

Dairy Sector Strategy – Nepal

CASA NEPAL COUNTRY TEAM

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Abbreviations

AEC	Agro Enterprise Centre
AI	Artificial Insemination
BFI	Banks and Financial Institutes
CASA	Commercial Agriculture for Smallholders and Agribusiness
CFUG	Community Forest Users Group
DDC	Dairy Development Corporation
DFID	Department for International Development
DIA	Dairy Industry Association
DLS	Department of Livestock
DoC	Department of Cooperatives
USAID	United States Agency for International Development
DMPCU	District Milk Producers' Cooperative Union
GDP	Gross Domestic Product
GiZ	Deutsche Gesellschaft für Internationale Zusammenarbeit
GoN	Government of Nepal
iDE	International Development Enterprises
LF	Leasehold Forestry
LN2	Liquid Nitrogen
MAPs	Medicinal and Aromatic Plants
MASF	Market Access for Smallholder Farmers
MCC	Milk chilling centre
MEDEP	Micro-Enterprise Development Programme
MPC	Milk producer cooperatives
MPCS	Milk Producers Cooperative Society
NABC	Nepal Animal Breeding Centre
NAMDP	Nepal Agricultural Market Development Programme
NARC	National Agriculture Research Council
NDA	Nepal Dairy Association
NDDB	National Dairy Development Board
NLBC	National Livestock Breeding Centre
NRB	Nepal Rastriya Bank
NVA	National Veterinarians Association
ODA	Official Development Assistance
PA	Practical Action
PACT	Project for Agriculture Commercialisation and Trade
SHF	Smallholder farmer

SMEs	Small and medium-sized enterprises
SMP	Skimmed Milk Powder
VAHW	Village Animal Health Worker

Executive summary

Dairy is of special importance in Nepal given the high demand for products and the emergence of organised commercial activity.

Sector Description

- Dairy provides employment for 130,000 people and contributes 9% of Nepal's GDP as well as 33% of AGDP¹. The sector is dominated by a vast number of small-scale subsistence production units and micro and small collection-and-processing units, as well as a limited number of large-scale industrial processing units. However, there is a growing presence of SME actors responsive to emerging commercialisation trends.
- Among the 3.8 million farming households in the country, 95% have dairy animals because of the key role they play in household subsistence and nutrition, the provision of draft power and local transport. However, most households produce mainly for home consumption with some flush season sales. Only about 14% of milk producing households (i.e. 500,000) are both producers and sellers.
- Production is characterised by flush/surplus and lean/deficit seasons, while milk prices have long been regulated to protect the small producer. With an average daily supply shortfall of 550,00 litres, there is significant scope for smallholders to step up.
- While SMEs face various challenges in accessing commercial finance and investment to exploit opportunities, there is an emerging investment landscape including incubators for supporting the investment readiness of agri-businesses.

Analysis

At the **production end**, smallholder farmers have low incentive to commercialise due to a combination of high production costs, high investment upgrading costs (e.g. better breeds, feed, etc.) and low confidence in the market. Any improvement requiring investment must be raised through the farmer's own resources, as access to loans and other sources of finance is extremely low. Most farmers with milk-producing animals rely on traditional animal husbandry practices, which do not promote increases in productivity. Improving practices across the industry will require a major effort. Families that may have a small surplus (more often in the flush period) will opportunistically enter the market to sell milk. Generally, this is purchased by existing informal sector buyers who amalgamate and sell it outside the formal milk network without being subjected to quality checks. This raises public health concerns.

Equally, existing price control mechanisms have not encouraged farmers to commercialise their farming practices, because there is no price differential between milk sold in the low season and excess milk available during the flush season. The difficulty in selling milk during the flush creates another opportunity for the informal sector, which buys below the designated price and sells onward to consumers in direct competition with formal processors. The control price is currently being reviewed² and the decision on a new price structure is imminent³.

On the **post-production side**, most collection centres and processing units are operating below capacity due to inherent supply problems. The quality of raw milk is also a serious issue when it comes to commercial bulk processing and the production of consistent value-

¹ Final report on study of cost of milk production, NDDB

² The last price revision was made by Government in 2017 and current submissions by industry and stakeholders have detailed input cost increases and made practical suggestions on seasonal and locational variation in price.

³ When these are announced the CASA, Dairy team will undertake detailed evaluation of the impact and opportunities they present.

added products. (The result is a shorter shelf-life of existing processed products and limitations on the range of finished products that can be developed.)

Market competition for private businesses is tough because a large State Company (DDC) is a major player. To stay competitive, processors must innovate with differentiated products in order to grow their businesses. Formally registered processors must compete at two levels: (1) with the DDC, which participates in the price setting mechanism and receives an operational cost subsidy from the Government; and, (2) numerous informal dairy processors and amalgamators, which are basically unregulated and not subjected to milk standardisation, and as such can buy and sell product outside the boundaries of price control. Processors' risk appetite to innovate and invest is low due to the above-mentioned problems plus an unfavourable business environment. Due to low investment, the industry has seen a significantly low uptake of innovation and technology, which has also resulted in low product diversification.

Finally, **accelerating the commercialisation of the dairy sector** requires: (1) driving more milk into the formal sector; (2) improving the utilisation capacity of collection centres and processors; (3) improving the quality of milk; and, (4) improving the uptake of innovation and technology.

Responsive strategy

CASA's dairy strategy is founded on optimising engagement with SMEs seeking investment to drive growth while addressing binding constraints to commercialisation (which in many cases are business opportunities that are not taken up). This is typically expected to involve a journey with partner SMEs, from preparations for receiving investment (e.g. business model development and BDS support) through to matchmaking with commercial finance providers and impact investors. These preparations in turn are expected to generate several success stories that will contribute to CASA's overall evidence base for convincing donors and investors to channel more finance to SMEs that engage large numbers of producers in their supply chains. The strategy also focuses on strengthening producer aggregation to access commercial markets as well as supporting key improvements in the business environment.

To implement the strategy, three broad project areas have been identified as drivers of inclusive commercialisation. In projects defined under the current intervention areas, we estimate that we will reach 32,700 producers, with at least 22,890 benefitting from our projects. We anticipate it will be possible to scale out to approximately 34,350 beneficiaries by expanding existing projects and identifying new intervention areas in future years. All the currently elaborated projects are presented in Table 3.

1 Background

1.1 CASA project overview

DFID's approach to economic development and agriculture relies on an increasingly commercial approach to agricultural programming by:

- Boosting agri-business investment, financing agricultural infrastructure and supporting smallholder-farmer access to markets;
- Helping farmers and their families to have opportunities and jobs outside their farms, and supporting SMEs in rural areas;
- Supporting subsistence farmers without other economic opportunities, so that they avoid hunger, malnutrition and extreme poverty;
- Encouraging commercial approaches that reduce the cost of nutritious diets.

In support of this approach, DFID has launched the five-year, flagship Commercial Agriculture for Smallholders and Agribusiness (CASA) programme which seeks to change how investors, donors and governments view and invest in agribusinesses that work with smallholder supply chains. In doing so, CASA will increase economic opportunities for smallholders by:

- a) Demonstrating the commercial viability of small and medium-sized (SME) agribusinesses with significant smallholder supply chains and attracting more investment into these businesses;
- b) Deepening the smallholder impact of existing investments made by development finance institutions (DFIs, notably CDC), and impact investors;
- c) Enabling poor smallholder farmers to engage with and trade in commercial markets;
- d) Researching and communicating the case for successful engagement with smallholder-linked agribusiness.

CASA has three components, two of which (Components A and C) are managed out of Nairobi, Kenya by NIRAS-LTS in partnership with Swisscontact and CABI. CASA's component B is separately implemented by Technoserve and focuses on technical assistance and investment promotion for larger agri-enterprises involved in global development. In addition to its three components, the programme has three strategic cross-cutting components:

- Gender and social inclusion (GESI);
- Nutrition and food security;
- Climate change and the environment.

Component A will demonstrate high-impact interventions in the three target countries (Malawi, Uganda and Nepal) leading to: (a) mobilisation of investments for partner agri-businesses (which can include commercially-minded farmer associations and cooperatives) and expanded outreach to smallholders; and (b) improved access to markets for smallholders. The ultimate target group for CASA is the 'missing middle' of 'stepping-up' smallholders⁴ – that is, those that wish to engage in commercial agriculture but have largely not done so to date. (Among the missing middle, 40% live on less than \$2 a day, while 50% of women in the missing middle live on less than \$2 a day).

Component C is a learning and knowledge-sharing component. Among other things, it will leverage knowledge gains from Component A interventions and other research to inform

⁴ 'Stepping-up smallholder farmers are described as those that sell or wish to sell at least 50% of their cash crops/produce.

donors and investors about the merits of investing in agribusiness SMEs with significant outreach to smallholders.

1.1.1 Focus of this report and information sources

To capture the latest progress, the CASA Nepal Country Team has made efforts to consult with some key actors in the dairy sector to broaden understanding of the roles performed by various market actors; the problems and opportunities in the core market; and the corresponding support and business-enabling functions. This report draws from multiple sources including secondary information arising from a literature review and primary information obtained through various focus group discussions and informant interviews carried out during the field investigation exercise. Unlike the scoping report, this progress report has systematically aligned the sector analysis with the Inclusive Markets approach that guides the design and implementation of CASA projects.

The aim of the report is not to provide an all-encompassing rigid strategy for the whole project phase. Rather, this is an evolving document and provides evidence-based analysis to develop the opening portfolio of projects. This document will be updated periodically based on additional information collected through field visits, continuous interaction with sector stakeholders and insights gathered from the output and outcome analysis of project activities.

1.2 CASA dairy sector's locational focus overview

Although, initial scoping and location analysis⁵ was carried out in Provinces 3 and 4, CASA Nepal will prioritise its work in Provinces 2 and 5 in order to facilitate alignment with other DFID programmes.

Province 2 is an upcoming milk production area and stands as the fourth largest milk producing province. A majority of the milk produced in Province 2 is buffalo milk, which is high in fat content. This gives producers a comparative advantage: as more processors venture into more diversified products such as mozzarella cheese, they will need to go to Province 2 to source their milk. This Province however lags in food security, nutrition and in the Human Development Index, further strengthening the rationale for CASA to work to address these cross-cutting issues.

Similarly, Province 5 stands as the third largest milk producing province and, as in Province 2, most of the milk produced in this province is buffalo milk. The province is committed to working in the dairy sector using the genetic improvement of livestock for achieving higher productivity in milk and higher meat yields. It is continuing an artificial insemination (AI) programme for the genetic improvement of cows and buffaloes, and it offers tax incentives for agro-based industries, tariff exemptions for agriculture equipment and machinery for promoting commercialisation.

In addition, CASA Nepal will look for opportunities to work in other regions of the country where potential for commercialisation is ripe. Specifically, Provinces 1, 3 and 4⁶ are considered major dairy hubs as 70% of the dairy cooperatives are in these areas, with

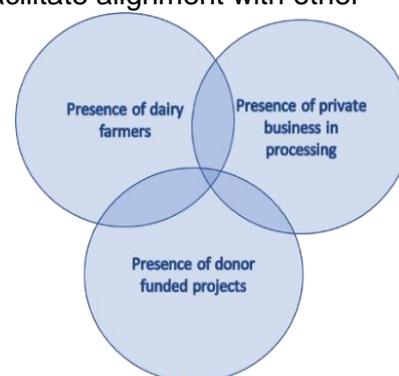


Figure 1: Selection criterion for location

⁵ Criteria for location selection included: presence and numbers of target groups in given areas, contribution to national production, productivity, competitive advantage, presence of other donor projects, presence and interest of private sector in the area, operational efficiency, potential as a base for replication and existence and efficiency of market hubs in given locations.

⁶ Co-operative Statistics in Detail, 2074, Ministry of Land Management, Co-operatives and Poverty Alleviation, Department of Co-operatives

cooperative membership accounting for about 84,000 dairy-farming households⁷. Competitive advantage and opportunities to commercialise are high in the selected districts, as infrastructure is available for the collection and chilling and three major SMP plants.

⁷ Co-operative Statistics in Detail, 2074, Ministry of Land Management, Co-operatives and Poverty Alleviation, Department of Co-operatives

2 Sector description

2.1 International context

The international dairy sector is highly localised. As milk is a bulky and perishable product, dairy products are mostly consumed in the country or region where they are produced. Only a small fraction of global production is traded internationally. Despite technological developments in refrigeration and transportation, only 7% of global milk production is traded internationally if intra-EU trade is excluded⁸. The five largest milk producers are the European Union (with a 20% share of global production), India (20%), the United States (12%), Pakistan (6%) and China (5%)⁹.

In 2017, Nepal imported milk worth \$18.7 million¹⁰. India is the main exporting country for Nepal, and almost 80% of Nepal's imports of dairy products originate in India. The open border and proximity to markets are the main element favouring trade between the two countries. There are also many unofficial transactions due to the porous border. The scale of these unofficial transactions is estimated to be almost half that of the formal transactions. Apart from India there is significant import of dairy products from other parts of the world, including New Zealand, Bangladesh and Belgium.

The imports from India, which are mainly in the form of powdered milk, are estimated at 4,481 tonnes per annum, equivalent to 19 million litres of whole milk. They are important, as domestic production has not been able to keep up with national demand. To satisfy demand and increase the utilisation of their capacity, processors therefore depend upon imports from India. This suggests an opportunity for CASA to focus on minimising this demand-supply gap. This will require additional assessment of the actual gap, as well as a better understanding of the underutilisation of capacity and its distribution at the SME-processor level. Currently the buying price of milk in Nepal is higher than that in India, which encourages the informal movement of raw milk along the extensive border between the two countries.

The large milk powder plant in Chitwan was damaged during the 2015 earthquake and was forced to cease production. This plant, with a drying capacity of 150,000 litres of milk per day, had played a pivotal role in processing part of the annual flush of milk – the SMP produced was distributed to smaller dairies, reconstituted and sold as liquid milk. In the first lean production period following the closure of the plant, the country started to experience milk shortages, and imports of skimmed milk powder (SMP) from India were increased. In August 2018 the re-furbished plant was opened, but imports were still allowed. In April 2019 there were disturbances as farmers objected to the fact that they could not sell their milk. The government quickly placed a total ban on the import of SMP from India. August 2019 again saw a shortage of milk in Nepal and there is strong pressure to lift the ban on SMP¹¹ to ensure that there will be milk available for all the festivals.

Small volumes of milk and milk products were exported from Nepal even though the exports have not been sustained. The major export commodities were butter and ghee to India. Some butter was also exported to other countries including the United States by Dairy Development Corporation (DDC). The only exports from a private dairy enterprise were by Chitwan Milk to Pakistan: during 2010, the company exported SMP for the first time to Pakistan, but this was a one-off activity.

⁸ Developing Countries and the Global Dairy Sector Part I Global Overview, Vivien Knips

⁹ OECD-FAO Agricultural Outlook 2018-2027

¹⁰ <http://www.worldstopexports.com/international-markets-for-imported-milk-by-country/>

¹¹ Newspaper reports state that the government is reviewing this request but is reluctant to allow all processors to import. Milk producer representatives argue that the SMP ban has encouraged increased purchase of local milk and fear the lifting of restrictions will allow small processors to again stockpile SMP that they will reconstitute.

There are exports of the traditional Nepali milk derivative ‘chhurpi’¹² from the eastern part of Nepal to the US where it is in demand as dog chew. The chhurpi traders in Ilam District say they are receiving more orders from international buyers¹³. However, this remains a niche product, and it is yet to be assessed whether the demand for such product is strong enough to drive further commercialisation of parts of the dairy sector in Nepal.

As a result of the 2018 ban of SMP imports, the dairy and other associated industries have been struggling to keep up with consumer demand, especially during the lean¹⁴ season. Converting raw milk into SMP is an important strategy for dealing with oversupply of milk in the flush season and covering some of the deficit in the lean season. This was an important driver for the success of Amul¹⁵ in India. Further studies are needed to assess the impact of such a ban in greater detail. Specifically, a study will need to assess whether private businesses see this as an opportunity to expand SMP processing.

2.2 National context

Dairy production is spread across all Districts in Nepal. Most milk production is carried out under traditional production systems in mixed farming systems with small non-commercial holdings¹⁶. However, in recent years there has been a push to commercialise dairy farming.

2.2.1 Sector growth scenario

Among the 3.8 million farming households in the country, 95% have dairy animals. Most of these farmers are producing for household consumption, with only about 500,000 farming households engaged as both producers and sellers¹⁷ (See Table 1).

Table 1: Proportion of milking animals and milk production¹⁸

Milking animals	Number	%	Milk production (metric t)	% of Total milk Production
Cattle	1,026,135	43	643,807	35
Buffalo	1,355,384	57	1,210,422	65
Total	2,381,519	100	1,854,249	100

The consumption requirement for milk in Nepal is 92 litres per person, and the country produces 72 litres per person annually, thus fulfilling 80% of this¹⁹. It is estimated that the average current deficit is around 550,000 litres of fluid milk per day with 10-20 % variability during the lean season (March-July) and the flush season (August-February)²⁰. According to the Department of Livestock Services, production is increasing at a rate of 4% annually, but demand is growing at 8%. As supply is not keeping pace with demand, the demand-supply mismatch is likely to widen over the years without substantial change in milk production. This also means that the sector is at very rudimentary stage, as only 14-16% farmers are commercialised.

A major challenge for dairy management is the milk cycle, which has flush and lean seasons. Whilst demand for milk is constant throughout the year, supply fluctuates

¹² Chhurpi is a kind of hard cheese produced by people in the mountainous region. It is a common food for people in Nepal

¹³ Himalaya Dog Chew is the company actively engaged in trading chhurpi from Nepal to USA. It's being marketed as a dog food

¹⁴ Lean season (March-July) and flush season (August-February)

¹⁵ AMUL (Anand Milk Union Limited), was formed in 1946, as a dairy cooperative movement in India. Specialising in dairy products, AMUL now takes pride in having built the largest food product business in the country.

¹⁶ Final Report on Study on Cost of Milk Production, NDDB, NEPC, Jan 2014

¹⁷ General Secretary of Nepal Dairy Association, Mr. Prahlad Dahal

¹⁸ Statistical information on Nepalese Agriculture 2016/17, MoAD

¹⁹ President of Nepal Dairy Udyog Sangh, Arniko Raj Bhandari,

<https://myrepublica.nagariknetwork.com/news/we-don-t-need-fdi-says-dairy-industrialists/>

²⁰ Milk marketing strategy study, NDDB

considerably. This creates significant challenges for private dairies trying to procure milk, as the ratio of flush season production to lean season production is 65:35²¹.

Average milk yields are low compared to India, Pakistan and Sri Lanka, at about 500 kg/cow/year and 859 kg/buffalo/year²² (See Figure 2). The milk cycle management also poses several problems as demonstrated in 'flush' and 'lean' seasons, where there is either over- or under-supply of raw milk respectively. A comparison of milk productivity with other South Asian countries is shown in Figure 2. The quality of raw milk supplied by farmers to milk processors is also a major concern. The processors often complain that the milk spoils too fast due to contamination and that the fat and solids-not-fat (SNF) quantities are not adequate, and that all this affects shelf-life and the potential for processing.

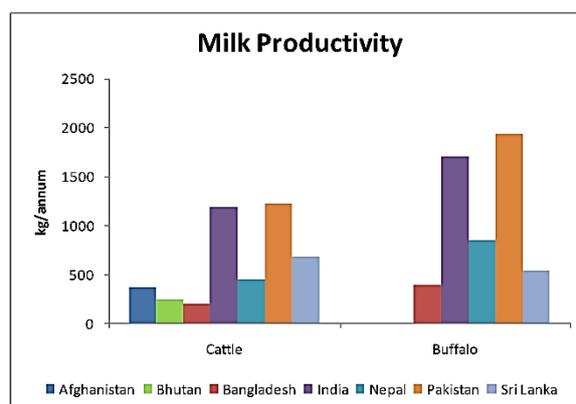


Figure 2: Per Animal milk productivity in South Asian Countries

Of the total milk production, only 25% of raw milk comes into the formal sector, where it is processed into products such as pasteurised milk, yoghurt/curd, various cheeses, butter, ghee, ice-cream and milk powder (See Table 2). Shifting some of the 75% of the milk from the informal sector to the formal sector would be an indicator of commercialisation and a potential strategy for CASA.

Table 2: Estimated Milk collection in the formal sector²³

Type of Dairies	Total annual collection (metric t)	% in the formal sector
Cottage Dairy	51,268,630	11.45
Small Dairy	89,203,810	19.93
Medium Dairy	184,987,840	41.33
Large Dairy	98,945,295	22.11
SMP	23,165,090	5.18
Formal sector collection (mt)	447,570,665	25.22%
Total estimated milk production (mt)		1,774,844

Sectoral characteristics

There are 2,788 registered dairy farms, of which 415 farms have less than five animals, 1,413 have five-10 animals, 732 have 11-30 animals and 117 have more than 30 animals²⁴. Milk collection centres are widespread and mostly owned and managed by farmers cooperatives.

On average, the annual production of milk from cattle and buffaloes is low compared to other South Asian countries, as illustrated in Figure 2 above. This is mainly due to the extremely low productivity of non-descript indigenous cattle as compared to that of buffaloes. Only about 5% of the cattle in Nepal are considered pure breeds, like Holstein and Jersey.

²¹ Dairy sector study of Nepal, FAO

²² Dairying in South Asian Region: Opportunities, Challenges and Way Forward, M.N.A Siddiky, 2017

²³ Dairy Value chain study in Nepal, NDDDB 2074-75

²⁴ Geo-mapping of commercial dairy farms and dairy processing industries in Nepal, NDDDB, 29 June 2017

Farmers therefore use AI to crossbreed Holstein and Jersey cattle with their local cattle²⁵ to boost milk production.

Nepali milk production can be broadly classified under two systems:

1. Traditional subsistence milk production;
2. Market-linked commercial/semi-commercial milk production.

Under the traditional subsistence production system, most dairy animals are of indigenous origin and are maintained under low input mainly through communal grazing with rare use of external inputs. Under this system animals are kept for milk and milk products mainly for household consumption. Any surplus milk is sold to village tea shops, where such local opportunities exist²⁶.

Under the market-linked commercial/semi-commercial milk production system there are:

1. *Smallholder dairies*: These systems are common throughout the country. Increasing urban markets and improved marketing systems have led to a slow but steady move towards dairy farming as a source of supplementary income generation and even as a commercial venture rather than as part of a subsistence system. The marketing of milk has also been facilitated by the establishment of milk collection centres that transport milk to the main chilling centres. Private sector involvement in processing milk from smallholders is also increasing.
2. *Peri-urban milk production*: Most smallholders and medium-large scale dairy farms have emerged in the vicinity of peri-urban areas where there are good road links and good market potential for the milk and products in adjoining municipalities. To support this system and growth, several collection and chilling centres have been established by cooperatives and the private sector. The private dairy units have focused their activities on these established centres, providing an important driver for faster local smallholder dairy growth. The lower opportunity costs of land and labour in peri-urban areas compared to municipalities have greatly encouraged dairy development in these areas.

Since it is practically impossible for farmers to individually sell the small quantities of milk to commercial off-takers due to a combination of scale, poor rural infrastructure and scattered small farms, these collection centres play a crucial and effective role in linking smallholders with commercial off-takers. There are 542 milk producer cooperatives (MPC)²⁷ that typically aggregate fresh milk and sell to retailers, larger independent private dairies in urban centres, powder processors and others. However, most collection centres are running at under capacity, as the supply from the producer farmers is low.

According to the Nepal Dairy Association there are more than 1,500 dairy processors in the country. Five have capacity to process over 50,000 litres/day and employ up to 150 staff (DDC, Sujal Dairy, Chitwan Milk, Sita Ram Gokul and Himalayan Dairy), and nine have capacity of over 10,000 litres/day; some 100-150 are of medium capacity, with the ability to process 4,000-6,000 litres/day; a further 100-150 are small, with a capacity of 1,000 litres/day; and the remaining 1,000 or so are cottage industries with a capacity of less than 100 litres/day.

DDC is a state-owned enterprise and a significant player in the market, handling a disproportionately high share of total milk production in the country (40%). It also has

²⁵ Cattle farming in Nepal: Why farmers cry, Daily Global, 2017, <https://www.dairyglobal.net/Market-trends/Articles/2017/9/Cattle-farming-in-Nepal-Why-farmers-cry-183891E/>

²⁶ Milk Marketing Strategy Study, NDDB 2068

²⁷ Geo-mapping of commercial dairy farms and dairy processing industries in Nepal, NDDB, 29 June 2017

significant market power to set prices for milk purchases from farmers as well as for selling to consumers.

DDC has been the market leader, though its market share has been slowly decreasing since it ceased to be the sole dairy supplier. Private dairies have now captured 56% of the market. This suggests DDC is slowly losing its brand value. Some retailers in Eastern Terai even mentioned that Kamdhenu Dairy Cooperative products are better than DDC's products.

No brand seems to have any specific market segment focus. All existing brands aim to create products fit for mass consumption.

Institutional consumers (hotels, restaurants, coffee shops) are underserved, and they are buying dairy products in the same manner as retail consumers. Though they have slightly different requirements, their choices are the same as those of household consumers. There are opportunities to be exploited to cater for this segment if dairies can focus specifically on it and respond with the right mix of product, price, packaging and distribution channels.

Himalayan Java Coffee Shop

"We need a specific quality of milk for our coffee shop to get the right texture and taste. We used milk from Nepal Dairy for the past six months, but they could not keep up with our quality requirement, so we switched to using milk from Adhunik Dairy. So far they have been giving us quality milk."

Dairy product market share

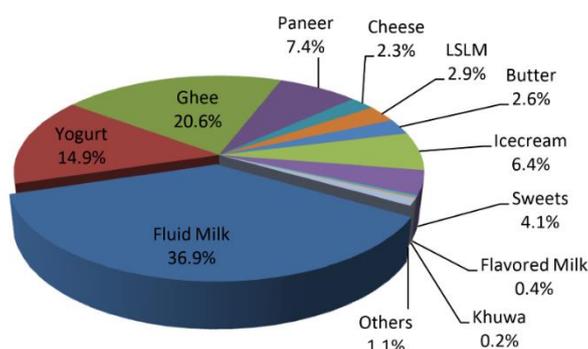


Figure 3: Portion of products sold by retailers²⁸

Of the dairy products sold in the formal sector, fluid milk has the biggest share (36.9%) of the value of an average retailer's dairy transactions. Ghee (20.6%) and yoghurt (14.9%) are the other major chunks in the dairy produce market, followed by paneer (7.4%) and ice cream (6.4%)²⁹ (See Figure 3).

2.3 The dairy market system in Nepal

2.3.1 Landscape and development initiatives

Some of the major organisations and donors working in milk and dairy are MEDEP, PACT, GiZ, MASF, iDE, PA, Forward, AEC, DLS, USAID and DFID. Most interventions are input-focused on improving farmers' productivity via feed improvements, disease control, animal health and husbandry, and breed improvement. A few projects have worked in output markets. Some of the most recent projects are summarised in Table 3:

²⁸ Demand and Supply Situation of Major Dairy Products, Kamadhenu Dairy Cooperative Limited, 3iR

²⁹ Demand and Supply Situation of Major Dairy Products, Kamadhenu Dairy Cooperative Limited, 3iR

Table 3: Recent projects undertaken by Donors in Dairy Sector in Nepal

Donor	Project	Objective	Timeframe	Budget	Working Area
Heifer International	Feeding support tool development for enhancing dairy animal productivity for improved livelihood of dairy SHFs.	To increase household income and create improved livelihoods for dairy SHFs through the improvement of dairy animal productivity, particularly better feeding management.	October 2016 - January 2018	\$129,958	Palpa, Arghakhanchi and Kapilbastu Province 5
Heifer International	Improving dairy animal productivity and farmers' incomes through effective control of mastitis disease	Enhance dairy SHFs' livelihoods through increased income from productivity improvements thanks to effective mastitis control.	October 2016 - January 2018	\$129,142	Surkhet, Bardiya, Banke and Dang Province 5 and 6
Practical Action in partnership with FORWARD - Nepal	Dairy for development in Nepal	Lower production costs to boost rural livelihoods by enhancing production techniques, strengthening value chains and improving the genetics and health of dairy cows to increase productivity.	April 2018 - March 2021	£400,000	Chitwan, Makwanpur and Nawalparasi Province 3

Input markets are often a key constraint where supply chains are weak. When they don't function, it creates problems in supply, as is the case in Nepal. Donors have prioritised working in input markets without looking at output markets. This has often created unsustainable results.

CASA will build on the input-related investments that other donors are making in commercialising milk production in Nepal. This will be done through selection of working areas; partnering with output market actors to establish a supply chain or aggregation relationship where other donors are investing in the dairy-input area; focus on input-related projects only to cater to specific quality requirement of dairy processors; and bundling projects related to dairy input with actors in output markets. This approach will help CASA make complementary investments to existing investments in milk production promotion.

2.3.2 Market performance and drivers of commercialisation

- **Strong growth in demand for milk and dairy products:** According to the National Dairy Development Board (NDDDB), the estimated annual growth in demand for milk and dairy products is 11%. This has been mostly driven by internal migration to urban areas from rural areas (9%), population growth (1.35%) and increased consumption arising from dietary changes (2%).

- **Greater public investment in infrastructure and agri-business promotion:** ‘Farm to market’ connectivity is gradually improving, with over 7,000 km of roads constructed during the past decade³⁰. Government support to agribusiness has also been improving, and public spending on the sector has increased almost fivefold during the past decade. The Government of Nepal (GoN) has given high priority to the sustainable development of the agriculture and dairy sectors by investing in grassroots farmers to make breeds and feed available to drive down the cost of production to make them economically and professionally strong.
- **Steady increase in private investment in small-scale processing plants:** There has been a remarkable increase in the establishment and expansion of regionally based dairy processing industries, especially in the eastern region of Nepal. There has been some proactive engagement by the dairy processors’ association to address the industry-wide seasonal surplus. Throughout the past two years, and to avoid ‘milk holidays’ (i.e. surplus periods with no market for raw milk or a smaller market), processors collected around 500,000 litres of surplus milk in the flush season. They converted this into milk powder and used it for producing other processed products during the lean season.

The industry is also facing an acute shortage of SMP due to the government’s SMP import ban. This indicates that the industry was not ready, or that a transition had not been planned. As a result, parts of the milk processing industry are now struggling to cope with the decision. A few dairies, such as Anmol dairy, Panauti and Nova dairy, Bhaktapur, had to halt operations, as they were unable to procure sufficient milk powder³¹.

However, this disruptive regulatory decision has created opportunities for local businesses to venture into the SMP business. The largest privately-owned powder manufacturing dairy processor, Chitwan Milk, which had been about to close, has been brought into operation several times a year under the initiative of the dairy associations³². There has also been interest from dairy companies such as Panthi Dairy and Shivam Dairy to invest in small-scale SMP plants to capitalise on this market opportunity. The challenges to overcome are: a) the availability of affordable financing options for capital investment in land, infrastructure and equipment, if there is no underutilised capacity in the existing plant; b) technical know-how and the capacity to install and run an SMP plant efficiently; and c) technical know-how and the capacity to establish and manage an efficient supply chain of raw milk.

This presents an opportunity for CASA to engage and provide support. To overcome the challenge of capital investment, CASA can identify actors and help to identify possible investors. For this, a development financing organisation will be suitable. For the other two challenges, CASA can offer technical assistance and help the businesses start SMP production. After the businesses have started, they become attractive SMEs to invest in.

- **Milk price is high enough for farmers to profit:** The producer milk price appears to have been held constant over the last two years; the consumer price may have been allowed to increase slightly. The mechanism to determine the price involves all the main stakeholders, and a key determinant of the consumer price is often the state-owned Dairy Development Company, which controls about 40% of the commercial milk market and receives an annual government subsidy to cover any losses it incurs. The fact that a committee receives reports from various information sources and then makes a decision is laudable. There is some concern that the pricing decisions are not based on market forces: for example, the prices don’t take into consideration the difference between lean production periods and the flush. What is encouraging is that the final price is strongly

³⁰ World Bank; Road Sector Development Project; 2013

³¹ <https://thehimalayantimes.com/nepal/lack-of-milk-powder-hits-dairy-factories/>

³² <https://thehimalayantimes.com/nepal/chitwans-milk-processing-industry-brought-into-operation/>

tilted towards the producers, and the finally agreed price is always shared 69% with the farmers, while the remainder (31%) is shared by collection centres and processors. For example, the current price sets the price paid to producers at Rs 54 – Rs 60 per litre depending on the two quality indicators of fat content and SNF, while the consumer price is Rs 70 per litre. Current media reports indicate that the milk price, currently under review, may be increased by as much as Rs 10 per litre to make sure the industry remains viable.

- **Improved cattle breeds, particularly Jersey and Holstein Frisian, are being reared in Nepal** as recommended by the National Agriculture Research Council (NARC), though at limited scale. These breeds have better productivity, with average daily production ranging from 10-15 litres for 10 months per lactation, compared with about 5 litres for local breeds over a shorter period. Popularising these varieties can significantly drive the commercialisation of milk production in Nepal.

2.4 Investment opportunities in the Nepal dairy sector

2.4.1 Agribusiness scenario in dairy

From a business-activity perspective, the dairy sub-sector is of specific importance given the high demand for products and the emergence of organised commercial activity. However, dairy-sector businesses face challenges in modernisation and in driving supply chain efficiencies: access to appropriate risk capital may help businesses tackle these. Dairy businesses could also present more viable investment opportunities for private equity investors. Further, the emergence of industrial-scale agro-processing like cleaning, processing and packaging have also served to increase the returns to firms from agro-commodities.

To illustrate the financial advantage of agro-processing, dairy sector firms that manufacture and distribute processed milk products have margins of up to 30%³³. While agribusinesses are growing in response to increasing demand and better support from the public sector, they are also grappling with several value-chain inefficiencies, especially in agricultural production and distribution, that impact their growth.

2.4.2 Investment opportunities

There are nearly 150 private dairy companies in Nepal, of which 15 are medium and large with more than \$300,000 in fixed capital invest³⁴. The largest private dairy companies by turnover and capacity include Nepal Dairy, Sujal Dairy and Himal Dairy. Private dairy companies face strong competition from the DDC, which creates inefficiencies in the market and threatens the viability of private enterprise.

Typically, private dairies have processing capacity of 10,000-30,000 litres of milk/day. Only 50% of this capacity on average is currently utilised³⁵. This is partly due to the low predictability of milk procurement from MCCs.

Dairies can make the quantity and price of the milk supply predictable through investments in backward linkages with milk aggregators, as well as by creating better backward

Hetauda Dairy, Makwanpur

“During the flush season, private dairies have no choice but to buy the excess milk. The purchase is done to ensure supply during the lean season. If they don’t buy the excess milk, the collection centres will not supply milk to them during the lean season. The excess milk is then sent for conversion to powder milk for sale during the lean season.”

³³ A Report on Market Data for Private Sector Investments in Nepal Agriculture Sector, Dolma development fund, Intellectap

³⁴ A Report on Market Data for Private Sector Investments in Nepal Agriculture Sector, Dolma development fund, Intellectap

³⁵ A Report on Market Data for Private Sector Investments in Nepal Agriculture Sector, Dolma development fund, Intellectap

linkages by establishing their own chilling plants. Private dairies can invest in building efficient and transparent partnerships with distributors and in their own retail networks to help overcome inefficiencies in the current milk distribution networks. Investments can also be made in technology and processes to assess and certify milk quality. These will allow private dairies to build brand recognition and trust amongst buyers.

There is a significant demand-supply mismatch, where domestic production and processing capacities are insufficient to cater to the rising demand for dairy products in Nepal. As a result, Nepal relies on imports to meet demand and annually imports over \$250 million-worth of semi-processed and processed food³⁶. This gap has driven Nepalese agriculture to become more organised and has incentivised the entry of private sector industries. A significant opportunity exists for domestic businesses and investors to leverage this growing demand and decrease import-dependence. However, the lack of access to capital, especially risk capital in the early stages of a business, poses a considerable hurdle to the growth and development of agriculture. **Hence, there is an opportunity to catalyse the growth of agribusinesses by making available stage-specific access to financial and technical support.**

Some key success factors that investors can use to evaluate the attractiveness of private dairy industries include³⁷:

- Existence of backward linkages such as partnerships with MCCs and owned or contracted cold storage units for securing a supply of milk;
- Diversification into dairy processing;
- Use of improved packaging techniques that increase the shelf life of products;
- Good brand recognition amongst end consumers, and status of “preferred brand” amongst private sector dairies;
- Stringent quality control and certification processes that are adequately marketed to end consumers to build trust;
- Efficient and transparent partnerships with distributors to avoid practices like “milk buy-back”.

2.4.3 Investment climate for dairy business

One of the biggest hurdles faced by agribusinesses in Nepal is the lack of access to capital to support their growth. The supply of debt is inadequate, with 56% of all businesses in Nepal reporting that they are not served adequately by the banking sector and only 1% having commercial banks as a source of financing³⁸. While some amount of debt support might still be accessible for established businesses, the current system has little or no provision for most early- and growth-stage businesses. A high lending rate of around 16% is another major growth constraint for SMEs in Nepal³⁹. This has affected some SMEs, which have laid off employees to be able to service debt and stay in business.

Government support to agribusiness has been improving, however, and public spending on the sector has increased almost fivefold in the past decade (See

³⁶ Trade and Export Promotion Centre Nepal, database accessed in March 2014

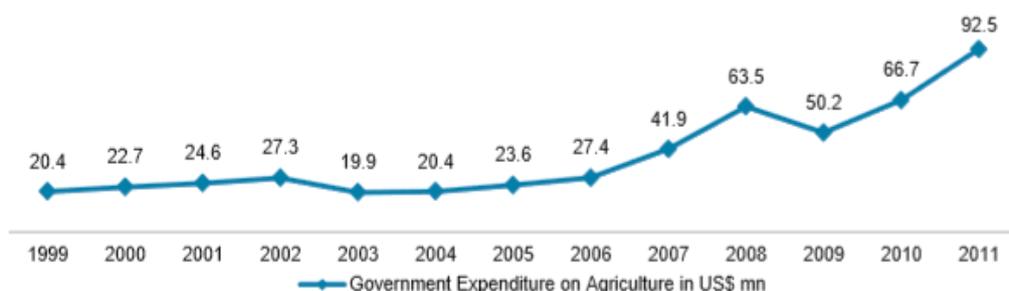
³⁷ A Report on Market Data for Private Sector Investments in Nepal Agriculture Sector, Dolma development fund, Intellectap

³⁸ IFC Enterprise Finance Gap Database, accessed in March 2014

³⁹ SMEs and Economic Growth in Nepal, Kathmandu Tribune, November 18, 2018

Figure 4).

Figure 4: Growth in government expenditure on agriculture⁴⁰



Efforts are being made to improve SME-level outcomes through government agri-extension services, priority sector lending norms for agribusinesses and a focus on private sector investments⁴¹. Mechanisation and better-quality inputs are improving as well, with 373 Agri-extension service centres established by GoN. (The Terai area has benefited especially, accounting for over 92% of the total available mechanical power in the country.)

Banks and financial institutes

Concessionary agriculture loans from banks and financial institutions (BFIs) can be secured from banks: for anyone working in agriculture, including farmers and SMEs, the government pays 6 percentage points of the interest rate charged by a bank. However, accessing these loans at these rates is challenging:

- Bank procedures for small business loans are too complex, making the lending process unnecessarily long and expensive for both the businesses and the banks;
- The most popular bank product, overdrafts (lines of credit), is inappropriate for many small businesses, as they do not deposit their revenues in banks;
- Banks require high levels of immovable collateral, whereas small businesses mostly tend to have only movable assets;
- Although Nepalese banks have sophisticated management information systems, they generally do not use them to measure staff and loan performance, which are crucial for profitable small-business lending.

Most SMEs therefore pursue alternative bank loan credit products, carrying unattractively high interest rates, currently around 16%.

Funding organisations and individuals

Although private equity and venture capital are still in a nascent phase in Nepal, some overseas firms have entered over the last few years, such as Business Oxygen, One to Watch and Dolma Fund. There has also been growth in domestic funds, such as True North Associates, I-Capital, Team Ventures and Safal Partners. Major funding organisations operating in Nepal are presented in

⁴⁰ Statistical Information on Nepalese Agriculture; Ministry of Agricultural Development; 2012

⁴¹ Agriculture is a focus sector for the Ministry of Industry's "Invest in Nepal" initiative

Table 4.

Table 4: Major funding organisations operating in Nepal⁴²

Name of the fund	Priority Sectors	Range of investment	Target CASA Enterprises
Business Oxygen	NA	£80,000 – £400,000	SMEs, large processors
Dolma Impact Fund	NA	£400,000 – £3 million	Large processors
One to Watch	NA	£240,000 – £800,000	Medium to large processors
True North Associates	NA	£240,000 and above	SMEs, large processors
M&S Holdings	NA	£8000 – £160,000	Production units, SMEs
I-Capital	NA	Up to £80,000	SMEs
Safal Partners	NA	£1000 – 8,000	Production units, Micro enterprises

There is also an increasing trend of local investment companies looking for opportunities to invest in start-ups and growth-oriented SMEs. At the recent second Nepal start-up meet, investment companies such as NICL Investment Company, Hathway Investment and Kathmandu Capital expressed interest in investing in new companies⁴³. Many of these local funds are registered as local investment companies with the prime objective of investing in public company shares or real estate. Similarly, institutions are emerging that are trying to collaborate with other stakeholders to develop prototype investment instruments such as debt instruments, simple agreements for future equity (SAFE) and equity seed round investments.

Local angel investors have also grown in recent years. These people have deep pockets, business knowledge and risk-taking capacity, and they are looking for opportunities to get involved in new business ventures. Institutions such as Safal Partners have been able to connect with such angel investors and set up a funding structure in which these angel investors pool funds to provide SMEs with much-needed seed capital.

In March 2019, GoN introduced the Specialised Investment Fund Regulation 2075 to promote alternate investments such as private equity funds, venture capital funds and hedge funds. This has led several fund management companies, such as Panaya Advisors, to diversify and establish their own investments funds. For the current fiscal year, GoN has received five applications for local fund establishment, out of which four are expected to be approved⁴⁴.

Further, development agencies have launched a series of challenge funds to support entrepreneurship development in Nepal. Development challenge funds include UNCDF – Nepal Innovation Challenge AgriTECH; UNCDF – Women MSME in Fin TECH Innovation; and DFID’s Sakchyam – Access to Finance Programme and Skills for Employment Programme (SEP). In the budget for the fiscal year 2017/18, the Ministry of Finance (MOF) announced NPR 1 billion as a challenge fund for start-ups to provide innovative entrepreneurs with seed capital. However, the eligibility criteria are vague, and the fund limits itself to businesses that are socially responsible and create employment.

Under the new Foreign Investment and Technology Transfer Act 2019 (2075) (“FITTA”), all FDI in the dairy sector has been banned. For other sectors, a minimum for FDI has been set

⁴² “Mapping of Nepal’s Evolving Startup Ecosystem”, Nepal Economic Forum/SDC, June 2019.

⁴³ “Mapping of Nepal’s Evolving Startup Ecosystem”, Nepal Economic Forum/SDC, June 2019.

⁴⁴ As per CA. Aashish Dhakal, Global Equity Fund.

at NPR 50 million (about \$450,000). Foreign investors are required to invest a minimum of that amount.

Challenges faced by non-banking investors

The pool of investors remains limited compared to the increasing number of SMEs and start-ups. The mismatch in demand and supply has means that investors are in a better position to negotiate deals. There is also a mismatch between the state of businesses and the ticket sizes of available funds. Most SMEs' funding requirements are somewhere between £8,000 and £80,000. However, the PE and VC firms in Nepal have a much larger ticket size⁴⁵.

Existing laws restrict PE and VC firms (both domestic and offshore) from providing capital in the form of debt. Hence, these funds invest in equity or equitylike instruments in SMEs and look for an internal rate of return (IRR) of more than 20% on their investment. Equity investments are an expensive form of financing compared to debt instruments offered by banks, which have a fixed rate of interest. However, businesses are not able to access funds from banks, because lending is based on collateral and not on cashflow or future enterprise value.

To obtain funds, the majority of entrepreneurs have accepted unfavourable terms of financing without properly analysing the implications for their future growth. In most cases, the terms of equity financing are similar to debtlike instruments, which are aggressive favour investors.

Many businesses that received equity investments have said that investors expect an IRR of 15-20%, which is very high. Despite these high expectations, businesses rely on private investors because of the difficulty of securing funds from the banking system and because private investors bring other benefits such as market access and networking.

Bureaucratic hurdles include the time to carry out due diligence on the enterprise. Getting FDI approval from the government can take as much as nine months, during which period the enterprise may have incurred losses and missed business opportunities. A few investors, such as BO2, have a technical assistance fund component, which is used for capacity building of the enterprise. But due to delays in FDI approval, they have not been able to make full use of these funds. In some instances, the entrepreneurs themselves searched for experts and solutions that would otherwise have been covered by the technical assistance funds.

Supporting organisations and individuals

SME and start-up supporting entities include incubators, accelerators, business development services and individual mentors. There are also organisations that run acceleration programmes as well as managing funds, such as TNA, Chaudhary Foundation and Idea Studio. However, the acceleration programmes and funds are considered and operated as separate entities. The acceleration programmes are mainly aimed at providing a pipeline of investment-ready companies to the fund. As the organisations are fund managers, the funds under their management are subject to strict investment rules. Major incubators and accelerators in Nepal are listed in Table 7.

Most of these programmes are concentrated in Kathmandu Valley, making it difficult for businesses outside Kathmandu to use their services. Exceptions include Nepal Communitere and Antarprerana, which have launched a six-month incubation programme in Chitwan – I-Cube Chitwan – with the Chitwan Chamber of Commerce. Similarly, Chaudhary Foundation's Nepal Social Business runs incubation programmes in the districts of mid-western and far-western Nepal.

⁴⁵ £250,000 and bigger

Weaknesses of supporting organisations

Recent studies reveal that the main objective of entrepreneurs joining an incubation and acceleration programme was to obtain funds for the business. A few start-ups also mentioned that they pledged equity shares as a payment for enrolment with acceleration programmes.

However, many businesses that have undergone incubation or acceleration programmes have not been able to secure funding. One reason is that the applicants have been deemed too risky, and there is a limited amount of funding available and innumerable opportunities to invest. Another is that entrepreneurs try to negotiate deals with investors at unrealistic values – they overvalue their companies. Thirdly, a majority of entrepreneurs have failed to persuade investors that their teams are capable of taking the company from a small, great idea and turning it into a clear, scalable business with a high return on investment. Lastly, entrepreneurs often do not have a clear go-to-market strategy that demonstrates the sustainability of the business.

The quality and sourcing of entrepreneurs has been a major challenge for a majority of incubators and accelerators. There is a misconception among many entrepreneurs about what is involved in becoming an entrepreneur. Many individuals and companies are applying to incubators and accelerator programmes, but their quality is still not up to the standard required by investors and funding organisations.

CASA can help identify potential businesses, invest in building their capacities and support the testing of innovative business models. However, CASA's support to business will also be guided by the criteria that investors set to make the businesses investable.

Legal and regulatory environment

Key acts and policies governing entrepreneurship and investment include the following⁴⁶: Company Act 2017; Insolvency Act 2006; Income Tax Act; Foreign Investment and Technology Transfer Act 2019; The Foreign Investment and Technology Act 2019 (FITTA); Industrial Enterprise Act 2016; Securities Act 2007; Partnership Act 1964; Foreign Exchange (Regulation) Act 1962; Specialised Investment Fund Regulation 2075.

Government subsidy

Government subsidies are essential to encourage entrepreneurs to start their own business. In Nepal, subsidies are mostly provided to export-oriented industries, prioritised industries and industries established in the least developed, undeveloped and underdeveloped regions. The government provides subsidies in these sectors to promote and protect domestic industries and to improve domestic investments. In recent years, and with the aim of empowering emerging entrepreneurs, the GoN has increased subsidies. According to the Budget Speech of Fiscal Year 2018-19, the following subsidies are available: -

- *Subsidies for Acquisition to Industries Operating Through Cooperatives*: 25% for the acquisition of necessary equipment for milk, meat, fruit and vegetable processing industries operating through cooperatives while it also applies to the establishment of feed industries for fish and livestock based on non-food industries at the local level⁴⁷.
- *Agro-Based Subsidies*: For the aim of improving agricultural outcomes in rural Nepal, the GoN under the Prime Minister Agriculture Modernisation Project provides subsidies on agricultural equipment and tools purchase, construction of agriculture collection centres, agriculture Haat Bazaar centre, primary processing centre, warehouse and business training centre.

⁴⁶ See Annex 6 for details and implications of each policy/act.

⁴⁷ Fiscal budget 18-19, 25

- *Interest Subsidies on Loans*; To encourage young entrepreneurs with higher education as well as innovative knowledge, skill, and capacity⁴⁸ to launch their own business, the GoN provides loans up to Rs. 700,000 with a 5% interest rate for business start-ups. To obtain this loan, the applicant requires their educational certificates as collateral.
 - Loan (on collective guarantee) of up to Rs. 1 million at 5% interest is provided for Dalit community applicants by socially integrating them to run the business through cooperatives and community production systems. There is a provisioned budget for modernisation and promotion of traditional skills and occupation⁴⁹. This is a potential product that could be leveraged by CASA's socially excluded missing middle target group.
 - The government also provides loans at 6% interest on collective project-based loans up to Rs. 1.5 million operated by women through the development of their entrepreneurship, skill development, and training. Furthermore, the product can be obtained for commercial agriculture and livestock⁵⁰. This is also a potential product that could be leveraged by CASA's women missing middle target group.
- *Subsidies on Export*: A 5% cash incentive is provided on exports in the sector of industrial development for products such as cement, sugar and iron rod, among others. There is a compulsory requirement of a credit guarantee and insurance of such businesses⁵¹.

Government subsidies are accompanied by many preconditions and procedures. At the same time subsidies in different forms and volumes are being made available through agencies at both the Federal and local levels.

To promote and encourage farmers, the government has subsidies for up to 75% for agriculture and livestock insurance. The uptake of these insurance services has been slow due to lack of awareness, but these are being promoted by cooperatives and farmers groups. The uptake among farmers especially for large livestock is quite good as the awareness level on these insurances have been growing. This is an important opportunity as the introduction and popularisation of livestock insurance can expedite the commercialisation process by reducing some of the risks and uncertainties. This can be promoted with the dairy processing companies, along with cooperatives and chilling plants as distributor/aggregator for insurance companies.

2.5 Crosscutting areas

2.5.1 Gender and social inclusion

About 70% of rural women are engaged in dairy farming (DCIP Report, 2010). Women are the principal caretakers of dairy animals. A typical workday for women in both male- and female-headed households involves milking the cattle, cleaning the shed, collecting forage and feeding the cattle. Often women balance activities including dairy management (feeding, shed management, collecting forage and fodder), collecting and drying dung and household care. These roles can be shared, but women are increasingly taking over all responsibilities in the absence of men. The table below shows the current dairy-farming activities, the roles of men and women and the implications of existing practices for women's livelihoods.

⁴⁸ Fiscal budget 18-19, 25

⁴⁹ Fiscal budget 18-19, 25

⁵⁰ Fiscal budget 18-19, 25

⁵¹ Fiscal budget 18-19, 25

Table 5: Role of male and female members of family in dairy animal farming

Activities	Roles		Implication of current practice
	Men	Women	
Collecting forage/fodder (sometimes from a long distance, up to 3 hours)		X	<ul style="list-style-type: none"> - Increase workload on women - Less chance for participating in social activities and functions. - Health hazards due to heavy weights, including uterine prolapse - Health hazards due to heavy weights, including prolapse
Milking animals	X	X	Lack of understanding of hygienic practices while milking animals frequently (and resulting possibility of milk quality degradation and spoilage)
Husbandry practices (feeding, shed management, healthcare and reproductive care)		X	Women are primarily involved in dairy management and have limited access to information in these areas.
Taking milk to collection centres	X		Men dominate all discussion and information on the productivity of animals, average income from milk selling and quality issues. Women do not have access to the information.
Income from milk selling	X		Men generally have access to income from milk sales. Women have limited access to such income.

Milk sales provide households with income in a short time interval, enabling them – especially – women, to meet daily basic needs. The gender division of labour means that women, especially in male-headed households, spend much time on non-cash activities. They have limited involvement in livestock trading or in the investment and spending of household income from livestock marketing. Their invisibility in market transactions contributes to the marginalisation of their work.

Efforts have been made to improve access to veterinary services for women and lower-caste groups. The study conducted by Gurung (2016) in Eastern Nepal revealed no discrimination reported in providing veterinary service to men, women and people of different caste and ethnic background. However, in remote rural areas, pockets of discrimination may still exist. CASA will carefully investigate the intersection of gender, caste, and ethnicity during the design and implementation of projects.

The growing pattern of rural male outmigration to urban areas and abroad has brought changes in the dynamics of household labour and land utilisation. In some households the absence of adult labour has led women to take over male-dominated farming practices, further increasing their workload. A regular flow of remittances is an important resource for some women to invest in agricultural or non-agricultural activities. Other women continue cultivating their land – although less intensively – to produce crops for household consumption. Still others have abandoned farming as money from remittances frees them from the drudgery of agricultural labour.

Membership in cooperatives, including women-only cooperatives has played an important role in widening women’s social and economic spheres. The Nepal Agriculture Cooperative Central Federation Limited (NAFFCL) has a total of 1,030 member cooperatives. Women comprise about 82% of the members of these cooperatives. Cooperatives have helped many women build the confidence to transition from subsistence to semi-subsistence farming. Women’s full integration into the market system, such as in the dairy sub-sector, needs to be harnessed to enable them to capture its benefits. As they enter more profitable activities

along the dairy value chain, women are likely to encounter challenges and risks, given that they have been mainly involved in production and primary processing. CASA will further investigate women's and men's position in the dairy sub-sector market, including the challenges, risks and mitigation measures. The sector has the potential to benefit women as dairy farmers, as dairy farming practice crosscuts social class, ethnicity and cast.

2.5.2 Food security and nutrition

About 28.6% of Nepal's population is poor, with 9.6% suffering from severe poverty. The 2016 Global Hunger Index scored Nepal at 21.9, which is considered "serious". Key factors contributing to that score include:

- 7.8% of the population is considered undernourished;
- There is 11.3% prevalence of wasting of children under 5 years;
- There is 37.4% prevalence of stunting among children under 5 years;
- The mortality rate for children under 5 years is 3.6%.⁵²

Poverty is highest in rural areas, concentrated in the Western and Mid-Western Development regions of the country.⁵³ Increased production and access to milk and milk products have directly contributed to improving farm families' food and nutrition security. The national annual per-capita availability of milk is about 70 litres, which is less than the minimum consumption of 92 litres recommended by the FAO. Clearly, there is huge unmet demand for milk and milk-related products in Nepal. Even at this low level of consumption, there is daily milk demand of 8.2 million litres in Nepal. With an increasing population and changing food habits, demand for milk and milk products has been growing at 8 percent per annum.

CASA's thematic focus on nutrition aims to ensure that both positive and negative impacts on nutrition and food security are understood and evaluated at different stages of the value chain, including in areas not directly targeted by the project. Each stage is considered in the context of the effects on availability, accessibility, affordability and acceptability – principally for both urban and rural poor and specifically for groups such as women and children.

The informal milk sector, which accounts for three quarters of Nepalese production, is sourced primarily from small and subsistence-level farmers, who produce primarily for household consumption and sell the excess into local markets for consumption as raw milk or for artisanal processing. As such, the informal sector is an important element of food security and nutrition for the rural poor, for whom protein is frequently lacking or expensive – especially for women and children. This applies both to farmer households and people living in the immediate vicinity. Stall-fed livestock provide manure as an important by-product, which can be effectively integrated into vegetable crop production for both household consumption and sale.

However, the lack of quality control and effective sanitation in production, milking, post-harvest work and distribution exposes consumers to poor product quality, a range of food-borne pathogens and residues from the veterinary treatment of cows. The perception amongst consumers that raw milk is healthier than processed milk means that processed products are less accepted.

It is important that CASA's efforts to divert more milk production into formal processing are complemented by the promotion of approaches to increase the volume of milk produced at smallholder level and to improve post-harvest handling. That will avoid a net reduction in the availability of subsistence-level milk and milk products. The approach laid out in this study to

⁵² IFPRI (2016) Global Hunger Index, IFPRI.

⁵³ Katovich & Sharma (2014) Costs and Returns of Grain and Vegetable Crop Production in Nepal's Mid-Western Development Region, USAID.

balance the development of quality standards and controls with information and consumer education should contribute positively.

Increasing the volumes of milk in the formal sector will help to increase the availability of safe and nutritious dairy products in urban and peri-urban areas that have access to appropriate and financially viable cold chains and retail outlets. In the short term, improving the availability of processed milk in rural areas will rely on products not requiring refrigeration, such as UHT milk.

CASA's approach to strengthen the links between smaller scale producers and processors will help disseminate information throughout the value chain on market tastes, quality standards and production demands. This will reduce post-harvest wastage and the buyback of unsold production. The currently high levels of returned product represent not only a financial challenge for processors but also a substantial loss in highly nutritious foods for consumers.

Decentralising production will integrate more smallholder farmers into formal production systems and increase the availability and affordability of processed milk products outside the major urban areas where production is currently based. This will improve nutrition, but consideration will have to be given to both packaging and pricing to ensure the benefits reach lower-income households.

2.5.3 Climate change and environment

The CASA project mainstreams consideration of climate change and the environmental (CCE). Our first rule is: "do no harm". We recognise that trade-offs between CCE and economic development are sometimes inevitable, but these should be minimised. Our second rule is to help address CCE challenges whenever possible. In some instances, we may be able to increase the resilience of the environment, reduce the severity of climate change or help better prepare for a changing climate, while simultaneously meeting the project's development objectives.

Climate-smart agriculture (CSA) is defined by the FAO (UN Food and Agriculture Organisation) as consisting of three components: increased productivity and income generation for livelihoods; mitigation of climate change either by avoiding greenhouse gas emissions (such as carbon dioxide, nitrous oxide, methane, black carbon, and fluorocarbons); and adaptation to climate change by, for example, reducing exposure and risk to floods, fires, droughts, pests and disease.

The warming of the earth's climate system has multifaceted effects on production systems involving animals. It affects feed supply; challenges thermoregulatory mechanisms, resulting in thermal stress; encourages the emergence of new diseases due to changes in epidemiology; and causes many other indirect impacts. The intensification and increased frequency of thermal stress is the most prominent impact of global warming on dairy cattle. It results in different physiological, metabolic and milk production disturbances.

A study of small farmers found that the majority thought the productivity of dairy cows had declined with the rise in temperatures.⁵⁴ Other studies expect significant impacts from climate change because the productivity of livestock and availability of natural resources to support them – such as the areas of land suitable for livestock production – are sensitive to climate change. In Nepal, livestock-dependent communities are generally in regions that are highly vulnerable to climate change. Dairy cows are more vulnerable than meat breeds to heat stress, poor nutrition and disease. The atmospheric temperature of the earth has increased due to the cumulative effects of greenhouse gases emitted from human industrial and agricultural activities.

⁵⁴ Shobha Poudel *, Shinya Funakawa and Hitoshi Shinjo (2015) Household Perceptions about the Impacts of Climate Change on Food Security in the Mountainous Region of Nepal. Sustainability 2017, 9, 641

The challenges for the dairy sector include bringing milk to the consumer at competitive prices when dairy production is subject to changes in weather patterns, market dynamics and prices. At the same time, there is a growing emphasis on sustainability. People are concerned about the environment, animal welfare and the quality of their food.

There is a direct link between GHG emissions and the efficiency with which producers use natural resources. For livestock production systems, nitrous oxide (N₂O), methane (CH₄) and carbon dioxide (CO₂) emissions imply losses of nitrogen (N), energy and organic matter that undermine efficiency and productivity. An efficient dairy nutrition system therefore reduces GHG emissions.

Possible projects to reduce emissions are, to a large extent, based on technologies and practices that improve production efficiency at the animal and herd levels. The composition of feed has some bearing on enteric fermentation and the emission of methane gas from the rumen or hindgut. The volume of feed intake is related to the volume of waste product.

The project measures include:

- i) The use of good quality feed. This refers to feed that contains adequate nutrients for both maintenance and production. When dairy cattle consume low-quality feeds high in fibre, they are not adequately utilised by rumen microbes and often lead to the production of large quantities of methane.
- ii) Use of improved forage species. The use of improved grass species and forage legumes results in increased animal productivity. Biomass feeds that have high yields per unit area and are highly digestible will in the long run reduce the amount of land needed for feed production and reduce enteric inefficiencies. They can thus be a basis for increased feed conversion efficiency and a reduction in animal numbers, reducing GHG emissions.
- iii) Rotational grazing allows the maintenance of forages at a relatively high growth stage. It enhances the quality and digestibility of the forage, improves the productivity of the system and reduces CH₄ emissions per unit of live weight gain (LWG). Rotational grazing is more suited to managed pasture systems, where investment costs for fencing and watering points, additional labour and more-intensive management are more likely to be recouped.

2.5.4 Animal welfare

Animal welfare lags in Nepal, as people struggle to achieve a basic quality of life. The reasons behind poor welfare are multifaceted and include misconceptions, limited resources and a lack of honest animal ownership. A lack of proper government regulation to protect animals is not helping either. CASA's projects in the dairy sector will take animal welfare into consideration. Aspects that will be taken into account include behaviour and physiology, productivity, reproductive success, mortality rates, and incidence of injury and disease. Projects on implementing good manufacturing practices (GMP) will focus on animals' housing, food, water, and health to improve their welfare, productivity, and profitability. Productivity will be assessed in conjunction with other measures to ensure that welfare is appropriately addressed and managed.

Through its projects, CASA will also emphasise the following five freedoms to protect animals from unnecessary suffering⁵⁵:

1. Freedom from hunger and thirst, through ready access to fresh water and a diet that maintains full health and vigour.

⁵⁵ Good Practice Note, Improving Animal Welfare in Livestock Operations, Dec 2014, International Finance Corporation World Bank Group.

2. Freedom from discomfort, through an appropriate environment including shelter and a comfortable resting area.
3. Freedom from pain, injury, and disease, through prevention or rapid diagnosis and treatment.
4. Freedom to express normal behaviour, through sufficient space, proper facilities and company of other animals of the same kind.
5. Freedom from fear and distress, through conditions and treatment that avoid mental suffering.

Where relevant, all projects will adhere to the good practice note on improving animal welfare in livestock operations developed by IFC. CASA will also refer and adhere to the Government of Nepal's "Animal Welfare Guidelines 2073".

3 Analysis

This analysis recognises CASA's strong focus on aggregation and market access as means to better engage SHFs in commercial markets; and on investment and financing to ensure pipeline investment that can drive growth for SMEs, especially those with large outreach to CASA target producers. The problems identified are symptomatic of wider issues (underlying causes) in the market. To deliver a result which will strengthen the market system sustainably rather than simply temporarily alleviating symptoms, the analysis seeks to understand the underlying causes of these issues before devising solutions.

3.1 Problems in the core Functions and underlying causes

The demand for milk in the formal markets exceeds supply mainly due to the recent establishment of solid milk plants (SMPs) by the private sector. But farmers still feel market uncertainty risk and are not incentivised to invest in good breeding stock, feeds, or veterinary medicines and services. Limited investments make it difficult to raise productivity and profits, and hence visualise pathways towards commercialisation.

3.2 Problems in production:

3.2.1 Low farmer incentives to commercialise milk production

Despite ample growth opportunities, farmers are hesitant to invest in commercialisation due to fluctuations in demand during the flush season. In field work, it was observed that SHFs still fear there might be 'milk holidays' and they will not be able to sell their milk. SHFs are unable to cope with these fluctuations for long periods of time, and within a period of two or three months farmers typically sell their dairy animals. That creates a bigger problem for the lean season, as the supply is even less. SHFs are seldom able to deal with external shocks such as earthquakes, as well as bandhs and political blockades (frequent occurrences that severely affect access to markets). These events can happen anytime, which creates uncertainty. Once affected by such events, it takes farmers a long time to recover.

High cost of production

The main reason for low commercialisation of milk production is the high cost of production, farmers say. Producer groups, too, stressed that the cost of production is very high. The biggest factor is the cost of feed, which accounts for 50% to 60% of the overall production cost. Farmers are becoming increasingly dependent on grain-based concentrate feed rather than fodder grasses. But commercially produced concentrates are expensive. The cost of manufactured feed has a significant impact on SHF with fewer cattle. To compensate for the high costs, farmers usually feed the cattle less, which affects milk productivity and quality. While switching to fodder-based feeding is a good option, fodder is also not available year-round.

In addition, farmers are using traditional practices to raise their cattle, which are not appropriate anymore and contribute to poor productivity. The farmers receive limited

**Amar Kunwar, Administrator
Tanahun District Milk Producers
Cooperative, Tanahun**

"The milk collection before the earthquake used to absorb 13,000 litres a day, but this decreased to about 1,000 litres a day following the earthquake. Markets collapsed and demand dropped. Processors also stopped making payments for three or four months, which meant that farmers had no income. Within two or three months farmers started selling their dairy animals. These days farmers are increasing production again and aggregated local collection has recovered to 8,000 to 9,000 litres a day. However, farmers are hesitant to invest more, as they still fear that the market might collapse."

information on modern technology, and production inefficiency is around 30% in rural areas⁵⁶ where inefficient traditional practices are guided by informal institutions. Lastly, the absence of better breeds with higher productivity also contributes to higher cost of production.

High investment costs

Dairy animals are quite expensive, and farmers are reluctant to invest in better stock because of seasonal market challenges. Farmers also face problems of loan access, as available loan products are not tailored to farmers and the interest rates are often too high.

Low confidence of farmers in the market

Dairy farmers are not confident in the market, leading to slow growth and low attractiveness for investors. Milk chilling and collection centres are operating below capacity as they are not able to source enough milk. Collection and chilling cooperatives are trying to incentivise farmers to increase production through various schemes, including free services, quality bonuses and retirement funds for dairy farmers. But year-round assurance about the market remains an overriding issue.

3.2.2 Market access

Secured, profitable, year-round market access affects both dairy farmers and SMEs. In distant milk surplus areas, farmers struggle to sell their milk, but large processors from Kathmandu are unlikely to collect from these distant areas due to high transportation costs. While major urban areas are enjoying growing demand for processed dairy products, some of the larger dairy processing firms are struggling to meet this increased demand due to inconsistent milk supply. So, regions with higher milk production and collection potential present more opportunity for diversified product processing. Small local dairy processing firms exist but mostly compete in the same local markets with the same narrow range of products (standard milk, butter, ghee and curd). Most factories were installed without proper feasibility assessments and have higher capacity than required.

3.3 Problems in post-production:

Dairy SMEs face many issues in relation to growth. Most are running at under capacity as the demand for milk in the formal channel exceeds supply. A deeper challenge is that milk distributors receive different commissions from different private dairies, and as a result prefer to sell milk which gives them higher commission. Private dairies are required to buy back milk that remains unsold, which can make up 12% to 25% of total sales to distributors⁵⁷. Due to this system, dairy companies are not able to risk processing at full capacity.

3.3.1 Commercial production units

Commercial production units operate dairy farms at commercial or semi-commercial level. They make up about 25% of the dairy supply chain and face several problems that impede their growth.

High cost of production

The biggest problem is the high cost of production due to factors such as feed. Only 10% of commercial farms use outdoor grazing, due to the lack of good grazing pastures in Nepal⁵⁸, and manufactured feed is generally expensive. Another factor is the unavailability of better breeds. Cattle in Nepal have significantly lower productivity, yielding only about 10 to 12

⁵⁶ Dairy Sub sector: Analysis and Vision, Samarth-NMDP, 2012

⁵⁷ A Report on Market Data for Private Sector Investments in Nepal Agriculture Sector, Dolma development fund, Intellectap

⁵⁸ Cattle farming in Nepal: Why farmers cry, Daily Global, November 2017

litres per day. Cattle in India and Pakistan produce around 35 to 40 litres per day. The third factor is traditional practices, which include haphazard feeding, inadequate feed and inadequate amounts of water.

High investment costs

Commercial and semi commercial dairy farms require huge investment to start. Land is extremely expensive, as are dairy animals. Acquiring loans for these farms is also a problem as the loan process is complex, and farms are not able to produce the documentation required.

3.3.2 Micro and small businesses

These businesses are collection centres, localised processing units and input retailers, and they produce only for local markets. They are mainly responsible for milk collection and local production of dairy products. The technology used is usually local and limited in capacity and efficiency, and it breaks down frequently, causing high wastage. However, they are running under capacity due to low supply of raw milk and a lack of planning and vision.

Domination of informal markets

Reasons for the low supply of milk include the domination of informal markets and the domination of the supply chain by subsistence farmers. Subsistence farmers are not fully committed to dairy farming, so processors are reluctant to invest in them. A dairy in Pokhara (Himal Dairy) worked with a producers' group to invest in farmer productivity, allocating funds for the farmers to purchase cattle. But once the farmers had recovered their cost of purchase after a year, they sold the cattle. Uncertainties such as these make the private sector hesitant to invest in production.

Lack of connectivity and weak transportation services

Milk is usually sourced from relatively accessible areas, and collection centres are established in areas that have road access. These centres fail to include farmers from remote areas, who then sell only to their local market. So milk from remote areas never reaches the formal markets. Larger enterprises have their own fleets for sourcing milk, but SMEs do not have the capacity to invest in transportation. This limits their ability to source milk from additional sources.

Himal Dairy, Pokhara

“Even when milk is available, it is difficult to get it as we don't own any transport trucks. We have to make arrangements with the transportation companies. They already have fixed routes and don't entertain additional requests.”

Weak management and marketing performance

Many SMEs start with a comprehensive business plan, but then don't implement or update the plan. Another of their fundamental weaknesses is a lack of awareness of market opportunities. Though a vast amount of trade related information is available, most SMEs rely heavily on private contacts for market-related information.

Therefore they typically end up installing factories with a higher capacity than required, so these factories are constantly running under capacity. Very often, SMEs are family-level enterprises, and managerial competence is perceived as unimportant. They rarely seek the services of BDS providers for expansion and growth, so they lack vision and struggle with everyday management.

3.3.3 Medium and large businesses

Medium and large businesses are concentrated in urban areas where business volumes are high. They face similar constraints to small and micro businesses, such as the domination of informal markets and the limited number of milk suppliers. However, the medium to large

processors face greater undersupply, as they have unmet demands of between 5,000 and 10,000 litres of milk a day. One way to increase the supply is to source from distant markets, but this is only profitable in large consignments of 20,000 litres.

Low quality of Raw Milk

The quality of raw milk is a serious issue for bulk processing and developing consistent products. Quality is governed by practices at the farmers' level and it is reduced by factors such as a lack of information in hygienic practices and the unavailability of milk-chilling facilities in nearby regions. Processors also fear that if quality standards are enforced too much, they will not get any milk when the lean season comes.

Low-quality milk has a short shelf life and can only be used to make a limited range of finished products. If the quality of the raw milk is low, the same applies to the resulting processed products. The problem is intensified when they are handled badly post-processing. Then the finished products' shelf life is short, and they can be harmful to consume.

Low uptake of innovations and new technologies

Nepal's processed dairy market is quite competitive, and businesses are looking for ways to differentiate their products. This implies investing in innovations and new technologies, but access to finance is low, as is the industry's risk appetite.

BFI's current loan products are similar to personal individual loans for cars and homes. They require non-moveable assets as collateral; they charge high interest rates; and they take a long time to process. BFIs also perceive agri-businesses as risky, and they don't offer provisions for overdrafts. Businesses also lack the skills to develop business plans and frameworks for finance, marketing and management framework – all of which are required by BFIs and investors.

Access to consumers

Distribution markets usually work on margins, and the higher the margin the processor can give the more products will be pushed by distributors and retailers. Brands with low margins are not marketed well to consumers even if they are of better quality, which is a problem for processors with limited market share.

Uneven playing field

Private dairy businesses must comply with quality standards enforced by the government. But they face unfair competition from unregulated cottage dairy industries, which have captured market share by promoting raw milk as a fresher, healthier choice than packaged products.

Private businesses also have to compete with the giant government-owned company DDC, which sets prices at farmer level and also for final products, and which is compensated for any losses by the GoN. Private processors are forced to pay high prices to farmers and to let retailers and distributors take high margins. This limits processors' margins and, hence, their incentives for growth.

Nepal Dairy, Kathmandu

“The dairy market is very competitive, and the only way to stand out from the competition is to have a differentiated and diversified product. There are so many things you can do with milk, but the quality is so poor that it limits our ability to develop more diversified products”

Table 6: Key Problems faced at Production and Postproduction level

S. No	Key Problems	Production		Postproduction	
		Producers	Commercial Production Units	Micro and Small businesses (local collectors and processors)	Medium and Large businesses (Processors)
1.	High Cost of Production	✓	✓	✓	
2.	High Investment Cost	✓	✓		
3.	Low Confidence in the market	✓			
4.	Market Access	✓	✓	✓	
5.	Domination of informal markets			✓	✓
6.	Supply chain dominated by subsistence farmers			✓	✓
7.	Lack of connectivity and weak transportation services			✓	✓
8.	Weak management and marketing performance			✓	
9.	Low quality of Raw Milk	✓	✓	✓	✓
10.	Low uptake of innovations and new technologies				✓
11.	Access to consumers				✓
12.	Uneven playing field				✓

4 Strategy for change

CASA's dairy strategy is founded on optimising engagement with SMEs seeking investment to drive growth, while addressing constraints on smallholder producers' commercialisation and engagement. (In many cases, these consist of business opportunities that are not taken up.) Our engagement is typically expected to involve a journey with partner SMEs from preparations for receiving investment (such as business model development and BDS support) through to matchmaking with commercial finance providers and impact investors.

4.1 Process leading to strategy and project outlines

During the inception phase, CASA employed the Inclusive Markets approach to arrive at the inception deliverables of this Inclusive Growth Strategy document and the Project Outlines within. Supported by the project's technical advisors, the CASA country teams completed the following steps of the IM approach:

- i) Development of the sector dynamics and institutional landscape (combination of desk research and key informant interview);
- ii) Analysis of systemic constraints and underlying causes of rather slow investment uptake for commercialisation of the dairy sector including validation with market actors;
- iii) Development of the inclusive growth strategy for stimulating greater investment in poultry sector along with theory of change and vision of change;
- iv) Mainstreaming of CASA crosscutting areas in (i) and (ii) above;
- v) Identification of intervention areas and design of outline projects, including initial interactions with potential SME and other partners and service providers, and completing pre-due-diligence assessments of SMEs;
- vi) Developing an initial list of potential sources of finance and investment for SME matchmaking, including accelerators and incubators for potential BDS and support to SMEs for investment readiness preparation.

The next steps in the IM process are: (a) scoping of at least five project concept notes⁵⁹ (first three months of implementation), including mainstreaming of CASA crosscutting areas; (b) design of project plans, including mainstreaming of CASA crosscutting areas and monitoring and results measurement activities, as well as partner due-diligence exercises, negotiations and contracting; (c) implementation, monitoring, results measurement and evaluation (most projects expected to commence from 1 April 2020 but possibly some quick wins beforehand); and (d) collaborating with Component C on preparing dairy SME success stories and engaging with investment actors.

For DFID to agree that a project is relevant, it may be necessary to make some changes to the outline dairy projects portfolio during scoping of the project concept notes and, subsequently, for the second round of projects.

CASA employs the following criteria to select relevant projects for producers, SMEs and the enabling environment:

- Does the project directly or indirectly target smallholders, especially women, with the capacity to step up – that is, increase production, productivity and quality to meet market requirements?
- Are there suitable actors available to partner with?
- Does the project avoid distortion of the market and create a sustainable market?
- Does the project create access to commercial markets for target smallholders?

⁵⁹ Initial samples of project concept notes were provided to DFID during the Inception Phase for feedback.

- Does the project demonstrate a business case or new business model that will attract investment to commercialise smallholder supply chains?
- Is the project feasible, sustainable, scalable and relevant (in terms of factors such as resources and timelines)?
- Are the cross-cutting issues incorporated where relevant?

CASA employs the following criteria to select SME partners:

- Annual turnover under \$2.0 million, or less than 50 employees;
- Must want finance in the range of \$100,000 \$1,000,000 either immediately or in the foreseeable future. (Exceptions could be possible to the lower limit, where there is expected to be a second round of finance meetings or the limit is expected to be exceeded during the life of the CASA project);
- Ideally has not received finance in the past. (An exception may be an SME seeking finance within the above range for a new stage of expansion);
- Engages or will potentially engage large numbers of smallholders in the supply chain; and passes CASA's due-diligence assessment.

4.2 Market potential, opportunities and growth potential

There are four drivers of commercialisation for the Nepal dairy sector:

1. More milk into the formal sector

Currently, the informal sector dominates the market, preventing milk from entering the formal sector. The informal market has been able to dominate due to unfair competition and its ability to capitalise on consumers' traditional milk consumption habits. Formalising production would improve the availability of nutritious milk products, especially in urban centres. Given the rural poor's dependence on home-produced raw milk as a food source, it is important to increase milk availability for the formal sector is generated through increases in production.

2. Improve the utilisation capacity of collection centres and processors

Processors and collectors have not been able to operate at full capacity. SMEs can work with producer groups to increase their supply and hence increase the utilisation of capacity.

3. Improve the quality of milk

Substandard milk means substandard products for processors, so they cannot compete with imported products. Processors are also stuck with traditional products such as ghee, butter, yogurt and cannot diversify into premium products. The market for premium quality products exists but businesses cannot enter it as they don't have competitive products.

4. Improve uptake of innovation and new technology

Due to underutilisation and limited market share, SMEs are reluctant to invest in innovation and technology. This has resulted in slow growth, and the products have not been able to compete in the market. The uptake of new innovation and technology can stimulate growth. In India, the dairy sector achieved growth by introducing UHT technology and Tetra packs.

4.3 Vision of change

Our **Vision of change for dairy** is as follows:

Inclusive commercialisation of the Nepal dairy sector through increased investment in dairy SMEs and increased availability of quality milk in the formal supply chain.

4.3.1 Vision of change for processors

Processors have access to more milk in the supply chain and are incentivised to produce diversified products through investment in innovation and technology.

4.3.2 Vision of change for collectors

Collection centres operate at full capacity by expanding their supply network to involve more farmers from rural areas.

4.3.3 Vision of change for producers

Producers have assured markets and are incentivised to invest in commercialising quality milk production to increase their production and income.

4.4 Intervention areas and project outlines

The CASA team employed an Intervention Logic Analysis Framework (ILAF). After identifying potential projects and activities linked to each core problem, the team further streamlined the activities across all the ILAFs and grouped them into three broad project areas (See Table 7).

Table 7: Intervention Areas and their links to growth and investments

Intervention area	Link with drivers for growth	Project	Link to investment readiness	Possible future investors
Strengthen the raw milk supply to improve utilisation capacity of collection and processing	Growing urban demand Growing demand from processors	Introduce shared logistics to improve aggregation, expand SMP production, incentivise increased milk production	Prepare for investment: Improving access to BDS Acceleration support Matchmaking with investors	M&S Holdings, True North Associates, iCapital, BFI
Improve uptake of new innovation and technology	Growing consumer demand	New decentralised business model, increased BDS, investment/finance access, product diversification, attract investors through better brand positioning	BDS support to develop and strengthen business models Acceleration and incubation support Matchmaking with investors	M&S Holdings, True North Associates, iCapital, BFI
Improve the business enabling environment	Demand from processors and producers	Implement GMP, advocate fair pricing, improved consumer awareness, regulate informal markets.	N/A	N/A



Commercial Agriculture for Smallholders and Agribusiness

The CASA programme makes the commercial and development case for investing in agribusinesses that source produce from smallholders. It does this by demonstrating how this can be done effectively, by bridging evidence gaps and by ensuring investors and policymakers have access to the right information and people to make inclusive agribusiness models succeed.

By showcasing successful models for businesses that source produce from smallholders and pulling together the evidence base supporting the commercial and development impact of their business models, CASA will attract more investment into the sector, boosting economic growth and raising demand for smallholder produce.

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