18. SHEEP AND GOAT FATTENING

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I. SUMMARY

This profile envisages the establishment of a farm for Sheep and Goat fattening with a capacity of 3000 sheep and 2000 goats per annum.

The present demand for the proposed product is estimated at 2.5 million head per annum. The demand is expected at reach to 210 million heads by the year 2010.

The farm will create employment opportunities for 28 persons.

The total investment requirement is estimated at Birr 2.1 million, out of which Birr 0.58 million is required for plant and machinery.

The project is financially viable with an internal rate of return (IRR) of 12% and a net present value (NPV) of Birr 0.46 million, discounted at 8.5 %.

II. FARM DESCRIPTION AND APPLICATION

The main activities of the project will be more of a feed lot management in which sheep and goats will be properly fed and conditioned to the standard, where the export market will demand. Thus, the sheep and goats that will be maintained on the farm will be intensively managed under appropriate feeding and health care.

Local breeds or types of sheep and goats in the surrounding area will be used mainly because they are acclimatized to the climate and are considered to be better resistant to some diseases and parasites prevalent in the area.

The sheep and goats will be purchased from individual farmers and the local livestock markets. Thus when the farm becomes fully functional, in addition to the job opportunity it creates for the surrounding labour force, it will be a good market outlet for sheep and goats producing farmers in the locality.

On the other hand, because of the current healthy bilateral trade relations with the neighbouring Sudan, there is high opportunity for live sheep and goat to be exported to the Sudanese markets. Thus, the farm envisages no market problem at its initial and expanded phase.

III. MARKET STUDY AND FARM CAPACITY

A. MARKET STUDY

1. Past Supply & Present Demand

The demand for sheep and goat is essentially derived from the domestic and export market for sheep and goat meat. Since there is no specific data on the consumption of sheep and goat meat, data obtained form Household Income, Consumption and Expenditure Survey of the CSA is used in estimating the domestic demand for sheep and goat meat in the country. According to the survey, the per capita consumption of sheep and goat meat in the country is 582 and 391 gm, respectively. The total domestic demand for sheep and goat meat for the year 2004 is, therefore, estimated at 41,399 and 27,812 tonnes, respectively, making use of the projected population size of 71,131,683 for the year.

Sheep and goat meat is exported in the form of fresh or chilled carcasses. Total exports of meat and meat products during the period 1990 - 2002 are shown in Table 3.1. Exports exhibited considerable fluctuations and averaged at 905 tonnes during the period under reference.

Table 3.1
EXPORT OF MEAT AND MEAT PRODUCTS

Year	Export (Tonnes)
1990	208
1991	138
1992	15
1993	40
1994	209
1995	580
1996	1268
1997	1823
1998	2508
1999	1906
2000	1166
2001	799
2002	1105
Average	**905**

Source: *CSA, Statistical Abstract, various years.*

In estimating the export demand for meat and meat products, exponential smoothing method is applied on export data (see Table 3.2).

The Exponential Smoothing Model is given by:

$Y''_{t+k} = L_t + kT_t$

Where,

L_t = alpha* Y_t + (1 - alpha) (L_t-1 + T_t-1)

T_t = beta(L_t - L_t-1) + (1 - beta) T_{t-1}

Where Y''_{t+k} stands for forecasted value;

L_t indicates the long-term level or base value for the time-series data, i.e. the level term;

T_t indicates the expected increase or decrease per year, i.e. the trend term;

k stands for the number of time periods we want to forecast;

t represents time; and

alpha and beta are smoothing parameters.

Table 3.2
EXPONENTIALLY SMOOTHED FORECAST OF MEAT AND MEAT PRODUCTS EXPORT (TONNES)

Alpha = 0.3
Beta = 0.2

Year	Export (Tonnes)	Level Term	Trend Term	Forecast	Abs.% Error	MAD
1990	208	208	0	NA	NA	NA
1991	138	138.0	-70.0	208		70.00
1992	15	15.0	-123.0	68	-3.53	53.00
1993	40	40.0	25.0	-108	3.70	148.00
1994	209	209.0	169.0	65	0.69	144.00
1995	580	580.0	371.0	378	0.35	202.00
1996	1268	1268.0	688.0	951	0.25	317.00
1997	1823	1823.0	555.0	1956	-0.07	133.00
1998	2508	2508.0	685.0	2378	0.05	130.00
1999	1906	1906.0	-602.0	3193	-0.68	1287.00
2000	1166	1166.0	-740.0	1304	-0.12	138.00
2001	799	799.0	-367.0	426	0.47	373.00
2002	1105	1105.0	306.0	432	0.61	673.00
2003				1411		305.67
2004				1717		

On the basis of the smoothed data, the total export demand for meat and meat products for the year 2004 is estimated at 1,717 tonnes. Making use of the above stated average carcass weight, adopting previous IPS estimate of 60% share of sheep and goat meat in the total meat and meat products export, and applying expert estimate of 60% share of sheep meat in the total sheep and goat meat export from the country, the total export demand for sheep and goat for the year 2004 is estimated at 1,545,300 and 1,030,200 heads, respectively.

2. Projected Demand

Since the domestic demand for sheep and goat is influenced by population size and income, the 2.9 per cent population growth rate is used in projecting the domestic demand. The proportion of the regional population in the total population of the country (0.8%) is applied in estimating the market share from the total projected domestic demand for the product. The export demand is projected on the basis of the exponentially smoothed forecasted reported in Table 3.2. Given the significant influence of supply in meeting the export demand, the region's share in the total sheep and goat population of the country (i.e. 0.4% for sheep and 1.5 % for goat) is applied in estimating the market share from the total projected export demand (see Table 3.3).

Table 3.3
PROJECTED DEMAND FOR SHEEP AND GOAT (HEADS)

Year	Projected Demand (heads)						Market Share		
	Domestic Demand		Export Demand		Total				
	Sheep	Goat	Sheep	Goat	Sheep	Goat	Sheep	Goat	Total
2005	106498000	71547626	1820700	1213800	108318700	72761426	859267	590588	1449855
2006	109586442	73622507	2096100	1397400	111682542	75019907	885076	609941	1495017
2007	112764449	75757559	2371500	1581000	115135949	77338559	911602	629775	1541377
2008	116034618	77954529	2646900	1764600	118681518	79719129	938865	650105	1588970
2009	119399622	80215210	2922300	1948200	122321922	82163410	966886	670945	1637831
2010	122862211	82541451	3197700	2131800	126059911	84673251	995688	692309	1687997
2011	126425215	84935153	3473100	2315400	129898315	87250553	1025294	714212	1739506
2012	130091546	87398273	3748500	2499000	133840046	89897273	1055726	736671	1792398
2013	133864201	89932822	4023900	2682600	137888101	92615422	1087009	759702	1846711
2014	137746263	92540874	4299300	2866200	142045563	95407074	1119167	783320	1902487
2015	141740905	95224560	4574700	3049800	146315605	98274360	1152226	807543	1959770
2016	145851391	97986072	4850100	3233400	150701491	101219472	1186212	832390	2018601
2017	150081081	100827668	5125500	3417000	155206581	104244668	1221151	857876	2079027
2018	154433433	103751670	5400900	3600600	159834333	107352270	1257071	884022	2141093
2019	158912002	106760469	5676300	3784200	164588302	110544669	1294001	910847	2204848
2020	163520450	109856522	5951700	3967800	169472150	113824322	1331970	938369	2270340
2021	168262543	113042361	6227100	4151400	174489643	117193761	1371009	966610	2337619
2022	173142157	116320590	6502500	4335000	179644657	120655590	1411147	995590	2406737
2023	178163279	119693887	6777900	4518600	184941179	124212487	1452418	1025330	2477748
2024	183330015	123165010	7053300	4702200	190383315	127867210	1494853	1055853	2550706
2025	188646585	126736795	7328700	4885800	195975285	131622595	1538487	1087181	2625669

3. Pricing and Distribution

The price of sheep and goat is characterized by seasonal variations; it increases considerably during religious holidays and stabilizes during extended fasting periods. According to the estimates of sheep and goat traders, the price of sheep and goat ranges between Birr 210 to Birr 290 for sheep and Birr 150 to Birr 230 for goat. An average price of Birr 220 and Birr 200, respectively, for sheep and goat is recommended for the envisaged plant.

The envisaged plant can supply its product directly to slaughtering plants and meat exporters. Appointing agents at strategic towns is also a viable option.

B. FARM CAPACITY AND PRODUCTION PROGRAMME

1. Farm Capacity

The farm will have the capacity to accommodate 1,000 heads of sheep and goats per one cycle. One cycle is assumed to be not more than sixty days. The actual operation will be based on putting a batch of 500 heads on the farm within one month. Hence, the batch will stay on the farm for two months. Thus at any time, there will be 1,000 sheep and goats on the farm. The main function of the farm will be cleaning, feeding, upgrading, conditioning, etc. of Assosa and /or the surrounding breed of sheep and goats.

For effective utilization of resources (manpower, equipment, transport, etc.) and efficient operation and management of the farm operation schedule will be based on monthly basis. In one month 500 heads, i.e., 350 sheep and 200 goats will be purchased and considered as one batch.

In general terms, the annual plant capacity will be 5,000 sheep and goats (3,000 sheep and 2,000 goats) with 3% per cent mortality rate.

2. Production Programme

The farm will work all year round. The farm will start at 75% of its capacity in the first year and will operate at full capacity in the second year and thenafter.

IV. FARM MATRERIALS AND INPUTS

A. FARM MATERIALS

Annual farm inputs requirement at full capacity of the sheep and goats farm are described in Table 4.1.

Table 4.1
ANNUAL FARM MATERIALS REQUIREMENT AND COSTS OF SHEEP AND GOAT FARM AT REQUIREMENT FULL CAPACITY

Sr. No.	Description	Unit of Measure	Qty.	Cost, (Birr 'ooo)
1	Feed			
	- Concentrate	Tonne	81	56.7
	- Roughage	Tonne	167	59.9
2	Sheep	Head	3000	3000
3	Goat	Head	2000	160
4	Vaccines and drugs	Lump		25
6	Others	Set		5
7	**Total Cost**			**604.6**

B. UTILITIES

Annual requirement of electricity, water, and fuel for processing and sanitation are estimated at 12,000 kWh, 600 m^3 and 16,120 liters, respectively. The total cost of utilities is about Birr 52,000 per annum.

V. FARM TECHNOLOGY AND ENGINEERING

A. FARM TECHNOLOGY

1. Farm Operations

Sheep and goat will reach the farm through suppliers or contract as per the pre-determined procurement procedure. The next process will be receiving and treating the animals. The treatment includes weighing, vaccinating and dipping followed by prophylactic treatment. Physical examination to isolate the sick animals and separation of sexes are also part of the production process. Then, the actual feeding and supplements practice are the main part of the task. Castration will be done depending on the request of the client. The final stage of the process will be marketing. At this time, it is also important to separate marketable and unfit animals.

2. Source of Technology

Local suppliers such as Hagbes Ethiopia Plc., Omedad, etc. can supply the machinery and equipment required by the farm.

B. ENGINEERING

1. Farm Machinery and Equipment

The required farm machinery, equipment and tools are listed in Table 5.1. Total costs are estimated to be Birr 585,750 out of which Birr 445,750 is required in foreign currency.

Table 5.1
FARM MACHINERY AND EQUIPMERNT REQUIREMENT ALONG WITH ESTIMATED COST

Sr. No.	Description	Unit of Meas.	Qty.	Unit Cost (Birr)	Total Value ('000 Birr)		
					FC	LC	Total Cost
1	Crush	No	1	10		10	10.0
2	Vet equipment	Set		1.0	1.0		1.0
3	Hoof trimmer	No	5	0.25	1.25		1.25
4	Burdizzo	No	5	0.25	1.25		1.25
5	Knapsack sprayer	No	5	0.45	2.25		2.25
6	Tractor	No	1	120		120	120
7	Trailer	No	1	40	40		40
8	Generator	No	1	80	80		80
9	Water pump	No	1	90	90		90
10	Pick-up	No	1	230	230		230
11	Office equipment	Set		10		10	10
	Grand Total Cost				**445.75**	**140**	**585.75**

2. Land, Building and Civil Works

The total land area required for the sheep and goat farm is about 50 hectares, out of which about 2 hectares is required for building area for store and isolation (treatment ward). The rest will be used for the production of improved forage and hay that will be used as feed for the animals.

The farm area will be fenced with treated eucalyptus posts and barbed wire so that the animals will be isolated to avoid unnecessary contact and introduction of diseases.

The total cost of buildings and civil works is estimated at Birr 431,700. Rural land lease cost in BGRS ranges from Birr 15 to Birr 30 per hectare. Accordingly, the total land lease cost at the rate of Birr 30 per hectare and for 70 years of land holding is estimated at Birr 105,000. The details of building & civil works requirement & related costs are presented on Table 5.2.

Table 5.2
BUILDINGS AND CIVIL WORKS REQUIREMENT
AND CORRESPONDING COSTS ('000 BIRR)

Sr. No.	Description	Unit of Measure	Qty.	Unit Cost	Total Cost
1	Sheep shed/house	m^2	900	1000	90
2	Feeder/waterer	m^2	150	50	7.5
3	Fence	m^2	400	25	10
4	Office	m^2	9	1000	9
5	Store	m^2	30	800	24
6	Water well	No.	1	80,000	80
7	Reservoir/tank	No.	1	15,000	15
8	Others				141.5
	Grand Total Cost				**377.5**

Accordingly, assuming that the total land lease cost will be paid in advance, the investment requirement for land, building and civil work is estimated at Birr 482,500.

3. Proposed Location

The envisaged project is proposed to be located in Metekel zone of the Benishangul Gumuz Regional State.

VI. MANPOWER AND TRANNING REQUIREMENT

A. MANPOWER REQUIREMENT

The manpower required by the envisaged farm is 28 persons.

Manpower and corresponding labour cost requirement details are as shown in the Table 6.1.

Table 6.1
MANPOWER AND ANNUAL SALARY REQUIREMENT FOR THE FARM

Sr. No.	Description	Req. No.	Salary (Birr)		
			Per staff/month	Monthly	Annual
1	Farm Manager	1	980	980	11760
2	Secretary/casher	1	450	450	5400
3	Flock Attendant	10	200	200	2400
4	Assist. Veterinarian	1	800	800	9600
5	Record Keeper	1	500	500	6000
6	Tractor Operator	1	420	420	5040
7	Purchaser	1	600	600	7200
9	Office boy/girl	1	200	200	2400
10	Guards	8	200	1600	19200
	Sub total		**4750**		**54360**
	Employee benefit (25%)				10872
	Grand Total	**28**			**65232**

B. TRAINING REQUIREMENT

No special training is required for the envisaged farm.

VII. FINANCIAL ANALYSIS

The financial analysis of the Sheep and Goat fattening project is based on the data presented in the previous chapters and the following assumptions:-

Construction period	1 years
Source of finance	30 % equity
	70 % loan
Tax holidays	6 years
Bank interest	7.5 %
Discounted cashflow	8.5 %
Repair and maintenance	3 % of the total plant and machinery
Accounts receivable	30 days
Raw material, local	30 days
Raw materials, import	90 days
Work in progress	60 days
Finished products	30 days
Cash in hand	5 days
Accounts payable	30 days

A. TOTAL INITIAL INVESTMENT COST

The total initial investment cost of the project including working capital is estimated at 2.13 million, of which 23.02 per cent will be required in foreign currency.

The major breakdown of the total initial investment cost is shown in Table 7.1.

Table 7.1
INITIAL INVESTMENT COST

Sr. No.	Cost Items	Total ('000 BIRR)
1	Land lease value	105
2.	Building and Civil Work	235.5
3.	Farm Machinery and Equipment	585.75
4.	Office Furniture and Equipment	10
5.	Vehicle	930
6.	Pre-production Expenditure*	102.4
7	Working Capital	93
	Total Investment cost	**2,062.01**
	Foreign share	**23.88**

B. PRODUCTION COST

The annual production cost at full operation capacity is estimated at Birr 1.1 million (see Table 7.2). The material and utility cost accounts for 59.1 per cent while depreciation and financial cost take 31.4 per cent of the production cost.

Table 7.2
ANNUAL PRODUCTION COST AT FULL CAPACITY ('000 BIRR)

Items	Cost	%
Raw Material and Inputs	604.6	54.9
Utilities	52	4.7
Maintenance and repair	9.6	0.9
Labour direct	54.4	4.9
Factory overheads *	10.9	1.0
Administration Cost **	30	2.7
Total Operating Costs	**761.5**	**69.1**
Depreciation	263.6	22.4
Cost of Finance	93.5	8.5
Total Production Cost	**1,118.58**	**100**

* *N.B Pre-production expenditure includes interest during construction (Birr 97.4 thousand), and (Birr 5 thousand) costs of registration, licensing and formation of the company including legal fees, commissioning expenses, etc.*

**Estate overhead cost includes salaries and wages of supervisors, insurance of farm workers, social costs on salaries of direct labour, etc.*
*** Administrative cost includes salaries and wages, insurance, social costs, materials and services used by administrative staff etc.*

C. FINANCIAL EVALUATION

1. Profitability

According to the projected income statement, the project will start generating profit in the 6th year of operation. Important ratios such as profit to total sales, net profit to equity (Return on equity) and net profit plus interest on total investment (return on total investment) show an increasing trend during the lifetime of the project.

The income statement and the other indicators of profitability show that the project is viable.

2. Break-even Analysis

The break-even point of the project including cost of finance when it starts to operates at full capacity (year 7) is estimated by using income statement projection.

$$BE = \frac{\text{Fixed Cost}}{\text{Sales} - \text{Variable cost}} = 34\ \%$$

3. Pay-Back Period

The investment cost and income statement projection are used to project the pay-back period. The project's initial investment will be fully recovered within 8 years.

4. Internal Rate of Return and Net Present Value

Based on the cash flow statement, the calculated IRR of the project is 12% and the net present value at 8.5% discount rate is Birr 0.46 million.

D. ECONOMIC BENEFITS

The project can create employment for 28 persons. In addition to supply of the domestic needs, the project will generate Birr 60 thousand per annum in terms of tax revenue when it starts to operate at full capacity. Moreover, the Regional Government can collect employment, income tax and sales tax revenue. The establishment of such a farm will have a foreign currency earning effect of the country by increasing the current export level.