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GOAT MEAT SECTOR ASSESSMENT AND STRATEGY

NEPAL AGRICULTURAL MARKET DEVLOPMENT PROGRAMME (NAMDP)

2018

CEAPRED

swisscontact

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Abbreviations

ADS	Agriculture Development Strategy
CBS	Central Bureau of Statistics
DLS	Department of Livestock Services
DLSO	District Livestock Service Office
FAO	Food and Agriculture Organisation
FNCCI	Federation of Nepalese Chambers of Commerce and Industries
HVAP	High Value Agriculture Product
JTA	junior technical assistant
MoAD	Ministry of Agriculture Development
MoLD	Ministry of Livestock Development
MT	Metric Ton
NAMDP	Nepal Agriculture Market Development Program
NARS	National agricultural research system
NARC	Nepal Agriculture Research Council
PPR	Peste des petits ruminants

1 Background

Nepal Agricultural Market Development Programme (NAMDP) is a bilateral initiative between the Government of Switzerland and the Ministry of Agriculture, Government of Nepal. Under the Swiss Agency for Development and Cooperation's (SDC) Nepal Agriculture Growth Initiative (NAGI), NAMDP aims to sustainably improve livelihoods of rural smallholders, especially disadvantaged groups and women-headed households, through participation in commercial agriculture and 'interconnected markets'. The objective framework of NAMDP is based on a long-term vision of thriving and inclusive agriculture markets that develop the comparative advantages for import substitution and export growth and thus contribute to poverty reduction.

NAMDP- Phase 1 is a three years and ten months (March 2016 - Dec 2019) project being implemented by a consortium of Swisscontact (as the lead) and the Center for Environmental and Agricultural Policy Research, Extension and Development (CEAPRED). NAMDP follows Market System Development (MSD) approach (also known as 'Making Markets Work for the Poor'/ 'M4P' approach). NAMDP is expected to produce tangible, visible and measurable impact in a number of commodity markets/ value chains and cross-sectors. The program, during the 1st half of Phase 1, will be concentrated in two spatial clusters in Nepal; the Eastern cluster including Ramechhap, Okhaldhunga and Khotang districts, and the Western cluster including Surkhet, Jajarkot, Dailekh, Kalikot, and Achham districts. During the 2nd half of Phase 1, the programme will expand to other important and promising road corridors; these may include parts of the Terai region.

NAMDP- Phase 1 covers initial 8 months' preparation period (March to October 2016) and about three years' implementation period (November 2016 to December 2019). One of the objectives of the preparation period is to conduct detailed assessments of the sectors and cross sectors identified in the draft Programme Document. The goat meat sector is one of the sectors assessed.

For the purpose of this study secondary information received from the national statistics yearbook, yearly information booklet from District Agriculture Development offices and from other relevant publications was analysed. Primary information was collected from the different actors like farmers, traders, local agro-vets, agriculture service centres in the project districts and key government agencies through individual surveys, key informant interviews and focus group discussions. The primary and secondary information on the demand and supply scenario, actors involved in the sector, relationship between the actors were then analysed to come up with a comprehensive picture of the sector dynamics.

2 Sector description

2.1 Basic information

2.1.1 International context - Meat

Global meat production and consumption have increased rapidly in recent decades. Worldwide meat production has increased by 20 percent in last 10 years. Over the last decade, consumption of meat in the developing countries of Asia has been growing by 3.5 percent per annum[1]. Animal protein has become increasingly important in Asian diets over the past decade.

China is the largest meat producer in the world, in spite of the backyard traditions of its supply base. The demand for livestock products in the Southeast Asian sub region is projected to increase by 3.5 to 4.0 percent annually by the year 2020. This increase – predominantly driven by high income growth,

[1] Worldwide FAO

rapid urbanization and changes in dietary patterns and is called the "livestock revolution" (FAO, 2005b).

Pork is the most widely eaten meat in the world accounting for over 36% of the world meat intake. It is followed by poultry and beef with about 35% and 22% share respectively (2012, FAO).

International context: Goat

In 2014 there were 1006.7 million domesticated goats in the world. The highest population of goat is in Asia (60 percent) followed by Africa (34 percent). Goats are raised mainly by middle class and poor household. The following table shows the goat population in the top ten countries and Nepal's contribution to world goat population in 2014.

Table 1: Goat population in different countries including Nepal (2014)

SN	Countries	Number (Million)	Percent
1	China	187.8	18.66
2	India	133.0	13.21
3	Pakistan	66.6	6.62
4	Bangladesh	55.9	5.55
5	Nigeria	71.0	7.05
6	Sudan	31.0	3.08
7	Iran	22.1	2.20
8	Ethiopia	29.1	2.89
9	Mongolia	22.0	2.19
10	Indonesia	19.2	1.91
11	Nepal	10.1	1.00
	Total world production	1006.7	

Source: FAO Statistic, 2014 and DLS - livestock statistic book 2013/14

Developing countries produce 97 percent of the total goat meat in the world. China produces the highest goat meat (2 million MT) followed by India (0.5 million MT). Compared to neighbouring countries, Nepal produced around 0.05 MT in 2014.

There is a high demand of goat meat in the Arabian countries and India is exporting to them. Though, India itself has a high demand of meat, it is exporting to other countries as the product is fetching good price. As per the Economic Times, the annual demand of goat meat is increasing by 2.5 percent in India and there is gap between demand and supply for the product. More than 60 countries are importing goat meat from India that created huge market for the product. In 2013/14 Nepal imported 495,194 live goats from India for meat. Majority of these live goats are imported from the Quarantine Check Post at Biratnagar, Bhairahawa, Birgunj, Nepalganj and Gaddachauki (Kanchanpur). Due to the open boarder system between India and Nepal, illegal import of goats from India is also high.

China also has meat deficiency despite of its high meat production. Nepal imports live goats from China (Tibet) especially during the festival season.

Table 2: Goat meat production in different countries including Nepal (2013)

SN	Countries	Meat production (MT)	Percent
1	China	2,002,418	37.27
2	India	509,000	9.47
3	Pakistan	297,000	5.53
4	Nigeria	295,910	5.51
5	Bangladesh	204,000	3.80
6	Sudan	156,000	2.90
7	Iran	143,400	2.67
8	Ethiopia	74,000	1.38
9	Indonesia	66,990	1.25
10	Mongolia	64,134	1.19
11	Nepal	55,578	1.03
	Total world production	5,372,407	

Source: FAO statistics and DLS - livestock statistic book 2013/14

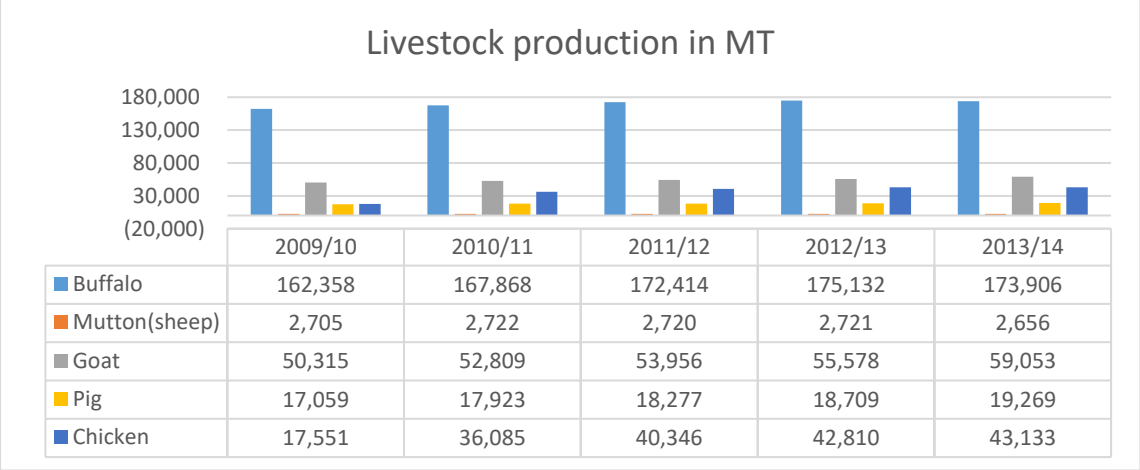
2.1.2 National context - Meat

Agriculture contributes 34.7 percent to Nepal's GDP where livestock contributes nearly 26.8 percent of agriculture GDP (MoAD, 2016). Roughly 70 percent of households keep some type of livestock, including cows, buffaloes, goat, pigs and chickens.

The livestock are kept mainly for farmers own consumptions and surplus products are sold in the local market. The main product sold in the market are egg, milk and meat. The main sources of meat are from buffalo, goat, sheep, pigs and poultry.

The overall trend of meat production over the last 9 years shows an average annual growth rate of about 3.75 percent. The highest share in total meat production is from buffaloes (58.35 %), followed by goats (19.82%), poultry (14.47%), pigs (6.47%) and sheep (0.89%). The production of these meat varieties is highest in hills region followed by terai and mountains. In terms of total meat production in the country, hills contribute nearly (50%) followed by terai (42%) and mountains (8%). Among all types of the meat, mutton has the highest cost per unit weight in Nepal.

Figure 1: Livestock production in MT



	2009/10	2010/11	2011/12	2012/13	2013/14
Buffalo	162,358	167,868	172,414	175,132	173,906
Mutton(sheep)	2,705	2,722	2,720	2,721	2,656
Goat	50,315	52,809	53,956	55,578	59,053
Pig	17,059	17,923	18,277	18,709	19,269
Chicken	17,551	36,085	40,346	42,810	43,133

Source: Livestock Statistic Book, DLS 2013-14

The per capita consumption of meat in Nepal is about 9 kg per year but urban consumption is nearly 14 kg per year. The highest rate of growth has been in poultry and goat meat production. These growth rates do not seem to be realized from increased animal productivity but from the increase in number of animals.

On average, 43.34% of the households (5,427,302 total households in Nepal[2]) keep goats, about 30.75% keep buffalo, 8.20% keep pig and 1.77% keep sheep.

Table 3: Household involve in Meat sector

Meat	No. of households involved[3]	Percentage
Goat	2,352,453	43.34%
Buffalo	1,668,820	30.75%
Pig	444,825	8.20%
Sheep	96,245	1.77%

National context – Goat

Goat is one of the key livestock in the Nepalese farming system. This is a multipurpose animal kept primary for meat but also for milk, manure, fibre (i.e. Pashmina) and haulage (i.e. to transport the goods in the mountain region). Goat meat is one of the most expensive type of meat in Nepal and the price has been increasing each year (Agribusiness Promotion and Market Development Directorate).

The economic share of goats is 12% in Livestock GDP which in turn is 26.8 % of the GDP (MoAD, 2016). There are 10,177,531 goats reared with average annual growth rate of 4% in the country producing 59,053 MT ton of meat annually which contributes 19.82 % of the total meat production (figure of 2013/14 from DLS).

Nepal annually imports around 12-15% goat meat of its total consumption from India. Majority of goats from India are sold in Kathmandu followed by Bharatpur, Nepalgunj, Butwol, Pokhara and Biratnagar. Kathmandu import 80% of its demand for live goats from India. Pokhara used to be the second largest importer of live goat from India (80% of its demand) five years back, but now imports around 25% of its demand only as the traders have started their own transportation service to procure goats from the Far-west and the Mid-west regions of Nepal. As per the Chaupaya Kharid Bikri Sewa Sang, Pokhara, the local butchers prefer Indian goat as the carcass yield is higher by around 2 kgs in Indian goat compared to goats from Nepal.

There are three types of goat breed available in Nepal which are Native, Imported and Cross breed. The details of the breed as per their type and agro economic zones are shown in Table 4.

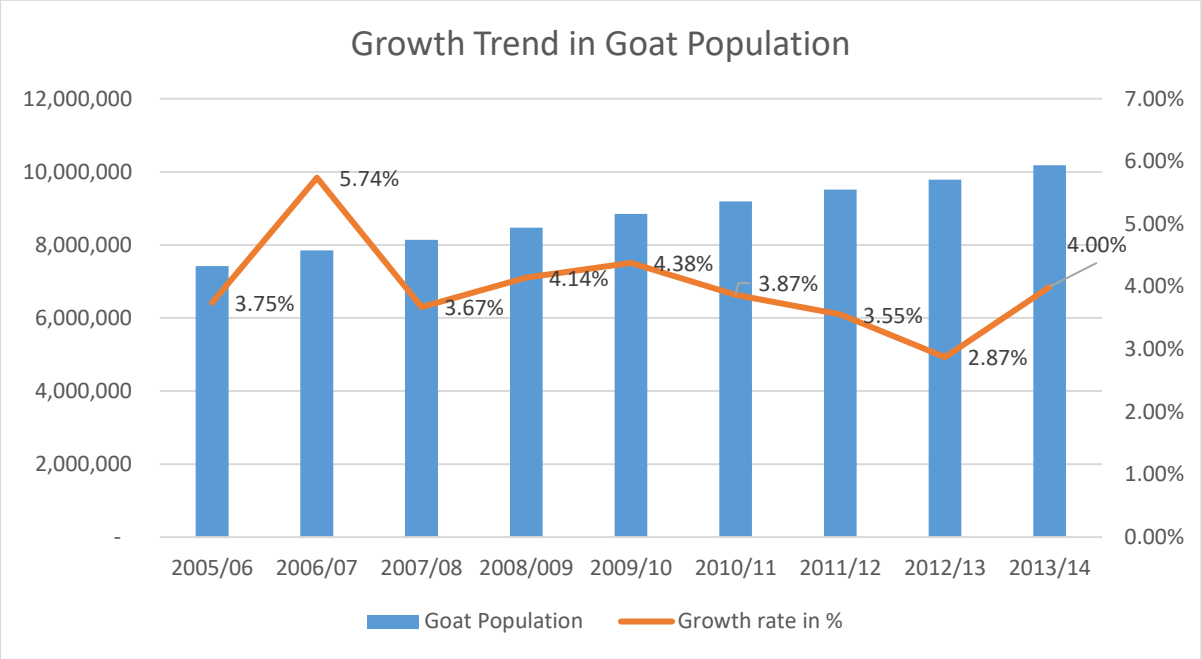
Table 4: Goat breeds in different agro ecological region

Agro economic zones	Goat Breeds			Alleviation (meter)
	Native Goat	**Imported and recommended**	**Cross bred**	
1. Himal	Chyangra		-	2,500 and above
2. Mountain	Sinhal	Boer	-	1,500 – 2,500
3. Hills	Khari	Boer, Jamunapari, Barbari	Jamunapari Cross, Barbari Cross, Boer Cross	300 – 1,500
4. Terai	Terai goat	Jamunapari, Barbari		< 300

[2] Statistical Year Book of Nepal 2013, Central Bureau of Statistics
[3] National sample census of agriculture Nepal, 2011-12

About 15 years back, Nepal had a goat population of 6,606,850 (2001/2002) with annual growth rate of just below 2 percent. The goat population has increased by an average of 4% in last 9 years which indicates the increasing importance of goats farming in Nepalese farming system. The growth rate was highest at 5.74% during 2006/2007 and the lowest at 2.87 in the year 2012/13.

Figure 2: Growth Trend of Goat Population in Nepal



The annual average goat meat production growth rate in the last nine years was 3.95 percent. The highest growth rate was in 2013/14 (see Table 5). In spite of this local production is not enough to cater to the demand of goat meat and a large number of goats are imported from bordering countries. It has been estimated that the current import of goat meat constitutes about 15 % (around 11,500 MT) of the Nepalese goat market.

Table 5: Goat Meat Production Trends in last 9 years

Year	Goat meat in MT	Annual growth in percentage
2005/06	42,820	2.69%
2006/07	44,933	4.93%
2007/08	46,570	3.64%
2008/09	48,472	4.08%
2009/10	50,315	3.80%
2010/11	52,809	4.96%
2011/12	53,956	2.17%
2012/13	55,578	3.01%
2013/14	59,053	6.25%

Size of the population involved in goat rearing

In Nepal around 43% of the households keep goats with an average holding of 3.3 ha/household. Further disaggregation of households with goats reveals that about 32% of them keep 1-2, 42% keep 3-5, 18% keep 6-9 and the remaining 7.5% keep 10 or more goats (CBS, 2012).

Women/ DAGs involvement

Goat rearing is practiced by most of the caste in Nepal as there is no cultural barrier to goat raising. In rural area around 80% of the households keep around 2 to 3 goats as part of their farming practice as they say goat raising is easier compared to other livestock.

Women are involved in goat rearing activities specially in fodder collection, litter management and associated activities that accounts to about 75% of their involvement in the production processes. Men are mainly involved in disease treatment and health care related services and marketing activities (see Annex 2 for division of labour between men and women). Children also contribute in fodder collection and watering.

Male are visible in broader activities outside the household, such as trading and marketing. Nevertheless, income from the goat selling goes to the common basket in the family with the major saying of male member in deciding the pattern of expenses from the earning. Joint involvement of male and female members in decision is emerging slowly in Nepal, depending on exposure to the outside world, education and family environment. Poor and Dalit families take more joint decisions compared to other caste and ethnicity (Source: Report on value chain analysis of goat, 2011, High Value Agriculture Project in Hill and Mountain Areas).

International rules/policies

High yielding goat breeds such as Jamunapari, Barbari, Boer are available in India, but it is difficult to import these animal (bucks) for breeding purpose. Both the Indian and Chinese governments do not allow importing live goats (bucks) for breeding purpose to Nepal. Only small number of breeding stock can be obtained from both neighbouring countries by bilateral agreement between the governments through the diplomatic channel. The reason behind this is because both the countries do not have adequate production of improved genetic material to export to other countries.

2.1.3 Context in the western and eastern clusters of Nepal

Agro-ecologically, terai produces more goat meat (55.09 %) followed by mountain (36.50 %) and Himalayan region (7.58%) (see Table 6).

Table 6: Meat production from the goats (MT) (2013/14)

Ecological Region	Development Regions					Total	Percentage
	Eastern	**Central**	**Western**	**Mid. Western**	**Far Western**		
Himalayan	1,149	1,065	123	1,396	746	4,479	7.58
Mountain	4,162	5,409	5,885	4,184	1,919	21,559	36.50
Terai	9,261	7,922	4,594	8,705	2,535	33,017	55.09
Total	14,572	14,396	10,602	14,285	5,200	59,055	100
Percentage	24.6	24.3	18.12	24.18	8.8	100	

Source MoAD, 2013

Figure 3: Distribution of goat population by districts in Nepal

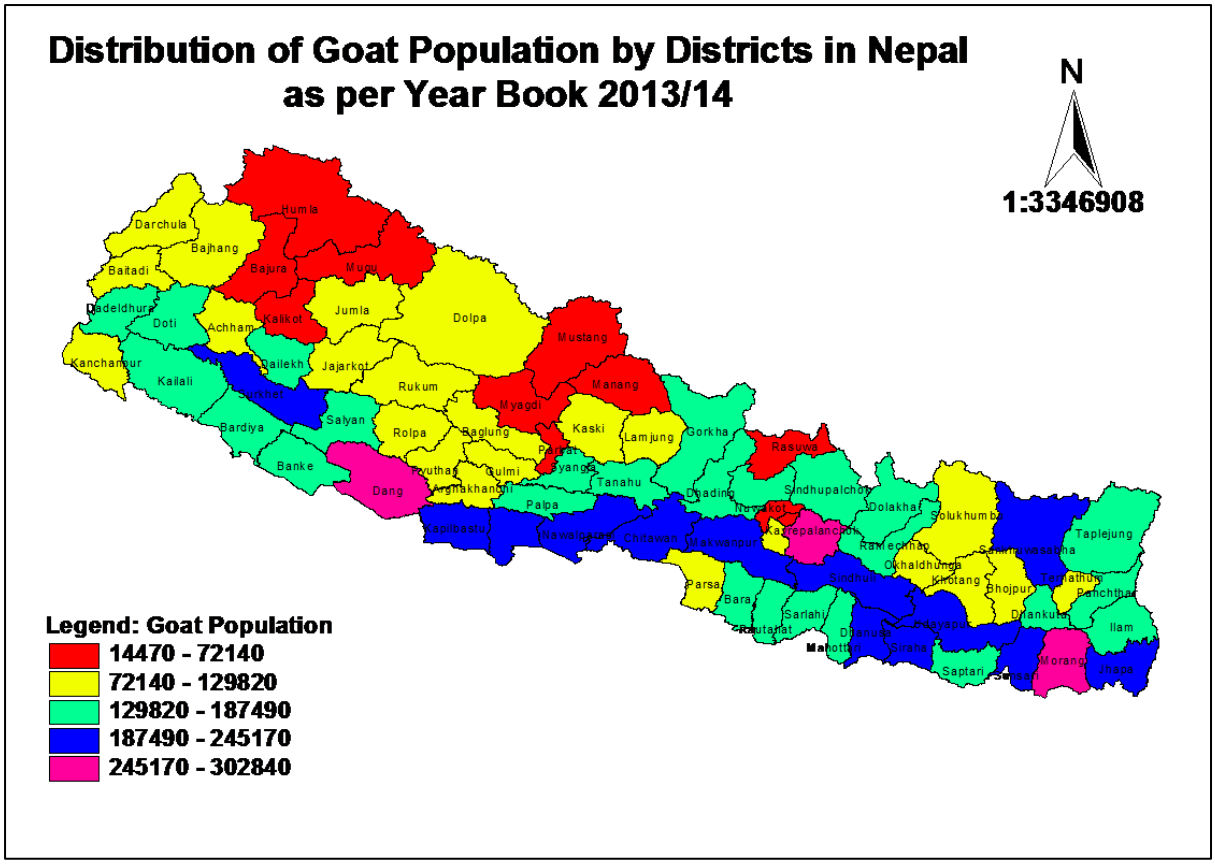
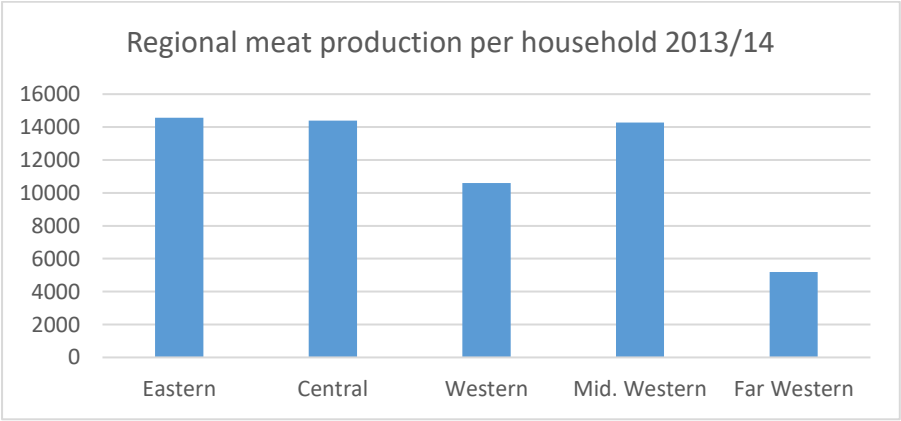


Figure 4: Goat meat production as per region as per household, 2013/14



Source MoAD, 2013

The NAMDP project districts have a significant number of goats for meat production. The goat population in the NAMDP target districts is shown in Table 7.

Table 7: Goat population and meat production in the project districts (MoAD, 2013)

Project cluster	Districts	Goat population (number)	Goat Meat production (MT)	Total meat production of district (MT)[4]	% share of goats in the districts
1. Eastern cluster including	Ramechhap	130,637	206	2,863	7.19
	Okhaldhunga	116,746	438	2,919	15.00
	Khotang	106,320	325	3,130	10.38
2. Western cluster including	Surkhet	219,306	995	4,821	20.63
	Jajarkot	102,000	655	1,824	35.91
	Dailekh	133,436	416	2,537	16.39
	Kalikot	48,187	337	984	34.24
	Achham	11,370	405	2,224	18.21

2.2 Common farming practices, seasons, price, and trade dynamics

2.2.1 National context

Goat production and management system varies across the agro ecological zones of the country. The breed and management system is different in the different agro ecological zones. This section highlights the production and management of goats in different agro ecological zone.

Goat Breeding

There are two breeding practices adopted in goat farming. They are (i) Natural Breeding and (ii) Artificial Insemination (AI). Natural Breeding is a traditional breeding system where buck is directly used for mating. This breeding system has its limitation as transition of disease and chances of inbreeding is high. Artificial Insemination in other hand is a new technique for goat in Nepal and through this technique fast multiplication of goat can be achieved. The government of Nepal has introduced AI technique through the World Bank Funded Agriculture and Food Security Project in the western hill and mountain region of Nepal. The AI success rate in goat is around 40-45% which is lower than in cattle and buffalo. Nepal Agriculture Research Council (NARC) is still researching and building the capacity of local technicians to increase the success rate of AI in goat (Source NARC). As the success rate is still not very high, this is not widely used by farmers, but practiced more in government and some big private farms.

Goat management System across the Agro –ecological zone

Goat management system varies with the agro ecological zones of the country. The following are the types of goat management system practiced in Nepal.

Extensive Management:

Migratory system/ Transhumance system: Goats along with other animals under this system are constantly moved from one place to other, from higher mountain to lower hills. The migration practiced is done in search of feed and to escape environmental extremes (hot or cold). This system has traditionally been adopted by the mountain communities of Nepal. In this system, flock of sheep and goats are migrated from high mountain to the lower hills during the winter. This system is cheaper but since last 5 years the system is gradually disappearing due to the expansion of community forest program in almost all districts and shortage of labour to follow the flocks in migratory route.

[4] Including meat from other animals such as buffalo, pigs, chicken etc.

Sedentary system: In this management system, the goats are reared on the common grazing land and arable crop field. This system is practiced in the hills and Terai regions of Nepal. Flock size is generally smaller in this system and the animals are grazed in the nearby forest, community grazing land or fallow crop fields during day time and housed during the night. Family member, especially the children, drive their goats for grazing.

Intensive (Stall Feeding) System: In this system, goats are kept in confinement with limited access to grazing. Commercial goat production under stall feed system is not very common in Nepal. However, its importance has been realized in the recent years as it is easy to care and disease transmission from outside plant and animal is prevented in this system. The goats also gain better body weight and are healthier in stall feeding system. In this system a regular supply of cultivated fodder is required but fodder cultivation is not yet practiced widely for goat feeding in Nepal. The main advantage of this system is effective utilisation of available forage resources, and protection of environmental damage caused by grazing goats.

Tethering system: Under this system, goats are tethered with a rope at some specific location daily for a defined period for grazing during the day time. The animals are moved to other location after grazing is complete at the first site. This system is more common with the smallholder farmers rearing only few animals and useful for effective utilisation of available pasture/ grazing areas. In this system, it is important to maintain the required time gap between two grazing at the same site so that the parasite built up from the previous grazing can be avoided.

Semi intensive system

Under this system, goats kept under the grazing system but are also supplemented with concentrate feed, mineral and other supplements as required. This system is aimed for market production but also utilize the natural resources in the community for goat production. Here crops by-product, fodder trees, home grown forage and kitchen waste are used for animal feeding.

Goat Price

Among all types of the consumed meat, mutton has the highest cost per unit weight. In 2015, the average goat meat price in Nepal was Rs. 593.60 as per the Livestock Production Promotion Director. The average price was Rs. 603.08 in mountains, Rs. 611.31 in hills and Rs. 600.38 in Terai. The current price of mutton in Kathmandu is Rs. 840 per kg (July 2016). The average farm gate price of live goat is Rs. 360 per kg (local traders buying price) and the national trader buys it in Rs. 400 per kg whereas the local butcher or slaughtering house buys it at Rs. 450 per kg. In majority of hilly districts, especially in rural areas goats are sold in estimation rather than by weighing. In some cases, weighing is also practiced but negotiation through estimation is the common practice. Single live goat (native variety) is sold between Rs. 9,000 to 13,000 depending on its size and look.

Price variation exists in the sector where the major price determination factor for the producers and local traders at farm gate level is the ongoing retail prices of goat meat at the local market or nearby major consumer market. In case of the regional and central traders of Kathmandu, Pokhara and Bharatpur, terminal market prices are usually determined by the quantity of supply and demand in the market.

Live goat market

There are many traditional live goat markets, known as Hatt Bazar, in the southern part of Nepal in the vicinity of the East West Highway. There are 148 live animal markets as shown in Table 8.

Table 8: List of major live goat market in Nepal

Development Regions	Districts	No of Livestock markets	Major Goat Markets
1.Eastern	Jhapa	75	Pathivara, Saneishchare, Dhulabari, Damak, and Surunga
	Morang		Belbari, Dohamana, Urlabari, Madhumalla, and Letang
	Sunsari		Dharan, Inaruwa, and Madhuban
	Siraha		Golbajar, Lahan
	Saptarti		Mahuli, Fattepur
2.Central	Dhanusha	49	Sakhuwa
	Mahottari		Gaushala and Rouja
	Sarlahi		Barahatwa, Hariwan, and Bailbas
	Rautahat		Chandraigahapur
	Bara		Kalaiya, Nijgar, Kolwi, and Dumarwana.
	Kathmandu		Kalanki, Balaju, Bijulibajar, Baneshor, and Tukucha
3.Western	Nawalparasi	10	Jamuniya
	Rupandehi		Haraiya
	Kapilvastu		Chanrauta, and Bahadurganj
4. Mid-Western	Dang	9	Lamahi, Ghorahi and Tulsipur
	Bardia		Gulariya
5. Far western	Kailali	5	Tikapur
Total markets		148	

Source: Premy and Aryal 2012. In: Proceeding Pp 106.
Note: There are at least 25 more markets added to the total 148 market in the past 2-3 years

2.2.2 Context in the western and eastern clusters of Nepal

Eastern Cluster (Ramechhap, Okhaldhunga and Khotang districts)

In the eastern cluster mostly semi intensive system of goat raising is practiced. Transhumance system is not adopted at all, as these districts do not have big range land like the western mountains. Small holders are using tethering management system. Usually goats are pooled (i.e. combine of 3-4 households) and grazed during the day time. Slowly, farmers have adopted and started practicing stall fed system as the community forest group restrict goat grazing in the forest area.

Western Cluster (Surkhet, Jajarkot, Dailekh, Kalikot and Achham districts)

The goat management system in the Western cluster is slightly different than in the Eastern cluster. In this cluster**,** a short migratory system is still in practice. The movement is restricted mostly within the districts. Mainly Jajarkot, Dailekh and Kalikot district have semi migratory system of management. But semi intensive management is gradually picking up.

Table 9: Landholding by households for goat production

	Landholding for goat production							
Total area of holding	**Ramechap**	**Okhaldhunga**	**Khotang**	**Surkhet**	**Dailekh**	**Jajrakot**	**Achham**	**Kalikot**
Holding without land	86	86	156	151	174	102	85	-
Holding with less than .5 ha of land	15,202	7,414	8,756	22,549	17,721	7,925	16,734	5,065
Holding with more than .5 ha of land	19,521	13,498	16,620	15,648	11,591	7,762	7,421	2,807

and under 3 ha of land								
Holding with more than 3 ha of land	835	836	536	151	116	102	85	376
Total	**35,644**	**21,834**	**26,068**	**38,499**	**29,602**	**15,891**	**24,325**	**8,248**

Source: National sample census of agriculture Nepal, 2011/12

The above table shows that in eastern cluster 38% of farmers have less than 0.5 ha or no land whereas in case of western cluster 60% of the farmers fall under this category. Farmers involved in goat production in western cluster in average have less land holding.

Price

The factors influencing price of goat in the clusters is similar to other regions which is determined by the ongoing retail prices of goat meat at the local market. Majority of the farmers in remote areas still sell their goats in estimation and negotiation with the traders. The small farmers normally do not calculate their cost of production while selling the goats.

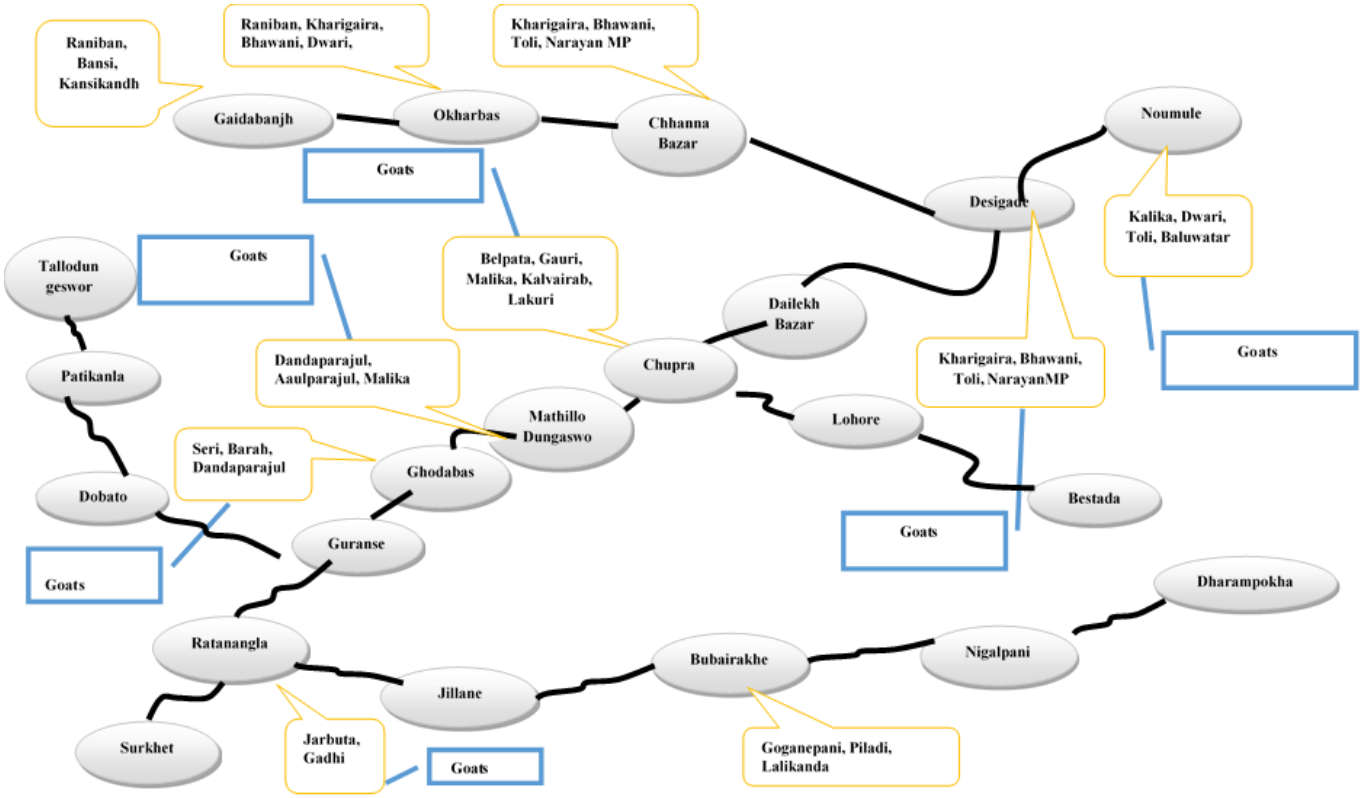
Trade dynamics

The majority of the goat raising pockets are in the hills of Nepal and the livestock markets are located in the terai. It is sometimes difficult to collect goat in the hills therefore Directorate of Livestock Market Promotion has initiated to establish livestock collection centres as primary market near the production pockets and link them to the secondary or terminal market. So far 36 such livestock collection centres are in operation in various parts of the country. These collection centres are operated by private sector where government provides 70% subsidy of around Rs. 1,500,000 for infrastructure development.

Table 10: Nearby market centres in the Project districts

Cluster	Project districts	Nearby markets
Cluster 1	Ramechhap, Okhaldhunga and Khotang	Lahan, Golbazar, Kathmandu
Cluster 2	Surkhet, Jajarkot, Dailekh, Kalikot and Achham	Lamahi, Ghorahi, Tulsipur, Gularia and Tikapur

Figure 5: Karnali road corridor Map and major goat hubs



Meat Production Potentials and Productive performance

Productivity

Khari is the dominant breed, which is considered as a native breed of Nepal and has been widely reared in the Terai and the mid-hills. A comparative production, as shown in Table 11 shows that Khari produces the lowest meat compared to others, but Khari is twinner (57% doe can have twins) and can produce three times in two years.

The cross bred can have more meat (18 months' age) but are less twinner. Farmers prefer crossbreds as they look attractive and even produce more meat. Among the cross bred, Boer is a breed recently introduced in Nepal and has shown good performance when crossed with Khari. The 50 percent Boer has growth potential of 120-gram average daily gain which is almost double of the native breed of 60 gm per day (NARC). Government as well as private breeding farms are crossing Khari with Boer for better performance and have started promoting it.

Table 11: Productive performance of native goats in Nepal

Breeds	Live weight (kg)					
Breeds	**Birth weight (kg)**	**3 Month weight**	**6 months Weight**	**9-month weight**	**12-month weight**	**18-month weight**
Chyangra	1.5	7.5	13.5	15.0	18.0	20.0
Sinhal	2.10	7.25	13.60	15.70	18.34	21.5
Khari	1.50	6.5	8.0	12.5	15.0	16.5
Terai	1.60	6.4	9.0	11.0	14.0	18.0

Source: Upreti, 2065 and Joshi *et al* 2003

Research has shown that with right feed, nutrition and health care productivity of goat can be raised. Currently Khari goat are sold at the age to 24 to 30 months as they take time to gain the desired weight. But with proper goat management with feed and care the productivity can be increased and the desired weight can be gained at the age of 18 months.

Table 12: Reproductive performance of native goats

SN	Reproductive Parameter	Goat Breeds			
		Chyangra	**Sinhal**	**Khari**	**Terai**
1	Age at first kidding (d)	730	731	478	459
2	Kidding interval (d)	365	365	268	225
3	Number of kids born/doe/annum	1.0	1.2	1.57	1.4
4	Twinning % age	0	27.3	57.0	45.0
5	Nos of kids weaned	-	1.11	1.71	-
6	Live weight gain per doe per annum	-	17.42	21.76	-

Source: Joshi *et al* 2003, Upreti, 2065 BS

Performance of Crossbred

Crossbred goat has better performance compare to indigenous breed. As shown in Table 14, weight gained by Jamunapari cross is high compare to native breed but the breed is singleton which has less yield per doe per year. But the meat dressing percentage is higher than native breed. The meat production from Barbari cross breed is better and meat fetch 15% higher price. But the crossbred is only suitable in dry region such as western terai region. Barbari cross cannot do well in eastern region due to the higher relative humidity.

The growth performance of Boer cross is highest when compared with other crossbred. Research done by NARC has shown that Boer cross can reach 38.0 kg live weight in 18 months which is comparatively higher than other crossbred. As both Khari and Boer are twinning, the crossbred also has high chance of twinning.

Table 13: Productive performance of Crossbred goat in Nepal

Breeds						
Breeds	**Birth weight (kg)**	**4 Month weight**	**6 months Weight**	**9-month weight**	**12-month weight**	**18-month weight**
Khari x Jamunapari	2.35	10.0	11.5	14.0	16	22.0
Khari x Barbari	1.67	7.0	9.01	12.0	15.0	21.0
Khari x Boer	2.27	14.13	18.18	26.28	35.11	38.0

Source: Upreti, 2065 and Kandel 2015. Adhikari et al 2.12 (Pp 245-250: Proceeding of National Goat seminar).

The reproductive performance of crossbred goats is shown in Table 15. The dressing percentage of goat is better at 62.12 percent compared to the 54.0 percent of the imported breed available in Nepal. The higher dressing percentage encourages the famer to grow more goat in their farmland.

Table 14: Reproductive performance of cross bred goats in Nepal

SN	Reproductive Parameter	Goat Breeds			
		Khari x Jamunapari	**Khari x Barbari**	**Khari x Kiko**	**Khari x Saanen**
1	Age at first kidding (days)	577	564	576	423.45
2	Kidding interval (days)	319	286	496	257
3	Number of kids born/doe/annum	45.5	58.33	33.0	91
4	Twinning % age	1.80	2.09	-	2.6
5	Nos of kids weaned	1.28	1.60	1.14	-
6	Live weight gain per doe per annum	19.15	16.15	18.37	-

Goat Feed and Feeding

Balance feed and nutrition is important for goat farming as it directly affects its productivity. Goats consume different types of feed. This includes forage, fodder, roughages and concentrate. Feed supply in terms of standard ration is not a common practice whereas majority of the farmers offer limited amount of maize grit (40-60 gm/day/goat) and often wheat bran (20-30 gm./day/goat) (source: Report on value chain analysis of goat, 2011, High Value Agriculture Project in Hill and Mountain Areas). However, in winter there is feed deficiency of around 36 percent in the country. Some of the common fodder and forages grown in Mid hills of Nepal are Ipil- Ipil, Ficuls lacor, Mulberry Tree, Kutmero, Wedgeleaf fig, Mountain Ebony, Butterfly tree, Monkey Jack, Chinaberry tree, Bead Tree, Elephant ear fig, Roxburg fig. In remote areas grazing in forest or nearby open land is a common practice where farmers have not yet practiced cultivating forage or fodder trees. Goat are normally fed with whatever is available at home and balance diet with green fodder, mineral mixture, different types of flour are hardly given due to which the productivity of goat is low.

NARC has designed and recommended cost effective and durable feeders in western region of Nepal. These feeders can save up to 42% of feed wastage, and are very durable up to 10 years. These feeders are made from iron bar and portable to carry in the hilly region. The cost of the feeder is reasonable costing NRs 2000 per (Chain Barrel) feeder. This technology is helpful to rear the goats in confinement and helps to protect the forest.

Health Management

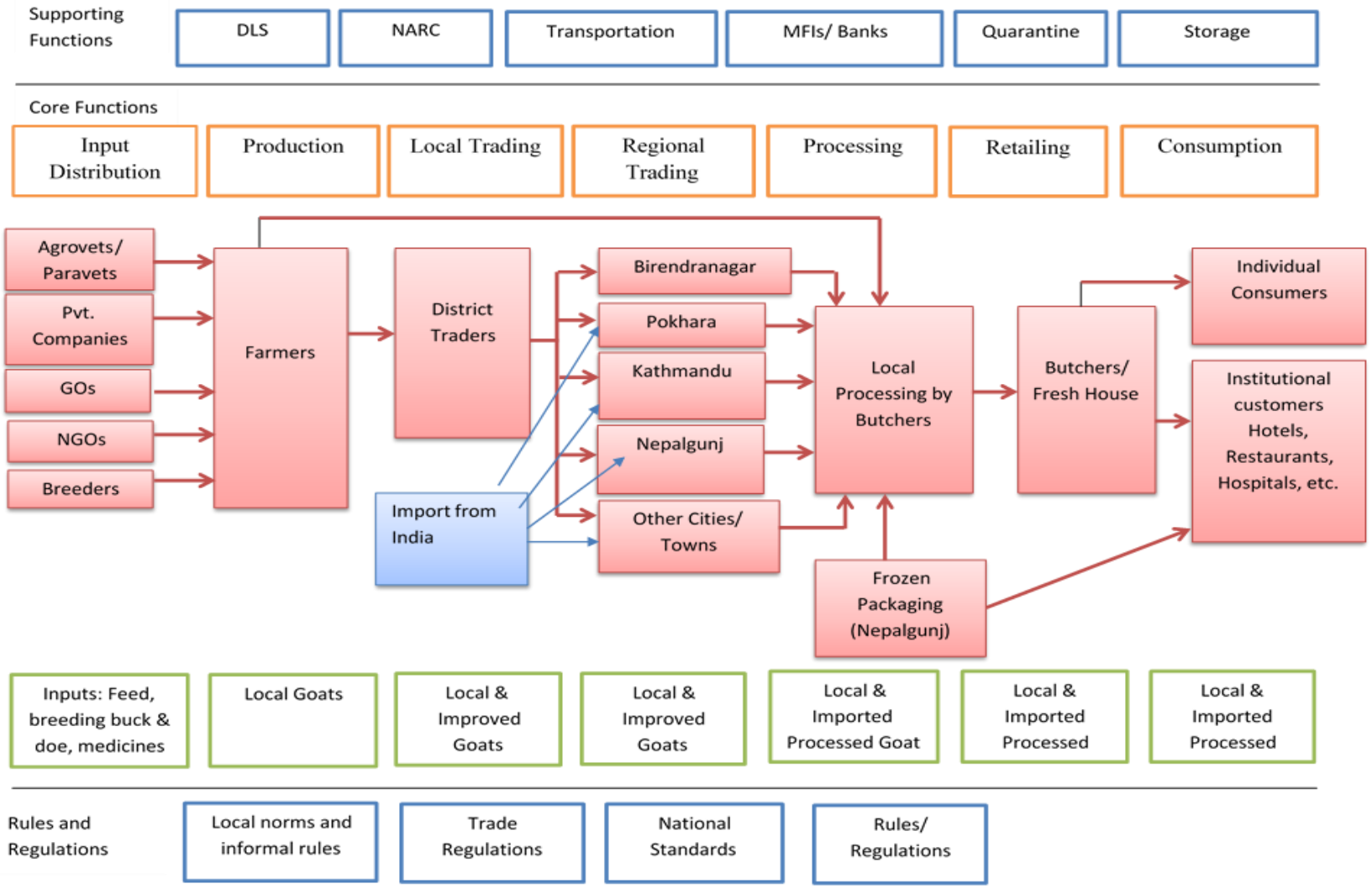
Goat can become infected with various parasites and infectious diseases. Foot and mouth disease, PPR, Orf, enterotoxaemia, mastitis are common infectious diseases, while, parasitic gastroenteritis, liverfluke, gid and scabies are the major problems caused by the parasites. PPR vaccines are provided free of cost by District livestock office. Annually around 5,500,000 PPR vaccines are produced in Nepal for goat by Nepal government which is not enough for the goat population of nearly 10 million. The animals should be vaccinated at 3 years interval. As the supply of the vaccine is lower than demand the government usually provides the vaccine by organizing camps in winter or distributing in areas where there is a potential of outbreak. It is also given to farmers group with at least 50 goats on demand. Private sector are not yet allowed to produce and distribute PPR vaccine as government wants to control the quality of the vaccine. Due to Nepal's difficult terrain and problems in electricity supply the government is facing challenge in cold chain maintenance for the vaccine at the district level.

Worms are another major problem which directly affects the productivity of goats. In some district deworming medicines are also provided free of cost by the government through DLSO but majority of the farmers buy it from local agro-vets. The overall goat mortality is around 10-12 percent. If there is a PPR epidemic the whole herd may die as it is very infectious.

2.3 Sector map: core functions, supporting functions & rules, and the market actors

2.3.1 Sector map

Figure 6: Sector Map

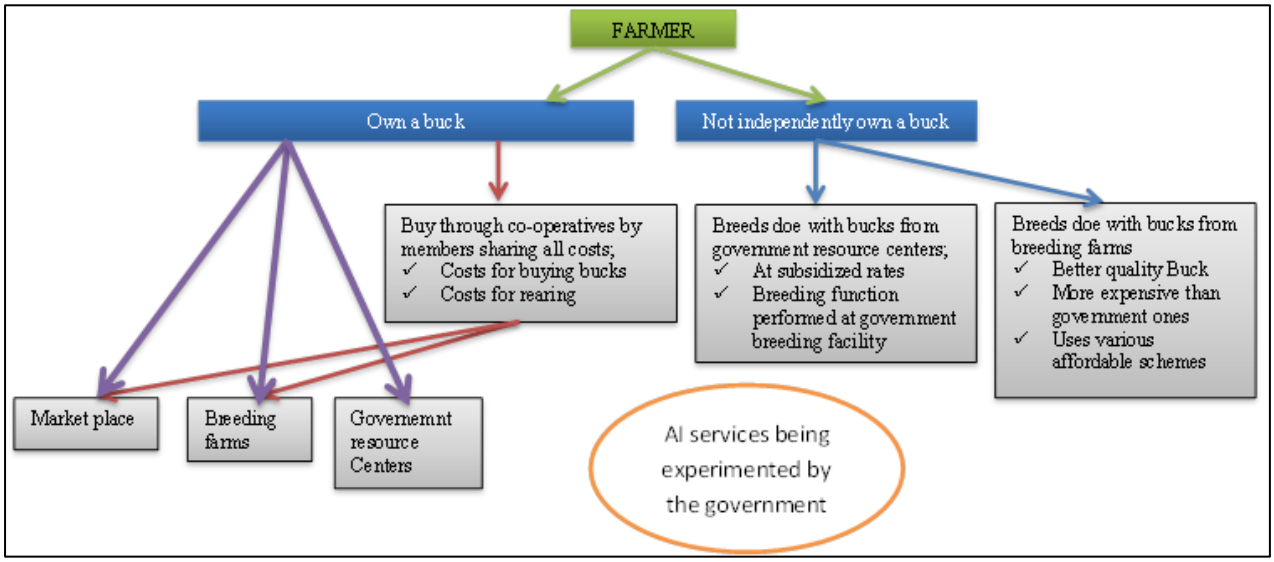


2.3.2 The core value-chain

The major functions involved in goat value chain are input distribution, production, local and regional trading, processing, retailing and consumption. The actors in relation to the goat meat value chain are described below:

Input suppliers: Input suppliers provide materials or services to producers. Material inputs which will be needed by producers include breeders. Producers will need a source to purchase animals when starting to raise their own goats. Most farmers do not independently own a buck and require services from the Government resource centres or private breeding farms. The diagram below shows the options a farmer has for breeding.

Figure 7: Goat breeding options for farmers



Other common inputs include salt, minerals, concentrates, veterinary medicines, forage/fodder tree seeds and saplings (Artocarpus lakoocha; Bauhinia purpuria; Ficus spp. and so on) that are mainly managed and supplied by the private sector such as agro-vets. In case of veterinary medicines both agro-vets and para vets are equally active for technical inputs. Only people who are certified by the government and technical institutions are allowed to work as junior technical assistant (JTA)/agro-vet in the rural areas.

Government agencies and non-governmental agencies working at district level such as the DLSO and local NGOs provide technical knowledge and inputs to farmers.

Farmers: Farmer refers to a person (or a household) who have been keeping and selling goat for meat. Mainly two types of farmers are engaged in goat keeping:
(a) Small farmers with scattered and low level of production, and
(b) Semi-commercial farmers characterised by 5-10 goats keeping mainly for selling in the market.
In general, goats from the small farmers are bought and shared for meat by the community or sold to local market traders or butchers. Semi-commercial farmers sell most of their goats to the various market intermediaries through local collection centres/ hatt bazar or directly at farm.

Local butchers: Local butchers are either unorganized and perform the butchering business as and when it is available, or often located in the local market/town by establishing butchering shops. Local butchers directly buy goats from the farmers and often hold in their own collection/holding centres in

order to supply as per the local demand of meat. In some cases, they also deal with the live goat selling to the large buyers/traders and serve as intermediaries.

District traders: Three types of district traders have been identified:
(a) those who collect the goats from the villages, hold in the collection centres/holding rooms and supply to the near- by market in the road-corridors; sell to the local butchers, and often sends some goats to the distance markets such as Kathmandu.
(b) those who collect goats from the villages and themselves do the further selling by taking the goats to the big cities and markets such as Kathmandu
(c) those who buy, hold/collect in the collection centres and send to the distance markets (Pokhara, Kathmandu) as quickly as possible with their agents in the destination to deal with the further selling activities.

In the case of the first two types of they often buy in credit from the farmers and pay them back once the goats are sold in the distance market (Source: Report on value chain analysis of goat, 2011, High Value Agriculture Project in Hill and Mountain Areas)

Sub-national traders: The traders in this category handle and sell the collected goats at the sub-national/regional centres, such as Birendranagar. They mainly sell live goat to the butchers/fresh houses.

National traders: The traders who have been active in trade of goat in Kathmandu and Pokhara are called national traders. They collect goats from district traders and sell live goats in the national market mainly to the butchers/fresh houses.

Retailers: Retailers are butchers/ fresh housekeepers who process the live goats and sell meat directly to the consumers, sekuwa corners, restaurants, hotels in the big cities and market. Some fresh houses in Nepalgunj are involved in processing of the meat. Processing usually consist of cleaning, removing head and legs and wrapping in plastic for storage. The meat is stored in deep fridge for longer time and is delivered to customers mainly in Kathmandu using insulated vans.

Importers: Importers are traders who import live goats from India and sell them in major cities of Nepal. There are about 11 importers who are operating through registered firms in Kathmandu and Pokhara. They also have branches at Belahiya, Krishnanagar and Nepalganj. They import live goats in Indian trucks twice a week on an average. They are imported through the quarantine check posts of Nepal. The goats are ordered through phone or by informing the delivery men for next lot of order, quantity and time. Normally in one truck around 300 live goats are imported.

2.3.3 Supporting Functions / Services

In the enabling function major activities include public research and related technology development; setting of professional standards/rules/norms; and advisory/promotional services through extension activities.

Department of Livestock Services (DLS) and Nepal Agriculture Research Council (NARC) are the main agencies involved in the development and dissemination of different production and management technologies/ practices related to goat-rearing. NARC is an autonomous organisation established to conduct agricultural research in the country. Its major function is to conduct qualitative agricultural research required for national agricultural policies. They have crop science and animal science division and under animal science they do research on breeding, nutrition, health, pasture and forage. The research station in Bandipur is the National Goat Research Program which focused on research on goat. There are four research stations focused for technology generation covering three agro

ecological zone of the Country and they are (1) Mountain: Agriculture Research Station, Pakhribas and Agriculture Research Station Jumla (2) Hills - Agriculture Research Station-Goat Bandipur and Regional Agriculture Research Station Lumle (3) Terai: Regional Agriculture Research Station, Khajura Nepalganj. Among these stations, only ARS Bandipur has been mandated to supply the goat's genetic resources to the DLSO and NGO/INGOs.

DLS was established by Nepal government to provide services on various livestock development programs like animal health, nutrition and breeding management. The DLS has district livestock service offices in all the 75 districts of Nepal and service centres at the field level. There are 51 central and regional offices and 11 livestock development farms under the DLS.

Under the Ministry of Livestock and Department of Livestock Services, the Directorate of Livestock Marketing and promotion is a government agency involved in the overall management of the livestock market in the country. It formulates plan and policies to connect rural livestock farmers with the market by providing them support in production, supply, transportation, and storage of livestock product (MoLD, 2016). There are two Goat Development Farms under the DLS network working as the resource centre to supply the improved goat breeds to the farmers. The farms to produce the nuclease breed under the DLS are (1) Goat Development farm Chitlang for hilly region and (2) Goat Development Farm in Kailali for Terai and hilly region.

In the production process, microfinance institutions and cooperatives assist farmers by providing loans.

Night buses for long distance and day buses for short distance within the country are the most used means of transportation to the end markets by unorganised traders, however the importers use the lorries to transport goats. This is due to the lack of organised transport and loading and unloading platforms. Transportation of goats in small quantities (30-40 goats) is also done by jeep. It was noted that goat transportation by bus is not a humane practice as it lacks sufficient space to rest compared to designed modes of transportation (three tier trucks used by importers). Transportation of goats to the distant market by such practices is observed as compulsion of the trader due to the unavailability of a sufficient number of goats to hire a separate vehicle.

Too much stress during transportation has been reported is known to deteriorate meat quality due to biochemical changes that stress related hormones bring about in animals. In the entire course of the domestic goat value chain, the major loss accounted is the body weight loss. In a study on Goat Value Chain in Nepal by Heifer International Nepal, recording of body weight of 11 goats at Chhinchu at 15:00 hours and again at Pokhara upon delivery in the morning of the next day revealed that on average 2.0 kilo per goat body weight loss was observed. Dehydration appears to be the major factor followed by stressors associated with mode of transportation, distance of the end market, rest in transit (which was lacking in this case), and feeding and watering provisions. This may be attributed to the congestion and unhealthy practices of transportation.

2.3.4 Rules, Regulations and Government Programmes

Ministry of Agriculture Development (MoAD) and the Ministry of Commerce are the main agencies involved in policy formulation. Government of Nepal has a policy of increasing meat production. Besides improving trading, the government policy emphasises improving the quality of products and value chain development. The following policies, programmes and rules affect the goat value chain.

Agriculture Development Strategy (ADS)

The ADS will guide the agricultural sector of Nepal over the next 20 years. ADS looks at the agricultural sector in its complexity, and encompasses not only the production sectors (crops, livestock, fisheries,

forestry) but also the processing sector, trade and other services (storage, transportation and logistics, finance, marketing, research, extension). Goat meat is the seventh prioritised value chain in ADS. In order to achieve the vision the ADS will accelerate agricultural sector growth through four strategic components including governance, productivity, profitable commercialization, and competitiveness while promoting inclusiveness (both social and geographic), sustainability (both natural resources and economic), development of private sector and cooperative sector, and connectivity to market infrastructure (eg agricultural roads, collection centres, packing houses, market centres), information infrastructure and ICT, and power infrastructure (eg rural electrification, renewable and alternative energy sources).

Some of the activities on ADS action plan are as follows:

- Promote the establishment of Community Agricultural Extension Service Centres (CAESC) in each VDC.
- Restructure the National Agricultural Research System (NARS). The NARS will be decentralized and made more responsive to the research needs of farmers, cooperatives, and agro-enterprises.
- Develop livestock policy including breeding development and animal health.
- Capacity building for improved breeds production.
- Establish a voucher system for animal breeds, veterinary services, and livestock insurance

Livestock Transportation Standard 2064

Key highlights of the standard:

- While transporting livestock internally from district to district in Nepal, the transporter need to have a health certificate of livestock from veterinarian of district livestock service office.
- It is compulsory to carry first aid kit within the vehicle.
- Details of livestock, breed, sender and receiver need to be clearly mentioned in paper.
- Floor space needed for goat sheep is 0.2 to 0.3 square feet per goat.
- Livestock are not allowed to be transported on the roof of vehicles, or public bus carrying passengers.
- Vehicle needs to be sanitised after every use before transporting again.

The means of transportation of meat should be of enclosed type made of non-rusting metal with the capacity of absorbing water. It needs to be easy to clean and has to be disinfectants friendly. Doors and windows should be with proper closing and opening system. There has to be provision for adjusting temperature while transporting meat.

Meat should not, at any cost, touch land surface as well as other external ailments and person involved should be healthy and free from contagious diseases.

Animal Slaughterhouse and Meat Inspection Act, 2055 B.S (1999)

The major highlights of the Animal Slaughterhouse and Meat Inspection Act, 2055 are as follow

- License: (1) A person or an organization interested to establish a slaughterhouse or selling of meat shall have to apply for a license in the prescribed format to the prescribed officer.
- Appointment of Meat Inspector: (1) In order to examine animal and meat, the Government of Nepal may appoint or designate a person who is at least a graduate in veterinary science as a Meat Inspector.
- Designation of a Meat Supervisor: (1) The Government of Nepal may designate a Meat Supervisor to any civil servant who is at least a graduate in veterinary science, for the

supervision of the slaughterhouse management as well as for the supervision of the functions of the Meat Inspector

- Authority to Enter: The Meat Inspector or the Meat Supervisor may enter into a slaughterhouse or butcher's shop at any time to inspect an animal or meat or to take sample of meat.
- Stamp or Marking of Meat: (1) The Meat Inspector shall have to affix clearly visible stamp or mark as prescribed at the time of giving permission for the sale of meat after the examination of meat of the animal.
- Penalties: (1) A person who violets Sub-section (1) or (3) of Section 8, Section 9, Sub-section (2) of Section 10, Sub-section (3) of Section 11 or Sub-section (2) of Section 12 shall be liable to a fine up to Five Thousand Rupees for the first time and Ten Thousand Rupees or an imprisonment up to one month or both from the second time and onwards for each offence.

Slaughterhouse and Meat Inspection Regulation, 2057 (2001)

Under the Slaughterhouse and Meat Inspection Regulation, some of the rules are applied for slaughterhouse and meat seller are as follow

- For establishment and operation of a slaughter house a separate place to keep animals before and after ante mortem examination is required.
- Arrangements should be made for enough light and ventilation in the working rooms of the slaughterhouse
- Cold storage facilities are required to keep meat safely
- Meat seller have to obtain license to operate
- Meat seller have to comply with terms and conditions while selling meat such as meat must be hanged that it is untouched with roof, wall, or pillar. Meat weighing tools and scales should be kept untouched with other goods or ground.

The animal slaughterhouse and meat inspection act has two major objectives, firstly to prevent adulteration and contamination of the meat during and after slaughtering and secondly to ensure slaughter of healthy animals without any disease condition which can make the meat unsafe for human consumption. This law has compulsory provision of ante mortem inspection of the animals by qualified meat inspector before slaughtering in slaughter house or designated place. After ante mortem inspection the inspector either give permission to slaughter the animal or reject or hold for further examination. Similarly, carcass of the animal after slaughter should also be inspected by meat inspector. The inspector marks the wholesome meat with stamp and also has right to condemn whole or the part of the carcass in case of any disease condition. The inspector may send the carcass for further test in case of any doubt.

Poor hygienic practices during slaughtering and marketing of meat is one of the major contributing factors for unsafe meat in Nepal. Butchers slaughter animals in open and unhygienic places and uses polluted water during slaughtering. The slaughterhouse and meat inspection act has not yet been enforced in Nepal.

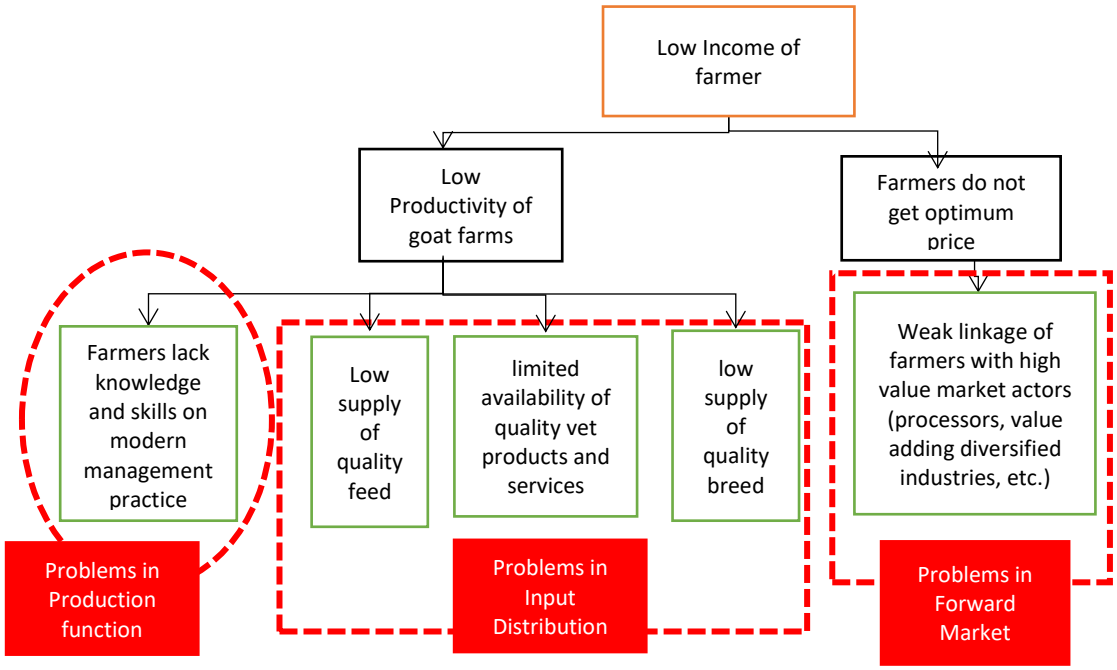
3 Analysis

3.1 Problems in the core functions and underlying causes

This section begins with an analysis of the *inputs market.* This is followed by a review of the production *function* The chapter will end with an analysis of the *forward market* of goat meat sector.

A detailed constraints tree was developed to identify the underlying causes of low income of goat farmers. The diagram below (Figure 8) is an abridged version of the constraints tree developed to identify the underlying causes of problems in the core functions.

Figure 8: Underlying causes of problem in core function



There are two main reasons for the low income of smallholder goat farmers – low productivity and inability to get good price for their products. These can be further broken down into three areas – problems in production function, problems in input distribution and problems in forward market. The underlying causes for these are discussed in the sections below.

Problems in Production function

Low supply of quality breed: Productivity of goats varies highly depending on the breed. Majority of the farmers are engaged in poor breed selection and management process. Example of one very serious problem that arises due to poor management of breeding is “in-breeding”. In-breeding causes radical decrease in the growth rates of live animals, increases mortality rates, reduces disease resistance and results in poor productivity and profitability for goat farms.

Khari, an indigenous breed, is the most popular breed in Nepal. Khari has some very useful characteristics such as twining ability, ability to graze in the mountains. Cross breeds currently are 10% of the Nepalese goat population. The most common cross breed is cross of Jamunapari and Khari. Jamunapari is an Indian origin breed with relatively large body size and higher growth potentials.

For breeding purpose, producers go to a goat resource centre run by NARC/ DLS or to a privately owned breeding farm. Recently quite a few privately owned breeding farms have invested in bringing Boer breed from South Africa and Australia. These breeds have three times more productivity than pure Khari or any other cross variety.

The concept of cross breeding and investing in improved breed is new to smallholder farmers. In the project district less than 20% of the farmers could identify the needs of better breed during the field visit. As per DLS there are a 30 breeding farms supplying improved variety to farmers. NARC has four-

in Bandipur, Nepalgunj, Pakhribas and Lumle. The government owns two more-in Chitlang and Kailali. There are not nearly enough breeders to supply improved buck to a significant portion of the Nepalese goat farmers.

It is expected that more entrepreneurs will get into the goat breeding business because it has a huge potential demand which is still largely untapped. However, breeders say that the high start-up investment is a strong barrier to entry in this market. It is a risky venture as many people are not familiar with the idea of purchasing improved breed buck from breeding farms. For many years development projects have been supplying free improved bucks to farmers and co-operatives. Government too runs a subsidized programme of supplying breeding bucks to co-operatives. Thus the challenge for new breeders is two-fold: first, to popularise the idea of improved breeding buck to a larger number of farmers. Second, convince farmers to "buy" bucks instead of waiting to receive it for free.

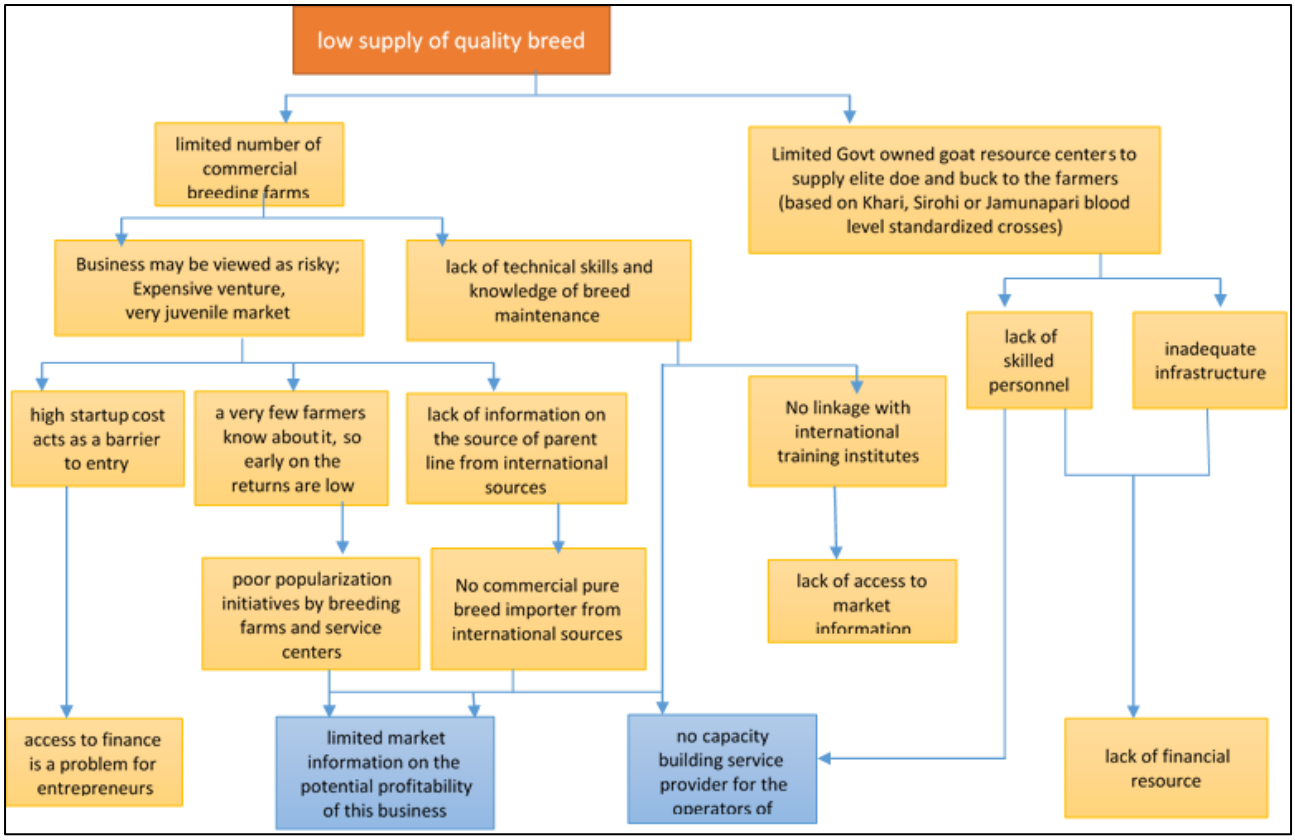
It is worth noting that existing private breeders have invested large amount of money to bring international breeds and set up advanced breeding space and goat shed but have invested little on their product promotion. Lack of access to quality information/awareness both on farmers' and new entrepreneur's end, is one of the main constraints to accelerating the breeding business.

The other problem facing the breeding business is the complexity of the business. The existing breeders are all highly experienced in large scale goat farming for many years. They say, the science of the business is mandatory to be learnt and hands-on capacity building training is very useful. This would not have been a problem if there was a capacity building and training service provider in the market for breeders. International linkage with research stations is also negligible. This is another reason why more entrepreneurs are not readily coming into this business.

The service industry around goat breeding business has one more constraint. This is the lack of commercial importers of high value goat breeds. Right now the existing breeding farms are independently bringing breed from various international sources. Department of Livestock Services and NGOs that are helping these farms with money, linkage and documentation. Commercial importers can work with multiple breeding farms in sourcing breed and the process will be less complicated if importing is outsourced to professional importers. This is one more complexity that intimidates new entrepreneurs to invest in this business.

NARC and DLS have set up multiple goat resource centres where they are supplying improved breeding buck to farmer co-operatives. The problem is with the scale of operation which is still small. Artificial insemination is also being tested at limited scale by the Government. The success rate is still unpredictable. Better service provision from the government and the private sector will take another 5-10 years to develop.

Figure 8: Constraint tree for low supply of quality breed



The figure above summarises the underlying reasons for low supply of quality breeds in the goat meat sector.

Low supply of quality feed: Another limiting factor in livestock production in Nepal is the acute shortage of forage and feed for livestock. It is estimated that livestock are under-fed by one-third and underfeeding causes animals to become more susceptible to diseases and parasites. In addition, productivity indices such as the age of first offspring; calving or kidding interval; rate of growth; and calf or kid mortality are all adversely affected.

Production system in Nepal is traditional in most of the cases where goats are either kept stall feeding or are grazed in the nearby forest. Most of the farmers keep goats based on partial feed supply (maize grits, wheat bran) and fodder from farmland & forest. Forages include grazing in the forest, on cultivated land after harvest, fallow land, from crop residue, tree fodder etc.

There is a gradual decline in free grazing area due to restriction on grazing for conservation of community forest. On top of this during winter season there is an acute shortage of forage. Farmers depend on naturally available land because they do not have the practice of growing fodder and nutritious grass on their own farmland. Most farmers have very small farming land on which they produce one or two crops such as maize, rice, wheat, vegetable or spice. They do subsistence farming and years of tradition of cropping practice is difficult to switch from. Opportunity cost of doing forage in a land where they alternatively grow “food crops” is deemed too high. There are, in some locations, community shared grazing lands. There, too, the practice of sowing nutritious forage seeds is lacking.

Medium and large farmers have enough land to spare for commercial forage production to be sold to the local community. Forage seeds are supplied, though on a very limited scale, by input companies. But market linkage between these actors is almost non-existent. One seed company is reported to be

selling their entire production of forage saplings to various government agencies, who then distribute these to farming households for free. Commercial purchase of fodder and supplementary feed is not practiced. Lack of information of farmers on monetary and economic gains of proper feeding; limited commercial supply of feed & forage and low affordability - all come together resulting into poor nutrition management by smallholder farmers.

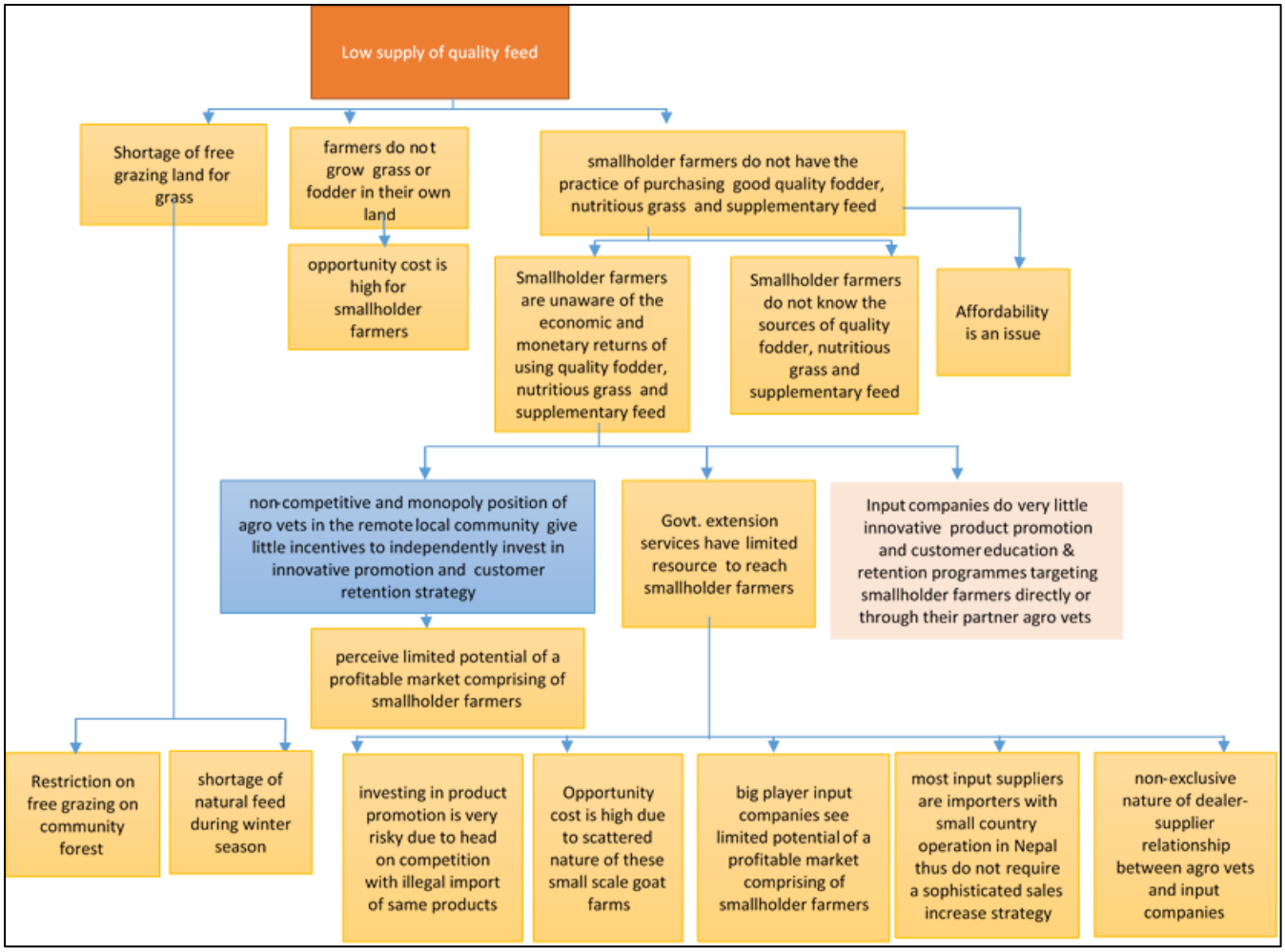
Government extension services have limited resource to reach smallholder farmers with appropriate information and knowledge. Input companies, ones who are producing supplementary feed, vitamins, minerals and important veterinary medicines, also do very little innovative product promotion and customer education & retention programmes targeting smallholder farmers. Input companies are at large only linked with the local agro vets. There is no capacity building or resource sharing relationship between these two actors. It is simply a buyer seller relationship of which almost all the time the agro vet sells products of multiple companies. There is no exclusive contract/ partnership between them, hence, any investment an input company wishes to make in building the capacity of agro-vets to better sell their products will prove to be counter-productive as competing input companies will also benefit from this enhanced capacity of the agro-vets.

Moreover, in Nepal feed and medicine products come into the market from two sources-through legal registered companies' who are producing or importing in Nepal and through an illegal channel, products smuggled through Indian borders into Nepal. Sometimes authorised dealers in Nepal are found to compete with their own company's products that was packaged to be sold in India but has been smuggled into Nepal. So an importer or a Nepal based producer is losing market due to this illegal trade which discourages them further to invest in product promotion.

Input companies do not see a profitable market targeting smallholder famers. This is again true for all kinds of inputs, from feed to vet medicines. They do not believe them to be able to become their loyal repeat customers. Also it is too much hard work for companies to promote product collecting farmers scattered all over the producing clusters. It is much easier for them to go through agro- vets. In a community there are usually only one or two agro- vets through whom all inputs are being sold to farmers. So input companies attach high opportunity cost to independent product promotion to farmers, bypassing the agro-vets. Only when an agro-vet calls the companies to report unsold products lying on the shelves for long, does a company arrange some kind of a promotional training or workshop campaign for product promotion.

Small importers do not require a sophisticated marketing strategy to boost sales. But large input companies (producers and importer) not having a marketing plan is a big drawback of the input market.

Figure 9: Constraint tree for low supply of quality feed



The figure above summarises the underlying reasons for low supply of quality feed in the goat meat sector.

Limited availability of quality vet product and service: Availability of quality veterinary services is a critical constraint to the growth of the goat meat sector.

Farmers in Nepal regard the DLSO as the most dependable source of vet service. Next to that are the service centres officers especially technical people like para vets and local agro vets. The problem with the government service is the limited outreach. The farmers, especially those in remote locations do not get veterinary service from the DLSO in time of immediate need. It was observed during the field visits that most farmers have access to agro-vets. Agro vets have very basic training to prescribe vet medicines. When DLSO or service centres officers are not available the farmers resort to the prescription of agro vets. Almost 90% of the farmers reported dissatisfaction with the advisory service provided by the agro-vets (based on NAMDP field discussion).

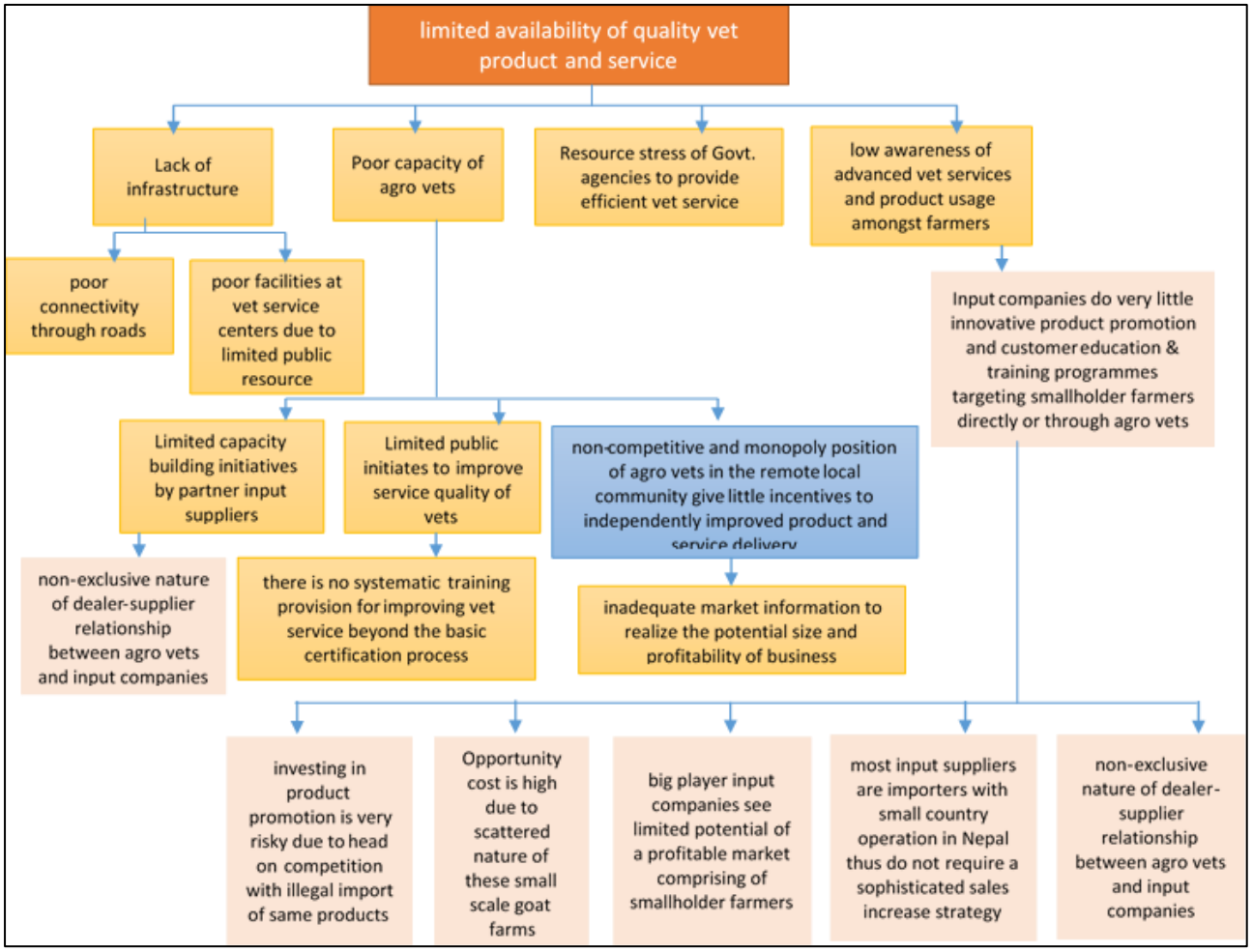
In general, the agro- vets do not have the capacity to provide professional vet service beyond basic ones. As mentioned earlier the input companies have limited incentives to build the capacity of agro-vets. The options for improving the technical capacity of the agro-vets ae limited as there are no training service providers providing advanced level training courses. Besides this, the often monopoly position of the agro-vets in the local community gives them little incentive to invest in their own

capacity building. They usually do not realise that with improvement in service quality they can increase their sells and profit.

Farmers in remote locations face a lot of difficulty travelling to district livestock office or even to the nearest agro-vet. Poor road connectivity acts as a constraint for many medicine companies to go to remote locations for regular distribution of their products.

Finally, government owned vet service facilities usually do not have the good infrastructure and technology and have limited human resources.

Figure 10: Constraint tree for limited availability of quality vet product and service



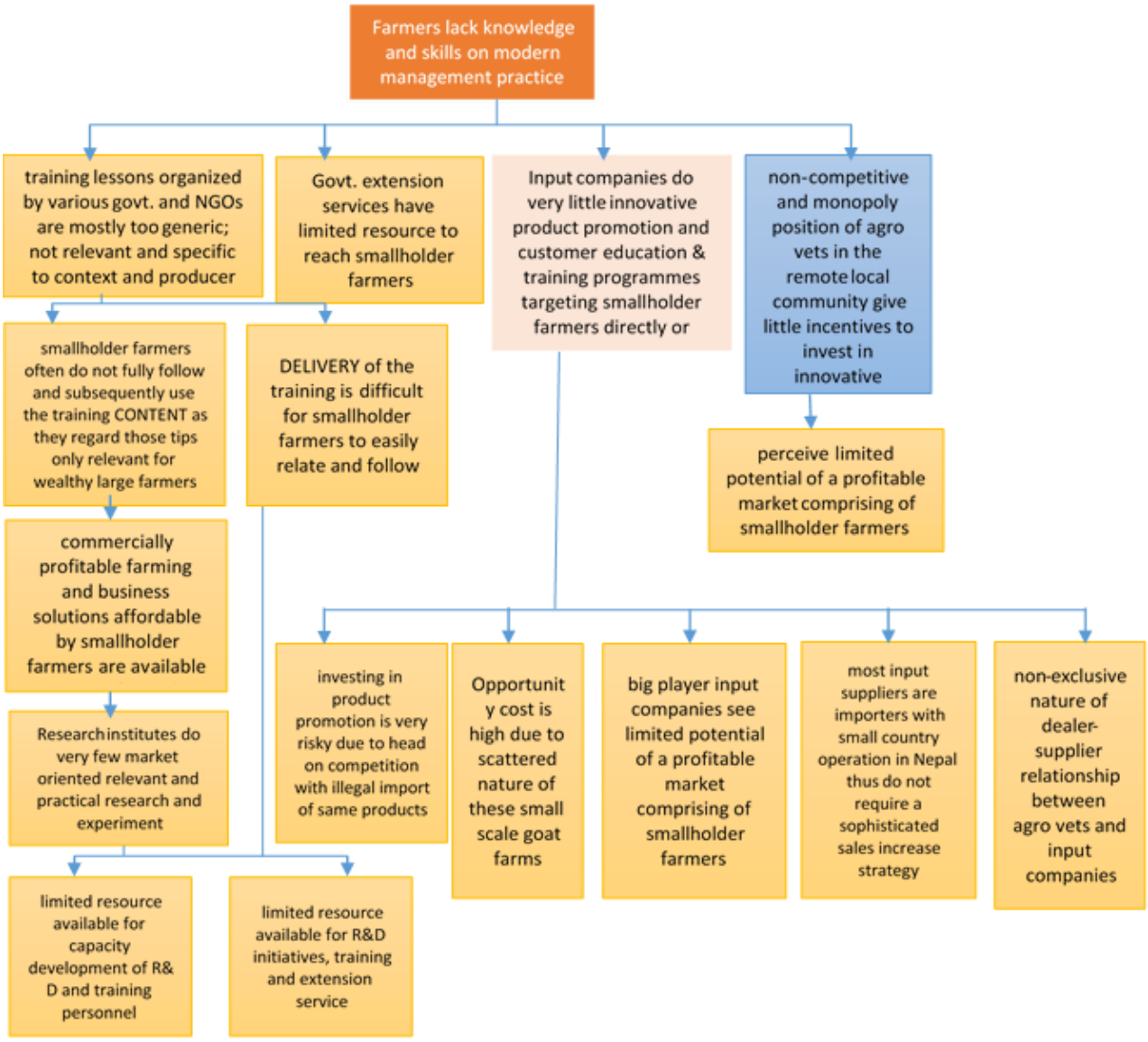
The figure above summarises the underlying reasons for the limited availability of quality vet products and services in the goat meat sector.

Farmers lack knowledge and skills on modern management practice: Farmers can receive information on modern management practice from two sources, the government training and extension services or the private sector customer education and retention programmes. As discussed before, the private sector companies lack the incentive to provide this service as they do not see the smallholder famers as a profitable customer group.

One more issue that is worth mentioning here is, whatever little training the farmers receive from government, NGOs, INGOs or even private sector, the training are not tailored to their needs. The content is sometimes too generic and irrelevant for smallholder farmers who only understand short

simple instructions with illustrations. Discussions on real life experience and problem also help them to relate to the information better. There is a need to make the training content and delivery suitable for smallholder farmers. Smallholder farmers do not readily accept an advice unless they see that it is affordable and gives a good return.

Figure 11: Constraint tree for farmers lack of knowledge and skills on modern management practices



The figure above summarises the underlying reasons for the Farmer's lack of knowledge and skills on modern management practice in the goat meat sector.

Weak link with the high value market: Wholesalers in Kathmandu prefer to import goats from Indian than to source from within the country. Only 20% of the demand in Kathmandu market is being supplied through domestic production, the rest is fulfilled through import from India. The reason for this is because the domestic producers in Nepal fail to meet all the four primary requirements to compete in a high value market- bulk volume, goats of specified size, timely supply and quality compliance.

Production in Nepal is scattered and volume per farm is very low. The producers and local traders do not have a system to aggregate their products for sale. Aggregation of scattered production is an

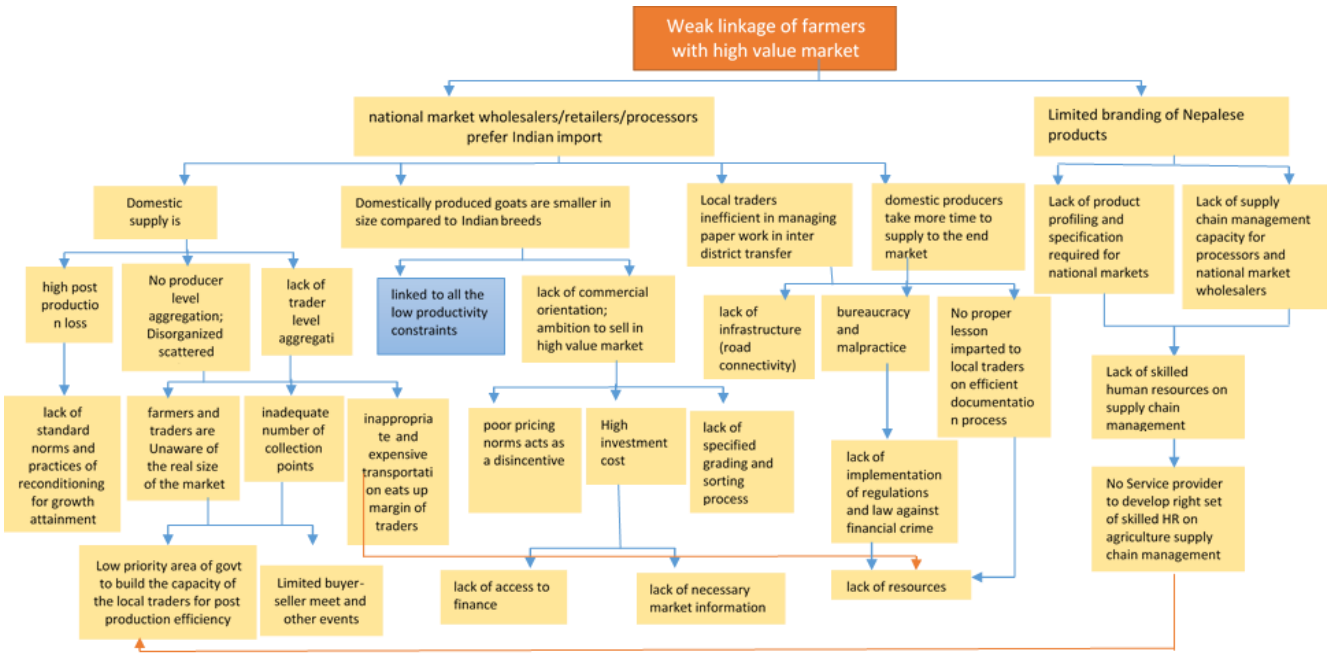
extremely useful supply chain function that drastically reduces lag time from farm gate to the point of sale. Farmers and local traders are unaware of the benefits of selling in bulk volume. The government does not attach much importance to post production functions. Hence, we see very little effort by the government in trying to get these farmers and traders develop a professional network of trade and resource allocation for infrastructure and marketing facility development. For example, there are very few collection centres, slaughter houses and meat fridge centres in emerging city areas-all of which helps traders to gather produce from scattered locations, store them and then deliver to the end markets.

Indian goats are larger in size than Nepalese ones and give more dressed meat due to which the butchers prefer Indian goats over Nepalese goats. The other underlying cause of the weak trade linkage is the lack of commercial orientation amongst farmers. Everything they produce sells in the market. Of course better size and quality fetches better price. However, farmers have very small scale of operation, on average 2 to 5 goats per farms, and they do not attach much importance in improving productivity as long as whatever they produce safely sells in the market.

Farmers who are able to send their produce to high end markets face a number of difficulties. First, the inter-district transfer process is complicated by tax requirements, complex documentation of quality compliance and above all bribery and harassment at every stop and check post. All these factors reduce competitiveness of the domestic production. There are no service providers who can work with the urban wholesalers, retailers or processors to develop an efficient supply chain for domestic production. Importing in bulk quantity is from Indian is much easier than investing in the domestic supply chain.

Branding of Nepalese products can also contribute to the improvement in the domestic supply chain. Consumers prefer Nepalese goat in terms of taste. But the butchers prefer Indian imports as they get more dressed meat per slaughter from Indian goats. If there was a campaign to promote Nepalese products, the demand pull would give enough incentives for the value chain actors to invest to improve the domestic supply chain.

Figure 12: Constraint tree for farmers not getting optimum prices



The figure above summarises the underlying reasons for the farmer's weak link with the high value market in the goat meat sector.

3.2 Particular constraints and underlying causes facing women and DAGs

The field visits done for this study revealed that most of the difficult, non-cash generating and indoor activities like management of pregnant animals and new born kids, collection and sale of manure, cutting and carrying of fodder and taking animals for grazing are performed by women. Men are involved in health care, decision making and cash generating activities like taking sick animals for medical treatment and breeding, taking the male kids for castration, marketing of animals, taking the animals for vaccination and deworming and construction of goat shed.

Private sector actors like input companies, breeders or agro- vets would only be interested to train people who are likely to become their future customers. The objectives of training based promotional activities are that farm output will increase and productivity will improve, hence, farmers are going to come back over and over again for more inputs. Due to this reason these actors are not motivated to train women.

Things are slowly changing especially in the mid and far west of Nepal where men migration is high. As most of the men are absent, women have started coming out of the house and doing things that normally men members would do such as selling goat, fetching medicines, breeding goats. This is however, not yet a common practice.

Farmers from the marginalised and the disadvantaged groups have 1 or 2 goats and have difficulty feeding their goats as many of them are land less or have very small land. They use these lands for cultivating staple crops for their own consumption. As they cannot spare their land to cultivate fodder for goat, the farmers are mostly dependent on free grazing in forest. But there is restriction on grazing in forest.

3.3 Opportunities and sector drivers

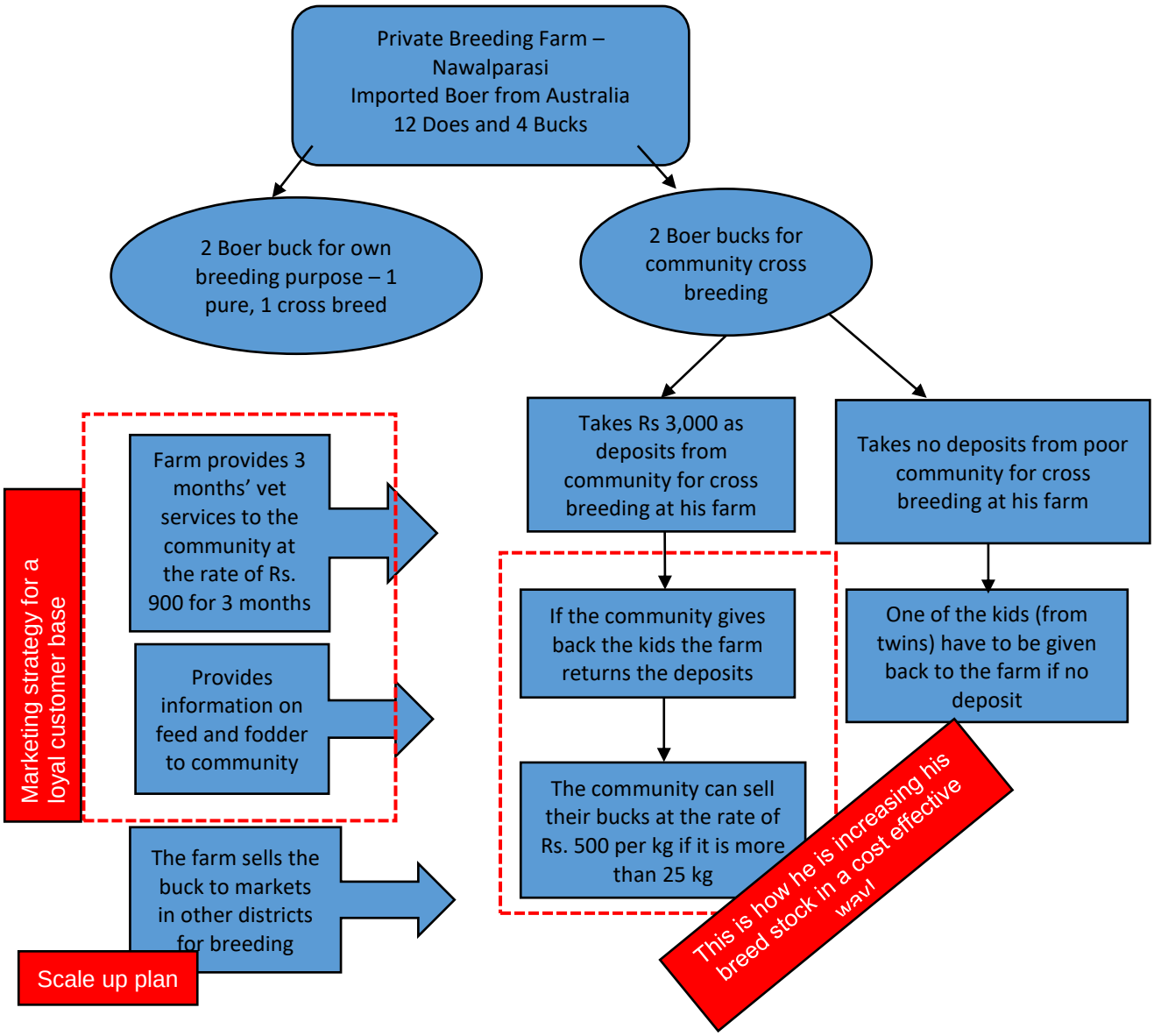
The prime driver of Nepal's goat sector is the sustained growth in demand (FAO study); with both the population and average incomes growing, consumption of meat is also steadily increasing. The price of goat meat has been rising and it is currently the most expensive meat in the market. In recent years, sector growth has been further stimulated by the following factors:

Establishment of government and private breeding farms: The Department of Livestock Service reports that there are about 132 commercial goat farms that are registered with the government out of which 30 have breeding programmes. Over the last 5 years private sector has made investments for the development of advanced commercial breeding farms with modern shed and feed management. 10% of the Nepalese goat population is now improved breed. Interesting features of this development includes:

- Breed diversification to a high productive one such as African or Australian Boer. This variety is expensive; one buck may cost up to NRS. 350,000. All the breeders interviewed for this study have purchased Boer from international sources. This shows the level of ambition of these breeders and potential of this service market.
- Breeders realise that Boer bucks would be expensive for smallholder farmers but acknowledge that they cannot achieve scale ignoring small farmers. As a result, new breeding farms are planning to experiment with promotional schemes that are affordable yet profitable for both breeders and farmers.
- All the breeders confirm that just selling Boer or a superior Jamunapari buck will not be sufficient. Farmers need assistance in rearing them. Breeders in their programme have arranged for advisory service on management practice, feed usage and veterinary services to their valued customers.

- They already have plans to increase outreach. They understand such big investments will only give positive returns with increased farmer base and that cannot alone come from the immediate locality. Everybody in their little ways is trying to go outside their communities to sell their bucks in other districts to expand the size of their market.
- Investments in breeding farms are highly constrained by expensive infrastructure and land availability. Some breeders have now come around this problem by outsourcing the cross breeding function of superior bucks to farmers giving them a buy back guarantee. In this way in a year or two they can have a breed stock large enough to cater hundreds of farming communities at less than half the expense that would incur if it was done in their own vicinity.
- All the respondent farmers from our interviews who had access to improved breed confirmed that they have seen dramatic change in productivity of goats. They also say that they will continue to make investments in better breed now that they have seen how much more money they can make.
- The diagram below is an example of a model adopted by a breeder, Bagaicha Farm House and Resort based in Nawalparasi. The breeding company has just started creating awareness about the crossbred and their services to farmers.

Figure 13: Private breeder farm model



To summarise, new breed with very high productivity is available in the market. New business models of breeding farms are also being developed and constantly being tested in the market. New entrepreneurs are investing in breeding services. With an available technology and commercial model, it is now the right time to invest in its scale up. This is a real opportunity to make a significant difference in the Nepalese goat market.

Nepal Government Program on Goat Production: The Department of Livestock Service is implementing the following programmes through District Livestock Service Offices.

Program name: Youth Focused Special Livestock Production Program
Youth focused commercial goat production program

- A Maximum of NRs. 200,000/- grant for private firms (more than 50 does) for goat production
- A Maximum of NRs 150,000/- grant for groups (more than 50 does) for goat production
- A Maximum of NRs. 200,000/- grant for cooperatives for goat production

Note: The proposed youth need to invest at least the same amount of matching fund and Livestock insurance is compulsory. The DLSO decides on the budget and whom to give the fund after evaluating the proposals by entrepreneurs.

Program name: Goat Mission Program
The Department of Livestock has started goat mission program in 45 districts of Nepal (covering most of the hilly districts). The total budget for the program for this fiscal year is Rs. 300,000,000. This budget is distributed to districts livestock offices to make yearly plan. The goat mission program focuses on free distribution or subsidised medicines (deworming, PPR, vitamins), distribution of seeds and saplings of fodder, shed development and availability of improved breeds for breeding purpose to farmers.

Both the programs are focused for commercial farmers which has at least 50 does. Government grant is focused mostly for expanding farmer's business through production improvement such as shed management of goats or procurement of better breed. The goat mission program has just started (July 2016) and it's too soon to see its effectiveness.

NAMDP can work with DLSO to identify potential cooperatives/farmers group and support them in purchasing of better quality breed from breeding farms for breeding purpose. Cooperatives/farmers group can charge a fee from its member for breeding. Along with breeding service, these groups can also provide information on farm and feed management.

Medicine companies aspire to fast increase sales base: Over the last 5 years a lot of pharmaceutical companies have diversified their portfolio to agro- medicine, new companies have come in, old ones have increased scale of operation and international companies have entered the market. The few medicine companies that we have interviewed have experienced significant increase in sales. Everyone experienced stronger competition in the market and have started to respond to it.

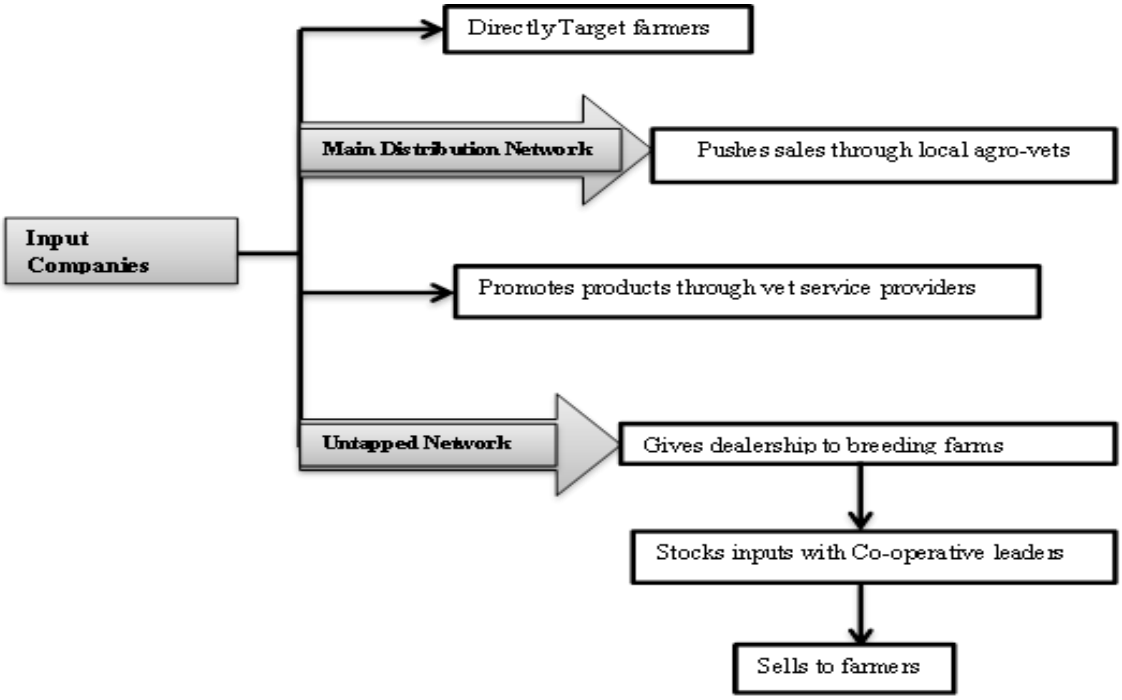
A prominent pharmaceutical company said that they have responded to competition by increasing their field presence by appointing sales representatives in important districts. In the last 3 years they have also increased the number of promotional events such as farmer training and capacity building programmes. They realise that their marketing strategy needs to be strengthened and they need to develop a concrete plan to achieve their annual sales target.

In the past they deployed marketing team and resources for promotional work with the local farmers and vet service providers when they received calls from local agro vets that the products lined up in the shelves were not selling well. Now they believe this kind of curative response will not yield good

result as farmers have many products to choose from and timing of marketing initiatives considering production cycle is very important. Four kinds of products are most popular for goats - vaccination, deworming, supplementary vitamins & minerals and anti-biotic medicine.

Appropriate usage of supplementary vitamins and minerals and correct usage of good quality medicines can significantly trigger productivity of goat farms. Medicine companies are now looking for innovative ways to draw the attention of the farmers and develop a loyal customer base. There is a good opportunity for them to link with the emerging breeding farms. All the breeders are now promoting usage of quality inputs and in some cases actually supplying inputs to the farmers so as to ensure the buck supplied by them produces best results. There is a very strong opportunity here to expand the network of inputs through these breeding farms. These breeding farms can now become dealers for input companies. Input companies can also penetrate deeper into the remote locations with their products by keeping stocks with the co-operatives or the group leaders who are in charge of keeping the buck shared by the community for breeding. This is a completely untapped network, we see some practice of it in scattered manner where a large breeding farm acquires bulk supply and distributes to his customer base but opportunity lies in formalising this practice and scaling it up.

Figure 14: potential network for medicine inputs



Commercial supply of forage and fodder has strong potential to gain fast popularity: This opportunity has emerged due to the strong push from the government to increase the supply of forage and fodder. As mentioned earlier government has partnered with a forage seed company for producing sapling of nutritious grass which is distributed to the farmers.

Farmers who are using this nutritious grass confirm significant and visible productivity improvement of goats This is can help to popularise the usage of nutritious fodder and forage. The farms of these farmer groups can be used as demonstration/model farms for other farmers.

The concept of commercially available nutritious forage is new in Nepal. Almost all the respondent farmers have shown concerns about decreasing availability of naturally found forage and are actively

seeking for affordable alternatives. This gives a good opportunity to expand the supply chain of better quality forage seed.

Farmland used for staple food will most likely be not used for forage production, however, almost every community has one or two large farmer's/land owners who can be supplied with these seeds through input companies who can sell the forage to the smallholder farmers. There is also a popular practice of using shared grazing ground for a community. Forage seeds may also be planted there.

Breeding farmers are already producing their own forage and this is always highlighted as one of the most important areas of investment because better quality breed would require good quality feed. Some of these breeders also supply forage to their loyal customers. This practice can be formalised and scaled up.

Agro-vets who are already selling seeds for vegetable, rice and maize can easily sell seeds for forage and fodder. Seed companies can be encouraged to include forage seed in their product line.

Agro vet enterprise is a profitable and fast growing business: Agro vets are prominent business entities in Nepal. It is quite a significant development that in remote locations almost all the farmers acquire inputs through agro vets. They might have to travel for hours sometimes to reach to the nearest one. But never the less, these input dealers are one stop solution for most farmers.

Young entrepreneurs will see good business opportunity to invest in agro veterinary service. Every year 90 individuals take veterinary certification which makes them eligible to become service providers in this service market. These young aspiring entrepreneurs can be encouraged to set up agro veterinary service centres including in new areas.

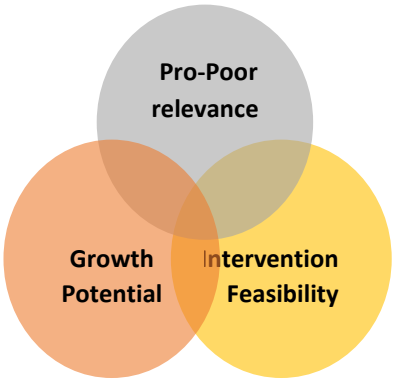
Processing and other retail outlets for fresh and processed meat are rising in the urban cities: Most of the trade in this value chain is of live goat. However, there are some cold stores such as DK Cold Store and Fresh Hygienic Food who supply processed meat in insulted vehicle to other regional markets, mainly Kathmandu. The estimated supply volume of such processed meat is 219 MT annually. The processing mainly consists of cleaning, removing head and legs and finally wrapping by plastic. The processed meat is then stored in -45 degree centigrade. The major customers for these kinds of processed meat are catering houses, hotels and restaurants (Source: Report on value chain analysis of goat, 2011, High Value Agriculture Project in Hill and Mountain Areas). The purchase price of live goat for the processor is NRs. 500 -520. The processed meat is sold at NRs. 640 in Kathmandu. As per DK Cold Store, 70% of goat comes from India for processing. His transportation cost from Nepalgunj to Kathmandu is Rs. 10 per kg in his refrigerated van. He supplies 7 to 8 tons of processed frozen meet per month.

Increasing urbanisation has created a demand for processed meat. This is a niche market but alternative demand channels open new opportunities for farming households. Increasing road access and increasing demand of goat meat has together created a good opportunity for small to mid-scale producers to increase their production. It is possible to work with a group of farmers and directly link them with processors or retail chain owners (bulk procurement agencies) to develop an efficient supply chain. A successful model can then be promoted to aspiring entrepreneurs for further investments.

4 Rationale for working in the sector: summary analysis

This section examines the Goat sector through three lenses: (i) poverty reduction potential, (ii), pro-poor growth potential, and (iii) systemic intervention potential.

Evaluation of ***potential growth*** of goat meat sector highlights encouraging factors:



- **The average annual growth in goat meat population has grown by 3.75% annually.** It has gone over 5% once in this decade; however, the recent earth quake had brought down the production growth rates. The good news is the sector is already showing significant signs of recovery. Identified by many as one of the fast growing sectors, that can give good income to smallholder farmers.

- **In Nepal overall meat consumption is on the rise.** The trend in meat consumption is increasing with the increase in urbanization and associated rising levels of income of households as meat is a highly income elastic consumption item. Goat meat is particularly popular in Nepal as it is preferred by all caste. About 20% of the total annual meat production of Nepal is from goat. In the past, demand for goat meat fluctuated as health conscious people preferred white meat, thus, shifted towards chicken meat. However, when bird flu incidence was reported chicken meat consumption was again substituted by goat and other meat. Until 1990s, chicken was the most expensive meat. However, from then till now goat meat has remained most expensive over other meat.

- **The demand-supply gap of goat.** To further substantiate the argument, we examine the imported goat market. The countrywide shortage of meat supply is currently met by imports from India and China. Annually 3.9 million goats are slaughtered and out of which 3.3 million are domestic and remaining 0.6 million are imported. It has been estimated that the import of goats constitutes about 12-15 % of the Nepalese goat market.

There is sufficient demand in the market for farmers to increase their production and productivity. The market is growing and global trend shows that with the increase in population and affordability, meat consumption will continue to rise. It is possible to fill the gap in supply through domestic production.

Evaluation of ***pro-poor relevance*** of this sector shows goats to be an important source of income for small, landless and poor farmers.

A high number of households in Nepal are engaged in goat farming. About 43.34 percent of the households keep goats with of an average holding of 3.3 per household. Further disaggregation of households with goats reveals that about 32.2 % are small farmers with 1-2 goats and 42.2 % with 3-5 goats (CBS, 2012).

Interaction with the farmers in the target districts revealed **that goat contributes 30-60% of the household income** that creates employment to about 30% of the household members (average family size of 6).

The interaction also showed that farmers' gross margin is around 35%.

In terms of consumption, goat meat is an important source of animal protein for rural households. As per the field interaction in NAMDP districts, it has shown that the estimated 75 % of the total

domestic production of goat meat is consumed at the village and the remaining 25 % is supplied to formal market place.

Smallholder farmers' access to local market places and traders are quite good. Although undeveloped and unsophisticated, the marketing system for goat from a basic functional sense seems to work reasonably well and is competitive. Farmers are able to sell immediately, whatever, they are able to produce and at an acceptable price (though not optimal), even in the remote rural areas. There appears to be no evidence of excessive margins being made by traders in the districts surveyed.

Much of the evaluation of ***feasibility of systemic intervention*** in this sector has already been discussed. The main points are summarised below:

- Private sector investment has gone up in this sector over the last 10 years.
- New technologies such as high productive breed and nutritious forage have been introduced.
- The existing companies are experiencing good and rising sales.
- Competition in the input industry is growing leading companies to invest in innovative product promotion.
- Companies are actively seeking untapped market segments to expand outreach.
- Services and products acquired through agro-vets is a well-accepted industry norm
- International input companies are setting up operations in Nepal.
- Government is investing in this sector
- Government wants to reduce the dependency on imports

A growing private sector and a favourable government support system in goat meat industry offers multiple entry points and leverage to create a momentum of growth through systemic interventions.

5 Strategy

5.1 Vision of change

The vision for the goat sector is to reduce poverty and improve the livelihoods of small scale goat farmers including women led households by facilitating a sustainable market system change through catalytic intervention in the sector. This vision shall be achieved by intervening in the three major constraint areas identified which are problems in production function, problems in input distribution and problems in forward market. Initial interventions will focus on problems in input distribution such as supply of better quality breed and improved feed and management practices, followed by interventions on disease management and forward market linkages.

5.2 Systemic change and Intervention Ideas

The goat sector framework for systemic change is targeted towards strengthening and facilitating the linkages between the market players of the goat sector. The intervention ideas are focused on better access to inputs, increase in productivity and forward market linkages that will eventually strengthen the market players in the goat sector such as small farmers, private breeders, traders and consumers facilitating a systemic change in goat sector.

The intervention to improve the breeding market system will focus on the production and supply of better quality breed to the smallholder farmers by maintaining the pure bred and cross bred of goats. The breed available in the market will be of various types so that those who can afford can have imported breed such as Boer and those who cannot can have local but better quality Khari breed. This will help even the farmers from the disadvantaged groups to have access to the breed market.

The strengthening of breeding market system will be backed up with the technical knowledge and skills on modern farm management and better feeding practices. The strengthening of this market system will increase the productivity and production of better quality goat Once the supply of goats increases there will be higher incentive for the market actors to improve aggregation and forward market linkages. This will lead to increased demand and the smallholder farmers who are raising only 2 or 3 goats will be motivated to increase their goat herd size. This will further increase the production which will in turn help in import substitution of goat. The increase in production of quality goat will promote establishment of processed food industries such as more butchering house and cold stores.

5.2.1 Intervention Area 1: Facilitate supply of better quality goat breed

The interventions vision is to facilitate private breeder farms to produce and supply quality breed to farmers. The picture of well-functioning market is that the farmers purchase better quality buck and doe from private breeder for production as per their capacity to invest. The quality buck and doe will increase the performance of the kids and goats which will fetch better price in the market and the cost of production will be low due to high productivity.

Proposed intervention ideas

- The private breeding farms will maintain a portfolio of breeds such as Khari, Jamunapari cross, Boer cross so that farmers can buy better quality breed as per their investment capacity. For smallholder farmers who have very small investments in goat farming will be encouraged to acquire pure Khari buck and elite doe to improve productivity to be able to avoid in-breeding triggered productivity loss. Farmers who are able to make larger investments will choose from either Jamunapari or Boer cross.
- Breeding farms will develop multiple schemes reflecting the investment capacity of farmers. Each of the services would have different cost implications and breeding farms will need to help the farmers allocate their resources efficiently into purchase of buck, feed, medicine and goat shed.
- Project will work with scientists and market experts to train breeding farms knowledge dissemination.
- Farmers will also be given technical training on breed management practice and appropriate input usage by breeding farms as an embedded service.
- Cost benefit analysis on modern goat management practices will be made and disseminate to farmers by breeding farms so that farmers can clearly see the incentive in quality goat raising and high productivity by it.
- In case of disadvantaged groups or small farmers who cannot afford to buy a buck, a group or cooperative in village (where breeders are not available) will buy a buck who will provide breeding service for a small fee.

Sustainability:

The sustainability analysis of the breeding system to produce quality goat and the responsibility of different market players is given in table 16 below.

Table 15: Sustainability of better quality goat breed

	Now		After intervention	
Function	**Who does**	**Who pays**	**Who does**	**Who pays**
Coordination	Private sector/ NAMDP	NAMDP	Private Sector	Private sector

Breeding services	Private sector/ DLS/ Cooperatives	Private sector/ DLS/ NAMDP	Private Sector / Cooperatives	Private sector
Technical training	Private sector	Private sector/ NAMDP	Private Sector	Private sector

5.2.2 Intervention Area 2: Increase access to forage inputs

The vision of this intervention is that the forage seed and sapling producers (nurseries) increase their production volume and supply and promote their product through agro-vets, breeding farms and large goat farms to promote usage. Majority of small farmers are using forestry land for grazing as a sedentary farming system. Stall feeding is still a new concept for them. Usage of forage for feeding will have a direct impact in the productivity of goats. Breeding farms and agro vets as part of its services will give technical knowledge and also make available seed and sapling of forage for cultivation. Research on better varieties of forage seeds will be done for high productivity and production of forage for farmers. For farmers from the disadvantaged groups, who do not have enough land for forage cultivation, linkages between them and community forest user groups for production of quality forage will be facilitated.

Table 16: Sustainable forage seed and sapling production

	Now		After intervention	
Function	**Who does**	**Who pays**	**Who does**	**Who pays**
Research on better variety of forage seed	NARC / Private sector	NARC/ NAMDP	NARC / Private sector	NARC / Private sector
Training on forage seed production	DLS / NARC	NAMDP / DLS	DLS / NARC	Forage producers/farmers
Promotion of forage seeds and saplings	Large farmers / agro vets/ breeding farms	NAMDP	Large farmers / agro vets/ breeding farms	Large farmers / agro vets/ breeding farms

5.2.3 Intervention Area 3: Facilitating in availing veterinary service provision to smallholder farmers

Agro vets and Para vets are the first point of contact for farmers when there is a problem with their livestock. Farmers depend on both public and private veterinarian services for their problem especially related with disease. Small farmers unless they face some problems do not even give basic medicines such as deworming to their goats. Awareness raising on heath care of goat is required and agro vets, para vets are the right channel for the flow this information. Capacity building of these service providers is required. Some of the para vets can also diversify their services from technical support to farmers to also support in insurance of goats.

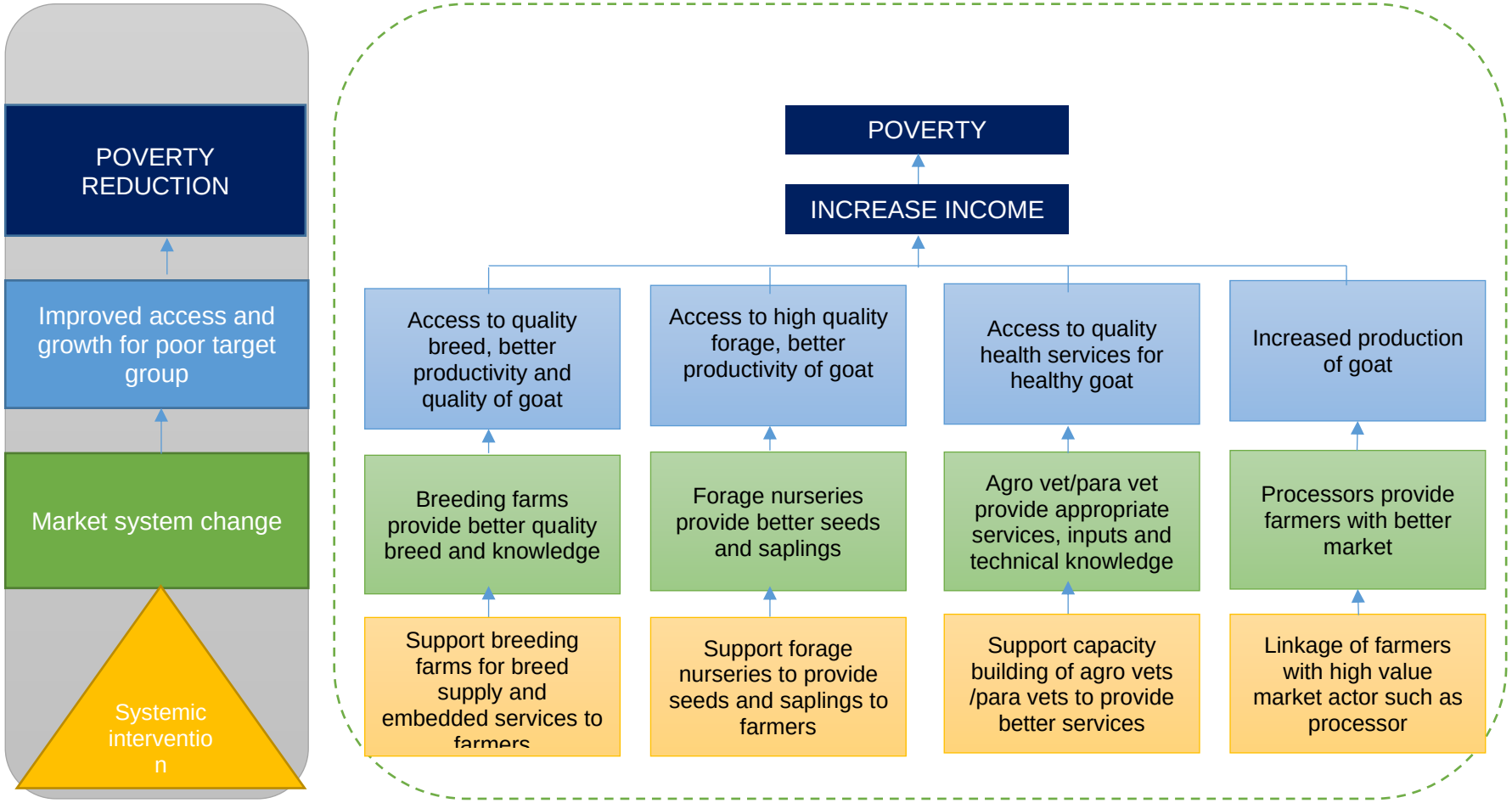
5.3 Prioritisation and sequencing of interventions

Availability of quality breed is the major constraint for the production of quality goat which can fetch good market price. Farmers are not aware about the problem inbreeding can bring and also where better breeds are available. While prioritising interventions, facilitation in the supply of better quality goat breed should be the first priority. This intervention will take time to show result, as a goat can be sold when it is around 30 kgs which will take around 18 months after birth if it raised with modern farming practice. Along with availability of better quality goat, knowledge and skills on modern goat

farming practices needs to be delivered so that the return on investment for farmers is high. This intervention will be targeted for both national big breeding farms who have been supplying goat at the national level and regional small farms focused more in the district and adjoining districts.

Along with this intervention the second priority intervention will be to increase access to forage usage. As better breed need better feed supply, cultivation of high quality forage is required to feed nutritious diet to goats.

5.4 Sector vision of change logic



Annexes

Annex 1: Related to NAGI and NAMDP

To be added later

Annex 2: Role description of women in core function

Who does what?

Activities	Men	Women	Issues related to gender
Construction of Shed	✓✓	✓	This requires intensive physical labour force so mostly done by male with female support.
Feeding of goat	✓	✓✓	Feeding of Goat is mostly done by Women. They cut the fodder and forage and provide it to the goats. Giving Timely water to goats are also done by women
Cleaning of shed	✓	✓✓	Majorly done by Women. Cleaning shed by water and using the Goat Droppings as manure is done mostly by Female.
Visiting to Agro vets, DLSO for Services	✓✓	✓	This is mostly done by Men, as the distance from their house to Agro vets, DLSO is long hence Men does this job.
When to sell Goats	✓✓	✓✓	Decision on time and made by both men and women
Marketing or Selling of goats	✓✓		Mostly done by Men. As there is dominance of men in our society. Men are largely involved in Monetary transactions and they do not allow women to do it
Returns of Sale	✓✓	✓	Mostly Money from the Sale of Goats are saved by the men and they give small amount to their Female Counterparts
Trainings related to Goat Farming	✓✓	✓✓	Trainings conducted by Different NGOs, INGOs are participated both in equal numbers. However, decisions in Household is mostly of Men.

Source: Field survey in districts June 2016

Annex 3: Intervention Ideas and feasibility

S.N	Constraint	Solution	Options	Feasibility	Screening	Activities	Potential Partners
1	Problem of inbreeding due to less availability of better quality buck	Availability of better quality breed in market	Work with private breeding farms to sell better quality buck to farmers or cooperatives	- Availability of many breeding farms ready to sell better quality buck to farmers	- there are already interested breeding firms who wants to expand their business and outreach	- Linking breeding farms with farmers - Technical Training on goat management by breeding farms - shed management training	Private Breeding farms
			Work with public breeding farms to sell or provide breeding service to farmers	- NARC is also doing research on production performance of different crossbred - DLSO in coordination with NARC can provides high quality buck for breeding purpose	- FAO, Worldbank, IFAD are already working with NARC and DLSO for production and performance monitoring of high quality breed - NAMDP can wait and see their results and activities	- Technical Training on goat management by breeding farms - shed management training	DLSO / NARC
			Artificial inseminatio	Still in research, around 40 - 45% success, not enough technical person available for goat AI	- AI in goat is still in research phase but this could be a potential intervention for future, after a year or two	- Train local paravets on AI	Paravets association/ paravets
2	limited awareness and availability of PPR vaccine and cold chain management of vaccine	Awareness on PPR vaccine	Coldchain management of PPR vaccine	problem in coldchain management of vaccines but loadshedding is a problem and will continue	a lot of investment will be needed for coldchain management such as installing alternative power in all DLSO or centers	establishment of alternative power to maintain coldchain of PPR vaccine	DLSO
			awareness campaign on PPR vaccine	Due to limited amount of vaccine (only 50% available as per the total population of goats) awarenss may create more shortage	follow up with DLS and private pharmaceutical who are negotiating with govt. to produce their own PPR vaccine	awareness campaing	Private Breeding farms / DLSO/

S.N	Constraint	Solution	Options	Feasibility	Screening	Activities	Potential Partners
			production of homemade nutritious feed	Breeding farms and DLSO are ready to train farmers on homemade feed production	farmers can produce homemade feed made of different types of cereal but this can be expensive for small farmers	- Technical Training home made feed production	DLSO/ breeding farms
3	Low productivity due to low supply of quality feed	Availability of better quality feed	cultivation of fodder/forage in farmers own land	large scale forage seed producer and suppliers are available in different districts	farmers who have lots of land can start cultivating forage	- linking forage seed/ sapling supplier to farmers for cultivation - linking big farmers with agrovets, DLSO for selling of seed or sapling	seed supplier/ Agrovets
			cultivation of fodder/forage by community forest users group	In some districts community forest groups are cultivating forage and selling it to small farmers	farmers can start buying forage from community forest users group if they cultivate high quality forage	- linking forage seed/ sapling supplier to community forest users group for cultivation - selling plan for community forest users group	community forest users group
4	limited availability of quality vet products and services	Availability of service providers	Capacity building of Paravets or Agrovets	around 20-25 paravets are available in districts (both govt. and private)	DLSO has been providing good services to those that can reach. This need to be further research	- capacity building on goat related disease and solutions - AI technical capacity to paravets - other disease management training	medicine suppliers
			Para vets as insurance agent	private paravets are available in district who are trying to diversify their business	need to do further research	- livestock insurance agent training	insurance agents
			Paravets establish their own agrovet shop	government with paravet association is providing interest free loan to establish business	Government already has a sheme, can look further on this	Business establishment training	Paravet association

S.N	Constraint	Solution	Options	Feasibility	Screening	Activities	Potential Partners
5	limited awareness and availability of PPR vaccine and cold chain management of vaccine	Awareness on PPR vaccine	Coldchain management of PPR vaccine	problem in coldchain management of vaccines but loadshedding is a problem and will continue	a lot of investment will be needed for coldchain management such as installing alternative power in all DLSO or centers	establishment of alternative power to maintain coldchain of PPR vaccine	DLSO
			awareness campaign on PPR vaccine	Due to limited amount of vaccine (only 50% available as per the total population of goats) awarenss may create more shortage	follow up with DLS and private pharmaceutical who are negotiating with govt. to produce their own PPR vaccine	awareness campaing	Private Breeding farms / DLSO/
6	weak linkages of farmers with high value market	Better linkages with market	Establishmet of collection centre in market hub	Govt. is providing Rs. 1,500,000 as grant to establish collection center for private	more research on major hub and interested traders can be identified	linking traders with government for establishing collectin centre	traders

Annex 4: Projects working on goat sector in Nepal

To be added later

Annex 5: People Interviewed

S.N	Name	Organisation	Designation	Address	Remarks
1	Raj Kr. Adhikari	Heifer International	Program Manager	Kathmandu	Meeting
2	Swoyam Prakash Shrestha	NARC	Head of Animal Health Research Division	Kathmandu	Meeting
3	Yamunar Shrestha	NARC	Chief Scientist ,Animal Breeding Division	Kathmandu	Meeting
4	Kishor Kumar Shrestha	NARC	Principal Scientist (S-5), Division Chief, Pasture and Fodder Research Division	Kathmandu	Meeting
5	Saroj Sapkota	NARC - Animal Breeding Division	9841596477/ 5523160/ 5532922	Kathmandu	Meeting
6	Birbhadra Acharya	Entrepreneur, Bagaicha farm house and resort	Breeding farm	Kathmandu	Meeting
7	Dipak Thapa	Chaupaya Kharid Bikri Sewa Sang - Kalanki	Large trader/ Ex-president of the association	Kathmandu	Meeting
8	Dr. Krishna Ch. Ojha	Qmed Pharmaceuticals	Senior Livestock Doctor	Kathmandu	Meeting
9	Dipak Pd. Dahal	Medivet Pharmaceuticals	Managing Director	Kathmandu	Meeting
10	Durga Dahal	Dahal Trading Concern	Seed and veterinary medicine supplier	Kathmandu	Meeting
11	Ishwari Khatiwada	Central Sheep and Goat Promotion centre	Livestock Development officer	Kathmandu	Meeting
12	Purna Bahadur Budha	President	Nepal Para Veterinary and livestock Association (NEVLA)	Kathmandu	Meeting
13	Dr. Bal Ram Thapa	Program Director	Directorate of Livestock Market Promotion	Kathmandu	Meeting
14	Gyan Bdr. Shrestha	President,	Chaupaya Kharid Bikri Sang	Pokhara	Meeting
15	Dr. Rakesh Prajapati	Chief	District Livestock office	Pokhara	Meeting

16	Kamal Prasad Poudel	Proprietor	Aarti Agrovet	Pokhara	Meeting
17	Devendra Raj Sharma	Proprietor	Aakash Vet	Pokhara	Meeting
18	Roshan Lal Shrestha	CEO	Kantivet Group	Kathmandu	Meeting
19	Mr. Oli	Surkhet	Regional Trader	Surkhet	Phone conversation
20	Nav Raj Acharya	Dharke	large scale goat farmer	Dhading	Phone conversation
21	Surya Bdr. Shahi	farmer	Shishir Bakhra Farm	Dailekh	Phone conversation
22	Dand Man Giri	farmer	Nawa Durga Bakhra Farm	Kalikot	Phone conversation
23	Nara Sahi	farmer	Aakansha Bakhra Farm	Achham	Phone conversation
24	Suraj Bhul	farmer	Namuna Krishak Bakhra	Achham	Meeting

Note: This list does not contain field visit interview list (except Pokhara)

Annex 6: Assessment team

To be added later