

Ensuring Environmental Sustainability in Value Chain Development

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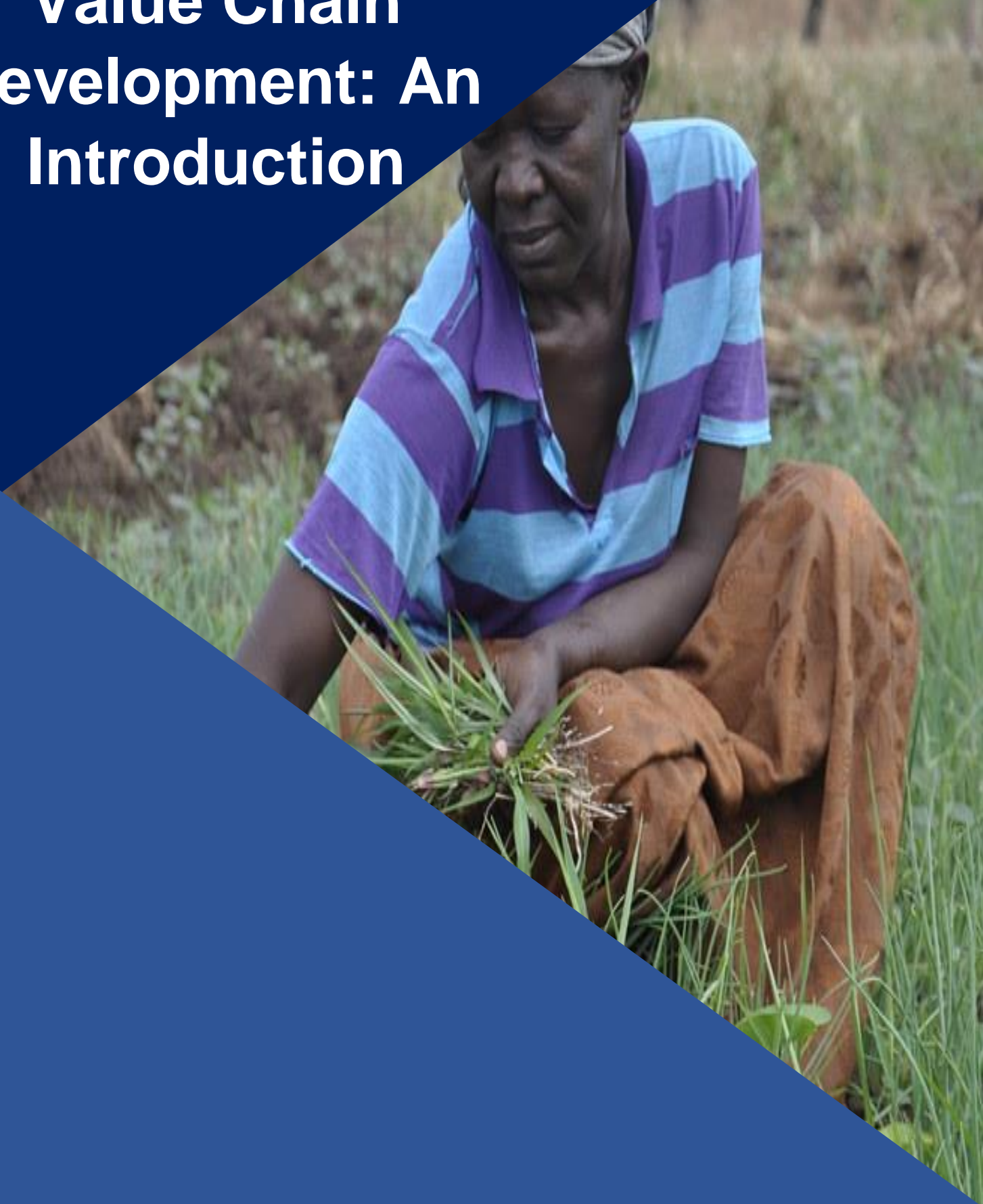
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Environment Sustainability in Value Chain Development: An Introduction



Environment Sustainability in Value Chain Development: An Introduction

Role of Environment Sustainability in Value Chains

Value Chain Development is an increasingly popular methodology for promoting growth and development across the globe, especially in the developing countries. It has the potential to improve working conditions, generate livelihoods, and lead to overall upliftment of society. However, with the changing times, environmental challenges such as biodiversity loss and climate change have impacted the economic and social dimensions of the value chains. Thus, environmental sustainability is a crucial component of future value chain development.¹

Environmental sustainability is the responsibility to conserve natural resources and protect global ecosystems to support health and wellbeing, now and in the future. Because so many decisions that impact the environment are not felt immediately, a key element of environmental sustainability is its forward-looking nature.² Integrating environmental considerations in Value chain development is increasingly important for several reasons:

- Environmental challenges can undermine the **growth and viability of sectors and economic activities**, compromising the impacts of interventions promoting sector development without any environmental lens.
- Many **emerging business opportunities in the green economy** may provide decent jobs and increase income prospects.
- The approach 'growth first, clean up later' is no longer viable as it entails **economic and social costs in the long run**; rather, comprehensive environmental considerations must be addressed at the onset of any strategy seeking to advance economic and social development.

Moreover, Environmental Sustainability does not have to be at odds with the business and economic goals of a value chain. Thus, adopting the right ways to ensure environmental sustainability in a value chain can be aligned with the profits and economic upliftment of the region.

Ways to Ensure Environmental Sustainability in Value Chain Development

Greening Value Chains³

Today, more and more products and services pass through global value chains to reach the end consumer. The goal of optimizing productivity at each level of the chain anywhere in the world is to impact on natural resource use at different stages. These value chains utilize valuable resources that need to be protected, harvested, and utilized in a sustainable manner to ensure the sustainable development of the sector. Thus, Greening Value Chains are those value chains that integrate both economic as well as environmental betterment of the sector at the same time.

¹ International Labour Organization. (n.d.). *Environmental Sustainability in Market Systems and Value Chain Development for Decent Work: A short guide for analysis and intervention design*.

² Sphera. (May,2020). What Is Environmental Sustainability?.

³ Donor Committee for Enterprise Development. (June, 2012). *Green Value Chains to Promote Green Growth*.

Greening Value Chains aims to improve the overall natural sustainability by optimizing links between each value chain actor and utilizing the natural resources efficiently. All the stages in a green value chain focus on rationalizing the natural inputs into the value chain and controlling the outputs affecting the natural environment.

Sustainability Solutions for Value Chains

Various environmental factors that affect and are affected by the growth and value chain development, include:

- **Biodiversity loss:** Biodiversity loss is caused by climate change, deforestation, soil degradation, overexploitation (overharvesting, overfishing), and disruption of ecosystems. Significant biodiversity loss generally occurs in agricultural value chains associated with the extraction of natural resources, as well as on and around production sites such as Honey value chain. This Biodiversity loss can undermine the viability of the sources upon which jobs and sectors depend, thus affecting prospects for long-term operation.
- **Greenhouse gas emissions:** Greenhouse gases (GHG) emissions trap heat in the atmosphere and cause climate change. Carbon dioxide (CO₂) constitutes the majority of greenhouse gases emitted, followed by methane (CH₄), nitrous oxide (N₂O), and fluorinated gases. Some of the major greenhouse gas emissions through agriculture value chains are as follows:
 - CO₂ is released into the atmosphere with degenerative soil management and combustion of fossil fuels, which happens most significantly in transportation, and electricity production.
 - CH₄ emissions are most prominent in agriculture value chains such as livestock stock value chains, and waste management (organic materials in landfills).
 - N₂O is emitted in agriculture through the over-application of fertilizers, transportation (fuel combustion), processing of products (chemical production for synthetic materials), and waste management after the production and processing (treatment of wastewater).
- **Waste management and land, air, and water pollution:** The agriculture sector globally is responsible for generating approximately 11.4 billion tons of biomass worldwide, including residues from crop production and industrial processing. Improper disposal of agricultural residues results in environmental pollution and the waste of valuable biomass resources. Management of agricultural waste is particularly suboptimal in developing countries where low-added-value traditional practices to manage the residues are commonplace.⁴
- **Resource efficiency and utilization:** With the growth and prosperity of agricultural practices and value chains throughout the world, there is also a significant increase in demand for resources, particularly energy, land, and water. Poor management of resources such as poor agricultural practices deplete biodiversity and water-holding capacity of the soil, and the continued expansion of land use for agriculture often results in deforestation.
- **Climate change impacts and disaster risks:** Changes in climate affect weather patterns and cause floods, droughts, heat waves, and extreme storms that negatively impact the sustainability of value chains and devastate livelihoods, particularly in vulnerable sectors like agriculture.

⁴ Sepulveda D. et.al, (2021). *Bio-Based Value Chains Potential in the Management of Cacao Pod Waste in Colombia, a Case Study*. MDPI.

Agri-food products pass through a number of stages during their life cycle, with different environmental impacts at each stage.⁵ Figure 1 below, illustrates the potential environmental risks at different stages of an agricultural value chain that might hamper the environmental sustainability of the sector.⁶

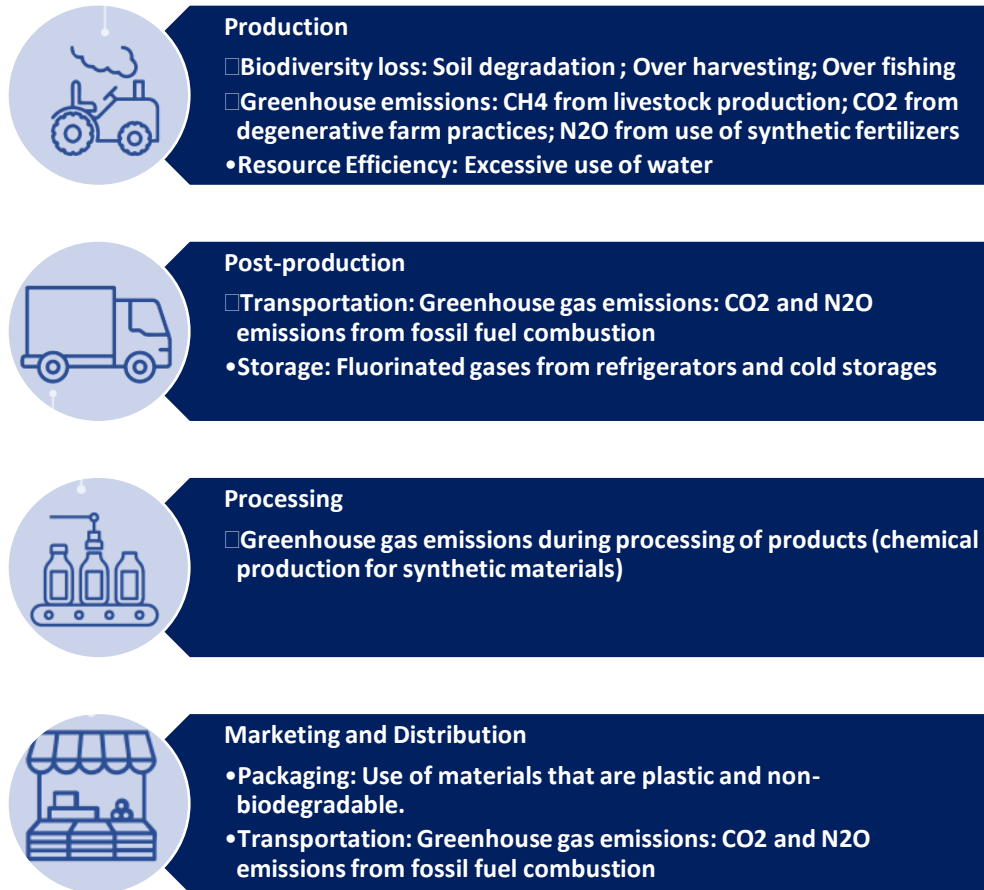


Figure 1: Environmental risks at stages of agriculture value chain

A full accounting of the environmental effects of food systems should, therefore consider impacts at each stage in order to find sustainable solutions to mitigate the impact of various environmental factors. Such evidence can show which specific stages of food value chains contribute a greater share of environmental impacts and should therefore be the focus of efforts to improve environmental performance. Understanding environmental performance along food value chains thus holds the promise of unlocking new possibilities for reducing the environmental damage of food systems and lead to environmental sustainability of the sector.⁷

⁵ Deconinck K. & Toyama L. (September, 2022). *Environmental impacts along food supply chains*. OECD.

⁶ International Labour Organization. (n.d.). *Environmental Sustainability in Market Systems and Value Chain Development for Decent Work: A short guide for analysis and intervention design*.

⁷ Deconinck K. & Toyama L. (September, 2022). *Environmental impacts along food supply chains*. OECD.

Greening Value Chains



Greening Value Chains

In order to ensure environmental sustainability in value chain development, various countries globally have been promoting greening value chains to maximize economic benefits while the environmental harm is minimized.⁸ Two case studies of Greening Value chains from Tanzania and Uganda have been discussed below:

Honey Value Chain in Tanzania

Introduction

Role of Honey Value Chain as a Greening Value Chain

Honey Value chain is one of the major greening value chains that is both focused on pro-poor and also contributes to biodiversity and ecosystem conservation.⁹ Boosting growth of honey value chain increases the production of honey by increasing the number of trees, especially bee loving trees, and utilizing better forest management methods to preserve biodiversity. On the other hand, it also develops markets for finished products, generating income and creating more job opportunities for the local populations living in and around those highly biodiverse areas. Thus, the development of this green value chain reduces pressure on natural resources, encourages communities to support conservation efforts, promotes community solidarity, builds capacity among community leaders, including women, and improves the livelihood of the population.¹⁰

Honey Value Chain in Tanzania: An overview

Tanzania is the second leading honey producer in Africa after Ethiopia producing approximately 8,000 tonnes annually.^{11 12} Beekeeping is a growing sector in Tanzania that has great potential to conserve the environment as well as improve the livelihoods of poor smallholder farmers. The country has about 33.5 million hectares of forests and woodlands scattered throughout the country, making it an ideal place for developing the beekeeping industry. The honey

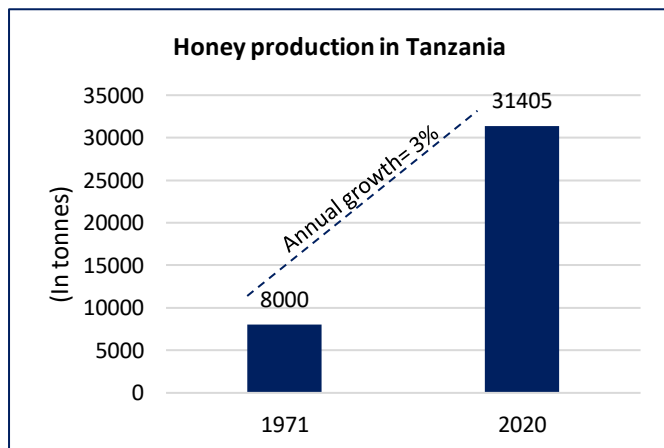


Figure 2: Honey production in Tanzania (1971-2020)

⁸ United Nations Industrial Development Organization. (June,2013). *Greening Value Chains For Sustainable Handicrafts Production in Viet Nam*.

⁹ Oduor A R, et, al. (2015). *Honey value chain development*. World Agroforestry.

¹⁰ Climate Chance. (2019). *Developing the Honey Value Chain for Kilum-Ijim Forest Conservation and Livelihood Improvement*.

¹¹ Norton Rose Fulbright. (2016). *The African bee-keeping story Local opportunities to satisfy a global demand*.

¹² Msolla P. (2020). *Honey Value Chain Development in Ruvuma Region, Tanzania*. University Of Agriculture.

produced in Tanzania is well known globally due to its flavor and organic nature. As illustrated in Figure 2, the production of honey of United Republic of Tanzania increased from 8,000 tonnes in 1971 to 31,405 tonnes in 2020 growing at an average annual rate of 3.00%.¹³ Additionally, the honey production in Tanzania in 2020 was accounted at 31,405 tonnes whereas approximately 1894 tonnes of Beeswax were produced.¹⁴

Challenges and Recommendations

Despite being one of the major growing sectors in Tanzania, honey value chain often deals with various challenges at different stages of the value chain that hampers its growth. Some of the major challenges with recommendations to overcome these hinderances are given below:

Value chain stage	Category	Challenge	Recommendation
Inputs	Beekeeping Equipment	Limited affordability of the beekeeping equipment: Although the beekeeping equipment is relatively well available in the country, the affordability of the beekeeping equipment is a severe constraint because of its high cost and low purchasing power of community.	Promote savings and inter loaning amongst farmers: Encourage farmer producer organizations to save and inter loan among themselves Bulk procurement of the beehives by the government can also reduce the prices.
	Access to finance	Limited Access to Finance: The limited access to finance constrains the community to invest in modern beekeeping equipment	Encourage Farmer producer organization to be a part of the SACCAS and SACCOS.
Production	Beekeeping practices	Weak beekeeping practices in the area: Beekeeping practices are relatively new to the sector. Moreover, as there are limited number of bee experts in the country, the extension support services available are limited.	Beekeeping training and demonstrations at the farmers' field: Organizing Beekeeping trainings in collaboration with the beekeeping experts, SIDO and Mavuno (NGO working in Kagera) for adoption of practices can create awareness amongst value chain actors. Exposure visits to successful beekeeping groups and farmer field schools: Community led initiatives such as Exposure visits

¹³ Knoema. (2020). Honey production in the United Republic of Tanzania.

¹⁴ Knoema. (2020). Honey production in the United Republic of Tanzania.

<p>Marketing & Distribution</p>	<p>Marketing</p>	<p>Low prices in the local market: The main market for honey in Tanzania is the local market which provides low price due to supply glut.</p> <p>Limited access to lucrative urban market: The access to lucrative urban market is limited due to lack of awareness, marketing skills and low-quality packaging of honey</p> <p>Limited skills in record keeping and business planning: Inadequate skills in record keeping and business planning often creates tensions among the group members when it comes to distribution of revenues.</p> <p>Limited bulk marketing of honey: Limited bulk marketing and high cost to be incurred for complying with regulations hampers the sectoral growth. modern beekeeping equipment.</p>	<p>could also lead to adoption of practices</p> <p>Capacity building of farmer producer organizations and individual farmers: Farmer producer organizations and individual farmers have to be strengthened on marketing, record keeping and business planning skills for them to work smoothly</p> <p>Introduce efficient packaging technology: Packaging technology has to be introduced and demonstrated at the farmer level so that the marketability of their products improves, which enables them to access urban market with high price</p> <p>Facilitate market linkages: Market linkages can be facilitated by conducting market assessments as well as identifying buyers and sellers through websites and selling centers.</p>
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Table 1: Challenges and Recommendation for Honey value Chain in Tanzania

Milk Value Chain in Uganda

Introduction

Role of Milk Value Chain as a Greening Value Chain

The livestock sector in Uganda contributed 18 % to the agricultural GDP, with dairy thought to be contributing 80% of the livestock sector GDP as of 2017. The dairy sector plays a very important role in the lives of many Ugandans, as a source of food, income and employment as it employs more than

100,000 people in Uganda.^{15 16} From a livelihoods perspective, the sector provides perhaps the one commodity—milk—that is available most of the year as a source of income for the rural poor.¹⁷

Milk Value Chain in Uganda: An overview

Milk is an important product in Uganda which has high potential to increase income, improve nutrition security and empower women. The milk value chain consists of various actors such as input suppliers, smallholder and commercial farmers, traders, processors (formal and informal), local vendors and supermarkets and grocery shops, exporters and consumers.¹⁸ Figure 3 provides a brief overview of the Milk value chain in Uganda.

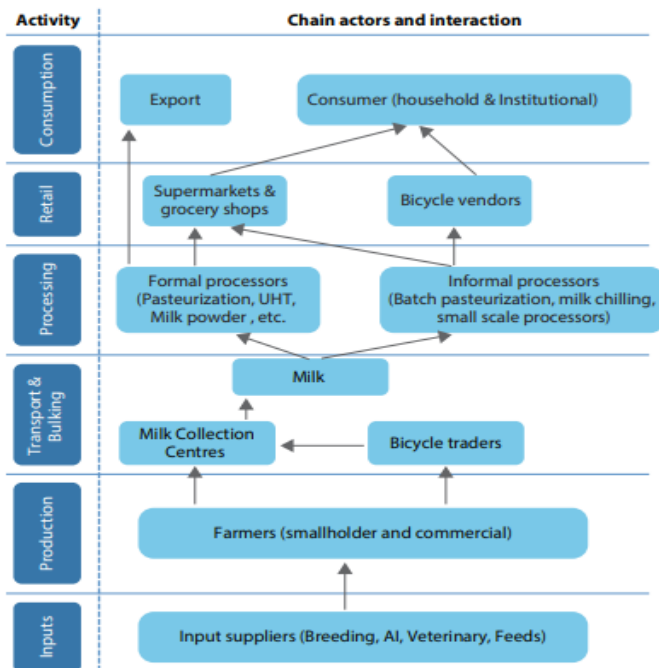


Figure 3: Dairy Value Chain in Uganda

Between 2017-2021, the milk production in Uganda has seen a consistent increase. As of 2017, the quantity of milk produced was recorded at 2.28 billion litres, which increased to 2.81 litres in 2021, thereby registering a growth of 23%. However, the quantity of milk production in 2021 fell short of the target of 3 billion litres.¹⁹ Figure 4 illustrates the production quantity of milk between 2017-2021.

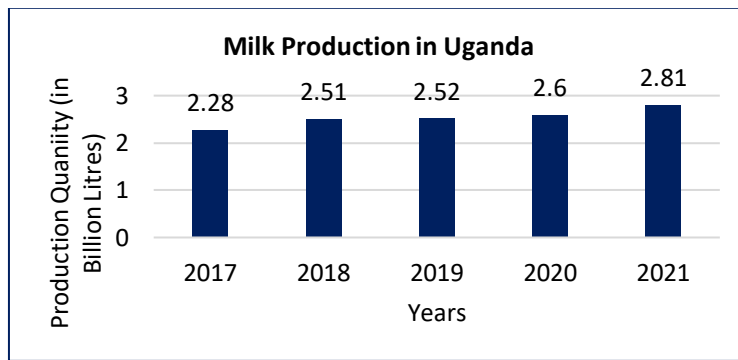


Figure 4: Milk Production in Uganda²⁰

¹⁵ SNV/Netherlands Development Organization. (2016). *Enhancing climate change outcomes in development programs in Uganda: Increasing resilience and lowering emissions in the dairy value chain.*
¹⁶ Dairy Development Authority. (July 2021). Dairy Subsector and DDA Performance Highlights: Annual Report.
¹⁷ United Nations Development Programme. (n.d.). *Nationally Appropriate Mitigation Action on Climate Smart Dairy Livestock Value Chains in Uganda*
¹⁸ United Nations Development Programme. (n.d.). *Nationally Appropriate Mitigation Action on Climate Smart Dairy Livestock Value Chains in Uganda*
¹⁹ Dairy Development Authority. (July 2021). Dairy Subsector and DDA Performance Highlights: Annual Report.
²⁰ Dairy Development Authority. (July 2021). Dairy Subsector and DDA Performance Highlights: Annual Report.

In terms of export earnings, as of 2021, dairy exports in Uganda reached a record high of 358.6 billion UGX in the last four years and nearly doubled compared to FY 2019/20.²¹

Challenges and Recommendations

Despite being one of the fastest growing sub-sectors in Uganda, the Dairy subsector is characterized by a variety of constraints that hamper its development. Some of the major challenges and recommendations to address these challenges are given below

Value chain stage	Category	Challenge	Recommendation
Inputs	Feed	<p>Low Availability and Quality of Feed: This has been a result of overgrazing leading to environmentally unsustainable practices</p> <p>Unawareness regarding feeding systems: Farmers are not aware of practicing silo feeding system and forage production</p> <p>Limited awareness on feed preparation</p>	<p>Trainings of Farmers on feeding systems: Farmers have to be trained on forage production and silo-based feeding system which will lead to decrease in overgrazing. Farmers have to be trained on the silage as well as feed preparation</p> <p>Encourage the participation of Private Service Providers: Private service providers such as Community Agro Vet Entrepreneur (CAVE) in EADD project have to be trained so that the farmers can access the inputs including feed from them</p>
	Water	<p>Limited access to water: This has led farmers to take their cattle to drink water from the wetlands, rivers and Lake Victoria which has led to overgrazing of wetlands</p>	<p>Invest in construction water harvesting structures: Water harvesting structures, deep wells and check dams (chaco) can bring water closer to the livestock keepers and decrease over grazing of wetlands. Farmer Producer Organizations should negotiate favorable earth moving equipment rentals from Local Governmental Authorities which will allow them to construct these water harvesting structures</p>

²¹ Dairy Development Authority. (July 2021). Dairy Subsector and DDA Performance Highlights: Annual Report.

	<p>Access to Finance</p>	<p>Limited access to finance: The limited access to finance constrains the community to invest in cattle</p>	<p>Promote inter-loaning among farmers: Encourage farmer producer organizations to save and interloan among themselves</p> <p>Encourage FPOs to join SACCOS: Farmer producer organization members should also be encouraged to be part of the SACCOS to improve access to finance</p> <p>Create awareness among banks to encourage loaning to FPOs: Farmer Producer Organizations should negotiate low interest rates with the Banks and provide loans to its members who would like to start dairy business as well as youth who can act as healthcare and AI service providers</p> <p>Provision of advance credit facility: Services to the farmers can be financed on credit and deducted from their payment directly at the collection Centre level</p>
<p>Production</p>	<p>Livestock management practices</p>	<p>Weak extension systems: Public extension system is weak because of the lack of incentive and resources for the field extension agent</p> <p>AI services are unaffordable for farmers</p>	<p>Strengthen Government Extension Services: Government extension service providers have to be strengthened in terms of increasing the manpower and improving their capacities</p> <p>Engage Collection Centres in provision of trainings: Milk Collection Centres can be ideal for delivering livestock management practice trainings. In this respect, the hub model of Eastern Africa Dairy Development (EADD) Project and primary society model of Uganda Crane Creamier Union has to be further studied for uptake</p> <p>Engage private service providers in provision of extension services: Private service providers such as Community Agro Vet Entrepreneur (CAVE) and Community Facilitator in EADD project have to be trained so that the farmers can access their</p>

			services on livestock management practices as well as AI services which will lead to decrease in the number of livestock heads
	Healthcare	<p>Lack of availability of good quality drugs: Good quality drugs and medicines are not available to treat the cattle diseases</p> <p>Weak Public healthcare system: This is due to the lack of incentive and resources for the healthcare agent</p>	<p>Improve awareness regarding high quality medicines: Awareness has to be improved for farmers on high quality medicines and drugs which will help them to maintain good health of their cattle</p> <p>Engage private service providers: Private service providers such as CAVE have to be trained so that the farmers can access their veterinary services. The trained private service providers have to be linked to the right and trustable farm input supplier which has been done in EADD</p> <p>Formulate an Animal disease plan annually: This would help in systematically determining the potential diseases, requisite treatment and money required to pay for these medicines and vaccines</p> <p>Leverage public sector extension systems: Linkages with the public extension system has to be leveraged through the medium of farmer producer organizations for the provision of vaccines and medicines wherever possible</p>
Processing	Storage and Primary Processing	<p>Limited access to refrigeration and milk chilling plant: This decreases the shelf life of milk and results in low prices</p> <p>Limited awareness of processing milk to cheese, yoghurt and butter</p>	<p>Construction of Milk chilling plants in collection centers on a demonstration basis to show the advantages of increased shelf life which will improve income and enable the farmers to invest in improved forage and cross breeds Farmers can be trained on milk processing</p> <p>Encourage linkages of equipment suppliers and FPOs: Linkages of dairy equipment suppliers with the farmer producer organizations have to be encouraged</p>

<p>Marketing & Distribution</p>	<p>Marketing</p>	<p>Milk is mainly sold in local markets due to supply glut: Due to limited organization of dairy producers, the main market for milk is local market which provides low price due to supply glut</p> <p>The access to lucrative urban market is very limited due to limited awareness, organization, marketing skills and refrigeration infrastructure</p> <p>Limited skills in record keeping and business planning leads to poor business decisions</p>	<p>Facilitate access to refrigeration through Collection Centres: Construct collection Centres in which access to refrigeration and chilling facilities will be facilitated</p> <p>Capacity Building of farmers: Training on the marketing, record keeping and business planning so that the farmers can run a successful farming business</p> <p>Facilitate market linkages between FPOs and processors: Market linkages with the dairy processors should be facilitated for the farmer producer organization so that they can get a stable market for their product</p> <p>Provide financial support to youth entrepreneurs: Youth entrepreneurs have to be supported financially to provide the transportation services to the farmers to access the collection centers following EADD model</p>
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Table 2: Challenges and Recommendations for Milk Value Chain in Uganda

Sustainability Solutions for Value Chains



Sustainability Solutions for Value Chains

As discussed in Chapter 1, agrifood systems account for a significant share of global environmental pressures such as greenhouse gas emissions, water pollution, and biodiversity loss at various stages of the value chain. Thus, addressing these pressures will require action not only by agricultural producers, but also by other supply chain actors, consumers, and policy makers.²² Additionally, informing these decisions requires evidence on environmental impacts along food value chains which can be done through a proper value chain assessment to understand at what stages the problem lies. The case studies of two countries, Sri Lanka and Mongolia have been given below:

Fisheries Value Chain in Sri Lanka

Introduction

The fisheries industry is a key sector in Sri Lanka which is capable of making a greater contribution towards the GDP of the country. In 2019, the fisheries sector contributed to almost 1.9 percent of the country's Gross Domestic Product.²³

The sector fulfills the requirements of nutritional intake of the people while constituting livelihood of about 2 million population.²⁴ The Coastal and marine fisheries provide full-or part time employment opportunities to almost 1 million people and support the livelihoods of another 3.6 million Sri Lankans.²⁵

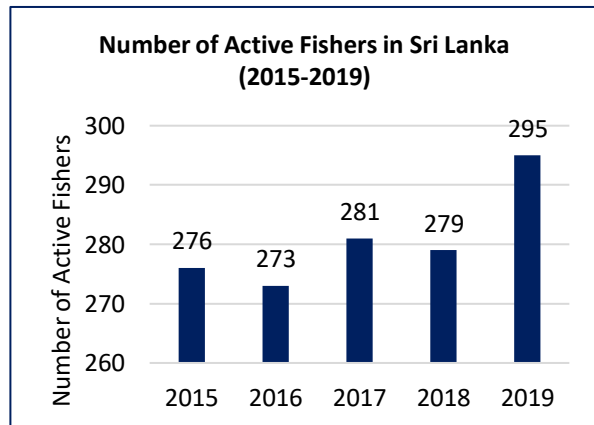


Figure 5: Number of Active Fishers in Sri Lanka (2015-2019)

Sri Lanka has a total of 16 fish producing districts. Tangalle and Galle districts together contributed to 27% of the total marine Fish production in 2018. Moreover, in 2018, there were 181,880 marine fishing households and 56,250 inland fishing households in Sri Lanka. As illustrated in Figure 5, between 2015 and 2019, the number of active fishers in Sri Lanka increased by 7% from 276,010 in 2015 to 295,325 in 2019.^{26 27}

²² Deconinck K. & Toyama L. (September, 2022). *Environmental impacts along food supply chains*. OECD.

²³ World Bank. (March,2022). *Sri Lanka and the World Bank Explore Path to Sustainable and Inclusive Growth for the Fisheries Sector*.

²⁴ Department of Fisheries and Aquatic Resources. (2022). *Welcome to the Department of Fisheries and Aquatic Resources*

²⁵ World Bank. (March,2022). *Sri Lanka and the World Bank Explore Path to Sustainable and Inclusive Growth for the Fisheries Sector*.

²⁶ Ministry of Fisheries. (2019). *Fisheries Statistics 2019*. Ministry of Fisheries.

²⁷ Ministry of Fisheries. (2020). *Fisheries Statistics 2020*. Ministry of Fisheries.

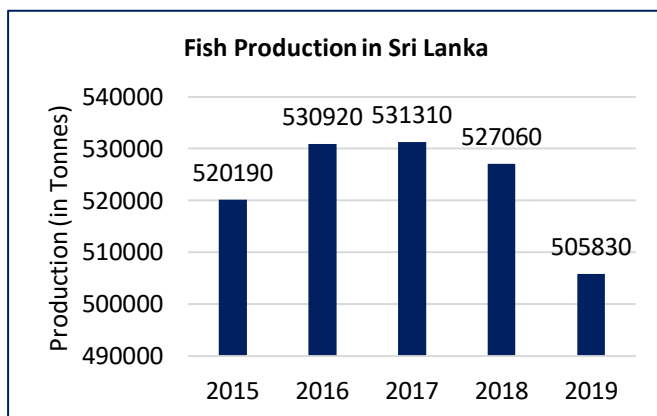


Figure 6: Fish production in Sri Lanka (2015-2019)

Between 2015-19, the total fish production in Sri Lanka declined by 2.76 % from 520,190 tons in 2015 to 505,830 tons in 2019 (Figure 6²⁸²⁹). However, during the same period, the contribution of marine fish production to total fish production was consistently higher than that of inland and aquaculture fish production. Marine production contributed an average of 84.46 % to total fish production while the inland and aquaculture fish production contributed an average of 15.35% to total fish production.

Sri Lanka’s fish exports have consistently increased. Between 2015 and 2019, Sri Lanka’s worth of Fish exports grew by 62.8% from 182 million USD to 295 million USD. Some of the exported products include sashimi quality tuna, tuna loins, fresh tuna steaks, tuna topping and tuna saku blocks. Additionally, the major export destinations of Sri Lankan fish products are Europe and America.

Despite huge significance given to the sector, the sector also deals with various environmental challenges such as overfishing, declining fish stocks, degradation of coastal ecosystems due to habitat destruction, and pollution. These challenges hamper the growth of the sector and restricts it to meet its full potential. Thus, sustainable management of fisheries sector is key to ensuring sector’s growth and development and meeting the high domestic demand of fish.

Challenges and Recommendations

Some of the major environmental challenges faced by fisheries sector in Sri Lanka and recommendations to overcome them are given in the Table 3³⁰³¹³² below:

Constraints Observed	Challenge	Recommendation
Environmental Impact of Value Chain	Decline in fish stock due to Overfishing: Overfishing has led to a significant decline in fish stock in several fisheries	Conducting a stock assessment study
	Degradation of coastal zones due to human expansion: Human population growth and expansion of infrastructure has led to a degradation of coastal zones	Increasing investments in rebuilding fish stock: Investment in rebuilding fish stock in overfished regions should be increased Establishment of permanent or temporary no-fishing zones: Areas important for reproduction of

²⁸ Ministry of Fisheries. (2020). Fisheries Statistics 2020. Ministry of Fisheries.

²⁹ Ministry of Fisheries. (2019). Fisheries Statistics 2019. Ministry of Fisheries.

³⁰ World Bank. (2021). Priorities for Sustainably Managing Sri Lanka’s Marine Fisheries, Coastal Aquaculture, and the Ecosystems That Support Them. World Bank.

³¹ Maheepala, A. (2016). Identifying International Fisheries Management Initiatives and fisheries law enforcement barriers in Sri Lanka –Fishers’ prospects. United Nations.

³² Environmental Foundation (Guarantee) Ltd. (2020). Comments on the Environmental Impact Assessment Report (EIAR) of the proposed Northern Province Sustainable Fisheries Development Project- Point Pedro Fisheries Harbor Development Project. Environmental Foundation (Guarantee) Ltd.

	<p>Reduction in fish stock due to destructive fishing practices: Destructive fishing practices such as the use of dynamites have reduced fish stock and damaged several fishing regions</p> <p>Invasive species and new parasites and diseases introduced through imported fishes: Fishing harbours with imported fish affect the local biodiversity of the region with the introduction of invasive species and new parasites and diseases</p>	<p>fingerlings should be set aside, and permanent or temporary no-fishing zones could be established</p> <p>Regulating fishing practices: Fishing practices such as the use of dynamites should be regulated so as to prevent damage to fishing regions</p> <p>Technology innovation to deal with diseases and parasites: Steps to contain the growth of invasive species and technology innovation to deal with diseases and parasites among the existing fisheries</p>
<p>Impact of Environmental changes on Value Chain</p>	<p>Migration of fishers to other sectors due to rebuilding fishing stocks in overfished areas: Rebuilding fishing stocks in overfished areas will have adverse implications such as migration of fishers to other sectors and dependence on imports to meet domestic needs for fish</p> <p>Rising sea levels and ocean acidification: Rising sea levels and ocean acidification have significantly impacted the distribution of marine and fresh water fish species</p> <p>Polluted Anchorages and landing centres: Anchorages and landing centres are often polluted which affects the quality of the produce</p>	<p>Formulation of mitigation strategies to address the socioeconomic impact of rebuilding fish stocks: A mitigation strategy to address the socioeconomic impact of rebuilding fish stocks should be formulated</p> <p>Investments in climate-resilient and green infrastructure: Investments in climate-resilient and green infrastructure such as waste disposal and recycling mechanisms around harbours should be increased in order to minimize pollution</p> <p>Investments in restoration of fishery ecosystems: Investments can be made through water quality enhancement, waste assimilation, nutrient recycling, etc.</p>

Table 3: Environmental Constraints and Opportunities in Fisheries sector, Sri Lanka

Cashmere Wool Value Chain in Mongolia

Introduction

The world cashmere market produces an average of 24,000 tons of cashmere a year, of which Mongolia supplies 40% (9.6 thousand tons)³³ making it the world’s second largest cashmere producer. Given its unique natural environment, Mongolia is well suited to sustaining large herds of sheep and cashmere goats and producing high-quality wool and cashmere for the global markets.³⁴

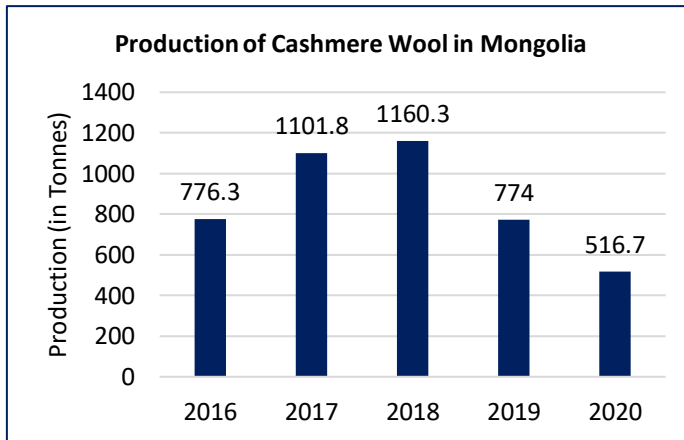


Figure 7: Production of Cashmere Wool in Mongolia (2016-2020)

The Mongolian cashmere wool sector is an important pillar of the country’s economy, supporting about a million nomadic herders.³⁵ However, between 2016-2020, the production of combed Cashmere Wool declined by 33.4% from 776.3 tonnes in 2016 to 516.7 tonnes in 2020 (Figure 7^{36,37}). The major producer of Cashmere Wool in Mongolia is the Gobi Corporation. The current purchase price for raw and processed cashmere depends on quality, yield, and color, with the price set according to international market prices.³⁸

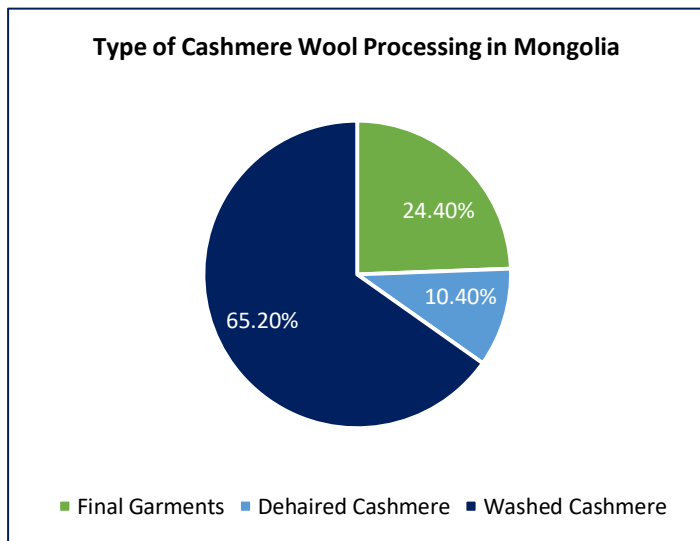


Figure 8: Type of Cashmere Wool Processing in Mongolia

The cashmere-wool industry is one of the most successful industries in Mongolia as its exports have the highest value per unit of weight (value density). However, between 2016-2020, Mongolia’s worth of combed Cashmere Wool exports declined by 49.14% from 331,900 USD in 2016 to 168,800 USD in 2020. The primary export markets for Cashmere Wool are China and European Union (EU) and over 70% of washed Cashmere Wool is exported to these regions.

As of 2019, income from cashmere is primarily from raw cashmere. As

³³ Myagmarjav S. et.al. (July,2021). *Cashmere Initiatives Working Together to Improve the Value Chain*. UNDP

³⁴ World Bank. (May, 2019). *Mongolia Central Economic Corridor Assessment: A Value Chain Analysis of the Cashmere-Wool, Meat, and Leather Industries*.

³⁵ CSCP. (n.d.). *Bringing Value to the Mongolian Cashmere Wool Sector Through Sustainability*.

³⁶ Spina, M. (2021). ANNUAL CASHMERE MARKET REPORT 2020. Retrieved from The Schneider Group

³⁷ National Statistical Office of Mongolia. (2021). Statistical Database. Retrieved from National Statistical Office of Mongolia

³⁸ World Bank. (May, 2019). *Mongolia Central Economic Corridor Assessment: A Value Chain Analysis of the Cashmere-Wool, Meat, and Leather Industries*.

illustrated in Figure 8³⁹, only 24% of the total cashmere in Mongolia is made into final products locally. Thus, while Mongolia supplies 40% of raw cashmere, it only supplies 12% of the market demand for cashmere products.⁴⁰

Apart from the great significance this sector holds for Mongolia, the increase in the demand for cashmere products has led to an increase in the number of goats, which has led to overgrazing and pasture degradation.⁴¹ The sector also faces various other challenges (as discussed in the next section) which need to be addressed through various sustainable solutions in order to tap the full potential of the sector.

Challenges and Recommendations

Some of the major environmental challenges faced by Cashmere Wool sector in Mongolia and recommendations to overcome them are given in Table 4 ⁴²below:

Constraints Observed	Challenges	Recommendations
Environmental Impact of Value Chain	<p>Overgrazing due to large herd sizes Large herd sizes have led to overgrazing thereby leading to the deterioration of the vegetation cover in pasture lands</p>	<p>Regulating the size of heard The size of herds should be regulated based on availability of grazing lands</p>
	<p>High environmental pollution from Cashmere goats: Carbon emissions from Cashmere goats are relatively high thereby leading to higher environmental pollution</p>	<p>Regulating the number of Cashmere Goats: Number of Cashmere goats in Mongolia should be limited to 10 million in order to reduce carbon emissions and prevent overgrazing</p>
Impact of Environmental changes on Value Chain	<p>Significant decline in pasture due to low rainfall: Low rainfall has led to a significant decline in pasture growth in recent years</p>	<p>Increasing investments in irrigation projects: The investments in irrigation projects should be increased so as to ensure adequate supply of water for pasture lands</p>
	<p>Large scale deaths due to volatile weather conditions: Volatile weather conditions have led to feed shortages thereby causing large scale deaths among Cashmere goat herds.</p>	
	<p>Limited availability of water due to destruction of natural springs: The destruction of natural springs has led to limited availability of water for goat herds</p>	<p>Increasing production of stockfeed and investing in storage facilities: Increasing production of stockfeed and investing in storage facilities for stockfeed should be promoted so as to ensure adequate supply of the same for the herds</p>
	<p>Reduction in growth of plants due to rodents: Eastern regions in Mongolia have</p>	

³⁹ Myagmarjav S. et.al. (July,2021). *Cashmere Initiatives Working Together to Improve the Value Chain*. UNDP.

⁴⁰ Myagmarjav S. et.al. (July,2021). *Cashmere Initiatives Working Together to Improve the Value Chain*. UNDP.

⁴¹ Myagmarjav S. et.al. (July,2021). *Cashmere Initiatives Working Together to Improve the Value Chain*. UNDP.

⁴² Supper, L. (2019). *Assessing sustainability of Mongolia’s Cashmere production*. University of Natural Resources and Life Sciences.

	<p>a large number of rodent varieties known as Brandt’s vole which have destroyed the growth of plants thereby leading to the desertification of pasture lands</p> <p>Increased risk of vector-borne diseases due to rising temperatures: Rising temperatures have increased the risk of vector-borne diseases such as rift-valley fever or blue-tongue disease among Cashmere goats</p>	<p>Protection of Natural Springs: Natural springs should be protected and a programme to revive natural springs that have been destroyed should be introduced</p> <p>Using pesticides to eliminate rodents: Pesticides to eliminate Brandt’s vole should be applied on a large scale on pasture lands to prevent the damage of valuable feed crops</p> <p>Availability of vaccines for vector-borne diseases: Cashmere goat herders should have access to vaccines for vector-borne diseases at affordable costs</p>
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Table 4: Environmental Constraints and Opportunities in Cashmere Wool sector, Mongolia

References

- Climate Chance. (2019). *Developing the Honey Value Chain for Kilum-Ijim Forest Conservation and Livelihood Improvement*. Retrieved, October 2022, from <https://www.climate-chance.org/en/best-practices/developing-the-honey-value-chain-for-kilum-ijim-forest-conservation-and-livelihood-improvement/>
- CSCP. (n.d.). *Bringing Value to the Mongolian Cashmere Wool Sector Through Sustainability*. Retrieved, October 2022, from https://www.cscp.org/mongolian_cashmere_wool/
- Dairy Development Authority. (July 2021). *Dairy Subsector and DDA Performance Highlights: Annual Report*. Retrieved, October 2022, from <https://dda.go.ug/assets/files/DDA-annulareport20-21.pdf>
- Deconinck K. & Toyama L. (September, 2022). *Environmental impacts along food supply chains*. OECD. Retrieved, October 2022, from https://www.oecd-ilibrary.org/agriculture-and-food/environmental-impacts-along-food-supply-chains_48232173-en
- Department of Fisheries and Aquatic Resources. (2022). *Welcome to the Department of Fisheries and Aquatic Resources*. Retrieved, October 2022, from http://www.fisheriesdept.gov.lk/web/index.php?option=com_content&view=article&id=1&Itemid=106&lang=en#:~:text=The%20fisheries%20industry%20is%20a,of%20about%20%20million%20population.
- Donor Committee for Enterprise Development. (June, 2012). *Green Value Chains to Promote Green Growth*. Retrieved, October 2022, from https://www.enterprise-development.org/wp-content/uploads/Green_Value_Chains_to_Promote_Green_Growth.pdf
- Environmental Foundation (Guarantee) Ltd. (2020). *Comments on the Environmental Impact Assessment Report (EIAR) of the proposed Northern Province Sustainable Fisheries Development Project- Point Pedro Fisheries Harbor Development Project*. Environmental Foundation (Guarantee) Ltd, Retrieved, October 2022, from https://efl.lk/wp-content/uploads/2020/04/EFL-Point-Pedro-Harbour-EIA-comments_FINAL.pdf
- International Labour Organization. (n.d.). *Environmental Sustainability in Market Systems and Value Chain Development for Decent Work: A short guide for analysis and intervention design*. Retrieved, October 2022, from https://www.ilo.org/wcmsp5/groups/public/---ed_emp/---emp_ent/documents/publication/wcms_779348.pdf
- International Trace Centre. (2021). *European Market for Tanzanian Bee Products*. Retrieved, October 2022, from <https://intracen.org/taxonomy/term/5994>
- Knoema. (2020). *Honey production in the United Republic of Tanzania*. Retrieved, October 2022, from <https://knoema.com/data/agriculture-indicators-production+honey+united-republic-of->

[tanzania#:~:text=The%20production%20of%20honey%20of,average%20annual%20rate%20of%203.00%25.](#)

- Maheepala, A. (2016). Identifying International Fisheries Management Initiatives and fisheries law enforcement barriers in Sri Lanka –Fishers’ prospects. United Nations. Retrieved, October 2022, from https://www.un.org/oceancapacity/sites/www.un.org.oceancapacity/files/aruna_14dec.pdf
- Ministry of Fisheries. (2019). Fisheries Statistics 2019. Ministry of Fisheries. Retrieved, October 2022, from <https://dof.gov.in/statistics>
- Ministry of Fisheries. (2020). Fisheries Statistics 2020. Ministry of Fisheries. Retrieved, October 2022, from <https://dof.gov.in/statistics>
- Msolla P. (2020). *Honey Value Chain Development in Ruvuma Region, Tanzania*. University Of Agriculture. Morogoro. Retrieved, October 2022, from <https://forvac.or.tz/wp-content/uploads/2020/03/Honey-Value-Chain-Master-Thesis.pdf>
- Myagmarjav S. et.al. (July,2021). *Cashmere Initiatives Working Together to Improve the Value Chain*. UNDP. Retrieved, October 2022, from <https://www.undp.org/mongolia/blog/cashmere-initiatives-working-together-improve-value-chain>
- National Statistical Office of Mongolia. (2021). Statistical Database. Retrieved from National Statistical Office of Mongolia, Retrieved, October 2022, from http://www.1212.mn/tables.aspx?TBL_ID=DT_NSO_1100_006V2
- Norton Rose Fulbright. (2016). *The African bee-keeping story Local opportunities to satisfy a global demand*. Retrieved, October 2022, from <https://www.nortonrosefulbright.com/en/knowledge/publications/7515691a/the-african-bee-keeping-story>
- Oduor A R, et, al. (2015). *Honey value chain development*. World Agroforestry. Retrieved, October 2022, from <https://www.worldagroforestry.org/publication/honey-value-chain-development>
- Sepulveda D. et.al, (2021). *Bio-Based Value Chains Potential in the Management of Cacao Pod Waste in Colombia, a Case Study*. MDPI. Retrieved, October 2022, from <https://www.mdpi.com/2073-4395/11/4/693/pdf>
- SNV/Netherlands Development Organization. (2016). *Enhancing climate change outcomes in development programs in Uganda: Increasing resilience and lowering emissions in the dairy value chain*. Retrieved, October 2022, from <https://cdkn.org/sites/default/files/files/Dairy-value-chain-report.pdf>
- Sphera. (May,2020). What Is Environmental Sustainability?. Retrieved, October 2022, from <https://sphera.com/glossary/what-is-environmental-sustainability/>
- Spina, M. (2021). ANNUAL CASHMERE MARKET REPORT 2020. Retrieved from The Schneider Group, Retrieved, October 2022, from <https://www.gschneider.com/annual-cashmere-market-report-2020/>

- Supper, L. (2019). *Assessing sustainability of Mongolia's Cashmere production*. University of Natural Resources and Life Sciences, Retrieved, October 2022, from https://www.researchgate.net/publication/335991449_Assessing_sustainability_of_Mongolia's_Cashmere_production
- United Nations Development Programme. (n.d.). *Nationally Appropriate Mitigation Action on Climate Smart Dairy Livestock Value Chains in Uganda*. Retrieved, October 2022, from https://www.unclearn.org/wp-content/uploads/library/nama_uganda_agriculture.pdf
- United Nations Industrial Development Organization. (June,2013). *Greening Value Chains For Sustainable Handicrafts Production in Viet Nam*. Retrieved, October 2022, from https://www.unido.org/sites/default/files/2014-06/Greening_Value_Chains_for_Sustainable_Handicrafts_Production_in_Viet_Nam_2013_0.pdf
- World Bank. (2021). *Priorities for Sustainably Managing Sri Lanka's Marine Fisheries, Coastal Aquaculture, and the Ecosystems That Support Them*. World Bank. Retrieved, October 2022, from <https://openknowledge.worldbank.org/handle/10986/36503>
- World Bank. (March,2022). *Sri Lanka and the World Bank Explore Path to Sustainable and Inclusive Growth for the Fisheries Sector*. Retrieved, October 2022, from <https://www.worldbank.org/en/news/press-release/2022/03/03/srilanka-world-bank-explore-sustainable-inclusive-growth-for-fisheries>
- World Bank. (May, 2019). *Mongolia Central Economic Corridor Assessment: A Value Chain Analysis of the Cashmere-Wool, Meat, and Leather Industries*. Retrieved, October 2022, from <https://openknowledge.worldbank.org/bitstream/handle/10986/31767/Mongolia-Central-Economic-Corridor-Assessment-A-Value-Chain-Analysis-of-Wool-Cashmere-Meat-and-Leather-Industries.pdf?sequence=1&isAllowed=y>



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