

Pre-Feasibility Study

**FODDER PRODUCTION &
TRADING COMPANY**



Small and Medium Enterprise Development Authority
Government of Pakistan
www.smeda.org.pk

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For information	Provincial Chief (Sindh) mkumar@smeda.org.pk

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 the need of the Dairy and livestock sector. 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 livestock 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 old storage technique for agricultural produce. It is to preserve fodder in such a way 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.

Berseem is also the most important forage legume in Pakistan. It is a major winter fodder crop and a source of abundant nutritious green fodder which is grown successfully under irrigated conditions. It is also known as milk multiplier as high palatability of the crop results in significant increase in milk production.

2. Project Brief

Livestock is a vital part of the agricultural sector as it contributes 58% in Agricultural sector¹ and provide freedom to carry 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 which must be good and persistent throughout the year. But the availability of fresh fodder having same proportionate ingredients throughout 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.

¹ Economic Survey 2016-17

The harvesting period is not bound to a specific season and one may reap this crop 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 carry highest percentage of water so people don't find it economical. While Alfalfa 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.

3. Investment Opportunity

Fodder production is the major limiting factor for livestock production and there is a dearth of formulated animal feeds to fulfill the requirements of livestock. The Alfalfah is the most demandable fodder type in the world especially in Pakistan because green fodder is not available throughout the year with the same nutritious value and to maintain the production of livestock diet, as the diet must be balanced. In Pakistan, there very few production house particularly focusing on the Alfalfah supply, whereas the demand is on the rise in the rural areas because live stock is associated with the crop production, milk production and meat selling and majority of farmers practice mixed farming. In rural areas, mostly fodder is being required to run the routine operations by providing healthy feed to animals. Similarly, there is also high demand in the international market in different regions of the world.

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, 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 inevitable and its availability round the year must be ensured.

A number of local and foreign investors are in process of setting up livestock and dairy farms in Pakistan. This livestock industry is sole consumer of fodder and thus this will increase the demand of Barley, Alfalfa , Berseem and other constituents of Fodder in Pakistan. The increase in demand will ultimately compelled the farmers to enhance the quality and to increase the quantity to get better prices and will also increase employment opportunities in the livestock sector.

Therefore, Investment conditions are also very favorable in this sector as ample land on lower cost with around ideal circumstances is available e.g low cost of land, water availability, road access, nearby human settlements etc. The cost of input is also comparatively on lower side vis-a-viz international market which includes mainly seeds and labor. Government is introducing flexible

terms such as reducing duties on agricultural related machines and products that would provide an easy access to state-of-the art machines and techniques.

4. Market Entry Timing

Fodder is used to feed livestock and this is obvious that whatever the seasonal and economic 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.

5. 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.

6. 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.

7. 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's use 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 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. 11.22 million.

8. Recommended Project Parameters

Capacity	Human Resource	Technology/Machinery	Production Land	Head office (Use for export and trading)
30/ton/acre/ year, 70% utilized initially	15	Local/Imported Machinery	Southern Punjab, Central and Upper Sindh	Karachi

Financial Summary

Project Cost	IRR	NPV (Rs)	Payback Period	Cost of Capital (WACC)
Rs. 11.22 million	41%	14,689,406	3 Years 3 Months	17.5%

9. Proposed Location

There are sufficient lands available in various regions of Pakistan, but said areas has adequate natural resources required to produce fodder. Sale points like mandi and farms are also near-by.

10. Key Success Factors

Alfalfah is rarely utilized on large scale for livestock, so, majority of people are not aware of its benefits. The apprehension of wastage and or/any harm to their animals may also forcing people to use the existing fodder products. But, once they experience the benefits and advantage of Alfalfah, they will switch. The few factors which may play significant role are:

- The consumption pattern; as dry alfalfah does not contain adequate moisture so animal would take approximately 4 to 6 kg, whereby other fodder type have high moisture level 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 throughout the year with sustainable quality.

11. Sector & Industry Analysis

11.1. Sector Characteristics and Overview

According to the International Feed Industry Federation (IFIF), the worldwide animal feed industry produced one Billion tons of feed in the year 2016. 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.

11.2 Fodder Exports of Pakistan

In the year 2015, Pakistan has exported² approximately 8,345 tons of Animal Fodder worldwide with an exporting value of USD 1.1 Million. The major buyers that imports Animal Fodder from Pakistan include Afghanistan, UAE, Kuwait, Australia and Qatar. The following table shows the trend observed in the exports of Pakistan in the previous years.

² Trademap

Years	Exported Quantity (tons)	Exported Value US Dollar Thousand
2012	5,761	746
2013	1,563	209
2014	1,346	197
2015	8,345	1,154
2016	965*	96

11.2 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
- Berseem

11.3 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.

11.4 Problems in haymaking

Problems in haymaking vary according to the crop, climate and prevailing weather at the time of 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.

12. Market Information

In Pakistani market, alfalfa is 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.

12.1 Market Potential

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.

12.2 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.

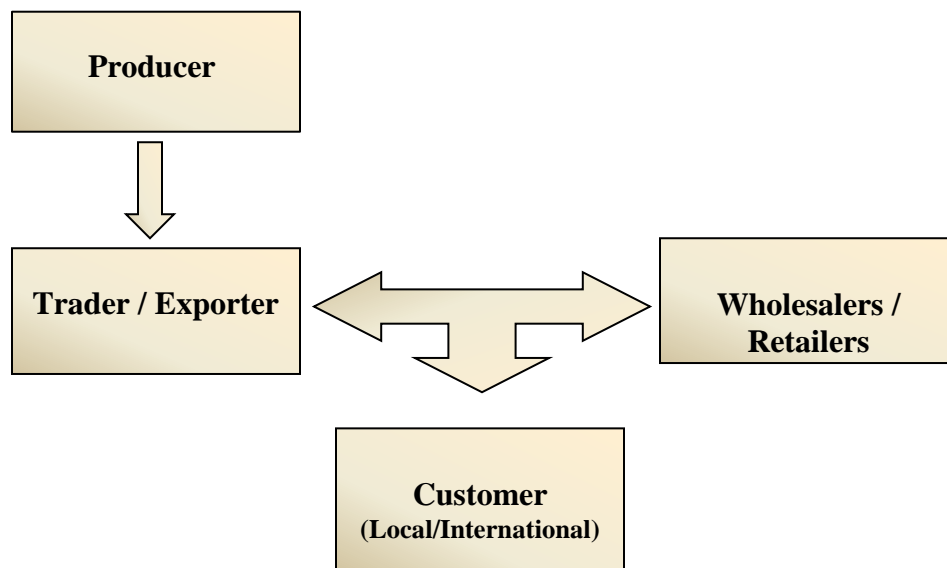
12.3 Product Mix

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 market dry more rather green in the future.

12.4 Channel of Distribution



13. 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

13.1 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.

13.2 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.

13.3 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. 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. Tractor 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 livestock 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

13.4 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.

13.5 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. Following Raw material will be required for the cultivation of Fodder.

Description	No	Price	Total Cost
Seed (Kg per Acre)	10	1200	12,000
Fertilizer (1 Bag per Acre) 50 Kg bag	3	1430	4,290
DAP (1 Bag per Acre) 50 Kg bag	1	2300	2,300
Farmers Cost per Acre	20	300	6,000
Pesticide (Spray)	1	1000	1,000
Cost per Acre		4,930	25,590

13.6 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	2	750,000	1,500,000

2	Raker	1	250,000	250,000
3	Bailer	1	1,200,000	1,200,000
4	Mover	1	800,000	800,000
5	Cultivator	1	65,000	65,000
6	Hydraulic Trailer	1	400,000	400,000
7	Front End Loader	1	375,000	375,000
8	Other Accessories	1	200,000	200,000
				4,790,000
Fire Fighting Equipment				
1	Fire Fighting Equipment	4	35,000	140,000
Total				140,000
<i>Total Tools & Equipment Cost</i>				4,930,000

13.7 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.

14. Land and Building Requirement

14.1 Building Construction Cost

As per discussion with market experts, 50 acres area is sufficient for cultivation initially. The production land would be located in areas of Southern Punjab, Central and Upper Sindh, 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 urban areas for this purpose. Therefore, it will be feasible to acquire some office on rent with alterations made accordingly. The rented office area will incur a sum of Rs. 50,000 / month.

14.2 Human Resource Requirement

Fodder production and trading requires highly specialized and skilled labor. A total of 15 persons will be required to handle the production process, storage and trading operations. Skilled labor with relevant experience will be required for production and trading. Total approximate manpower

requirement 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 Annum
1. Business Unit Manager/Owner				
Production Staff				
Manager	1	75,000	75,000	900,000
Supervisor /Forman	1	35,000	35,000	420,000
Machine Operator	3	18,000	54,000	648,000
Land Labor (Head Labour)	5	15,000	75,000	900,000
Total Production Staff	10			
General Administration/ Selling Staff				
Marketing Executive	2	35,000	70,000	840,000
Accountant	1	25,000	25,000	300,000
Office Assistant	1	20,000	20,000	240,000
Guard	1	15,000	15,000	180,000
Total G A /S Staff	5			
TOTAL	15	203,000	334,000	4,008,000

14.3 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 of 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.

15 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.

15.1 Space Requirement

Fodder will be cultivated on 50 Acres of fertile land, which will be acquired on contract farming basis. Trading will be managed from production site. For this project, we have assumed the following lease/rental rates for agriculture land.

Table 4 - Space Requirement

Area Required	Area	Monthly Rent Charges (Rs.)	Yearly Rent (Rs.)
Land on Contract Farming	50 Acres	25,000	1,250,000
Total Rent			1,250,000

15.2 Land / Office Furniture & Fixtures:

A lump sum provision of Rs. 213,000/- 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:

S.No.	Item	Quantity in Nos	Unit Cost	Cost
Office Furniture				
1	Table & Chair for Owner	1	25,000	25,000
2	Tables & Chairs for Admin/Marketing Staff	4	15,000	60,000
3	Waiting Chairs	8	6,000	48,000
4	Chairs for Workers/Labor	6	5,000	30,000
5	Electrical Fittings & Lights & Misc.	1	50,000	50,000
Grand Total				213,000

15.3 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. Office Renovation
3. Vehicle
4. Factory/office Furniture

15.4 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. 912,000/- per annum. Approximate cost of utilities has been given below:

Utility	Total Monthly Cost (Rs.)	Total Quarterly Cost (Rs.)	Total Annual Cost (Rs.)	Annual %age Increase
1. Electricity (For office & Tubewell)	35,000	105,000	420,000	5%
2. Diesel for Tractor & Other Accessories	35,000	105,000	420,000	5%
3. Water	2,500	7,500	30,000	5%
4. Telephone	3,500	10,500	42,000	5%
Total	76,000	228,000	912,000	

15.5 Working Capital Requirements

It is estimated that an additional amount of Rs. 1.53 Million (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.

Working Capital		
Utilities - Three Months (Office & Factory)		228,000
1.	Electricity/month	35,000
2.	Diesel for Vehicles	35,000
3.	Water/month	2,500
4.	Telephone/month	3,500
Salaries - Three Months (Production Staff)		1,002,000
Office Rent (Three months)		150,000
Misc. Expenses - Three months (@ 50,000 /month)		150,000
Total Working Capital		1,530,000

15.6 Vehicle for Support and Maintenance Services

A loading vehicle would be required for providing services for transportation of raw material from market to land or any other destination. For this purpose a transportation vehicle has been proposed which will cost around Rs. 2,200,000

15.7 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 outreach.
- 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 5% of the annual sales has been assumed which also covers the margin on bulk and off season buying.

15.8 Miscellaneous Expenses

Miscellaneous expenses of running the business are assumed to be Rs. 50,000 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.

15.9 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.

15.10 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 price 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, it is anticipated that the sales price will vary according to location.

15.11 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.

15.12 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.

15.13 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.

16 Contact Details

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

Machinery Supplier - 1

Name of Supplier /Organization	New Chaudhary Agricultural Mechanical Engineers		
Address	Chowk A.T.M Vehari Road Multan,		
Phone	+92302-8737610	Fax	+92-61-6354590
E-mail	info@newcame.com		
Website	http://www.newcame.com		

Machinery Supplier - 2

Name of Supplier /Organization	AGRIPAK		
Address	4 - Amber Palace, Main Shakra-e-Faisal, Adjacent to FTC Building, Karachi. PAKISTAN.		
Phone	+92-21-34556285	Fax	+92-21-34556288
E-mail	info@agripak.com.pk		
Website	www.agripak.com.pk		

15.14 Technical Experts / Consultants

Name of Expert	Mr. Abdul Waheed Shaikh
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Name of Organization	Maxim International (Pvt).Ltd
Contact Person	Muhammad Rasheed
Address	69-A, Sector XX DHA Phase 3 Khayban-e-Iqbal Road, Lahore, Pakistan
Phone	0344-4457835
E-mail	info@maxim-intl.com , Waheed.shaikh@yahoo.com
Phone	0300-2268694

15.15 Raw Material Supplier -1

Name of Organization	4 Brothers Bio Traders
Contact Person	Fazkurullah Memon
Address	77-D/1, First Floor Lahore Centre, Main Boulevard Gulberg, Block D 1 Gulberg III, Lahore, Punjab
Phone	0321-4480263
E-mail	info@4bgroup.com
Website	www.4bgroup.com/

Raw Material Supplier - 2

Name of Organization	Moringa Fodder Seeds
Address	Office # 126, Latif Center Ichra, Main Ferozpur Road, Lahore.
Phone	0333-41209000, 0346-0049624
E-mail	info@herbyzone.com
Website	http://herbyzone.com/contact-us/

16 ANNEXURES

16.1 Summary of Key Assumptions

16.2 Cost and Revenue Sheet

16.3 Projected Income Statement

16.4 Projected Balance Sheet

16.5 Projected Cash Flow Statement

Summary of Key Assumptions

(in Pak. Rs.)

Sr. No.	PARTICULARS	TOTAL COST/DETAILS
Fixed Capital		
	Tools & Equipment	4,930,000
	Tools & Equipment	4,790,000
	Fire Fighting Equipment	140,000
	Office Renovation	600,000
	Furniture & Equipment	213,000
	Vehicle	2,200,000
	Land for Cultivation	1,250,000
	Preliminary Expenses	500,000
	Total Fixed Capital	9,693,000
Working Capital		
	Utilities - Three Months (Office & Factory)	228,000
	1. Electricity/month	35,000
	2. Diesel for Vehicles	35,000
	3. Water/month	2,500
	4. Telephone/month	3,500
	Salaries - Three Months (Production Staff)	1,002,000
	Office Rent (Three months)	150,000
	Misc. Expenses - Three months (@ 50,000 /month)	150,000
	Total Working Capital	1,530,000
	TOTAL PROJECT COST	11,223,000
	Equity Financing	11,223,000
	Debt:Equity Ratio (50:50)	0.00%
PROJECT RETURNS AND OTHER FINANCIAL		
	IRR	41%
	NPV	14,689,406
	Payback Period (Years)	3 Years 3 Months
	Weighted Average Cost of capital	17.50%
OTHER ASSUMPTIONS		
	Depreciation	10%
	Machinery Annual Repair & Maintenance (as %age of total cost of Machinery)	3.00%
	Selling & Distribution Expenses	5.00%
INCREASE IN PRICE AND GROWTH		
	Increase in Cost Price	5%
Factory Operations and Capacity Utilisation Assumptions		
	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
Economy related assumptions		
	Utilities growth rate Charges	5%
	Increase in Salaries	10%
	Increase in Office Rent	10%
	Income Tax Rate	20%
Cash Flow Assumptions		
	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
Production Information - fodder		
	Ready Crop - Green (Tonnage per Acre including loss)	2.0
	Ready Crop - Dry (80%)	80%
	Cultivation Land (Acre)	50
	Sale - Dry Losan	90%
	Sale - Green Losan	10%
	Crop in a Year	8

**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 50 Acre/cut) - Dry (30% of Green)	72	35,000	2,520,000	
Crop (per 50 Acre/cut) - Green	10	6,500	65,000	
Total Revenue (Per Crop)	82		2,585,000	Rs. / Crop
No. of Crops (Per Year)			8	Crops / Year
Total Annual Sales			20,680,000	Rs. / Year

2. COST CALCULATION

Page 1

Description	No	Price	Total Cost
Seed (Kg per Acre)	10	1200	12,000
Fertilizer (1 Bag per Acre) 50 Kg bag	3	1430	4,290
DAP (1 Bag per Acre) 50 Kg bag	1	2300	2,300
Farmers Cost per Acre	20	300	6,000
Packaging Cost (50 Kg Polythin Bag)	0	0	-
Pesticide (Spray)	1	1000	1,000
Cost per Acre		4,930	25,590

Total Cost (Area Cultivation) - Per Crop 1,279,500

Total Cost (Area Cultivation) - Per Year 10,236,000

TOTAL ANNUAL COST OF PRODUCTION 10,236,000 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
Gross Revenue	20,680,000	23,885,400	27,587,637	31,863,721	36,802,597	42,507,000	49,095,585	56,705,401	65,494,738	75,646,422
Sales on Credit	2,068,000	2,388,540	2,758,764	3,186,372	3,680,260	4,250,700	4,909,559	5,670,540	6,549,474	7,564,642
Sales on Cash	18,612,000	21,496,860	24,828,873	28,677,349	33,122,338	38,256,300	44,186,027	51,034,861	58,945,264	68,081,780
Bed Debt Expenses	41,360	47,771	55,175	63,727	73,605	85,014	98,191	113,411	130,989	151,293
Net (Adjusted Sales)	20,638,640	23,837,629	27,532,462	31,799,993	36,728,992	42,421,986	48,997,394	56,591,990	65,363,748	75,495,129
Cost of Sales	11,570,000	13,294,600	15,279,638	17,564,794	20,195,831	23,225,528	26,714,763	30,733,756	35,363,514	40,697,487
Cultivation Cost	10,320,000	11,919,600	13,767,138	15,901,044	18,365,706	21,212,391	24,500,311	28,297,860	32,684,028	37,750,052
Cultivation Land Rent	1,250,000	1,375,000	1,512,500	1,663,750	1,830,125	2,013,138	2,214,451	2,435,896	2,679,486	2,947,435
Gross Profit	9,068,640	10,543,029	12,252,824	14,235,199	16,533,161	19,196,458	22,282,631	25,858,234	30,000,235	34,797,643
Gross Profit Margin	44%	44%	45%	45%	45%	45%	45%	46%	46%	46%
General Administrative & Selling Expenses										
Salaries	4,008,000	4,408,800	4,849,680	5,334,648	5,868,113	6,454,924	7,100,416	7,810,458	8,591,504	9,450,654
Office Rent	600,000	660,000	726,000	798,600	878,460	966,306	1,062,937	1,169,230	1,286,153	1,414,769
Amortization of Preliminary Expenses	100,000	100,000	100,000	100,000	100,000	-	-	-	-	-
Depreciation Expense	794,300	714,870	643,383	579,045	521,140	472,026	424,824	382,341	344,107	309,696
Maintenance Expense	147,900	147,900	147,900	147,900	147,900	147,900	147,900	147,900	147,900	147,900
Selling & Distribution	1,031,932	1,191,881	1,376,623	1,590,000	1,836,450	2,121,099	2,449,870	2,829,599	3,268,187	3,774,756
Subtotal	6,682,132	7,223,451	7,843,586	8,550,192	9,352,063	10,162,256	11,185,946	12,339,529	13,637,852	15,097,776
Operating Income	2,386,508	3,319,578	4,409,238	5,685,007	7,181,098	9,034,202	11,096,685	13,518,705	16,362,383	19,699,867
Earnings Before Taxes	2,386,508	3,319,578	4,409,238	5,685,007	7,181,098	9,034,202	11,096,685	13,518,705	16,362,383	19,699,867
Tax	477,302	663,916	881,848	1,137,001	1,436,220	1,806,840	2,219,337	2,703,741	3,272,477	3,939,973
Net Profit	1,909,206	2,655,662	3,527,390	4,548,005	5,744,879	7,227,362	8,877,348	10,814,964	13,089,906	15,759,893
Monthly Profit After Tax	159,101	221,305	293,949	379,000	478,740	602,280	739,779	901,247	1,090,826	1,313,324

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
Assets											
Current Assets											
Cash & Bank Balance	1,530,000	4,161,173	7,604,994	11,844,915	17,036,331	23,331,192	30,983,044	40,230,310	51,364,200	64,724,969	80,679,962
Accounts Receivable	0	172,333	199,045	229,897	265,531	306,688	354,225	409,130	472,545	545,789	630,387
Total Current Assets	1,530,000	4,333,506	7,804,039	12,074,812	17,301,862	23,637,881	31,337,269	40,639,440	51,836,745	65,270,759	81,310,348
Fixed Assets											
Plant Machinery & Facility	4,930,000	4,437,000	3,993,300	3,593,970	3,234,573	2,911,116	2,620,004	2,358,004	2,122,203	1,909,983	1,718,985
Factory Construction	600,000	540,000	486,000	437,400	393,660	384,294	345,865	311,278	280,150	252,135	256,922
Land	1,250,000	1,250,000	1,250,000	1,250,000	1,250,000	1,250,000	1,250,000	1,250,000	1,250,000	1,250,000	1,250,000
Furniture & Fixtures	213,000	191,700	172,530	155,277	139,749	125,774	113,197	101,877	91,690	82,521	74,269
Vehicle	2,200,000	1,980,000	1,782,000	1,603,800	1,443,420	1,299,078	1,169,170	1,052,253	947,028	852,325	767,093
Total Fixed Assets	9,193,000	8,398,700	7,683,830	7,040,447	6,461,402	5,970,262	5,498,236	5,073,412	4,691,071	4,346,964	4,067,268
Intangible Assets											
Preliminary Expenses	500,000	400,000	300,000	200,000	100,000	-	-	-	-	-	-
Total Assets	11,223,000	13,132,206	15,787,869	19,315,259	23,863,264	29,608,143	36,835,504	45,712,852	56,527,816	69,617,723	85,377,616
Owner's Equity	11,223,000	13,132,206	15,787,869	19,315,259	23,863,264	29,608,143	36,835,504	45,712,852	56,527,816	69,617,723	85,377,616
Total Equity & Liabilities	11,223,000	13,132,206	15,787,869	19,315,259	23,863,264	29,608,143	36,835,504	45,712,852	56,527,816	69,617,723	85,377,616



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
Cash Flow From Operating Activities											
Net Profit	0	1,909,206	2,655,662	3,527,390	4,548,005	5,744,879	7,227,362	8,877,348	10,814,964	13,089,906	15,759,893
Add: Depreciation Expense	0	794,300	714,870	643,383	579,045	521,140	472,026	424,824	382,341	344,107	309,696
Amortization Expense	0	100,000	100,000	100,000	100,000	100,000	-	-	-	-	-
(Increase) / decrease in Receivables	-	(172,333)	(26,712)	(30,852)	(35,634)	(41,157)	(47,537)	(54,905)	(63,415)	(73,244)	(84,597)
Net Cash Flow From Operations	0	2,631,173	3,443,821	4,239,921	5,191,416	6,324,862	7,651,851	9,247,267	11,133,890	13,360,769	15,984,993
Cash Flow From Financing Activities											
Receipt of Long Term Debt	0										
Repayment of Long Term Debt		0	0	0	0	0	-	-	-	-	-
Owner's Equity	11,223,000										
Net Cash Flow From Financing Activities	11,223,000	0	0	0	0	0	0	0	0	0	0
Cash Flow From Investing Activities											
Capital Expenditure	(7,130,000)					(30,000)					(30,000)
Factory/Office Furniture	(213,000)										
Preliminary Operating Expenses	(500,000)										
Office Renovation Cost	(600,000)										
Land for Cultivation	(1,250,000)										
Net Cash Flow From Investing Activities	(9,693,000)	0	0	0	0	(30,000)	0	0	0	0	(30,000)
NET CASH FLOW	1,530,000	2,631,173	3,443,821	4,239,921	5,191,416	6,294,862	7,651,851	9,247,267	11,133,890	13,360,769	15,954,993
Cash at the Beginning of the Period	0	1,530,000	4,161,173	7,604,994	11,844,915	17,036,331	23,331,192	30,983,044	40,230,310	51,364,200	64,724,969
Cash at the End of the Period	1,530,000	4,161,173	7,604,994	11,844,915	17,036,331	23,331,192	30,983,044	40,230,310	51,364,200	64,724,969	80,679,962

