

# Pre-Feasibility Study

## FODDER PRODUCTION & TRADING COMPANY

(SMEDA DOCUMENT)



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## 1. PROJECT PROFILE

This document is developed to provide the insight of the said business with potential investment opportunity in fodder production and trading unit to cater to the need of the emerging market. Fodder includes grazing, hay, silage and roots that are used as animal feed. Availability of fresh fodder varies throughout the year, but livestock must eat every day; fodder conservation is, therefore, desirable in most farming systems. Increasing demand of live stock escalates the demand graph of fodder and to keep an un-interrupted supply round the year, hay making is the most familiar type used by most of the farms across the globe.

Haymaking is an ancient and simple agricultural operation. It is to preserve fodder in such a way so that its nutrients are preserved with minimum loss in a storable form to make it available to livestock as feed at the time of scarcity. Hay making is very important for Pakistani farmers due to:

- Seasonal fluctuation in fresh fodder availability
- Difference in nutrient value of different fodders available in different seasons
- Difference in price and quality of fodders at different times of the year

The aim of haymaking is to store feed for later use on the farm, but now-a-days, hay is also a sellable commodity, as it is easy to transport and store. In some countries, urban dairies and draught or riding animals provide a large market, and some small-scale producers make hay for such markets. Others have to sell for ready cash and feed straw to their own stock. Large farms may grow hay as a cash crop, while not keeping livestock themselves.

The most acceptable form is Alfalfah (Lossan) which is also known as ‘Queen of the Fodder’. This is the best animal feed available which is also economical for both buyer and seller.

### 1.1. PROJECT BRIEF

Almost 70% populace of Pakistan is engaged directly or indirectly with the agricultural sector. Live stock is a vital part of this sector for it to continue different activities, such as, to produce milk and their bi-products. The basic need to make animal healthy and productive round the year is their diet (fodder) which must be good and persistent through out the year. But the availability of fresh fodder having same proportionate ingredients through out the year is restricted by the natural circumstances. To preserve fodder in the shape of hay by rinsing it with water and moisture by approximately 85% helps to feed animals with the same quality forage round the year. Alfalfah which is widely used as an animal feed to provide healthy and nutritious diet and plays a vital role to maintain and increase the productivity. The harvesting period is not bound to a specific season and one may reap this Alfalfah all year round. There are several benefits for haymaking as listed below:

- Decrease cost of production
- Ensure permanent supply of nutrients to livestock throughout the season/year

- Help maintain the milk yield
- Keep away the animals from diseases associated with green fodder such as bloat.

Animals consume green fodder in high quantity as it is backed by water so people don't find it economical. While Alfalfah is consumed less as the making process rinse the moisture, but give the same nutrition to the animal. Secondly, the requirement is persistent across Pakistan and round the year vis-à-vis the international market is also open and looking for a new venture to trade.

## 1.2. INVESTMENT OPPORTUNITY IN THIS SECTOR

### <sup>1</sup>Government Support

Fodder production is the major limiting factor for livestock production. In terms of Total Digestible Nutrients (TDN), there is a shortage of around 30.85 million tones and in terms of Digestible Protein (DP), around 2.99 million tones. However, there is dearth of formulated animal feeds to fulfill the requirements of livestock.

The following measures will be taken during the Medium Term Development Framework period:

- i) Availability of seed of high yielding multi-cut fodder varieties will be ensured;
- ii) In order to improve the nutritive value, treatment of crop residues and addition of molasses to feed, as well as silage and haymaking techniques will be demonstrated to livestock owners;
- iii) Animal feed industry in the private sector will be promoted and will be encouraged to establish feed lots for fattening of animals to increase use of manufactured feed at farm level; and,
- iv) Promotion of fodder production will be made an integral part of veterinary extension service.

The Alfalfah is the most demandable fodder type in the world especially in Pakistan because green fodder is not available through out the year with the same nutritious value and to maintain the production of live stock diet, the diet must be balanced. Opportunities are spread over locally as well as internationally. In Pakistan, there is no such production house particularly focusing on the Alfalfah supply, where as the demand is on the rise in the rural areas because live stock is associated with the crop production, milk production and meat selling. In rural areas, mostly fodder is being required to run the routine operations by providing healthy feed to animals. There is a high demand in the international market in different regions of the world. In addition, the export of other related products like animal hair, animal leather, guts, bladders and stomach of the animals, meat and meat preparation also depend upon the fodder availability.

There is a great need to enhance yield per animal and depends on improvement in the potential of local breeds and production of high quality fodder and feed. Scarcity of feed and its high cost is a major limiting factor in urban dairy. At present, there is insufficient quantity as well as quality of fodder, owing to which animals are underfed,

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<sup>1</sup> [www.pakistan.gov.pk](http://www.pakistan.gov.pk) - MTDF

weak, thin, and consequently produce less milk and meat which creates shortage of meat, milk and dairy products. Therefore, the need for adequate fodder is apparent and also which is available round the year to the milking animals.

Foreign investors have also shown an interest in the production of Alfalfah for animal feed as a <sup>2</sup>United Arab Emirates (UAE) delegation informed the Caretaker Federal Minister for Food, Agriculture and Livestock (Minfal), Prince Muhammad Isa Jan Baloch that their company had acquired 3,300 acres of land near Mirani Dam, Balochistan for growing Alfalfahh for animal fodder.

Investment conditions are also very favorable in this sector as ample land on lower cost with near perfect circumstances is available vis-à-vis the cost of input is also comparatively on lower side with international market which includes mainly seeds and labor. Government is introducing flexible terms such as reducing duties on agricultural related machines and products which provide an easy access to state-of-the art machines and techniques.

### **1.3. MARKET ENTRY TIMING**

Fodder is used to feed live stock and this is obvious that what ever the seasonal and economical conditions prevail, animals must be fed. This is the item which is demanded throughout of the year in all the locations. Therefore, a fodder production and trading unit could be established at any time of the year.

### **1.4. PROPOSED BUSINESS LEGAL STATUS**

The legal status of business tends to play an important role in any setup; the proposed fodder production and trading unit is assumed to operate on Sole Proprietorship basis.

### **1.5. PROPOSED CAPACITY**

Production capacity of the proposed fodder production and trading unit would be around 25 to 30 tons/acres per annum. At the initial stage, the unit would utilize 70% of capacity to produce Alfalfah (but one may use 50% of land for Alfalfah while 20% may use to harvest some other type of fodder) and which will be increased by 10% every year.

### **1.6. PROJECT COST**

In fodder production and trading unit, state-of-the-art machinery and technical equipment is required for production. Other equipment like tractor, cutter, baler and trolleys are required to run day-to-day operations. Despite the fact that processing machinery used is relatively extensive, but during the discussion with existing stakeholder, the primary input seed is available in the market for the harvesting of 2-5

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<sup>2</sup> <http://www.pakissan.com/english/news/newsDetail.php?newsid=16201>

years production on a reasonable price. There are two additional cost which is also associated with the production of fodder i.e. storage and logistic. The entire total project cost of the fodder production and trading unit is approximately Rs. 11.4 million.

### 1.7. RECOMMENDED PROJECT PARAMETERS

Capacity	Human Resource	Technology/ Machinery	Production Land	Head office (Use for export and trading)
30/ton/acre/ year, 70% utilized initially	19	Local/Imported Machinery	Nawab Shah	Karachi

### Financial Summary

Project Cost	IRR	NPV (Rs)	Payback Period	Cost of Capital (WACC)
Rs. 11.4 million	40%	14,428,543	3 Years 3 Months	17.5%

### 1.8. PROPOSED LOCATION

There are sufficient lands available in various regions of Pakistan, but Nawabshah has adequate natural resources required to produce fodder. Sale points like mandi and farms are also near-by. Additionally; Karachi is not far away from nawabshah and raw materials are available at or near Nawabshah and Karachi. Therefore, production land could be purchased in Nawabshah and the head office is recommended to be located in Karachi.

### 1.9. KEY SUCCESS FACTOR

Alfalfah is not a very common fodder type available on large scale for livestock, therefore, people are not inclined toward its benefits. The fear of waste and any harm to their animals may also force people to use the existing fodder products. But, once they realize the benefits and advantage of Alfalfah, they will continue its usage. The few factors which may make them loyal are:

- The consumption pattern; as alfalfah does not contain moisture so animal would have an intake of approximately 4 to 6 kg, whereby other fodder type have moisture which makes animals to eat 10 times extra forage as compare to Alfalfah.
- Availability is the second most important factor which affects the buying pattern of customers as Alfalfah is persistently available through out the year with sustainable quality.

## 2. SECTOR & INDUSTRY ANALYSIS

### 2.1. SECTOR CHARACTERISTICS AND OVERVIEW

The worldwide animal feed industry consumed 635 million tons of feed in the year 2006, with an annual growth rate of about 2%. The use of agricultural land to grow feed rather than human food can be controversial; some types of feed, such as corn (maize), can also serve as human food, while others such as grass cannot. Some agricultural by-products which are fed to animals may be considered unsavory by human consumers.

### 2.2. SECTOR CHARACTERISTICS

Haymaking turns green, perishable, forage into a product that can be safely stored and easily transported without danger of spoilage, while keeping losses of dry matter and nutrients to a minimum. This involves reducing its moisture content from 70 - 90% to 20 - 25% or less. Techniques for natural pasture, sown pasture and crops specifically cultivated for conservation at three levels of technology are considered: manual haymaking; simple mechanization with draught animal power or small tractors; and fully mechanized systems. It is, of course, possible to have some or all of the operations of haymaking done mechanically under contract, provided that the fields are big enough to warrant it. For the aforementioned, it is imperative that the climate at harvest time is feasible and reliable. In areas of uncertain climate, however, it is less suitable, since equipment must be close at hand for each operation as the condition of the hay decrease.

#### Common plants specifically grown for fodder

- Alfalfa (lucerne)
- Barley
- Maize (corn)
- Rutabaga (swede)
- Turnip
- Clover
- Orchard grass
- Timothy-grass
- Millet
- Sorghum
- Oats
- Soybeans
- Wheat

### 2.3. TYPES OF HAY

Hay may be made in several forms, according to the conditions, its intended use and the level of technology. Types of hay are described as follows:

- **Long hay**, the traditional, age-old form of herbage, mown, turned and carted.

- **Chopped hay** is an option where conditions for drying are good and systems highly mechanized; it is less bulky and better for mechanical handling, but must be conditioned, windrowed and collected with a forage harvester.
- **Baled hay.** Originally baling was by hand (trusses or bottles) and then by stationary machines. It has been automated since the 1950s with the introduction of the pick-up baler. Big bales which can be individually handled by a tractor-mounted front-end loader are now widely used in large-scale farming. Round bales are the simplest to make and most popular. Their shape sheds rain and resists water better than traditional bales.
- **Hand-trussed** hay is widespread in manual haymaking, often as a means of reducing shattering.
- **Wafered and pelleted hay** is dense and free-flowing, so it is easy to transport, handle and store. Field units are available, but expensive; they are used for high-quality legume hay in climates which allow rapid drying. Losses are lower than with baling.
- **Dried grass** is herbage artificially dried at high temperatures and is produced from time to time; the process allows conservation of a younger and higher quality material, but it is not currently economically attractive.
- **Barn-dried hay.** Equipment for fan-assisted drying (with or without additional heat) is now available, but is not widely used.

#### 2.4. PROBLEMS IN HAYMAKING

Problems in haymaking vary according to the crop, climate and prevailing weather at harvest:

- Under sub-humid and humid temperate conditions, the main problems are related to gradual drying, with a view to avoid loss by spoilage and to dry the crop as quickly as conditions will allow.
- Under hot, dry conditions, in contrast, the problems are more likely to be either shattering of the finer parts of the plant, through too rapid drying, or bleaching, with consequent loss of carotene and vitamins.

The main consideration is on the type of climate, where drying is a problem since much difficulty is faced during the process of haymaking. Fine-leaf grasses and legumes are traditional hay crops in most areas. In the subtropics, hay is made from coarse cereals, such as, maize and sorghum, now mostly in small-scale farming, notably in India and Pakistan.

Where hay is made from pasture, rather than arable crops, the fields may be both grazed and mown at different seasons of the year. If the main output of a field is hay, it will still be grazed when the weather is unsuitable, thereon left for the forage to reach the correct stage at the optimum season for haymaking; the aftermath may, thereafter, be left for animals to graze. With grazing fields, the immediate requirements of the



stock has priority. But, at the peak of the season, grass growth and forage availability outstrips the needs of the herd and the whole or part of field (shut off by electric fences) is used for hay.

## **2.5. CROPS BEST SUITED FOR HAY**

- Clovers
- Grasses
- Oats
- Barley
- Timothy

## **2.6. STEPS IN HAY MAKING**

- Cutting/Mowing
- Raking
- Baling

## **2.7. PRODUCT DEMAND**

Alfalfah is an animal feed widely grown throughout the world as forage for cattle, and is mostly harvested as hay, but can be made into silage, grazed or fed as green chop.

Its primary use is for dairy production, followed by beef, horses, sheep, and goat. Fodder production is a business which may start on a small or medium scale. Several businesses are running in different part of Pakistan, since nature has bestowed enormous natural resources, generous availability of water and other input(s) has made these lands suitable for fodder production. Discussions with the fodder producers and traders including exporters suggest that demand for fodder is basically filled by the land lords who harvest fodder as a seasonal crop and which might not prolong to 2 or 3 cuts per year means upto 3 to 4 months. Rest of the year they focus on other cash crops and as a result 50% of the required demand is fulfilled by the aforementioned type of production.

The sector is largely operating informally and no specific data is available on the total producers; and those who are the main suppliers. Looking at the prevailing practices of suppliers, they buy fodder of different types from various producers and sell it to the farm houses or to the sale points where animals are gathered. The buying practices are of two types; the seller may buy out the whole crop or trade on the basis of the load per truck.

### 3. MARKET INFORMATION

As live stock is playing a vital role in the economy of any country especially an agricultural country and the products which may use to feed the animals is generally high in demand. In the Pakistani market, alfalfa is the most acceptable type and when Alfalfa is used as hay, it is usually cut and baled. Loose haystacks are still used in some areas, but bales are much easier to transport and are easier to store.

Forage production is now more popular than ever before. There are three main reasons for this;

- Peri-urban and urban fodder production is more profitable than cash crops.
- Cultivation of forage is easier and cheaper than cash crops as it does not require much weeding, hoeing, and insecticidal sprays (e.g., cotton requires five to six sprays), and,
- It does not require a lot of other inputs like high doses of chemical fertilizer, etc.

With dairy units growing rapidly in smaller towns, the demand for forage at local level is increasing. The forage trade is achieving importance compared to other cash crops.

#### 3.1. MARKET POTENTIAL

##### Future of Fodder

The fodder industry is becoming progressively more mechanized. Today's producer is becoming more efficient by having tractors, cutters and trucks for logistics. Stakeholders related to this sector agree that providers and sources are not enough to meet annual requirement of fodder.

The live stock is increasing in numbers which might increase the size of the market in future, but, to be a successful fodder producer and trader, one requires plenty of experience, energy and a good location.

#### 3.2. TARGET CUSTOMERS

During the discussion with stake holders it was observed that the existing practice of the market is that customers come to the door step and buy in bulk. But there are several sale points available where a huge amount of fodder is being supplied. These un-served segments comprise of regular and occasional mandi's, farm houses and down-town areas or suburbs where people use cattle, buffalo and cows.

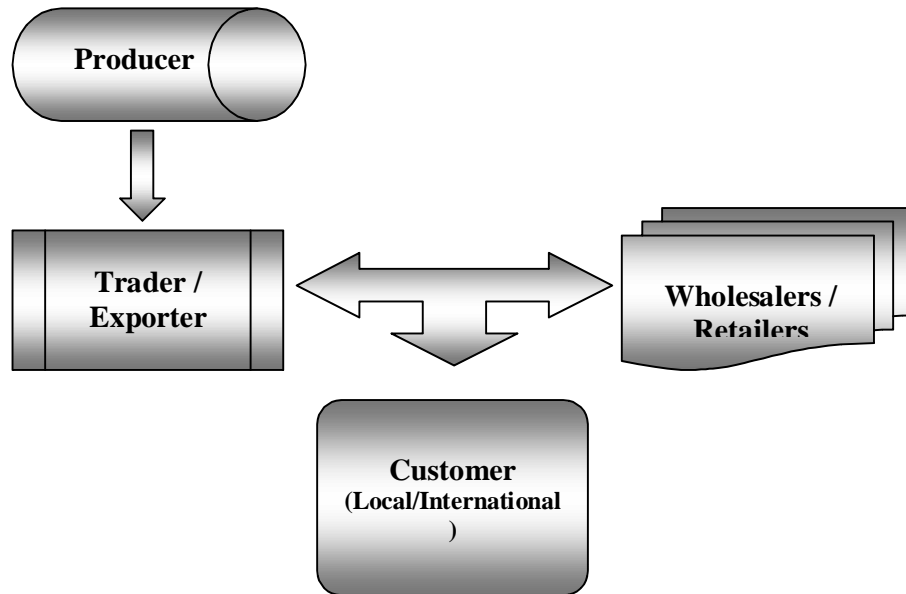
#### 3.3. PRODUCT MIX

There are numerous ways to preserve fodder, but, for the specified project emphasis is on Alfalfah, in which two kinds are available in the market.

- Dry
- Green

The ratio between the production of dry and green Alfalfah is 70:30 initially, but, we may harvest dry more rather green in the future.

**3.4. CHANNEL OF DISTRIBUTION**



## 4. PRODUCTION PROCESS

The hay making can be done through two stems as listed below. It is recommended that thick stems are used.

- Thin Stems
- Thick Stems

### 4.1. TIMING THE HARVEST OPERATIONS

Mowing-conditioning is the first step in hay making and should occur based on the maturity of the crop and the weather. The crop maturity decision is based on finding an optimum between yield and growth stage. Alfalfa hay should be mowed before the crop is in bloom, whereas, grass hay crops should be mowed when or shortly after the plants shoot-up seed heads. Crops such as orchard grass must be cut before the seeds develop as the quality of orchard grass drops very quickly after the seed head emerges

### 4.2. BASIC STEPS IN HAY MAKING FROM THICK STEM FODDERS

- Stop irrigation one week before harvesting
- Harvest the required area the same day
- Chop the crop and spread in barnyard
- Leave it for raking for at least for four days
- At 20% moisture level, stack it in a verandah which has constant air flow from all sides
- Continue to heap on one side as new lot comes

The hay making of Alfalfah is being done through proper processes which comprise of five basic steps widely used which are follows:

- Preparation of Land
- Sowing of Seed
- Cutting/Mowing
- Raking
- Baling

The process flow is very easy to understand and to increase effectiveness machines and labor skills must be jointly. Supervision must be in experienced hands to get the best out from the efforts.

### 4.3. PROCESS FLOW

#### Preparation of land

In making land, one has to understand that water is deemed necessary for the cultivation of Alfalfah and it should be more appropriate to choose fertile land. Fertility will increase the production capacity and useful life of the same crop.

## **Sowing of Seed**

Selection of seed mainly depends on the land, water and the weather. There is variety of seed types and seed is readily available in the market or you may ask research institute(s) like Sargodha Research Institute or Faisalabad Research Institute for providing the same. The seed vary in prices due to its useful life. By and large there are three varieties which are available with three different useful cultivation life, i.e. 2, 3 and 5 years. Use and usage of seed vary from land location conditions and sowing may start immediately after the land is properly prepared according to the standards guided by the agricultural institutions.

## **Cutting/Mowing**

The cutting criterion of Alfalfah is basically related with time and two main seasons' summer and winter. This is observed that in summer the total time span increases from 45 to 50 days, but, subsequently winter season decrease it to about 40 days. A total of 10 cut per year would be acceptable. Tractor(s) with small or medium size frame(s) may be used to mow the land.

## **Raking**

In this stage, Alfalfah crop may undergo a process for removing moisture which is mandatory for storage and baling. This whole process could be done through a mechanical machine called raker through which moisturizer would evaporate and the Alfalfah in the form of hay is available for live stock with the same nutritious value.

## **Baling**

There are two types of making bales through which Alfalfah may take depending on certain shape and size according to the requirement(s). Baling would be done by machine having steel fingers which bind it. The two types are stated as below:

- Round/Square
- Big/Small

Baling should occur only after the hay has reached the proper moisture for storage. There are products available in the market to ensure the aforementioned that is applied to the bale before it reaches the appropriate moisture level. These products help to prevent molding and heating when hay is baled too wet. Often this occurs when rain is expected before the hay is dry enough to bale. These products can be used on legume hay at up to 25% moisture. Proper small bales, the baling moistures for dry hay should range from 18 to 20% moisture. For large bales, the moisture should be 16% or lower. The shape and size is depends upon the buyer choice, availability of vehicle(s) and the destination place.

## Harvest Losses

No matter how carefully you harvest your hay; there will always be a portion of the hay that is lost during the harvesting process. Hay harvest losses from raking will increase as the hay dries. Losses are highest when the field is low yielding. Losses can be as high as 20% in some fields. Wheel and rotary rakes will cause more loss than parallel bar type rakes. The best practice is to rake the hay once only and that should occur on the day of baling. Other incidences of hay loss are owing to respiration and rain. These losses are highly variable and can range from as low as 2% to as high as 100%. These losses are typically a loss of the most digestible plant components. To minimize respiration and rain losses, two strategies can be used: to avoid rain and to optimize the annual harvest.

## Hay Making Safety Considerations

Hay making can be a dangerous activity and so proper precautions should always be followed. Here are a few considerations to keep in mind:

- Shield disc mowers properly (knife tip speeds are 160 to 190 mph)
- Always use a tractor with cab or at least a rollover protection system
- Never stand behind conditioning rolls or flails
- Remember that baler flywheels and hydraulic accumulators store energy
- Keep fingers out of moving knotters (even if they are temporarily manually powered)
- Do not ride the wagon when a bale thrower is used
- Handle bales safely
- Keep equipment 'harvest ready'
- Keep guards and shields in proper order
- Securely block hydraulically-raised equipment before working around or under the machine
- Disengage power and shut off engine before unplugging clogged equipment
- Keep a fire extinguisher on all powered equipment
- Do not allow kids or other riders on the equipment

## 4.4. PRODUCTION MIX OFFERED

Formulation of the production mix is the key to success. Careful consideration must be given to the right mix according to the market demand and the weather acceptability

otherwise one can result in a long term loss. A mix and merge of dry and green would be recommended and particularly dry is considered to be the main product.

#### 4.5. RAW MATERIAL REQUIREMENT

For the production process seed, insecticides and pesticides are the required materials which are used periodically in order to sustain the quality of the fodder. It is recommended that seed should be taken after having considered the land fertility and soil type vis-à-vis water requirement and the seasonal production.

#### 4.6. MACHINERY REQUIREMENT

Machinery required for the production of fodder is available in local market but imported machinery having state-of-the-art functionality, reportedly gives good quality output. Following machinery will be required for setting up a fodder production and trading unit:

S. No.	Tools Detail	Required No. of Units	Unit Price	Total Cost (in Rupees)
1	Tractor FIAT-350 HP	2	750,000	1,500,000
2	Cutter	1	150,000	150,000
3	Raker	1	150,000	150,000
4	Baler	1	1,000,000	1,000,000
5	Hydraulic Trolleys	2	200,000	400,000
6	Tube wale Drilling	2	250,000	500,000
7	Other Accessories	1	200,000	200,000
				3,900,000
<b>Fire Fighting Equipment</b>				
1	Fire Fighting Equipment	4	25,000	100,000
	Total			100,000
<b>Total Tools &amp; Equipment Cost</b>				<b>4,000,000</b>

There are many international and local suppliers of fodder production machinery working in Pakistan and other countries who may be contacted for obtaining machinery; however, during the course of study for this pre-feasibility we have obtained some contact details of local and foreign manufacturer(s) which are as follows:

#### NEW CHAUDHRY AGRICULTURAL MECHANICAL ENGINEERS

Chowk A.T.M. Vehari Road Multan, Lahore.

**Phone:** +92-61-6527607, +92-61-6529022, +92-61-6526132. Fax# +92-61-4233706

**AGROTRACTORS(PVT)LTD** (The dealer of John deer)  
38-AMAINGULBERG  
LAHORE  
Pakistan  
92 42 5871746  
<http://www.deere.com/servlet/AgHomePageServlet>

### **Harvesting Hay**

Harvesting hay is the process of mowing a forage grass or legume, allowing it to air dry thoroughly, then baling it into a round or square "package". There are many variations and designs of machines that perform each step in this process and some that perform optional steps that may speed up or improve the process

### **Machine Capacity**

There are four different factors which can limit the capacity of a machine to harvest hay. Depending on field conditions, power, throughput capacity, speed or traction can limit the field capacity of a machine. Actually, in systems where machines must interact (such as, harvest, transport, and unloading), machines capacity can be limited by other machines. These factors which limit capacity are important concepts because harvesting quality hay can depend largely on timing(s).

## **4.7. PLANT AND MACHINERY MAINTENANCE**

Machinery is expected to be serviced on an annual basis. During the projection period, maintenance expenses are estimated to be around 3% of the total cost of the machine.



## **5. LAND AND BUILDING REQUIREMENT**

### **5.1 Site Development**

The fodder production and trading project is estimated to require a total area of 50 acres for production and for export dealing and to run normal operational activities. These areas will be used for setting up the production facility, storage and office. An office may be located in the commercial area preferably I.I.Chundrigar Road.

### **5.2 Building Construction Cost**

As per discussion with market experts, 50 acres area is sufficient for the production facility. The production land would be located at any place in Nawabshah, where basic infrastructure is established, with special emphasis on sufficient availability of water. As per the discussion, an office is required on rent for trading which would be located in Karachi for this purpose. Therefore, it will be feasible to acquire some office on rent with alterations made accordingly. The land cost for fodder production and storage is estimated to be approximately Rs. 480,000/- vis-à-vis the rented trading office incurring a sum amount of Rs.35,000/- month.

## 6. HUMAN RESOURCE REQUIREMENT

Fodder production and trading requires highly specialized and skilled labor. A total of 19 persons will be required to handle the production process, storage and trading operations. The business unit will work on two shifts (12 hours per shift). Skilled labor with relevant experience will be required for production and trading. Total approximate manpower requirement(s) for the business operations along with the respective salaries are given in the table below:

Title/Designation	No of Persons	Individual Salary	Staff Salary		
			Per Month	Per Quarter	Per Annum
Business Unit Manager/Owner					
<b>Production Staff</b>					
Manager	1	40,000	40,000	120,000	480,000
Supervisor /Foreman	2	20,000	40,000	120,000	480,000
Machine Operator	3	10,000	30,000	90,000	360,000
Land Labor	6	8,000	48,000	144,000	576,000
<b>Total Production Staff</b>	<b>12</b>				
<b>General Administration/ Selling Staff</b>					
Marketing Executive	2	20,000	40,000	120,000	480,000
Accountant	1	15,000	15,000	45,000	180,000
Office Assistant	1	8,000	8,000	24,000	96,000
Guard	1	6,500	6,500	19,500	78,000
Cook	1	8,000	8,000	24,000	96,000
Driver	1	7,000	7,000	21,000	84,000
<b>Total G A /S Staff</b>	<b>7</b>				
<b>TOTAL</b>	<b>19</b>	<b>113,000</b>	<b>213,000</b>	<b>639,000</b>	<b>2,556,000</b>

### 6.1 Experience

Machinery and tractor operations involved at a fodder production land are of a technical sort; therefore, it is proposed that tractor and machine operator, supervisor, manager and other related staff must possess minimum of two to three years experience of the same type of operations. For the position of the supervisor and manager, some academic qualification pertaining to the sector is preferable from any recognized agricultural university.

## 7. FINANCIAL ANALYSIS & KEY ASSUMPTIONS

The project cost estimates for the proposed 'Fodder Production and Trading Unit' have been formulated on the basis of discussions with industry stakeholders and experts. The projections cover the cost of land, machinery and equipment including office equipment, fixtures, etc. Assumptions regarding machinery have been provided, however, specific assumptions relating to individual cost components are given as under.

### 7.1 LAND & BUILDING

Land area of 50 acres for setting up the proposed Fodder Production would be purchased and the cost is estimated to be around Rs. 3,500,000/-/ But, the trading unit would be on a rental basis which will cost around Rs. 35,000/- per month for a 120 Sq. ft office area.

It has been assumed that it would be a land with basic infrastructure available. However, for the necessary land preparation, construction and renovation and customization of the office facility around Rs. 480,000/- will be required, which has been assumed to be depreciating at 10% per annum using diminishing balance method.

### 7.2 OVERALL FACTORY & OFFICE RENOVATION

To make the mandatory changes depending on the to the land and for the renovation of office premises in Year 5 and Year 10, a cost would incur for which an amount equivalent to 5% of the total land/office construction cost is estimated.

### 7.3 LAND / OFFICE FURNITURE & FIXTURES:

A lump sum provision of Rs. 200,000/- for procurement of office/land furniture is assumed. This would include necessary items to be used by labor, such as, table, desk, chairs and stationery for office. The breakup of land and office furniture & fixtures is as follows:

Item	Number	Total Cost
Beds and relevant necessities		15,000
Grocery Items		5,000
Table & Chair for Owner	1	25,000
Tables & Chairs for Admin/Marketing Staff	1	15,000
Waiting Chairs	4	6,000
Curtains & Interior Decoration for office	-	50,000
Chairs for Workers/Labor	6	5,000
Electrical Fittings & Lights	-	60,000
Others	-	19,000
<b>Total</b>		<b>200,000</b>

#### 7.4 DEPRECIATION TREATMENT

The treatment of depreciation would be on a diminishing balance method at the rate of 10% per annum on the following. The method is also expected to provide accurate tax treatment.

1. Machinery
2. Land and Building Construction
3. Vehicle
4. Furniture and Fixtures, etc.

#### 7.5 UTILITIES

Fodder production and trading unit will be operated using diesel/petrol for machines, while water will be consumed for irrigation and harvesting of fodder. The cost of the utilities including diesel/fuel, water, electricity and telephone is estimated to be around Rs. 780,000/- per annum. Approximate cost of utilities has been given below:

Utility	Total Monthly Cost (Rs.)	Total Annual Cost (Rs.)	Annual %age Increase
1. Electricity	10,000	120,000	5%
2. Diesel for Tractor, Tubewell & Other Accessories	35,000	420,000	5%
3. Water	2,500	30,000	5%
4. Telephone	17,500	210,000	5%
<b>Total</b>	<b>65,000</b>	<b>780,000</b>	

#### 7.6 WORKING CAPITAL REQUIREMENTS

It is estimated that an additional amount of Nine Lac Seventy Thousand rupees (approximately) will be required as cash in hand to meet the working capital requirements. These provisions have been estimated based on the following assumptions for the proposed business.

Description	Amount in Rs.
First Three Months Salaries (Production staff)	640,000
First Three Months Other Utilities Charges	195,000
First Three Months Misc. Expenses	30,000
First Three Months Rent Expense	105,000
<b>Total</b>	<b>970,000</b>

#### 7.7 VEHICLE FOR SUPPORT AND MAINTENANCE SERVICES

A loading vehicle would be required for providing services for transportation of raw material(s) from market to land or any other destination. For this purpose a transportation vehicle has been proposed which will cost around Rs. 500,000.

## 7.8 SELLING & DISTRIBUTION EXPENSES

For the purpose of this pre-feasibility, it has been assumed that the Fodder Production and Trading Unit engaged with local/international sales and for the purpose to enhance sales, certain strategies must be carried out concurrently which are stated as under;

- Hire Distributor(s) in different part of Pakistan to increase the reach.
- Locate sales points like farm houses and mandi's and induce them through trial to buy the product and be regular customers.
- Find out companies across the regions and make strategic alliances to enter into partnership contracts on a profitable percentage.

These arrangements would raise a considerable cost to the business for which an amount equivalent to 2% of the annual sales has been assumed which also covers the margin on bulk and off season buying.

## 7.10 MISCELLANEOUS EXPENSES

Miscellaneous expenses of running the business are assumed to be Rs. 10,000 per month. These expenses include various items like office stationery, daily consumables, meal expenses of workers and labours located on land, traveling allowances, etc. the aforementioned expenses are assumed to increase at a nominal rate of 10% per annum.

## 7.12 FINISHED GOODS INVENTORY

The proposed setup is assumed to maintain finished goods inventory to meet persistent demand from the local market or to complete any foreign order and to distribute as a sample on different sale points. For this purpose, finished products equivalent to 15 days would be maintained. This would comprise of most demanded product category .i.e. Alfalfah.

## 7.13 REVENUE PROJECTIONS

As per the discussions with market expert, around 25 to 30 tons per acre fodder can be produced in a year and all are sold out because of its demand domestically and internationally. In summer months like May and June, while in winter months like October, November and December, are months in which there is a shortage of green fodder in the market. For the projection purpose, annual revenue growth rate of 5% has been assumed which would cover anticipated growth in the industry as well price. Based on our discussions with the industry experts and entrepreneurs, it is anticipated that the sales price will vary according to location.

## 7.14 ACCOUNTS RECEIVABLES

Considering the industry norm, particular to the Fodder Production and Trading unit, it has been assumed that 90% of the sales will be on cash. Whereas, remaining 10% sales

will be on credit to local distributors only to facilitate them. A collection period of 30 days is assumed for the credit sales.

All of the above assumptions are based on the findings during the discussions with the industry experts and stakeholders. A provision for bad debts has been assumed equivalent to 2% of the annual credit sales.

### **7.15 FINANCIAL CHARGES**

It is assumed that long-term financing for 5 years will be obtained in order to finance the project investment cost. This leasing facility would be acquired at a rate of 15% (including 1% insurance premium) per annum with 60 monthly installments over a period of five years. The installments are assumed to be paid at the end of every month.

### **7.16 TAXATION**

The business is assumed to be run as a sole proprietorship; therefore, tax rates applicable on the income of a non-salaried individual taxpayer are used for income tax calculation of the business.

### **7.17 COST OF CAPITAL**

The cost of capital is explained in the following table:

<b>Particulars</b>	<b>Rate</b>
Required return on equity	20%
Cost of finance	15%
Weighted Average Cost of Capital	17.5%

The weighted average cost of capital is based on the debt/equity ratio of 50:50.

### **7.18 OWNER'S WITHDRAWAL**

It is assumed that the owner will draw funds from the business once the desired profitability is reached from the start of operations. The amount would depend on business sustainability and availability of funds for future growth.

<b>7.19</b>	<b>ANNEXURES</b>
<b>7.19.1</b>	<b>Summary of Key Assumptions</b>
<b>7.19.2</b>	<b>Cost and Revenue Sheet</b>
<b>7.19.3</b>	<b>Projected Income Statement</b>
<b>7.19.4</b>	<b>Projected Balance Sheet</b>
<b>7.19.5</b>	<b>Projected Cash Flow Statement</b>

Summary of Key Assumptions		
		(in Pak. Rs.)
Sr. No.	PARTICULARS	TOTAL COST/DETAILS
<b>Fixed Capital</b>		
	<b>Tools &amp; Equipment</b>	<b>4,000,000</b>
	Tools & Equipment	3,900,000
	Fire Fighting Equipment	100,000
	Office Renovation	480,000
	Furniture & Equipment	200,000
	Vehicle	500,000
	Land for Cultivation	5,000,000
	Preliminary Expenses	250,000
	<b>Total Fixed Capital</b>	<b>10,430,000</b>
<b>Working Capital</b>		
	<b>Utilities - Three Months (Office &amp; Factory)</b>	<b>195,000</b>
	1. Electricity/month	10,000
	2. Diesel for Vehicles	35,000
	3. Water/month	2,500
	4. Telephone/month	17,500
	<b>Salaries - Three Months (Production Staff)</b>	<b>639,000</b>
	<b>Office Rent (Three months)</b>	<b>105,000</b>
	<b>Misc. Expenses - Three months (@ 10,000 /month)</b>	<b>30,000</b>
	<b>Total Working Capital</b>	<b>969,000</b>
	<b>TOTAL PROJECT COST</b>	<b>11,399,000</b>
	<b>Loan Finance</b>	<b>5,699,500</b>
	<b>Equity Financing</b>	<b>5,699,500</b>
	<b>Debt:Equity Ratio (50:50)</b>	<b>50.00%</b>
<b>PROJECT RETURNS AND OTHER FINANCIAL</b>		
	IRR	40%
	NPV	14,428,543
	Payback Period (Years)	3 Years 3 Months
	Debt Equity Ratio	50:50
	Cost of finance	15%
	Weighted Average Cost of capital	17.50%
<b>OTHER ASSUMPTIONS</b>		
	Depreciation	10%
	Machinery Annual Repair & Maintenance (as %age of total cost of Machinery)	1.00%
	Selling & Distribution Expenses	2.00%
<b>INCREASE IN PRICE AND GROWTH</b>		
	Increase in Cost Price	5%
<b>Factory Operations and Capacity Utilisation Assumptions</b>		
	Increase in Production (Annual)	10%
	Annual sales price increase	5%
	Operational Hrs./day	12
	Operational Days / Month	26
	Operational Months	12
	Annual Operational Days	312
<b>Economy related assumptions</b>		
	Utilities growth rate Charges	5%
	Increase in Salaries	10%
	Increase in Office Rent	10%
	Income Tax Rate	20%
<b>Cash Flow Assumptions</b>		
	Sales on Credit - as %age of total	10%
	Sales on Cash - as %age of total	90%
	Accounts Receivable period (months) - only for 10% credit sales	1
	Provision for bad debts (only on 30% credit sales)	2%
	Raw Material Inventory	30
	Finished Goods Inventory	25
<b>Production Information - fodder</b>		
	Ready Crop - Green (Tonnage per Acre)	30
	Ready Crop - Dry (80%)	80%
	Cultivation Land (Acre)	50
	Sale - Dry Losan	90%
	Sale - Green Losan	10%
	Crop in a Year	10

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**FODDER Production & Trading Business****COST AND REVENUE SHEET****1. REVENUE CALCULATION****Cultivation Area**

50 Acre

Product Name	Quantity (Tonne)	Cost (per Tonne)	Total Sales Price
Crop (per Acre) - Dry (30% of Green)	1,080	2,250	2,430,000
Crop (per Acre) - Green	150	2,000	300,000
<b>Total Revenue (Per Crop)</b>	<b>1230</b>		<b>2,730,000</b>

Rs. / Crop

**No. of Crops (Per Year)****10**

Crops / Year

**Total Annual Sales****27,300,000**

Rs. / Year

**2. COST CALCULATION**

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Description	No	Price	Total Cost
Seed (Kg per Acre)	10	125	1,250
Fertilizer (1 Bag per Acre) 50 Kg bag	1	650	650
Water (Drilling) - Tube wale	1	1000	1,000
Farmers Cost per Acre	20	200	4,000
Packaging Cost (50 Kg Polythin Bag)	492	50	24,600
Pesticide (Spray)	1	75	75
<b>Cost per Acre</b>		<b>1,775</b>	<b>31,575</b>

Total Cost (Area Cultivation) - Per Crop

1,578,750

Total Cost (Area Cultivation) - Per Year

15,787,500

**TOTAL ANNUAL COST OF PRODUCTION****15,787,500** Rs. / annum

FODDER Production & Trading Business										
Projected Income Statement (Rs.)	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
<b>Net (Adjusted Sales)</b>	27,245,400	31,468,437	36,346,045	41,979,682	48,486,532	56,001,945	64,682,246	74,707,994	86,287,734	99,662,332
<b>Cost of Sales</b>	20,787,500	23,734,563	27,110,920	30,980,362	35,416,293	40,503,191	46,338,296	53,033,552	60,717,856	69,539,636
Cultivation Cost	15,787,500	18,234,563	21,060,920	24,325,362	28,095,793	32,450,641	37,480,491	43,289,967	49,999,912	57,749,898
Cultivation Land Rent	5,000,000	5,500,000	6,050,000	6,655,000	7,320,500	8,052,550	8,857,805	9,743,586	10,717,944	11,789,738
<b>Gross Profit</b>	6,457,900	7,733,875	9,235,125	10,999,319	13,070,239	15,498,753	18,343,951	21,674,442	25,569,878	30,122,696
<b>Gross Profit Margin</b>	24%	25%	25%	26%	27%	28%	28%	29%	30%	30%
<b>General Administrative &amp; Selling Expenses</b>										
Salaries	2,556,000	2,811,600	3,092,760	3,402,036	3,742,240	4,116,464	4,528,110	4,980,921	5,479,013	6,026,914
Office Rent	420,000	462,000	508,200	559,020	614,922	676,414	744,056	818,461	900,307	990,338
Amortization of Preliminary Expenses	50,000	50,000	50,000	50,000	50,000	-	-	-	-	-
Depreciation Expense	518,000	466,200	419,580	377,622	339,860	308,274	277,446	249,702	224,732	202,258
Maintenance Expense	40,000	40,000	40,000	40,000	40,000	40,000	40,000	40,000	40,000	40,000
Selling & Distribution	544,908	629,369	726,921	839,594	969,731	1,120,039	1,293,645	1,494,160	1,725,755	1,993,247
<b>Subtotal</b>	<b>4,128,908</b>	<b>4,459,169</b>	<b>4,837,461</b>	<b>5,268,272</b>	<b>5,756,752</b>	<b>6,261,190</b>	<b>6,883,257</b>	<b>7,583,244</b>	<b>8,369,807</b>	<b>9,252,757</b>
<b>Operating Income</b>	<b>2,328,992</b>	<b>3,274,706</b>	<b>4,397,664</b>	<b>5,731,048</b>	<b>7,313,487</b>	<b>9,237,563</b>	<b>11,460,694</b>	<b>14,091,198</b>	<b>17,200,071</b>	<b>20,869,938</b>
Financial Charges (15% Per Annum)	799,563	666,535	512,122	332,886	124,837	-	-	-	-	-
<b>Earnings Before Taxes</b>	<b>1,529,429</b>	<b>2,608,171</b>	<b>3,885,543</b>	<b>5,398,162</b>	<b>7,188,650</b>	<b>9,237,563</b>	<b>11,460,694</b>	<b>14,091,198</b>	<b>17,200,071</b>	<b>20,869,938</b>
Tax	305,886	521,634	777,109	1,079,632	1,437,730	1,847,513	2,292,139	2,818,240	3,440,014	4,173,988
<b>Net Profit</b>	<b>1,223,543</b>	<b>2,086,537</b>	<b>3,108,434</b>	<b>4,318,530</b>	<b>5,750,920</b>	<b>7,390,050</b>	<b>9,168,555</b>	<b>11,272,959</b>	<b>13,760,057</b>	<b>16,695,951</b>
<b>Monthly Profit After Tax</b>	<b>101,962</b>	<b>173,878</b>	<b>259,036</b>	<b>359,877</b>	<b>479,243</b>	<b>615,838</b>	<b>764,046</b>	<b>939,413</b>	<b>1,146,671</b>	<b>1,391,329</b>

FODDER Production & Trading Business											
Projected Balance Sheet (Rs.)	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 Balance	969,000	1,705,518	3,312,438	5,734,757	9,139,665	13,699,861	21,335,431	30,708,952	42,147,897	56,035,994	72,798,525
Accounts Receivable	0	227,500	262,763	303,491	350,532	404,864	467,618	540,099	623,814	720,505	832,184
<b>Total Current Assets</b>	<b>969,000</b>	<b>1,933,018</b>	<b>3,575,201</b>	<b>6,038,248</b>	<b>9,490,197</b>	<b>14,104,725</b>	<b>21,803,049</b>	<b>31,249,051</b>	<b>42,771,711</b>	<b>56,756,500</b>	<b>73,630,709</b>
<i>Fixed Assets</i>											
Plant Machinery & Facility	4,000,000	3,600,000	3,240,000	2,916,000	2,624,400	2,361,960	2,125,764	1,913,188	1,721,869	1,549,682	1,394,714
Factory Construction	480,000	432,000	388,800	349,920	314,928	307,435	276,692	249,023	224,120	201,708	205,537
Land	5,000,000	5,000,000	5,000,000	5,000,000	5,000,000	5,000,000	5,000,000	5,000,000	5,000,000	5,000,000	5,000,000
Furniture & Fixtures	200,000	180,000	162,000	145,800	131,220	118,098	106,288	95,659	86,093	77,484	69,736
Vehicle	500,000	450,000	405,000	364,500	328,050	295,245	265,721	239,148	215,234	193,710	174,339
<b>Total Fixed Assets</b>	<b>10,180,000</b>	<b>9,662,000</b>	<b>9,195,800</b>	<b>8,776,220</b>	<b>8,398,598</b>	<b>8,082,738</b>	<b>7,774,464</b>	<b>7,497,018</b>	<b>7,247,316</b>	<b>7,022,585</b>	<b>6,844,326</b>
<i>Intangible Assets</i>											
Preliminary Expenses	250,000	200,000	150,000	100,000	50,000	-	-	-	-	-	-
<b>Total Assets</b>	<b>11,399,000</b>	<b>11,795,018</b>	<b>12,921,001</b>	<b>14,914,468</b>	<b>17,938,795</b>	<b>22,187,463</b>	<b>29,577,514</b>	<b>38,746,069</b>	<b>50,019,027</b>	<b>63,779,084</b>	<b>80,475,035</b>
<b>Owner's Equity</b>	<b>5,699,500</b>	<b>6,923,043</b>	<b>9,009,580</b>	<b>12,118,014</b>	<b>16,436,543</b>	<b>22,187,463</b>	<b>29,577,514</b>	<b>38,746,069</b>	<b>50,019,027</b>	<b>63,779,084</b>	<b>80,475,035</b>
<b>Long Term Liability</b>	<b>5,699,500</b>	<b>4,871,975</b>	<b>3,911,421</b>	<b>2,796,455</b>	<b>1,502,252</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
<b>Total Equity &amp; Liabilities</b>	<b>11,399,000</b>	<b>11,795,018</b>	<b>12,921,001</b>	<b>14,914,468</b>	<b>17,938,795</b>	<b>22,187,463</b>	<b>29,577,514</b>	<b>38,746,069</b>	<b>50,019,027</b>	<b>63,779,084</b>	<b>80,475,035</b>

FODDER Production & Trading Business											
Projected Statement of Cash Flows (Rs.)	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
<b>Cash Flow From Operating Activities</b>											
Net Profit	0	1,223,543	2,086,537	3,108,434	4,318,530	5,750,920	7,390,050	9,168,555	11,272,959	13,760,057	16,695,951
Add: Depreciation Expense	0	518,000	466,200	419,580	377,622	339,860	308,274	277,446	249,702	224,732	202,258
Amortization Expense	0	50,000	50,000	50,000	50,000	50,000	-	-	-	-	-
(Increase) / decrease in Receivables	-	(227,500)	(35,263)	(40,728)	(47,041)	(54,332)	(62,754)	(72,481)	(83,715)	(96,691)	(111,678)
<b>Net Cash Flow From Operations</b>	<b>0</b>	<b>1,564,043</b>	<b>2,567,474</b>	<b>3,537,286</b>	<b>4,699,111</b>	<b>6,086,448</b>	<b>7,635,570</b>	<b>9,373,521</b>	<b>11,438,945</b>	<b>13,888,097</b>	<b>16,786,531</b>
<b>Cash Flow From Financing Activities</b>											
Receipt of Long Term Debt	5,699,500										
Repayment of Long Term Debt		(827,525)	(960,554)	(1,114,967)	(1,294,203)	(1,502,252)	-	-	-	-	-
Owner's Equity	5,699,500										
<b>Net Cash Flow From Financing Activities</b>	<b>11,399,000</b>	<b>(827,525)</b>	<b>(960,554)</b>	<b>(1,114,967)</b>	<b>(1,294,203)</b>	<b>(1,502,252)</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
<b>Cash Flow From Investing Activities</b>											
Capital Expenditure	(4,500,000)					(24,000)					(24,000)
Factory/Office Furniture	(200,000)										
Preliminary Operating Expenses	(250,000)										
Office Renovation Cost	(480,000)										
Land for Cultivation	(5,000,000)										
<b>Net Cash Flow From Investing Activities</b>	<b>(10,430,000)</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>(24,000)</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>(24,000)</b>
<b>NET CASH FLOW</b>	<b>969,000</b>	<b>736,518</b>	<b>1,606,921</b>	<b>2,422,319</b>	<b>3,404,908</b>	<b>4,560,196</b>	<b>7,635,570</b>	<b>9,373,521</b>	<b>11,438,945</b>	<b>13,888,097</b>	<b>16,762,531</b>
<b>Cash at the Beginning of the Period</b>	<b>0</b>	<b>969,000</b>	<b>1,705,518</b>	<b>3,312,438</b>	<b>5,734,757</b>	<b>9,139,665</b>	<b>13,699,861</b>	<b>21,335,431</b>	<b>30,708,952</b>	<b>42,147,897</b>	<b>56,035,994</b>
<b>Cash at the End of the Period</b>	<b>969,000</b>	<b>1,705,518</b>	<b>3,312,438</b>	<b>5,734,757</b>	<b>9,139,665</b>	<b>13,699,861</b>	<b>21,335,431</b>	<b>30,708,952</b>	<b>42,147,897</b>	<b>56,035,994</b>	<b>72,798,525</b>