 days. One lactation period of Holstein Friesian cow is estimated to be 305 +\_ 5 days.



**Table 11: Daily Feeding Requirements of One Female Calf\*\* (from birth till one year of age) in year 1**

Description	Daily Feed Allowance (Kgs)	Rate Rs./ Kg	Daily Feed Cost (Rs.)	Total Cost in Year 1 (Rs./ Calf)
Milk Replacer (First 3 months of age per calf)	6 litres	40	240	21,600
TMR (from 4 <sup>th</sup> to 12 <sup>th</sup> months of age)	8.3 (@ 3 % of live BW)	30	248	68,062.5
<b>Total</b>				<b>89,662.5</b>

\*\*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.

**Table 12: Daily Feeding Requirements of One Heifer (Older than 1 year)\*\*\* in year 2**

Description	Daily Feed Allowance (Kgs)	Rate (Rs./ Kg)	Daily Feed Cost (Rs.)	Total Cost in year 1 (Rs./ Heifer)
TMR	16.5 (@3% of Live BW)	30	495	180,675

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

**Table 13: Total Cost of Feeding in Year 1 and 2**

Description	Total Cost (Rs.)****			
	No. of Animals	Year 1	No. of Animals	Year 2
Lactating Cows	82	21,998,550	68	20,084,676
Female Calves (younger than one year)	44	4,258,969	36	4,384,302
Heifers (Female calves older than one year)	-		33	8,779,450
<b>Total</b>	<b>126</b>	<b>26,257,519</b>	<b>137</b>	<b>33,248,428</b>

\*\*\*\*Prices are rounded off to near decimal point for 365 days of feeding. The number of animals are calculated after mortality count which is 7% in new born, 3 % in female calves older than one year and 2% in adult cows.

**Table 14: Total Cost of Vaccination, Medication and AI in Year 1**

Description	Rs./ animal	Total Cost in year 1 (Rs.)
Vaccination and Medication	1,000	126,175
Artificial Insemination (AI)	5,000	410,000
<b>Total</b>	<b>6,000</b>	<b>536,175</b>

### 9.11 Utilities and other costs

An essential cost to be borne by the project is the cost of electricity. Direct electricity expenses of the dairy farm are estimated to be approximately Rs. 115,179 per month i.e. Rs. 1,382,147 annually. The type of electricity connection is Industrial B-1 Category and one time connection charges are Rs. 35,000. It is further assumed that within the cooling system, the cone exhaust 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 will operate for 7 hours daily (average) to carry out three milking sessions daily for a herd of 100 cows.

The indirect or regular electricity expense for management building and staff residence is assumed to be approximately Rs. 5,000 per month or Rs. 60,000 in year one of the project.

The fuel cost (diesel) for running generator set in case of absence of electricity is assumed at an average 4 hours daily; for a monthly expense of Rs. 42,600 or Rs. 511,200 annually in first year of operations.

Machinery maintenance expense is assumed to be Rs. 10,000 per month or Rs 120,000 in year one.

Monthly expenses related to travelling, communication and office vehicle running are Rs. 5,000, 3000 and 2,000 respectively.

Similarly, monthly expenses related to business promotion and office routine tasks are Rs. 8,830 and Rs. 1,950 respectively. Professional fees related to any legal, audit or technical consultation is assumed to be Rs. 4,415 per month.

Insurance of equipment, machinery and office vehicle is assumed to be 5% of total cost, which is Rs. 14,946 per month in first year of operations.

## 9.12 Revenue Generation

Based on capacity utilization of 80% 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 5% for a maximum utilization of 95%.

**Table 15: Revenue Generation – Year 1**

Description	Unit	Annual Production	Price (Rs./Unit)	Total Revenue in Year 1 (Rs.)
Sale of Milk	No. of Liters	838,040	60*	50,282,400
Sale of male calves	No.	44	10,000	441,750
Sale of culled cows	No.	15	150,000	2,250,000
<b>Total</b>				<b>52,974,150</b>
The annual culling rate is 15% applicable to all animals in the herd.				

## 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

#### **Profarm Pakistan Pvt. Ltd.**

Plot No. 52, Block R-1,

M. A. Johar Town, Lahore, Pakistan.

T: +92 (0)42 35291992-4 (3 lines), F: +92 (0)42 35291995

E: [info@profarm.com.pk](mailto:info@profarm.com.pk), Customer Service (24/7): +92 323 8888 211

#### **Dairy Solution Pvt. Ltd.**

177/B- Johar Town, Lahore

Ph: +92-42-35169450 +92-42-35169451

Fax +92-042-35169449

#### **Cattle Kit Pvt. Ltd. Pakistan**

104-A, Punjab Government Servants Housing Society Near Mohlan Waal, Lahore Ph: +92 (042) 35978500-3

Email: [Info@cattlekit.com.pk](mailto:Info@cattlekit.com.pk)

Web: [www.cattlekit.com.pk](http://www.cattlekit.com.pk)

## 10.2 Raw Material Suppliers

### Feed Suppliers

Hi-Tech Feeds Pvt. Ltd.

1-A, Shadman Chowk, Jail Road, Lahore. Ph: 042-37564503

Shareef Feeds Pvt. Ltd.

7-A, New Muslim Town, Lahore. Ph: 04235758233-5

National Feeds Pvt. Ltd.

171- Shadman – II Lahore. Ph: 042 37551405-8

Anmol Vanda

c/o Livestock and Dairy Development Department, Govt. of Punjab,

16-Cooper Road, Lahore

Free Landline: 0800-78685, 0800-78686

Big Feed Pvt. Ltd.

2-A, Ahmad Block, New Garden Town, Lahore. Ph: 042-35835374-35835373

### AI / Semen Suppliers

Ghazi Brothers

B-35 KDA Scheme No 1,

Mian Muhammad Shah Road, Karachi. Ph: 021-4543579

World Wire Sires by Maxim International Pvt. Ltd.

69-A, Sector-XX, Khayaban-e-Iqbal, DHA, Lahore.

Ph: 042-35693993

Altaf & Co.,

Altaf & Co Plaza, 16/1, Out Fall Road, Lahore. Ph: 042-35763411-4

### Milk Contractors/ Processors

Engro Foods Pvt. Limited

5th, 6th Floor, Harbor Front Building Marine Drive, Block 4, Clifton,

Karachi. Ph: +92 21 3529-6000 (10 lines)

Nestle Pakistan  
308, Upper Mall, Lahore,  
Ph: 042-35757082-95, UAN +92-42-111637853

### 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](http://www.holsteinusa.com))
2. United States Livestock Exporters Association (USLEA)  
([www.livestockexportersusadotcom.wordpress.com](http://www.livestockexportersusadotcom.wordpress.com))
3. Veepro Netherland ([www.veepro.nl](http://www.veepro.nl))
4. Mr. Berg, Berg Exports, Netherlands ([info@bergexport.nl](mailto:info@bergexport.nl))
5. Mrs. Karin, Ugerup Cattle Exports Sweden ([Karin@ugerup.mu](mailto:Karin@ugerup.mu))
6. Mr. Johan, Hun land Exports from Holland ([www.hunland.com](http://www.hunland.com))
7. Mrs. Renee, Strickland Global, USA ([www.stricklandglobal.com](http://www.stricklandglobal.com))

### 10.3 Technical Experts / Consultants

Dr. Sami Ullah.  
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## 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.

**Table 16: Useful Web Links**

Small & Medium Enterprises Development Authority (SMEDA)	<a href="http://www.smeda.org.pk">www.smeda.org.pk</a>
Government of Pakistan	<a href="http://www.pakistan.gov.pk">www.pakistan.gov.pk</a>
Ministry of Industries & Production	<a href="http://www.moip.gov.pk">www.moip.gov.pk</a>
Ministry of National Food Security & Research	<a href="http://www.mnfsr.gov.pk">www.mnfsr.gov.pk</a>
Government of Punjab	<a href="http://www.punjab.gov.pk">www.punjab.gov.pk</a>
Government of Sindh	<a href="http://www.sindh.gov.pk">www.sindh.gov.pk</a>
Government of Khyber Pakhtunkhwa	<a href="http://www.khyberpakhtunkhwa.gov.pk">www.khyberpakhtunkhwa.gov.pk</a>
Government of Balochistan	<a href="http://www.balochistan.gov.pk">www.balochistan.gov.pk</a>
Government of Gilgit Baltistan	<a href="http://www.gilgitbaltistan.gov.pk">www.gilgitbaltistan.gov.pk</a>
Government of Azad Jamu Kashmir	<a href="http://www.ajk.gov.pk">www.ajk.gov.pk</a>
Trade Development Authority of Pakistan (TDAP)	<a href="http://www.tdap.gov.pk">www.tdap.gov.pk</a>
Security Commission of Pakistan (SECP)	<a href="http://www.secp.gov.pk">www.secp.gov.pk</a>
Federation of Pakistan Chambers of Commerce and Industry (FPCCI)	<a href="http://www.fpcci.com.pk">www.fpcci.com.pk</a>
State Bank of Pakistan (SBP)	<a href="http://www.sbp.org.pk">www.sbp.org.pk</a>
Punjab Small Industries Corporation	<a href="http://www.psic.gov.pk">www.psic.gov.pk</a>
Sindh Small Industries Corporation	<a href="http://www.ssic.gov.pk">www.ssic.gov.pk</a>
Punjab Board of Investment & Trade (PBIT)	<a href="http://www.pbit.gov.pk">www.pbit.gov.pk</a>
Sindh Board of Investment (SBI)	<a href="http://www.sbi.gov.pk">www.sbi.gov.pk</a>
Pakistan Agricultural Research Council (PARC)	<a href="http://www.parc.gov.pk">www.parc.gov.pk</a>
Balochistan Agricultural Research Centre (BARC)	<a href="http://www.parc.gov.pk">www.parc.gov.pk</a>
Southern-zone Agricultural Research Centre (SARC)	<a href="http://www.parc.gov.pk">www.parc.gov.pk</a>
Arid Zone Research Institute (AZRI)	<a href="http://www.parc.gov.pk">www.parc.gov.pk</a>
Punjab Livestock & Dairy Development Board	<a href="http://www.plddb.pk">www.plddb.pk</a>

University of Agriculture, Faisalabad,	<a href="http://www.uaf.edu.pk">www.uaf.edu.pk</a>
Lasbela University of Agriculture, Water & Marine Sciences, Lasbela	<a href="http://www.luawms.edu.pk">www.luawms.edu.pk</a>
Sindh Agriculture University, Tondojam	<a href="http://www.sau.edu.pk">www.sau.edu.pk</a>
Gomal College of Veterinary Sciences, Dera Ismail Khan	<a href="http://www.gu.edu.pk">www.gu.edu.pk</a>
KPK Agricultural University, Peshawar	<a href="http://www.aup.edu.pk">www.aup.edu.pk</a>
Pir Mehr Ali Shah Arid Agricultural University,	<a href="http://www.uaar.edu.pk">www.uaar.edu.pk</a>
Rawalpindi	
University College of Veterinary & Animal Sciences, Islamia University Bahawalpur (IUB),	<a href="http://www.iub.edu.pk">www.iub.edu.pk</a>
University of Veterinary & Animal Sciences (UVAS), Lahore	<a href="http://www.uvas.edu.pk">www.uvas.edu.pk</a>
Bahauddin Zakariya University (BZU), Multan	<a href="http://www.bzu.edu.pk">www.bzu.edu.pk</a>
Animal Husbandry In-Service Training Institute (AHITI), Peshawar	
Veterinary Research Institute (VRI), Punjab	
Agribusiness Support Fund (ASF), Lahore,	<a href="http://www.asf.org.pk">www.asf.org.pk</a>
Livestock and Dairy Development Department, Punjab	<a href="http://www.livestockpunjab.gov.pk">www.livestockpunjab.gov.pk</a>
Livestock & Fisheries Department, Sindh	<a href="http://www.sindh.gov.pk">www.sindh.gov.pk</a>
Agriculture & Livestock Department, KPK	<a href="http://www.khyberpakhtunkhwa.gov.pk">www.khyberpakhtunkhwa.gov.pk</a>
Livestock & Dairy Development, Balochistan	<a href="http://www.balochistan.gov.pk">www.balochistan.gov.pk</a>



## 12 ANNEXURES

### 12.1 Income Statement

Statement Summaries Income Statement										SMEDA
										Rs. in actuals
	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Revenue	52,974,150	52,256,417	76,489,928	95,027,614	125,191,153	159,591,549	205,656,178	264,477,793	323,504,058	422,438,238
Cost of goods sold	30,043,041	37,543,371	45,285,672	55,232,376	69,834,472	88,159,732	110,971,684	136,690,106	173,443,958	221,043,367
<b>Gross Profit</b>	<b>22,931,109</b>	<b>14,713,046</b>	<b>31,204,256</b>	<b>39,795,238</b>	<b>55,356,681</b>	<b>71,431,817</b>	<b>94,684,493</b>	<b>127,787,687</b>	<b>150,060,101</b>	<b>201,394,871</b>
<i>General administration &amp; selling expenses</i>										
Administration expense	780,000	855,942	939,278	1,030,727	1,131,080	1,241,204	1,362,049	1,494,660	1,640,182	1,799,873
Rental expense	-	-	-	-	-	-	-	-	-	-
Utilities expense	60,000	66,000	72,600	79,860	87,846	96,631	106,294	116,923	128,615	141,477
Travelling & Comm. expense (phone, fax, etc.)	96,000	105,600	116,160	127,776	140,554	154,609	170,070	187,077	205,785	226,363
Office vehicles running expense	24,000	26,400	29,040	31,944	35,138	38,652	42,517	46,769	51,446	56,591
Office expenses (stationary, etc.)	23,400	25,678	28,178	30,922	33,932	37,236	40,861	44,840	49,205	53,996
Promotional expense	105,948	104,513	152,980	190,055	250,382	319,183	411,312	528,956	647,008	844,876
Insurance expense	179,345	161,411	143,476	125,542	107,607	89,673	71,738	53,804	35,869	17,935
Professional fees (legal, audit, etc.)	52,974	52,256	76,490	95,028	125,191	159,592	205,656	264,478	323,504	422,438
Depreciation expense	1,249,427	1,249,427	1,249,427	1,249,427	2,207,747	2,207,747	2,207,747	2,207,747	2,207,747	2,207,747
Amortization expense	111,800	111,800	111,800	111,800	111,800	-	-	-	-	-
Property tax expense	-	-	-	-	-	-	-	-	-	-
Miscellaneous expense	-	-	-	-	-	-	-	-	-	-
<b>Subtotal</b>	<b>2,682,894</b>	<b>2,759,027</b>	<b>2,919,429</b>	<b>3,073,080</b>	<b>4,231,278</b>	<b>4,344,526</b>	<b>4,618,245</b>	<b>4,945,253</b>	<b>5,289,362</b>	<b>5,771,295</b>
<b>Operating Income</b>	<b>20,248,215</b>	<b>11,954,020</b>	<b>28,284,827</b>	<b>36,722,158</b>	<b>51,125,403</b>	<b>67,087,291</b>	<b>90,066,249</b>	<b>122,842,434</b>	<b>144,770,739</b>	<b>195,623,576</b>

Other income	-	-	-	-	-	-	-	-	-	-
Gain / (loss) on sale of assets	-	-	-	-	-	-	-	-	-	-
<b>Earnings Before Interest &amp; Taxes</b>	<u>20,248,215</u>	<u>11,954,020</u>	<u>28,284,827</u>	<u>36,722,158</u>	<u>51,125,403</u>	<u>67,087,291</u>	<u>90,066,249</u>	<u>122,842,434</u>	<u>144,770,739</u>	<u>195,623,576</u>
<b>Interest expense</b>	<u>4,082,978</u>	<u>3,771,529</u>	<u>3,501,489</u>	<u>3,197,201</u>	<u>3,272,469</u>	<u>2,861,121</u>	<u>2,397,605</u>	<u>1,875,303</u>	<u>1,286,760</u>	<u>623,575</u>
<b>Earnings Before Tax</b>	<u>16,165,237</u>	<u>8,182,490</u>	<u>24,783,338</u>	<u>33,524,957</u>	<u>47,852,934</u>	<u>64,226,170</u>	<u>87,668,644</u>	<u>120,967,132</u>	<u>143,483,979</u>	<u>195,000,001</u>
<b>Tax</b>	<u>4,877,332</u>	<u>2,083,371</u>	<u>7,893,668</u>	<u>10,953,234</u>	<u>15,968,026</u>	<u>21,698,659</u>	<u>29,903,525</u>	<u>41,557,995</u>	<u>49,438,892</u>	<u>67,469,500</u>
<b>NET PROFIT/(LOSS) AFTER TAX</b>	<u>11,287,905</u>	<u>6,099,119</u>	<u>16,889,671</u>	<u>22,571,723</u>	<u>31,884,908</u>	<u>42,527,511</u>	<u>57,765,119</u>	<u>79,409,136</u>	<u>94,045,087</u>	<u>127,530,502</u>
Balance brought forward		5,643,952	11,743,072	14,316,371	36,888,094	68,773,002	111,300,513	169,065,632	248,474,769	342,519,856
Total profit available for appropriation	11,287,905	11,743,072	28,632,742	36,888,094	68,773,002	111,300,513	169,065,632	248,474,769	342,519,856	470,050,357
Dividend	5,643,952	-	14,316,371	-	-	-	-	-	-	-
Balance carried forward	5,643,952	11,743,072	14,316,371	36,888,094	68,773,002	111,300,513	169,065,632	248,474,769	342,519,856	470,050,357

## 12.2 Balance Sheet

Pre-Feasibility Study	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	721,166	5,617,151	11,059,127	12,020,602	20,552,431	50,536,462	90,282,572	144,339,311	218,127,442	305,081,211	450,984,058
Accounts receivable	-	964,320	935,451	1,385,603	1,745,349	2,299,729	2,931,706	3,782,047	4,858,453	5,942,920	7,760,118
Finished goods inventory	-	-	-	-	-	-	-	-	-	-	-
Equipment spare part inventory	-	-	-	-	-	-	-	-	-	-	-
Raw material inventory	1,099,321	1,530,778	2,041,312	2,762,452	3,859,494	5,400,193	7,527,604	10,253,018	14,367,551	20,199,000	-
Pre-paid annual land lease	-	-	-	-	-	-	-	-	-	-	-
Pre-paid building rent	-	-	-	-	-	-	-	-	-	-	-
Pre-paid lease interest	-	-	-	-	-	-	-	-	-	-	-
Pre-paid insurance	179,345	161,411	143,476	125,542	107,607	89,673	71,738	53,804	35,869	17,935	-
<b>Total Current Assets</b>	<b>1,999,832</b>	<b>8,273,659</b>	<b>14,179,365</b>	<b>16,294,199</b>	<b>26,264,880</b>	<b>58,326,056</b>	<b>100,813,620</b>	<b>158,428,179</b>	<b>237,389,315</b>	<b>331,241,066</b>	<b>458,744,175</b>
<i>Fixed assets</i> Land											
	6,878,992	6,878,992	6,878,992	6,878,992	6,878,992	6,878,992	6,878,992	6,878,992	6,878,992	6,878,992	6,878,992
Building/Infrastructure	17,230,938	16,369,391	15,507,844	14,646,297	32,951,150	31,131,283	29,311,416	27,491,549	25,671,683	23,851,816	22,031,949
Animals	40,000,000	37,217,500	43,473,018	55,123,388	69,955,708	90,311,306	115,978,261	146,965,439	185,870,795	236,862,281	305,342,179
Machinery & equipment	3,523,900	3,171,510	2,819,120	2,466,730	2,114,340	1,761,950	1,409,560	1,057,170	704,780	352,390	-
Furniture & fixtures	228,900	206,010	183,120	160,230	137,340	114,450	91,560	68,670	45,780	22,890	-
Office vehicles	63,000	56,700	50,400	44,100	37,800	31,500	25,200	18,900	12,600	6,300	-
Office equipment	63,000	56,700	50,400	44,100	37,800	31,500	25,200	18,900	12,600	6,300	-
<b>Total Fixed Assets</b>	<b>67,988,730</b>	<b>63,956,803</b>	<b>68,962,894</b>	<b>79,363,837</b>	<b>112,113,131</b>	<b>130,260,981</b>	<b>153,720,190</b>	<b>182,499,620</b>	<b>219,197,230</b>	<b>267,980,969</b>	<b>334,253,120</b>
<i>Intangible assets</i> Pre-operation costs											
	559,000	447,200	335,400	223,600	111,800	-	-	-	-	-	-
Legal, licensing, & training costs	-	-	-	-	-	-	-	-	-	-	-
<b>Total Intangible Assets</b>	<b>559,000</b>	<b>447,200</b>	<b>335,400</b>	<b>223,600</b>	<b>111,800</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>
<b>TOTAL ASSETS</b>	<b>70,547,561</b>	<b>72,677,662</b>	<b>83,477,659</b>	<b>95,881,637</b>	<b>138,489,811</b>	<b>188,587,037</b>	<b>254,533,810</b>	<b>340,927,799</b>	<b>456,586,545</b>	<b>599,222,035</b>	<b>792,997,296</b>
<b>Liabilities &amp; Shareholders' Equity</b>											
<i>Current liabilities</i>											
Accounts payable	-	2,158,152	2,732,747	3,312,331	4,074,228	5,174,374	6,581,452	8,341,433	10,326,277	13,154,327	16,811,507
Export re-finance facility	-	-	-	-	-	-	-	-	-	-	-
Short term debt	-	-	-	-	-	-	-	-	-	-	-
Other liabilities	-	-	-	-	-	-	-	-	-	-	-
<b>Total Current Liabilities</b>	<b>-</b>	<b>2,158,152</b>	<b>2,732,747</b>	<b>3,312,331</b>	<b>4,074,228</b>	<b>5,174,374</b>	<b>6,581,452</b>	<b>8,341,433</b>	<b>10,326,277</b>	<b>13,154,327</b>	<b>16,811,507</b>
<i>Other liabilities</i> Lease payable											
	-	-	-	-	-	-	-	-	-	-	-
Deferred tax	-	-	-	-	-	-	-	-	-	-	-
Long term debt	35,273,781	32,384,277	30,255,041	27,855,766	28,725,101	25,481,676	21,826,904	17,708,616	13,068,025	7,838,891	1,946,572
<b>Total Long Term Liabilities</b>	<b>35,273,781</b>	<b>32,384,277</b>	<b>30,255,041</b>	<b>27,855,766</b>	<b>28,725,101</b>	<b>25,481,676</b>	<b>21,826,904</b>	<b>17,708,616</b>	<b>13,068,025</b>	<b>7,838,891</b>	<b>1,946,572</b>
<i>Shareholders' equity</i> Paid-up capital											
	35,273,781	35,273,781	35,273,781	35,273,781	38,846,680	38,846,680	38,846,680	38,846,680	38,846,680	38,846,680	38,846,680
Gain / Loss on Net value of Animals	-	(2,782,500)	3,473,018	15,123,388	29,955,708	50,311,306	75,978,261	106,965,439	145,870,795	196,862,281	265,342,179
Retained earnings	-	5,643,952	11,743,072	14,316,371	36,888,094	68,773,002	111,300,513	169,065,632	248,474,769	342,519,856	470,050,357
<b>Total Equity</b>	<b>35,273,781</b>	<b>38,135,233</b>	<b>50,489,870</b>	<b>64,713,540</b>	<b>105,690,482</b>	<b>157,930,987</b>	<b>226,125,454</b>	<b>314,877,750</b>	<b>433,192,243</b>	<b>578,228,817</b>	<b>774,239,216</b>
<b>TOTAL CAPITAL AND LIABILITIES</b>	<b>70,547,561</b>	<b>72,677,662</b>	<b>83,477,659</b>	<b>95,881,637</b>	<b>138,489,811</b>	<b>188,587,037</b>	<b>254,533,810</b>	<b>340,927,799</b>	<b>456,586,545</b>	<b>599,222,035</b>	<b>792,997,296</b>

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
<i>Operating activities</i>											
Net profit	-	11,287,905	6,099,119	16,889,671	22,571,723	31,884,908	42,527,511	57,765,119	79,409,136	94,045,087	127,530,502
Add: depreciation expense	-	1,249,427	1,249,427	1,249,427	1,249,427		2,207,747	2,207,747	2,207,747	2,207,747	2,207,747
							2,207,747				
amortization expense	-	111,800	111,800	111,800	111,800		-	-	-	-	-
Deferred income tax	-	-	-	-	-	-	-	-	-	-	-
Accounts receivable	-	(964,320)	28,869	(450,153)	(359,745)	(554,380)	(631,977)	(850,341)	(1,076,406)	(1,084,468)	(1,817,197)
Finished good inventory	-	-	-	-	-	-	-	-	-	-	-
Equipment inventory	-	-	-	-	-	-	-	-	-	-	-
Raw material inventory	(1,099,321)	(431,457)	(510,534)	(721,141)	(1,097,042)	(1,540,699)	(2,127,412)	(2,725,413)	(4,114,534)	(5,831,449)	20,199,000
Pre-paid building rent	-	-	-	-	-	-	-	-	-	-	-
Pre-paid lease interest	-	-	-	-	-	-	-	-	-	-	-
Advance insurance premium	(179,345)	17,935	17,935	17,935	17,935	17,935	17,935	17,935	17,935	17,935	17,935
Accounts payable	-	2,158,152	574,595	579,583	761,898		1,407,078	1,759,981	1,984,844	2,828,050	3,657,180
							1,100,145				
Other liabilities	-	-	-	-	-	-	-	-	-	-	-
<b>Cash provided by operations</b>	<b>(1,278,666)</b>	<b>13,429,441</b>	<b>7,571,212</b>	<b>17,677,122</b>	<b>23,255,994</b>	<b>33,227,456</b>	<b>43,400,882</b>	<b>58,175,028</b>	<b>78,428,722</b>	<b>92,182,902</b>	<b>151,795,165</b>
<i>Financing activities</i>											
Change in long term debt	35,273,781	(2,889,504)	(2,129,235)	(2,399,276)	869,335	(3,243,425)	(3,654,772)	(4,118,289)	(4,640,591)	(5,229,134)	(5,892,319)
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	35,273,781	-	-	-	3,572,899	-	-	-	-	-	-
Purchase of (treasury) shares	-	-	-	-	-	-	-	-	-	-	-
<b>Cash provided by / (used for) financing</b>	<b>70,547,561</b>	<b>(2,889,504)</b>	<b>(2,129,235)</b>	<b>(2,399,276)</b>	<b>4,442,234</b>	<b>(3,243,425)</b>	<b>(3,654,772)</b>	<b>(4,118,289)</b>	<b>(4,640,591)</b>	<b>(5,229,134)</b>	<b>(5,892,319)</b>
<i>Investing activities</i>											
Capital expenditure	(68,547,730)	-	-	-	(19,166,400)	-	-	-	-	-	-
Acquisitions	-	-	-	-	-	-	-	-	-	-	-

Cash (used for) / provided by investing acti (68,547,730)	-	-	-	(19,166,400)	-	-	-	-	-	-	-
<b>NET CASH</b>	<b>721,166</b>	<b>10,539,937</b>	<b>5,441,976</b>	<b>15,277,846</b>	<b>8,531,828</b>	<b>29,984,031</b>	<b>39,746,110</b>	<b>54,056,739</b>	<b>73,788,131</b>	<b>86,953,769</b>	<b>145,902,847</b>
Cash balance brought forward	721,166		5,617,151	11,059,127	12,020,602	20,552,431	50,536,462	90,282,572	144,339,311	218,127,442	305,081,211
Cash available for appropriation	721,166	11,261,103	11,059,127	26,336,973	20,552,431	50,536,462	90,282,572	144,339,311	218,127,442	305,081,211	450,984,058
Dividend	-	5,643,952	-	14,316,371	-	-	-	-	-	-	-
Cash carried forward	721,166	5,617,151	11,059,127	12,020,602	20,552,431	50,536,462	90,282,572	144,339,311	218,127,442	305,081,211	450,984,058

## 13 KEY ASSUMPTIONS

### 13.1 Operating Cost Assumptions

Description	Unit	Details
Machinery Maintenance	Rs./ Month	10,000
Direct Electricity	Rs./ Month	5,000
Office vehicle running expenses	Rs./ Month	2,000
Office Expenses (entertainment, janitorial, stationery etc.)	Rs./ Month	1,950
Communication Expenses	Rs./Month	3,000
Promotional Expenses	Rs./ Month	8,830

### 13.2 Production Cost Assumptions

Description	Unit	Details
Annual installed capacity	No. of cows	100
Capacity utilization	%.	100
Milk production starting capacity Utilization	%	80
Maximum production capacity utilization	%	95
Total milk production	Litres/ cow/ lactation cycle	12,000
Number of female calves in year 1	No.	44
Average number of days in Lactation	No. of days	305+_5
Purchase price of pregnant cow	Rs. per cow	400,000
Cost of Artificial Insemination (AI)	Rs/ animal/ year	5,000
Cost of vaccination and medication	Rs./animal/year	1,000
Mortality in new born calves	% of total animals/ year	7
Mortality in adult cows	% of total animals/ year	2

Mortality in heifers (females calves older than one year)	% of total animals/ year	3
Shed space per cow	Sq. Ft. per animal	80
Open paddock space per cow	Sq. Ft. per animal	160

*Pre-Feasibility Study*

*(Dairy Farm- 100 cows)*

### 13.3 Revenue Assumptions

Description	Unit	Details
Total Milk Production	No. of Liters/ year	838,040
Sale Price of Milk	Rs./ Litre	60
Sale Price Growth Rate	% per annum	10
Capacity Utilization	%	80
Maximum Capacity	%	95

### 13.4 Financial Assumptions

Description	Unit	Details
Debt: Equity Ratio	Ratio	50:50
Interest Rate	% per annum	12
Debt Tenure	Years	10