

Goat Farming Business Plan Manual

Community Goat Farming through Cooperative

2017-2022

50% Boer Crossed Breed Goat Farming Business in Barpak, Gorkha



Commercial Goat Farming through
Cooperative Is the Way Out for
Farmers

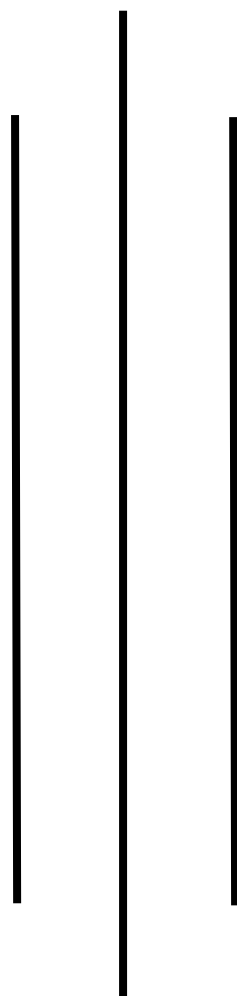
Sustainable Recovery and
Development of the Local Economy



District Livestock Service Office,
Gorkha

Goat Farming Business Plan

Manual



District Livestock Service Office,
Gorkha

Acknowledgement

There is highly potentiality for livestock development due to climate and bio-diversity in Nepal. In the country, there is availability of 64 liter milk, 11 kilogram meat and 32 eggs. There shall be increased in the production of 35% milk, 25% meat and 45% eggs in the present production, to meet the minimum annual consumption of livestock production as 91 liter milk, 14 kilo meat and 48 eggs in the developed country.

In this way, there is important contribution of buffalo, goat, sheep, pig, poultry etc. for especially meat production in livestock production. Likewise, Gorkha district is very important from point of view of goat farming. There are more than 200 thousand goats, and establishment of nearly 250 commercial goat farms in the district at present. Especially, Jamunapari crossed, Khari crossed, Barbari crossed breeds goats are available here. In the recent time, it has also been started of importing Boer crossed goats in this district. District Livestock Development Office (DLSO) has already developed former Bakrang Village Development Committee (VDC) and Dhawa VDC as a resource center of Boer goat; whereas, rearing of Boer goat have also been started through Women's Cooperative in former Barpak VDC (Sulikot Rural Municipality- RM, Ward-1 & 2) from the support of Japan International Cooperation Agency (JICA) Nepal from this year.

In this way, **“Goat Farming Business Plan Manual”** which is suitable and applicable for the Boer goat farming as well as other goat breeds, is going to be published by JICA Nepal, and this hand book shall be very useful to goat farmers in the future. This hand book has analytically covered goat production plan, cost plan, income plan, cost-benefits analysis etc. based on contemporary circumstance of Barpak. In this way, it is hoped that this upcoming publishing Business plan shall be helpful for the development and extension of goat farming business in the district, as it is useful as reference to farmers and stakeholders of this business to set up own business.

In addition to, it is very thankful to JICA Nepal for supporting to goat farming business by publishing **“Goat Farming Business Plan Manual”**.

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1 Introduction

JICA has implemented the Project on Rehabilitation and Recovery from Nepal Earthquake (RRNE Project) in Barpak, Gorkha- epicentre of devastating earthquake in 2015. One hundred sixty four Boer crossed goats as a revolving fund, and 11 buck of same breed have been distributed to Barpak Women Multipurpose Cooperative Ltd. for the sustainable recovery and development of local economy of Barpak through goat farming under livelihood program of this project. The beneficiary people are 78 women there at initial phase, and they have received the goat by borrowing a loan from the cooperative. The women need to pay the loan within 2 years, and to do so, they need to breed she-goat appropriately, produce quality kids and sell them.

Even after finishing the loan payback, there are still necessary costs for the continuation of goat farming. So, for the continuation of goat farming as a business, respective goat farmers have to recognize appropriate plan, and it is necessary to prepare income-expenditure plan accordingly. That's why, this "Goat Farming Business Plan" has demonstrated with different models for the goat farming business management, and it shall be helpful to farmers to apply any one suitable plan or formulate additional new plans.

Finally, this business plan shall be supportive to contribute for the establishment of the model women cooperative regarding goat farming, as well as for the sustainable recovery and development of local economy of Barpak through well-managed goat farming.

2 Production Plan

2.1 Preconditions of this plan

Some model cases of goat farming business management have been presented in this plan. The period of this simulation is for 5 years, and the number of initial she-goat is 1 or 2 head. The cases of keeping the first female kid as a new she-goat for breeding purpose have also been presented here. The farmers can utilize referring among the models presented here identifying own appropriateness. (See Appendix-1 for the other preconditions)

2.2 Production and breeding plan

The number of kids born is changed depending on the number of she-goat in farm. In addition to, the number of kid production is also largely changed according to your decision whether the new born female kid is kept for breeding purpose or not. Of course, if farmer keeps many female kids as she-goats, the number of kid production is increased, but the feeding cost and labor cost shall also be increased at the same time. So, it is important for farmer to make appropriate plan suited to farm conditions such as the financial situation and scale of the goat shed. On the other hand, if farmer afford to increase the she-goat, it is better to keep new female kids at the early stage such as 1st year or 2nd year, because it would very helpful to farmers to increase the income effectively.

<MODEL CASES>

(1) Initially 1 head of she-goat

1) Sell all born kids (*CASE (1)-1*)

- The number of she-goat is 1 head throughout 5 years
- Maximum 15 kids can be produced in 5 years.

Table 1: Breeding and production plan of keeping she-goats (A), and sell all born kid

	Month												Times of breed	Kids born	Sales of goat	Total remaining Nos. of goats after selling	
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec					
1st yr		Dist.		Breed A (1)				Birth A (1) 1 kid			Breed A (2)			2	1	0	2
2nd yr			Birth A (2) 2 kids		Sell A (1) 1 goat	Breed A (3)				Birth A (3) 2 kids			Sell A (2) 2 goats	1	4	3	3
3rd yr	Breed A (4)				Birth A (4) 2 kids		Sell A (3) 2 goats	Breed A (5)					Birth A (5) 2 kids	2	4	2	5
4th yr		Sell A (4) 2 goats	Breed A (6)				Birth A (6) 2 kids		Sell A (5) 2 goats	Breed A (7)				2	2	4	3
5th yr		Birth A (7) 2 kids		Sell A (6) 2 goats	Breed A (8)				Birth A (8) 2 kids		Sell A (7) 2 goats	Breed A (9)		2	4	4	3
	Total												9	15	13	3	

2) Keep first female kid for breeding purpose, and sell all other born kids (*CASE (1)-2*)

- The number of she-goat is 1 head initially, and then become 2 heads from the middle of 1st year.
- Maximum of 26 kids can be produced in 5 years.

Table 2: Breeding and production of keeping she-goat (A), and keeping 1st female kid (Z)

	Month												Times of breed	Kids born	Sales of goat	Total remaining Nos. of goats after selling	
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec					
1st yr		Dist.		Breed A (1)				Birth A (1) 1 female kid Z			Breed A (2)			2	1	0	2
2nd yr			Birth A (2) 2 kids	Breed Z (1)		Breed A (3)		Birth Z (1) 1 kid		Birth A (3) 2 kids	Breed Z (2)	Sell A (2) 2 goats	3	5	2	5	
3rd yr	Breed A (4)		Birth Z (2) 2 kids		Birth A (4) 2 kids	Breed Z (3)	Sell A (3) 2 goats	Breed A (5)		Birth Z (3) 2 kids		Birth A (5) 2 kids	3	8	5	8	
					Sell Z (1) 1 goat							Sell Z (2) 2 goats					
4th yr	Breed Z (4)	Sell A (4) 2 goats	Breed A (6)		Birth Z (4) 2 kids		Birth A (6) 2 kids	Breed Z (5)	Sell A (5) 2 goats	Breed A (7)		Birth Z (5) 2 kids	4	6	6	8	
							Sell Z (3) 2 goats										
5th yr		Birth A (7) 2 kids	Breed Z (6)	Sell A (6) 2 goats	Breed A (8)		Birth Z (6) 2 kids		Birth A (8) 2 kids	Breed Z (7)	Sell A (7) 2 goats	Breed A (9)	4	6	8	6	
		Sell Z (4) 2 goats							Sell Z (5) 2 goats								
Total													16	26	21	6	

(2) Initially 2 heads of she-goat

1) Sell all born kids (*CASE (2)-1*)

- The number of she-goat is 2 heads throughout 5 years.
- Maximum of 30 kids can be produced in 5 years.

Table 3: Breeding and production plan of keeping she-goats (A,B), and sell all born kids

	Month												Times of breed	Kids born	Sales of goat	Total remaining Nos. of goats after selling	
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec					
1st yr		Dist.		Breed A,B (1)				Birth A,B (1) 2 kids			Breed A,B (2)			4	2	0	4
2nd yr			Birth A,B (2) 4 kids		Sell A,B (1) 2 goats	Breed A,B (3)					Birth A,B (3) 4 kids		Sell A,B (2) 4 goats	2	8	6	6
3rd yr	Breed A,B (4)				Birth A,B (4) 4 kids		Sell A,B (3) 4 goats	Breed A,B (5)					Birth A,B (5) 4 kids	4	8	4	10
4th yr		Sell A,B(4) 4 goats	Breed A,B (6)				Birth A,B (6) 4 kids		Sell A,B (5) 4 goats	Breed A,B (7)				4	4	8	6
5th yr		Birth A,B (7) 4 kids		Sell A,B (6) 4 goats	Breed A,B (8)				Birth A,B (8) 4 kids		Sell A,B (7) 4 goats	Breed A,B (9)		4	8	8	6
Total													18	30	26	5	

2) Keep first female kid for breeding purpose, and sell all other born kids (**CASE (2)-2**)

- The number of she-goat is 2 heads initially, and then become 3 heads from the middle of 1st year.
- Maximum of 41 kids can be produced in 5 years.

Table 4: Breeding and production plan of keeping she-goats (A,B), and keeping 1st female kid (Z)

	Month												Times of breed	Kids born	Sales of goat	Total remaining Nos. of Goats after selling		
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec						
1st yr		Dist.		Breed A,B (1)				Birth A,B (1) 1 female kid Z & 1 kid				Breed A,B (2)			4	2	0	4
2nd yr			Birth A (2) 4 kids	Breed Z (1)	Sell A,B (1) 1 goat	Breed A,B (3)		Birth Z (1) 1 kid			Birth A,B (3) 4 kids	Breed Z (2)	Sell A,B (2) 4 goats	4	9	5	8	
3rd yr	Breed A,B (4)		Birth Z (2) 2 kids		Birth A,B (4) 4 kids	Breed Z (3)	Sell A,B (3) 4 goats	Breed A,B (5)		Birth Z (3) 2 kids			Birth A,B (5) 4 kids	5	12	7	13	
					Sell Z(1) 1 goat								Sell Z (2) 2 goats					
4th yr	Breed Z (4)	Sell A,B (4) 4 goats	Breed A,B (6)		Birth Z (4) 2 kids		Birth A,B (6) 4 kids	Breed Z (5)	Sell A,B (5) 4 goats	Breed A,B (7)			Birth Z (5) 2 kids	6	8	10	11	
							Sell Z (3) 2 goats											
5th yr		Birth A,B (7) 4 kids	Breed Z (6)	Sell A,B (6) 4 goats	Breed A,B (8)		Birth Z (6) 2 kids		Birth A,B (8) 4 kids	Breed Z (7)	Sell A,B (7) 4 goats	Breed A,B (9)	6	10	12	9		
		Sell Z (4) 2 goats							Sell Z (5) 2 goats									
Total													25	41	34	8		

3 Financial Plan

3.1 Cost headings

3.1.1 Fixed cost requirement

Fixed cost is the cost that is required to operate the business in every year, but it not directly inter-connection with production amount and sales of kids. The major fixed cost is such as Goat shed construction cost and She-goat procurement cost that are to be needed at the commencement of the goat farming business. According to this simulation, NPR 43,172/- is needed if farmer starts with 1 she-goat and NPR 60,664/- is needed if start with 2 she-goats. However, farmer shall not count these costs on the accounting book because the Goat shed cost should be depreciated in 5 years and the loan for goat would be paid after 2 years. It will be explained as followings:

Table 5: Fixed cost for goat farming business

	Particulars	Unit	Quantity	Rate	Total Amount	Remarks
1	Construction of Goat Shed					
	Bamboo 6-6.5 m long	no	50	250	12,500	wall & pillar
	CGI sheet 2 m.	no	8	750	6,000	roof
	Nails	kg	8	150	1,200	
	Curved hooks and nut bolts	set.	50	30	1,500	
	Stall feeding construction	no	1	2,000	2,000	
	Labor for shed construction	no	5	500	2,500	
Sub Total					25,700	

	Particulars	Quantity	Rate	Total Amount	Remarks
2	She-goat Purchasing	1	17,472	17,472	21kg @ NPR 832
		2	17,472	34,944	

3.1.2 Depreciation and Interest of fixed cost

As goat farmer has introduced goat shed and she-goat as the initial investment for goat farming business, it is shall be recorded these costs as depreciation and

interest on the accounting book every year. By the depreciation, the initial cost of the goat shed shall be divided into 5 years and the value of the shed becomes zero after that. In actual, goat shed can be used for about 10 years with its appropriate repair and management, but the depreciation cost will not be allocated from 6th year.

Likewise, as the goat shed has been constructed by self investment of the farmer, it has not been counted as interest of investment; whereas, in regards to interest of goat loan, it has to be paid at the rate of 6% to women's cooperative within 2 years.

Table 6: Depreciation and interest of fixed cost

	Particulars	Rate	1st Year	2nd Year	3rd Year	4th Year	5th Year
1	Depreciation of Goat Shed (20% depreciation per year on NPR 25,700)	20%	5,140	5,140	5,140	5,140	5,140

	Particulars	Rate	1st Year	2nd Year	3rd Year	4th Year	5th Year
2	Interest (Loan for 1 she-goat) (6% loan interest per year on NPR 17,472)	6%	1,048	1,048	0	0	0
	Interest (Loan for 2 she-goats) (6% loan interest per year on NPR 34,944)	6%	2,097	2,097	0	0	0

	Particulars	1st Year	2nd Year	3rd Year	4th Year	5th Year
Total	Depreciation and Interest cost (1 she-goat)	6,188	6,188	5,140	5,140	5,140
		27,797				
	Depreciation and Interest cost (2 she-goats)	7,237	7,237	5,140	5,140	5,140
		29,893				

3.1.3 Variable cost

Variable cost is changed depending on the number of she-goat. If the number of goat is increased, simultaneously the variable cost is also increased. However; if the number of goat is increased, the production of kids and income of farmer is also increased accordingly. In this way, the followings measures shall also be considered to increase the number of goats in the farm:

- The possibility to manage the goat by family members without hiring other person
- The scale of goat shed for the additional produced goats
- The situation of the location whether farmer can secure enough feed or not even in winter season

Table 7: Variable cost for goat farming

S.N.	Particulars	Rate	Number of she-goat	1st Year	2nd Year	3rd Year	4th Year	5th Year
1	Fodder and forage plantation (<i>Napier and other perenial fodder</i>)	750	1	750	0	0	0	0
			2	1500	0	0	0	0
			3	1500	750	0	0	0
2	Labor cost (@ NPR 500/8 hours * day)	500	1	25,000	25,000	25,000	37,500	37,500
			2	31,250	31,250	31,250	56,250	46,875
			3	31,250	31,250	31,250	56,250	56,250
3	Vaccine and medicine (@ NPR 800/year * she-goat including her kids)	800	1	800	800	800	800	800
			2	1,600	1,600	1,600	1,600	1,600
			3	1,600	2,400	2,400	2,400	2,400
4	Mating cost (@ NPR 200/ until pregnant)	200	1	400	400	400	400	400
			2	800	800	800	800	800
			3	800	1,200	1,200	1,200	1,200
5	Insurance for she-goat (NPR 17,472 * 5% * 50%)	437	1	437	437	437	437	437
			2	874	874	874	874	874
			3	874	1,311	1,311	1,311	1,311
6	Feed cost (@ 3kg/month * head, @ NPR 30/kg)	90	1	1,080	5,400	5,400	5,400	5,400
			2	2,160	10,800	10,800	10,800	10,800
			3	2,160	14,040	14,040	14,040	14,040

	Particulars	1st Year	2nd Year	3rd Year	4th Year	5th Year
Total	Variable cost (1 she-goat)	28,467	32,037	32,037	44,537	44,537
		181,615				
	Variable cost (2 she-goats)	38,184	45,324	45,324	70,324	60,949
		260,105				
	Variable cost (3 she-goats)	38,184	50,951	50,201	75,201	75,201
		289,738				

3.2 Income headings

3.2.1 Sales and Income plan

As it was explained in the previous section, depends on the number of she-goat, farmer can produce from 15 to 41 kids; whereas, 13 to 34 kids can be sold in 5 years. From selling those kids, farmer can earn from NPR 195,000/- to NPR 510,000/- in total, except stock of mother goats and kids worth from NPR 30,000/- to NPR 90,000/- in the goat shed.

In addition to, the Boer-cross kids can be sold to the buyers not only for meat purpose, but also for breeding purpose. In general, if farmer can sell the kids for breeding purpose, the price would be about 2 times higher than for meat purpose. But, it also depends on the growth of the kids and the existence of the demand at that time. Thus, in this simulation, it has been premised that all the kids are sold only for the meat purpose. This is average price rate for 5 years duration.

Table 8: Goat selling for meat and its income (NPR 600/kg, average weight 25 kg in 9 months)

Production Plan		Rate (NPR)	1st Year		2nd Year		3rd Year		4th Year		5th Year		Total Sales (NPR)
			Qty	Amount	Qty	Amount	Qty	Amount	Qty	Amount	Qty	Amount	
1-1	1 She-goat and sell all kids	15,000	0	0	3	45,000	2	30,000	4	60,000	4	60,000	195,000
1-2	1 She-goat and keep 1st female kid for breeding	15,000	0	0	2	30,000	5	75,000	6	90,000	8	120,000	315,000
2-1	2 She-goat and sell all kids	15,000	0	0	6	90,000	4	60,000	8	120,000	8	120,000	390,000
2-2	2 She-goat and keep 1st female kid for breeding	15,000	0	0	5	75,000	7	105,000	10	150,000	12	180,000	510,000

3.2.2 Inventory of Assets

The sample of the inventory of assets in each pattern model is shown on the table below. The value of goat shed becomes zero by the depreciation after 5 years in terms of the accounting management. In general, she-goat can be used for more than 10 years for breeding purpose if it is healthy, and then it would be sold as meat. Regarding the kids, they would be sold after 9 months fattening, but if they are not sold by the close of accounting book (it is usually at the end of fiscal year), it should be taken inventory them as year-end assets. As there might be different weight of goats and kids, it has been assumed average value as NPR 10,000/-; however, the contemporary market price might be different.

Table 9: Sample inventory of assets (shed, she-goats, and not sold kids)

Production Plan	Inventory price	1st Year		2nd Year		3rd Year		4th Year		5th Year		Value at end of 5 year	
		Qty	Amount	Qty	Amount	Qty	Amount	Qty	Amount	Qty	Amount		
1	Goat Shed	25,700	1	20,560	1	15,420	1	10,280	1	5,140	1	0	0
2	She-goat												
	(1)-1. 1 She-goat and sell all kids	10,000	1	10,000	1	10,000	1	10,000	1	10,000	1	10,000	10,000
	(1)-2. 1 She-goat and keep 1st female kid for breeding	10,000	1	10,000	2	20,000	2	20,000	2	20,000	2	20,000	20,000
	(2)-1. 2 She-goat and sell all kids	10,000	2	20,000	2	20,000	2	20,000	2	20,000	2	20,000	20,000
	(2)-2. 2 She-goat and keep 1st female kid for breeding	10,000	2	20,000	3	30,000	3	30,000	3	30,000	3	30,000	30,000
3	Stock kids before selling												
	(1)-1. 1 She-goat and sell all kids	10,000	1	10,000	2	20,000	4	40,000	2	20,000	2	20,000	20,000
	(1)-2. 1 She-goat and keep 1st female kid for breeding	10,000	1	10,000	4	40,000	7	70,000	7	70,000	5	50,000	50,000
	(2)-1. 2 She-goat and sell all kids	10,000	2	20,000	4	40,000	8	80,000	4	40,000	4	40,000	40,000
	(2)-2. 2 She-goat and keep 1st female kid for breeding	10,000	2	20,000	5	50,000	10	100,000	8	80,000	6	60,000	60,000

4 Analysis

4.1 Cost benefit analysis

Based on the cost and sales calculation shown in the previous section, the results of benefit analysis for each model of number of she-goat is shown in the below.

(1) Initially 1 head of she-goat

1) Sell all kids (*CASE (1)-1*)

In the model of *CASE (1)-1*, farmer keeps only 1 she-goat throughout the 5 years, and the proportion of the cost is relatively high because the number of kid production is small. Therefore, the farmer can earn income only from 4th year. The farmers can make net income NPR 118,116/- without labor cost in 5 years, except stock assets worth NPR 30,000/-.

Table 10: Cost benefits analysis of keeping she-goat (A), and sell all born kids

	Description	Note	1st Year	2nd Year	3rd Year	4th Year	5th Year	Total Amount in 5 years
Expenditure								
1	Goat shed depreciation	25,700	5,140	5,140	5,140	5,140	5,140	25,700
2	Loan payback of she-goat purchased	17,472	0	0	17,472	0	0	17,472
3	Loan interest	6%	1,048	1,048	0	0	0	2,097
4	Running cost	With labor cost	28,467	32,037	32,037	44,537	44,537	181,615
		Without labor cost	3,467	7,037	7,037	7,037	7,037	31,615
Total Expenditure		With labor cost	34,655	38,225	54,649	49,677	49,677	226,884
		Without labor cost	9,655	13,225	29,649	12,177	12,177	76,884
Revenue								
1	Goat selling for meat	15,000	0	45,000	30,000	60,000	60,000	195,000
Net Income		With labor cost	(34,655)	6,775	(24,649)	10,323	10,323	(31,884)
		Without labor cost	(9,655)	31,775	351	47,823	47,823	118,116

	Description	Note	1st Year	2nd Year	3rd Year	4th Year	5th Year	Amount at the end of 5 years
Liabilities								
1	Loan for she-goat	2 years	17,472	17,472	0	0	0	0
Assets								
1	Goat shed	25,700	20,560	15,420	10,280	5,140	0	0
2	She-goat	10,000	10,000	10,000	10,000	10,000	10,000	10,000
3	Stock kids before selling	10,000	10,000	20,000	40,000	20,000	20,000	20,000
Total Inventory			23,088	27,948	60,280	35,140	30,000	30,000

1) Keep first female kid for breeding purpose (*CASE (I)-2*)

In the model of *CASE (I)-2*, farmer keeps only 1 she-goat initially, and keeps 1 new female kid for breeding purpose from the middle of 1st year. Here, farmer can earn income from 3rd year, and the farmers can make net income NPR 206,501/- without labor cost in 5 years, except stock assets worth NPR 70,000/-.

Table 11: Cost benefits analysis of keeping she-goat (A), and keeping 1st female kid

	Description	Note	1st Year	2nd Year	3rd Year	4th Year	5th Year	Total Amount in 5 years
Expenditure								
1	Goat shed depreciation	25,700	5,140	5,140	5,140	5,140	5,140	25,700
2	Loan payback of she-goat purchased	17,472	0	0	17,472	0	0	17,472
3	Loan interest	6%	1,048	1,048	0	0	0	2,097
4	Running cost	With labor cost	38,184	45,324	45,324	70,324	60,949	260,105
		Without labor cost	6,934	14,074	14,074	14,074	14,074	63,230
Total Expenditure		With labor cost	44,372	51,512	67,936	75,464	66,089	305,374

		Without labor cost	13,122	20,262	36,686	19,214	19,214	108,499	
Revenue									
1	Goat selling for meat		15,000	0	30,000	75,000	90,000	120,000	315,000
Net Income		With labor cost	(44,372)	(21,512)	7,064	14,536	53,911	9,626	
		Without labor cost	(13,122)	9,738	38,314	70,786	100,786	206,501	

	Description	Note	1st Year	2nd Year	3rd Year	4th Year	5th Year	Amount at the end of 5 years
Liabilities								
1	Loan for she-goat	2 years	17,472	17,472	0	0	0	0
Assets								
1	Goat shed	25,700	20,560	15,420	10,280	5,140	0	0
2	She-goat	10,000	10,000	20,000	20,000	20,000	20,000	20,000
3	Stock kids before selling	10,000	10,000	40,000	70,000	70,000	50,000	50,000
Total Inventory			23,088	57,948	100,280	95,140	70,000	70,000

(2) Initially 2 heads of she-goat

1) Sell all kids (*CASE (2)-1*)

In the model of *CASE (2)-1*, farmer keeps 2 she-goats throughout the 5 years, and farmer can earn income from 2nd year. The farmers can make net income NPR 261,933/- without labor cost in 5 years, except stock assets worth NPR 60,000/-.

Table 12: Cost benefits analysis of keeping she-goat (A,B), and sell all born kids

	Description	Note	1st Year	2nd Year	3rd Year	4th Year	5th Year	Total Amount in 5 years
Expenditure								
1	Goat shed depreciation	25,700	5,140	5,140	5,140	5,140	5,140	25,700
2	Loan payback of she-goat purchased	17,472	0	0	34,944	0	0	34,944
3	Loan interest	6%	2,097	2,097	0	0	0	4,193
4	Running cost	With labor cost	38,184	45,324	45,324	70,324	60,949	260,105
		Without labor cost	6,934	14,074	14,074	14,074	14,074	63,230
	Total Expenditure	With labor cost	45,421	52,561	85,408	75,464	66,089	324,942
		Without labor cost	14,171	21,311	54,158	19,214	19,214	128,067
Revenue								
1	Goat selling for meat	15,000	0	90,000	60,000	120,000	120,000	390,000
	Net Income	With labor cost	(45,421)	37,439	(25,408)	44,536	53,911	65,058
		Without labor cost	(14,171)	68,689	5,842	100,786	100,786	261,933

	Description	Note	1st Year	2nd Year	3rd Year	4th Year	5th Year	Amount at the end of 5 years
Liabilities								
1	Loan for she-goat	2 years	34,944	34,944	0	0	0	0
Assets								
1	Goat shed	25,700	20,560	15,420	10,280	5,140	0	0
2	She-goat	10,000	20,000	20,000	20,000	20,000	20,000	20,000
3	Stock kids before selling	10,000	20,000	40,000	80,000	40,000	40,000	40,000
Total Inventory			25,616	40,476	110,280	65,140	60,000	60,000

2) Keep first female kid for breeding purpose (*CASE (2)-2*)

In the model of *CASE (2)-2*, farmer keeps 2 she-goats initially, and keeps 1 new female kid for breeding purpose from the middle of 1st year. Here, farmer can

earn income from 2nd year, and the farmers can make net income NPR 361,175/- without labor cost in 5 years, except stock assets worth NPR 90,000/-.

Table 13: Cost benefits analysis of keeping she-goat (A,B), and keeping 1st female kid

	Description	Note	1st Year	2nd Year	3rd Year	4th Year	5th Year	Total Amount in 5 years
Expenditure								
1	Goat shed depreciation	25,700	5,140	5,140	5,140	5,140	5,140	25,700
2	Loan payback of she-goat purchased	17,472	0	0	34,944	0	0	34,944
3	Loan interest	6%	2,097	2,097	0	0	0	4,193
4	Running cost	With labor cost	38,184	50,951	50,201	75,201	75,201	289,738
		Without labor cost	6,934	19,701	18,951	18,951	18,951	83,488
	Total Expenditure	With labor cost	45,421	58,188	90,285	80,341	80,341	354,575
		Without labor cost	14,171	26,938	59,035	24,091	24,091	148,325
Revenue								
1	Goat selling for meat	15,000	0	75,000	105,000	150,000	180,000	510,000
	Net Income	With labor cost	(45,421)	16,812	14,715	69,659	99,659	155,425
		Without labor cost	(14,171)	48,062	45,965	125,909	155,909	361,675

	Description	Note	1st Year	2nd Year	3rd Year	4th Year	5th Year	Amount at the end of 5 years
Liabilities								
1	Loan for she-goat	2 years	43,200	43,200	0	0	0	0
Assets								
1	Goat shed	25,700	20,560	15,420	10,280	5,140	0	0
2	She-goat	10,000	20,000	30,000	30,000	30,000	30,000	30,000

3	Stock kids before selling	10,000	20,000	50,000	100,000	80,000	60,000	60,000
Total Inventory			17,360	52,220	140,280	115,140	90,000	90,000

Based on the above results, in order to earn income from early stage, it is important to keep the female kid of initial stage for breeding purpose. Then, farmer needs to operate the goat farming cycle of breeding, delivery and sales. According to this simulation, keeping total 3 she-goats make farmer possible to obtain standard income.

4.2 Break Even Point

The result of analysis on Break Even Point (BEP) for each model is shown in the below. BEP can be defined as a point where total costs (expenses) and total sales (revenue) are equal. It is used to analysis to know the point where there is no net profit or loss.

In this simulation, here is explained necessary number of kid to be sold in 5 years to secure the farmer's net income. The calculation formulas used for the analysis are as follows.

- Break Even Point (BEP) = Fixed Cost / Marginal Profit Ratio
= Fixed Cost / {1 - (Variable Cost / Sales)}
- Break Even Sales Number (BESN) = BEP / Average Sales Price
- Break Even Sales Rate (BESR) = BESN / Number of Production
- Break Even Mortality Rate (BEMR) = (1 - BESR) × 100

(1) Initially 1 head of she-goat

1) Sell all kids (**CASE (1)-1**)

- $BEP = 45,269 / \{1 - (31,615 / 195,000)\} = \text{NPR } 54,028/-$
- Break Even Number of Goat Sales = $54,028 / 15,000 = 3.6 = \text{Avg. } 4 \text{ heads}$
- Break Even Sales Ratio = $4 / 13 = 0.31$
- Break Even Mortality Ratio = $(1 - 0.31) * 100 = 69 \%$

Here, BEP is NPR 58,993/-. It can be achieved if farmer could sell at least 4 kids out of 13 kids that would be produced in 5 years, results neither profit nor loss. In this sense, 69% (9 kids) were not sold or died among marketable 13 kids; the farmer will not be loss. As a result, if farmers could sell 9 kids, which is not sold or not died; the farmer will be in profit worth of those 9 kids.

2) Keep first female kid for breeding purpose (*CASE (1)-2*)

- $BEP = 45,269 / \{(1 - (63,230 / 315,000))\} = \text{NPR } 56,637/-$
- Break Even Number of Goat Sales = $56,637 / 15,000 = 3.6 = \text{Avg. } 4 \text{ heads}$
Break Even Sales Ratio = $4 / 21 = 0.19$
- Break Even Mortality Ratio = $(1 - 0.19) * 100 = 81 \%$

Here, BEP is NPR 56,637/-. It can be achieved if farmer could sell at least 4 kids out of 21 kids that would be produced in 5 years, results neither profit nor loss. In this sense, 81% (17 kids) were not sold or died among marketable 21 kids; the farmer will not be loss. As a result, if farmers could sell 17 kids, which is not sold or not died; the farmer will be in profit worth of those 17 kids.

(2) Initially 2 heads of she-goat

1) Sell all kids (*CASE (2)-1*)

- $BEP = 64,837 / \{(1 - (63,230 / 390,000))\} = \text{NPR } 77,383/-$
- Break Even Number of Goat Sales = $77,383 / 15,000 = 5.2 \cdot \text{Avg. } 6 \text{ heads}$
- Break Even Sales Ratio = $6 / 26 = 0.23$
- Break Even Mortality Ratio = $(1 - 0.23) * 100 = 77 \%$

Here, BEP is NPR 77,383/-. It can be achieved if farmer could sell at least 6 kids out of 26 kids that would be produced in 5 years, results neither profit nor loss. In this sense, 77% (20 kids) were not sold or died among marketable 26 kids; the farmer will not be loss. As a result, if farmers could sell 20 kids, which is not sold or not died; the farmer will be in profit worth of those 20 kids.

2) Keep first female kid for breeding purpose (*CASE (2)-2*)

- $BEP = 64,837 / \{(1 - (83,488 / 510,000))\} = \text{NPR } 77,529/-$
- Break Even Number of Goat Sales = $77,729 / 15000 = 5.2 \cdot \text{Avg. } 6 \text{ heads}$

- Break Even Sales Ratio = $6 / 34 = 0.18$
- Break Even Mortality Ratio = $(1 - 0.18) * 100 = 82 \%$

Here, BEP is NPR 77,529/-. It can be achieved if farmer could sell at least 6 kids out of 34 kids that would be produced in 5 years, results neither profit nor loss. In this sense, 82% (28 kids) were not sold or died among marketable 34 kids; the farmer will not be loss. As a result, if farmers could sell 28 kids, which is not sold or not died; the farmer will be in profit worth of those 28 kids.

4.3 Loan Payment

The loan which farmer has borrowed to buy she-goat has to be returned at the start of 3rd year (after the end of 2nd year) to women's cooperative. The loan repayment simulation of each model is shown in the table below.

Table 14: Loan payment status

Production Plan		Loan Amount	Net Income (<i>without loan payment</i>)					Loan Payment	
			1st Year	2nd Year	3rd Year	Total of 2 years	Total of 3 years	If Pay at the end of 2nd year, income remains	If Pay at the end of 3rd year, income remains
(1)-1	1 She-goat and sell all kids	17,472	(9,655)	31,775	17,823	22,119	39,942	4,647	22,470
(1)-2	1 She-goat and keep 1st female kid for breeding	17,472	(13,122)	9,738	55,786	(3,385)	52,401	(20,857)	34,929
(2)-1	2 She-goat and sell all kids	34,944	(14,171)	68,689	40,786	54,519	95,305	19,575	60,361
(2)-2	2 She-goat and keep 1st female kid for breeding	34,944	(14,171)	48,062	80,909	33,892	114,801	(1,052)	79,857

From the above table, we can conclude as followings:

- Initially 1 head of she-goat, and sell all the born kids (*CASE (I)-I*): As the farmer has loan of NPR 17,472/- and able to make income worth NPR 22,470/- at the end of second year, he/she can return the loan to cooperative at the end of 2nd year and save NPR 4,647/- also. So, the kids sold from end of 2nd year are the profits for respective farmers.

- Initially 1 head of she-goat, and keep the first female kid (**CASE (1)-2**): As the farmer has loan of NPR 17,472/- and still NPR 3,385 is in loss at the end of second year, he/she can return the loan to cooperative only from 3rd year, and will be able to save money worth NPR 34,929/- within this duration. So, the kids sold from 3rd year are the profits for respective farmers.
- Initially 2 head of she-goat, and sell all the born kids (**CASE (2)-1**): As the farmer has loan of NPR 34,944/- and able to make income worth NPR 54,519/- at the end of second year, he/she can return the loan to cooperative at the end of 2nd year and save NPR 19,575/- also. So, the kids sold from end of 2nd year are the profits for respective farmers.
- Initially 2 heads of she-goat, and keep the first female kid (**CASE (2)-2**): As the farmer has loan of NPR 34,944/- and only income worth NPR 33,892 within second year, he/she can return the loan to cooperative only from beginning of 3rd year, and will be able to save money worth NPR 79,857/- at the end of 3rd year. So, the kids sold from beginning of 3rd year are the profits for respective farmers.

Table 15: Total capital and net income at the end of 5 years

Production Plan		Revenue Collection in 5 years	Capital from stock goats and kids in 5 years	Total Capital at the end of 5 years	Net income with labor cost and other cost after loan pay back	Net income without labor cost but with other cost after loan payback
(1)-1	1 She-goat and sell all kids	195,000	30,000	225,000	(19,356)	130,644
(1)-2	1 She-goat and keep 1st female kid for breeding	315,000	70,000	385,000	62,154	259,029
(2)-1	2 She-goat and sell all kids	390,000	60,000	450,000	90,114	286,989
(2)-2	2 She-goat and keep 1st female kid for breeding	510,000	90,000	600,000	210,481	416,731

Likewise, we can conclude the total capital remained in the hand of farmers at the end of 5 years as followings:

- Initially 1 head of she-goat, and sell all the born kids (**CASE (1)-1**): At the end of 5 years, the farmer can make income worth NPR 195,000/- by selling the kids, and have stock of mother goat and kids worth NPR 30,000/- in the shed. In this sense, the respective farmer has total income or capital worth NPR 225,000/-. Likewise, the farmer will be in loss worth NPR 19,356/- after loan pay back if labor cost and other running costs are included; whereas, the farmer will have net income worth NPR 130,644/- if only labor cost is excluded, even after loan pay back.
- Initially 1 head of she-goat, and keep first female kid (**CASE (1)-2**): At the end of 5 years, the farmer can make income worth NPR 315,000/- by selling the kids, and have stock of mother goat and kids worth NPR 70,000/- in the shed. In this sense, the respective farmer has total income or capital worth NPR 385,000/-. Likewise, the farmer will have net income worth NPR 62,154/- after loan pay back if labor cost and other running costs are included; whereas, the farmer will have net income worth NPR 259,029/- if only labor cost is excluded, even after loan pay back.
- Initially 2 heads of she-goat, and selling all born kids (**CASE (2)-1**): At the end of 5 years, the farmer can make income worth NPR 390,000/- by selling the kids, and have stock of mother goat and kids worth NPR 60,000/- in the shed. In this sense, the respective farmer has total income or capital worth NPR 450,000/-. Likewise, the farmer will have net income worth NPR 90,114/- after loan pay back if labor cost and other running costs are included; whereas, the farmer will have net income worth NPR 286,989/- if only labor cost is excluded, even after loan pay back
- Initially 2 heads of she-goat, and keep first female kid (**CASE (2)-2**): At the end of 5 years, the farmer can make income worth NPR 510,000/- by selling the kids, and have stock of mother goat and kids worth NPR 90,000/- in the shed. In this sense, the respective farmer has total income or capital worth NPR 600,000/-. Likewise, the farmer will have net income worth NPR 210,481/- after loan pay back if labor cost and other running costs are included; whereas, the farmer will

have net income worth NPR 416,731/- if only labor cost is excluded, even after loan pay back

5 Conclusions

In general, the mortality rate in goat rearing is about 5 to 10 %. The result of above analysis among shows that profit will be secured in any 4 cases even if mortality rate is 69 to 82%. In other words, the goat farming business is with considerable safety margin.

However, it is necessary to consider that the goat farming business becomes deficit inevitably at the initial stage because there is no sale of kids in 1st year. Thus, at the beginning of the business, it is effective to suppress the initial investment by using the existing old goat shed or using scrap wood and bamboo that can be utilized freely instead of purchasing materials. Farmer can also consider ways to create base funds from other income sources, or to use a loan of women's cooperative.

As for the loan for she-goat, it is possible to repay it at the end of 2nd year depending on the number of she-goat raised. However, the farmer has to wait to repay the loan by 3rd year. In such situations, it is needs to apply for extension of loan repayment period to the women's cooperative according to "Goat Farming Group and Breed Management Policy-2017" of cooperative.

In this way, there may be some women struggling with cash flow at the beginning of the goat farming business. However, in all cases, it is expected that farmer can get profit within 5 years. After that, the production cycle can be operated efficiently and the business will become stable, so farmer can expect a large profit in the total 10 years of the average service period of she-goat. It is important to retain the production of quality goats, decrease the mortality rate, and sell goats as breeding purpose for better income. Finally, it is believed that the substantial goat farming will be led to commercial goat farming gradually, increasing the capacity of goat shed.

Appendix-1

Pre-conditions for preparing this business plan

- 1) Breeding: the goat gets breeding after 3 months of goat received by farmer, goat get delivery after 5 months of breeding, and re-breeding in 4th month after delivery.
- 2) Twins rate: In the first time, there is born of 1 kid, and 2 kids from 2nd time of delivery.
- 3) Proportion of male and female kids: 1:1
- 4) Average weight of the goat in nine months: 25 kg.
- 5) Average price rate of kids: NPR 600 / kg. (live weight)
- 6) Average price of mother goats and not sold kids: NPR 10,000/- per number
- 7) Interest rate of loan from cooperative: 6%
- 8) Goat rearing capacity: 1, 2, 3 mother goats, and from 1 to 10 kids
- 9) First female kid can be used as breeding purpose
- 10) Goats can be kept in stall feeding and grazing
- 11) Fodder has to buy in 1st and 2nd year, and cultivated fodder tree will start to give fodder from 3rd year
- 12) The price of goat shed is NPR 25,700/-, and it is afford by respective farmer
- 13) The age of goat shed is 5 years
- 14) Depreciation rate of fixed cost is at the rate of 20%
- 15) The feed is fed to the kids of 2 to 12 months at the rate of 100 gm per day
- 16) The feed is fed to pregnant goats from 2 months previous to 2 months back of delivery
- 17) Beyond the feed, the fodder/grass is given at the rate of 4% of total weight of goats every day