

DAIRY VALUE CHAIN CONSULTANCY REPORTS

Report 1: Dairy Value Chain Mapping & Gap Analysis Report

Consultant: Rula Awad

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Achieving Land Degradation Neutrality in Northern Jordan:

Small Ruminants' Dairy Value Chain Analysis in Northern Jordan for the ALDNT Project

Prepared for:

The ALDNT Project – GEF, FAO, RSS

Prepared by:

Dr. Rula Awad, Value Chain Consultant

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EXECUTIVE SUMMARY:

The Achieving Land Degradation Neutrality Targets Through Restoration and Sustainable Management of Degraded Land in Northern Jordan (ALDNT) project is a four-year initiative funded by the Global Environment Facility (GEF) and implemented by the Royal Scientific Society (RSS) under the supervision of the Food and Agriculture Organization (FAO). The project aims to assist Jordan in achieving its voluntary Land Degradation Neutrality (LDN) targets, aligning with national commitments under the United Nations Convention to Combat Desertification (UNCCD) and Sustainable Development Goal 15.3.

Northern Jordan, particularly the governorates of Ajloun, Irbid, and Mafrq, is characterized by diverse ecosystems and communities but faces significant challenges related to land degradation, unsustainable land use, and climate change. The (ALDNT) project emphasizes the adoption of Sustainable Land Management (SLM) practices that are socially inclusive, economically viable, and ecologically sound, with a focus on enhancing local livelihoods, particularly for smallholder farmers.

This consultancy was commissioned to conduct a comprehensive assessment of the dairy value chain of small ruminants in the target governorates. The assessment aimed to identify key stakeholders, current gaps and market barriers, opportunities for interventions, capacity development needs, and policy-level recommendations. The findings link dairy value chain strengthening with broader LDN and SLM objectives, promoting sustainable land management and diversified livelihoods.

A participatory, field-based methodology was employed, including stakeholder mapping, focus group discussions, and semi-structured interviews with producers and processors. The assessment revealed that small ruminant production is vital for rural livelihoods, contributing significantly to food security and income. However, the sector faces persistent challenges, including limited access to veterinary services, feed shortages, and weak market linkages.

The dairy value chain is characterized by informal and fragmented systems, with significant gaps in input supply, water access, veterinary services, extension support, and financial services. The assessment identified critical constraints, such as insufficient feed and water infrastructure, inadequate veterinary care, and a lack of accessible financial services, which hinder productivity and sustainability.

To address these challenges, the report recommends strategic public investment in feed and water infrastructure, gender-responsive extension and financial services, cold chain development, supportive regulatory frameworks, and integrated cross-sector planning. These interventions aim to enhance the productivity and inclusiveness of the dairy value chain while promoting land stewardship and climate-resilient rural development.

By embedding value chain development within the ALDNT's broader landscape restoration strategy, the project can catalyze transformative change, fostering healthier land and stronger livelihoods.

الملخص التنفيذي :

يهدف مشروع تحقيق أهداف الحياض في تدهور الأراضي من خلال استعادة وإدارة الأراضي المتدهورة في شمال الأردن (ALDNT) إلى دعم الأردن في تحقيق أهدافه الطوعية للحياض في تدهور الأراضي (LDN) ، وذلك في إطار الالتزامات الوطنية بموجب اتفاقية الأمم المتحدة لمكافحة التصحر (UNCCD) وهدف التنمية المستدامة ١٥،٣. المشروع هو مبادرة تمتد لأربع سنوات، ممولة من صندوق البيئة العالمي (GEF)، وتحت إشراف منظمة الأغذية والزراعة للأمم المتحدة (FAO) ، وتنفيذ الجمعية العلمية الملكية (RSS) .

تتميز شمال الأردن، وخاصة محافظات عجلون وإربد والمفرق، بتنوع النظم البيئية والمجتمعات، لكنها تواجه تحديات كبيرة تتعلق بتدهور الأراضي، والاستخدام غير المستدام للأراضي، وتغير المناخ. يركز مشروع (ALDNT) على اعتماد ممارسات إدارة الأراضي المستدامة (SLM) التي تكون شاملة اجتماعيًا، وقابلة للتطبيق اقتصاديًا، مع التركيز على تعزيز سبل العيش المحلية، وخاصة للمزارعين الصغار.

تم تكليف هذه الاستشارة لإجراء تقييم شامل لسلسلة قيمة الألبان للمجترات الصغيرة في المحافظات المستهدفة. كان الهدف من التقييم هو تحديد أصحاب المصلحة الرئيسيين، والفجوات الحالية، والحوافز السوقية، والفرص للتدخلات، واحتياجات تطوير القدرات، والتوصيات على مستوى السياسات. تربط النتائج تعزيز سلسلة قيمة الألبان بأهداف (LDN) و (SLM) الأوسع، مما يعزز إدارة الأراضي المستدامة وسبل العيش المتنوعة.

تم استخدام منهجية قائمة على المشاركة وميدانية، بما في ذلك رسم خرائط أصحاب المصلحة، ومناقشات مجموعات التركيز، والمقابلات شبه المنظمة مع المنتجين والمعالجين. كشفت التقييمات أن إنتاج المجترات الصغيرة يعد أمرًا حيويًا لسبل العيش الريفية، حيث يسهم بشكل كبير في الأمن الغذائي والدخل. ومع ذلك، يواجه القطاع تحديات مستمرة، بما في ذلك الوصول المحدود إلى الخدمات البيطرية، ونقص الأعلاف، وضعف الروابط السوقية.

تتميز سلسلة قيمة الألبان بأنظمة غير رسمية ومجزأة، مع وجود فجوات كبيرة في إمدادات المدخلات، والوصول إلى المياه، والخدمات البيطرية، ودعم الإرشاد، والخدمات المالية. حدد التقييم قيودًا حرجية، مثل نقص البنية التحتية للأعلاف والمياه، والرعاية البيطرية غير الكافية، ونقص الخدمات المالية القابلة للوصول، مما يعيق الإنتاجية والاستدامة.

لمعالجة هذه التحديات، يوصي التقرير بالاستثمار العام الاستراتيجي في البنية التحتية للأعلاف والمياه، وخدمات الإرشاد والاستجابة للجنسين، وتطوير سلسلة التبريد، وأطر تنظيمية داعمة، والتخطيط المتكامل عبر القطاعات. تهدف هذه التدخلات إلى تعزيز إنتاجية وشمولية سلسلة قيمة الألبان مع تعزيز إدارة الأراضي والتنمية الريفية المقاومة لتغير المناخ.

من خلال دمج تطوير سلسلة القيمة ضمن استراتيجية استعادة المناظر الطبيعية الأوسع لمشروع (ALDNT) ، يمكن أن يحفز المشروع تغييرًا تحويليًا، مما يعزز الأراضي الصحية وسبل العيش القوية.

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LIST OF ABBREVIATIONS

Abbreviation	Full Form
ALDNT	Achieving Land Degradation Neutrality Targets Through Restoration and Sustainable Management of Degraded Land in Northern Jordan
LDN	Land Degradation Neutrality
GEF	Global Environment Facility
RSS	Royal Scientific Society
FAO	Food and Agriculture Organization (of the United Nations)
UNCCD	United Nations Convention to Combat Desertification
SDG 15.3	Sustainable Development Goal 15.3: To combat desertification, restore degraded land, and strive toward a land degradation-neutral world by 2030
SLM	Sustainable Land Management
FGD(s)	Focus Group Discussion(s)
ACC	Agricultural Credit Corporation
JRF	Jordan River Foundation
JD	Jordanian Dinar (≈ 1.41 \$)
NGO	Non-Governmental Organization

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1. Introduction

The *Achieving Land Degradation Neutrality Targets through Restoration and Sustainable Management of Degraded Land in Northern Jordan (ALDNT)* project is a four-year initiative funded by the Global Environment Facility (GEF), implemented by the Royal Scientific Society (RSS) under the supervision of the Food and Agriculture Organization of the United Nations (FAO). The project supports Jordan's efforts to meet its voluntary Land Degradation Neutrality (LDN) targets, in alignment with the United Nations Convention to Combat Desertification (UNCCD) and Sustainable Development Goal (SDG) 15.3—aiming to combat desertification, restore degraded land, and achieve a land degradation-neutral world by 2030.

Northern Jordan, especially the governorates of Ajloun, Irbid, and Mafraq, is home to diverse ecosystems and rural communities, but faces acute challenges from land degradation, climate stress, and unsustainable land use practices. Addressing these threats requires integrated and sustainable approaches to land management that are socially inclusive, economically viable, and ecologically sound. As a key part of this strategy, the ALDNT project focuses on enhancing rural livelihoods and promoting practices that contribute to both environmental restoration and economic resilience.

Among the most significant livelihood systems in these areas is small ruminant livestock production, particularly sheep and goats. This sector is vital for rural households, providing income, nutrition, and cultural value, especially in marginalized and dryland communities (Awad et al., 2024a). Importantly, women play a central yet often underrecognized role in this system, particularly in tasks such as herding, milking, and traditional dairy processing (Yurco, 2024). Their contributions are critical not only for household economies but also for preserving local knowledge and sustaining value chain activities. Recognizing and supporting women's roles is essential to achieving inclusive and effective outcomes in value chain development.

According to the 2023 Agricultural Census by the Jordanian Ministry of Agriculture, Jordan's national flock exceeds 3.89 million head of sheep and goats (Jordanian Ministry of Agriculture, 2024), with more than half of dairy production derived from these animals—primarily in the form of traditional products like Jameed, white cheese, and labaneh (Al-Barakeh et al., 2024). Small ruminant production is especially concentrated in the northern and eastern regions of the country where agro-pastoral systems prevail and land conditions are often marginal or degraded (Awad et al., 2025).

Despite its importance, the sector is constrained by numerous challenges. These include limited access to feed and water, poor veterinary coverage, inadequate infrastructure, and weak linkages to markets and support services (Awad et al. 2024b). Additionally, the high degree of informality in the dairy value chain, and climate-related vulnerabilities further reduce the sector's resilience and potential (Lutta et al., 2023; Dixit et al. 2024). As noted, women's essential contributions are frequently overlooked, underscoring the need for gender-sensitive and inclusive interventions. Strengthening the small ruminant dairy value chain through inclusive, climate-resilient interventions can contribute not only to household incomes and food security, but also to broader land restoration and sustainable management goals.

This assessment was commissioned to identify gaps, opportunities, and policy recommendations to strengthen the small ruminant dairy value chain in ways that reinforce ALDNT’s overarching objectives. It provides a foundation for targeted interventions that can improve productivity, market access, and environmental stewardship while fostering inclusive rural development.

The assessment focused on three northern governorates—Mafraq, Ajloun, and Irbid—selected for their ecological vulnerability and economic reliance on livestock-based livelihoods. These areas represent a mix of dryland and upland landscapes where climate variability and land degradation are particularly pronounced. Fieldwork was conducted across fifteen villages to ensure broad geographic and socio-economic representation, informing recommendations that are context-specific and aligned with local realities.

2. Methodology and Data Collection Approach

2.1 Study Area

The value chain analysis was conducted in February 2025 across three governorates in northern Jordan (Mafraq, Ajloun, and Irbid) regions that collectively represent a vital hub for small ruminant production in the country. Fieldwork took place in 15 strategically selected villages:

Mafraq: Mansoura, Hosha;

Ajloun: Sakhra, Al-Hashemiyah, Halwah, Rajeb, Kufranja, Orjan;

Irbid: Rakeb, Dair Abe Sead, Sharhbeel, Fu’arra, Doqar, Saham, and Aqraba.

These locations were chosen to reflect the diversity of agro-ecological zones, production systems, and market linkages within the study area. The geographic distribution of these sites is illustrated in Figure 1.

According to the 2023 Agricultural Census by the Jordanian Ministry of Agriculture, Mafraq, Ajloun, and Irbid collectively host approximately 38% of the national sheep population and 22% of the national goat population. Specifically, the estimated sheep and goat populations in these governorates are 1,104,660 and 164,490, respectively, managed by over 10,000 registered small ruminant holders. Mafraq alone accounts for more than 70% of the sheep population among the three governorates, underscoring its critical role in the livestock economy (Table 1).

The predominance of small-scale and semi-intensive livestock systems in these areas makes them highly relevant for the ALDNT project’s focus on strengthening the dairy value chain and promoting sustainable land management. The selected villages represent a cross-section of production environments and market access conditions, allowing for a comprehensive and context-sensitive value chain analysis that informs policy and practical interventions tailored to local needs.

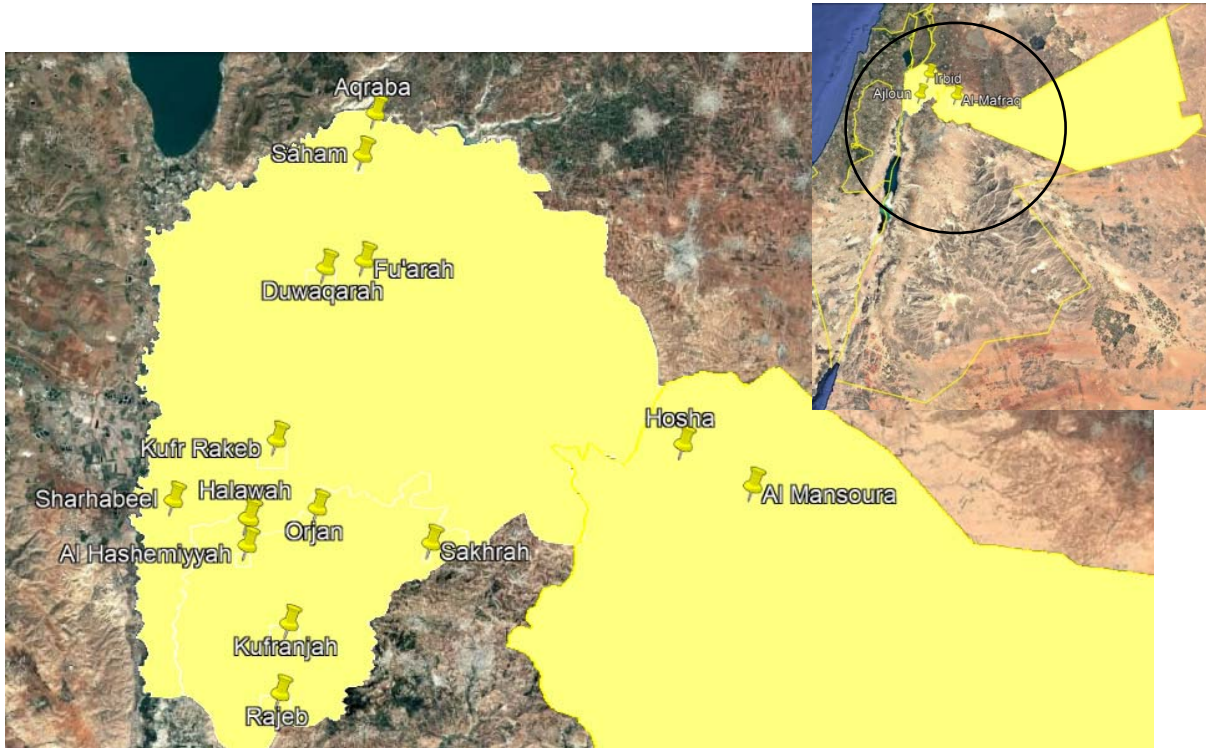


Figure 1. Map of the Study Area

Table 1: The small Ruminant population in the Mafrq, Ajloun, and Irbid

Governorate	Small Ruminant Holders	Estimated Sheep Population	Estimated Goat Population
Mafrq	5,824	796,050	63,440
Mansoura		2,314	302
Hosha		5,193	345
Ajloun	831	18,720	44,040
Sakhra		١,٤٠١	٢,٧٢٢
AlHashemiyah		٢٥٦	١,٣٣٢
Halwah		125	798
Rajeb		60	0
Kufranja		0	222
Orjan		285	238
Irbid	3614	289,890	57,010
Rakeb		١,٠٨٥	765
Dair Abe Sead		2,855	1,655
Fu'arra		١,523	121
Doqar		479	81
Saham		1,032	862
Aqraba		177	707
Total	10,269	1,104,660	164,490

Source: Jordanian Ministry of Agriculture, Agricultural Census (2023)

2.2 Data Collection Approach

The consultancy employed a mixed-methods, participatory approach to map the small ruminant dairy value chain across the northern governorates of Jordan. This approach ensured that findings were evidence-based, locally grounded, and reflective of diverse stakeholder perspectives—particularly women, informal producers, and marginalized communities.

The assessment began with comprehensive desk review supported the fieldwork, including the review of relevant studies, policy documents, and the official agricultural census issued by the Jordanian Ministry of Agriculture, which provided key contextual data on livestock trends and land helped identify knowledge gaps to be addressed through primary fieldwork.

Throughout the assessment, cross-cutting considerations such as gender equity, youth inclusion, and climate resilience were integrated to ensure that the final recommendations align with the ALDNT project’s overarching goals of sustainable, inclusive rural development.

To assess the structure, performance, and bottlenecks of the small ruminant dairy value chain in Northern Jordan, a Dairy Value Chain Mapping methodology was used. This process was designed to identify the key actors, processes, support systems, and constraints along the entire chain, from input supply to consumption, within the study area. The value chain mapping drew on a combination of qualitative data collection methods and iterative field validation. Key steps included:

a- Stakeholder Identification and Functional Mapping: All major actors involved in the dairy value chain, including input suppliers, livestock producers, milk collectors, processors, traders, retailers, and consumers, were identified and categorized by their role, scale of operation, and interdependencies.

b- Focus Group Discussions (FGDs): The Focus Group Discussions (FGDs) served as the primary data collection mechanism, offering in-depth qualitative insights into community-level experiences, needs, and priorities. A total of seven FGDs were conducted with women’s groups, smallholder producers, and local community committees across the three governorates. These discussions explored six thematic areas: dairy production practices, market access and pricing, training and skills development, women’s participation, policy and regulation, and financial services. Women constituted approximately (44%) of participants among animal holders and milk processors, highlighting their important role in small ruminant management and dairy-related activities. Institutional representatives and cooperative members made up about (18%) of the total FGD participants, providing valuable perspectives from service providers and organized producer groups. The distribution of FGDs is presented in Table 2.

Table 2: Summary of Focus Group Discussions by Governorate

Governorate	Villages Covered	No. of FGDs
Mafrqa	Mansoura, Hosha	1

Ajloun	Sakhra, Al-Hashemiyah, Halwah, Rajeb, Kufranja	3
Irbid	Rakeb, Dair Abe Sead, Sharhbeel, Fu'arra, Doqar, Saham, Aqraba	3
Total	14 villages across 3 governorates (Include 62 women; 79 men)	7

c- Key Informant Interviews: To complement the FGDs, semi-structured interviews were conducted with 25 dairy producers and 10 local dairy processors. These interviews examined key aspects such as livestock ownership and herd size, seasonal milk production cycles, milk handling and processing practices, marketing channels, access to feed and veterinary services, labor availability, and the main constraints facing production and processing. In addition, interviews captured perceptions of climate variability, observed impacts on productivity, adaptation strategies, and the roles of women in daily dairy-related tasks. For processors, topics also included sourcing patterns, processing capacity, quality control, supply chain dynamics, market access, and challenges related to competition, regulation, and pricing fluctuations.

d- Institutional Interviews: Two strategic interviews were conducted with the Assistant Secretaries of Marketing and Animal Production at the Ministry of Agriculture, to gain insight into institutional challenges, policy frameworks, and sectoral development priorities.

The combination of focus group discussions, key informant interviews, and institutional consultations enabled a comprehensive diagnosis of structural and operational challenges across the small ruminant dairy value chain. Findings from these methods were triangulated and thematically analyzed to identify key gaps in input provision, production practices, processing, marketing, and enabling environments. These insights form the basis of the gap analysis presented in the following section.

3. Results

3.1. Dairy Value Chain Mapping

The dairy value chain for small ruminants (sheep and goats) in the northern governorates of Jordan—Ajloun, Irbid, and Mafraq—is largely informal, decentralized, and fragmented. It consists of a web of interdependent actors who operate across multiple stages of the chain: from input suppliers and livestock producers to milk collectors, small-scale processors, and market intermediaries. These value chain functions are shaped by a complex mix of structural constraints, environmental limitations, and evolving policy frameworks.

The dairy value chain of small ruminants in Northern Jordan is also heavily influenced by topographical, socio-economic, and environmental factors that vary across locations. Despite shared challenges—such as feed scarcity, limited veterinary support, and weak market integration—the structure and functionality of the value chain differ significantly from one village to another. These differences are often driven by local land use patterns, infrastructure availability, proximity to urban markets, and access to natural resources.

Most small ruminant dairy activities are conducted on a micro-scale, with low levels of mechanization and a high dependence on unpaid family labor, particularly that of women. Value addition—such as the transformation of raw milk into labneh, white cheese, Jameed, etc. — typically takes place in home-based settings, with informal marketing and minimal regulatory oversight. The lack of formal milk collection points, cold chain systems, or cooperative processing units means that much of the milk is either consumed locally or sold at suboptimal prices, often determined by intermediaries.

Despite these constraints, the value chain remains a vital source of income, food security, and employment, especially in marginalized rural areas where alternative livelihood options are limited. Strengthening this value chain, therefore, presents a significant opportunity to not only improve rural livelihoods but also promote more sustainable and land-conscious livestock practices.

The following flow diagram illustrates the general structure of the small ruminant dairy value chain in Northern Jordan, highlighting the key functions and actors involved:

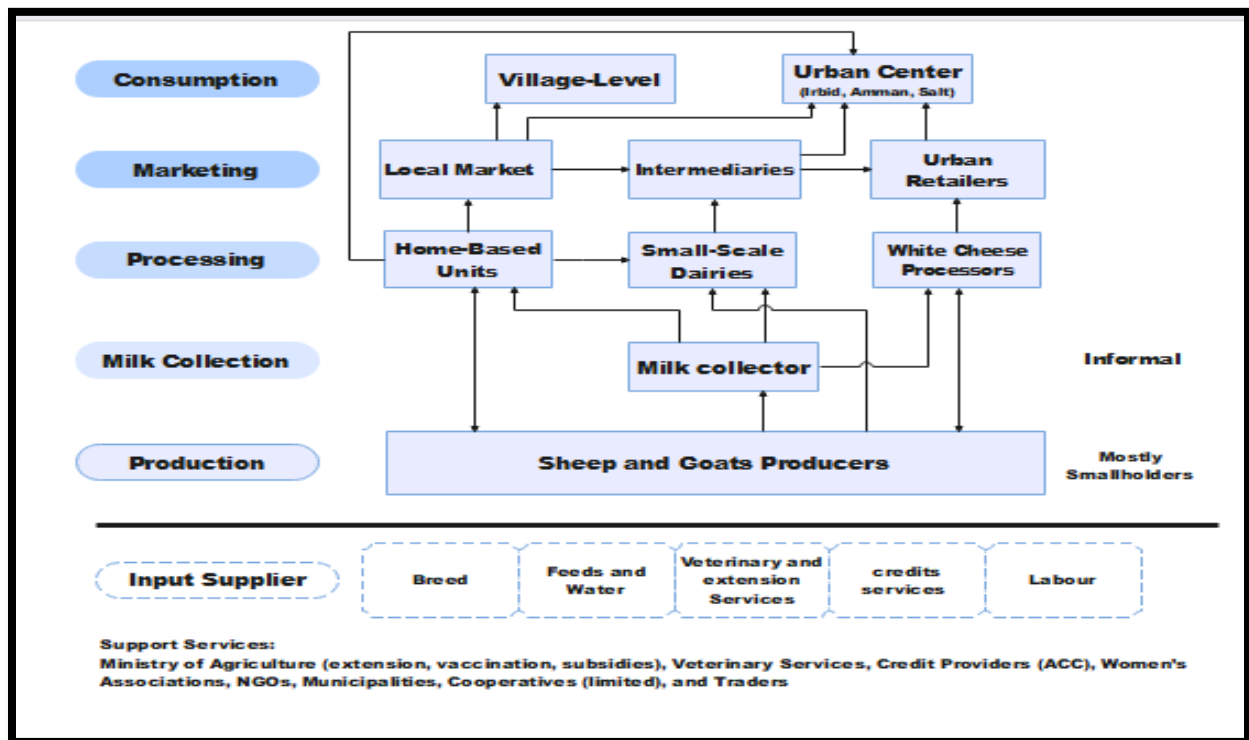


Figure 2. Small Ruminant Dairy Value Chain in the Study Area

The core segments of the value chain in the targeted area include:

1. **Input Supply** (feed, water, veterinary and extension services, financial access, labor)
2. **Production** (on-farm herding, milking)
3. **Processing** (home-based or semi-commercial dairying)
4. **Marketing and Sales** (local or external markets)

5. **Distribution** (intermediaries or direct-to-consumer)
6. **Consumption** (rural and urban consumers)

Each segment is supported, or constrained, by enabling services such as veterinary care, extension support, cooperatives, and policy regulation.

3.3.1 Input Supply:

Feed: Access to affordable, sufficient, and quality feed is a central constraint in the small ruminant dairy value chain across the northern governorates of Jordan. The primary feed sources for sheep and goats are subsidized barley and wheat bran, which are distributed by the Ministry of Agriculture through an official rationing system. While most smallholder producers rely heavily on these two commodities, particularly during dry seasons, current feed policies and market dynamics have left many farmers unable to meet their animals' nutritional needs affordably or sustainably. According to Ministry of Agriculture policy, registered small ruminant holders are entitled to 20 kg of subsidized barley per head per month, and approximately 8 kg of subsidized wheat bran per head per month, the latter being dependent on national wheat milling outputs. It is important to note that Jordan does not import wheat bran due to its high cost and perishable nature, making local production the sole source. In years of low rainfall, such as the 2024–2025 season, domestic wheat production declined sharply, leading to a reduced availability of wheat bran and subsequent price increases on the black market. Although subsidized feed is essential to maintaining herd productivity, farmers widely reported that the allocated quantities are insufficient, especially in drought years when natural grazing is unavailable. The selling price of subsidized barley for small ruminant holders stands at 175 Jordanian dinars (JD) per metric ton, compared to 221 JD/ton for unsubsidized barley. For wheat bran, the subsidized price is 77 JD/ton, while the market price for unsubsidized bran can rise significantly, reaching up to 140 JD/ton during scarcity periods. Additionally, free-market barley (non-subsidized and available without quantity restrictions) is often priced around 154 JD/ton, though availability varies by location. In practice, most farmers reported being forced to buy additional feed on the open market to compensate for the shortfall in their government allocations, thereby incurring significant financial burden. This issue is exacerbated by annual administrative decisions taken by the Ministry of Agriculture to reduce the subsidized quantities by 20%, based on estimations of herd fluctuations (10% replacement, 5% slaughter, 5% death). Although farmers are allowed to contest this deduction, the review process often takes weeks or months. During this verification period, farmers are compelled to purchase feed at full market price, pushing some into debt or forcing them to sell productive animals to cover expenses. It is also important to note that newborns and young animals are not included in the subsidy scheme, further adding to the financial stress of maintaining a growing herd. Natural grazing, once a traditional cornerstone of the production system, has become increasingly restricted. In forest, adjacent villages such as Aqraba, Saham and Ajloun, grazing is strictly prohibited on protected lands, with local authorities enforcing environmental regulations that forbid herding in forest reserves. In border villages near Syria, including Saham and Aqraba, grazing is also restricted due to military and geopolitical considerations. Moreover, the trend of land privatization and the widespread use of herbicides by landowners to deter encroachment have significantly reduced access to open grazing lands. As a result, many farmers now rent agricultural land to provide dry forage or stubble feeding after harvest seasons, further increasing production costs. Faced with limited rangeland and expensive purchased feed, farmers

have adopted a number of coping strategies. These include reducing herd sizes and rationing feed. However, these measures are largely reactive and unsustainable, particularly under conditions of prolonged drought or feed market volatility. The pressure on feed availability is compounded by poor infrastructure in remote areas, lack of feed storage facilities, and transportation challenges. Overall, the feed segment of the small ruminant dairy value chain in northern Jordan is severely constrained by systemic policy, market, and environmental limitations. While the government subsidy program provides a partial buffer, its limited scope, rigid eligibility criteria, and reduction policies during verification periods leave many farmers vulnerable. The increased reliance on expensive commercial feed inputs, combined with shrinking grazing options, threatens the viability of smallholder livestock systems and contributes to land degradation through overstocking and poor rangeland management—a dynamic that runs counter to the goals of the ALDNT project.

Water: Water access represents one of the most pressing and structural constraints in the small ruminant value chain across northern Jordan. In contrast to feed, where some level of subsidy and policy structure exists, the provision of water for livestock is entirely unregulated, decentralized, and market-driven, resulting in high costs and limited availability—especially in remote or dryland areas. Most livestock producers across the surveyed villages—particularly in Sharhabeel, Mansoura, Hawsha, Doqra, Fu’oura, and Saham—rely on purchased tanker water to meet both household and livestock needs, leading to considerable production costs and systemic economic vulnerability. In Sharhabeel, farmers face severe water insecurity. There are no piped infrastructure for livestock use. All water must be purchased and transported, further straining already, fragile household budgets. Access to the nearby valley has been politically restricted, and water from adjacent governorates (such as Halawa in Ajloun) cannot be extended to Sharhabeel due to administrative boundaries and regulatory obstacles. Despite a willingness among farmers to jointly invest in water pumping systems or networks, coordination has stalled. The absence of institutional support for even minimal water infrastructure has left producers to rely exclusively on the open market, pushing up the cost of production and reducing competitiveness. In Mansoura and Hawsha, similar conditions prevail. Farmers there also purchase water via tankers, incurring high and fluctuating costs, especially during peak summer months. While a well was drilled in Suwaylima under the Environmental Compensation Project, intended to supply livestock producers across this region, the project remains incomplete. Farmers confirmed that allocated funds exist, yet work has stalled without clear explanation. This unused infrastructure sits idle while producers continue to pay for water delivery. The financial burden is particularly acute in Hawsha, where some farmers are already in debt to the Water Authority for unpaid household water bills—raising ethical and logistical concerns about their ability to afford water for their animals when they cannot consistently secure their own domestic supply. In Doqra and Fu’oura, the situation is further complicated by declining water quality and infrastructure decay. A local well in Fu’oura has become polluted, and a nearby spring with the capacity to produce 20 tankers per day lies untapped due to neglect and lack of maintenance. Farmers noted that this natural spring could serve much of the livestock population in the area if rehabilitated. However, investment in its reclamation has yet to materialize, despite local knowledge of its viability and strategic location. In Saham and Aqraba, the physical presence of the Yarmouk River offers no relief, as its waters are off limits due to national border regulations. As a result, despite their proximity to a major water stream, producers are forced to buy water from distant sources, compounding their logistical and financial difficulties. This paradox—being near abundant natural water but unable to access

it—highlights the intersection of geopolitical constraints and natural resource management in border areas. In contrast, Orjan presents a rare exception. Farmers benefit from a nearby valley that supplies natural water throughout most of the year. Across all regions, the absence of public investment in shared wells, pipeline systems, or livestock cisterns is glaring. Unlike feed, water has no designated budget line within the Ministry of Agriculture’s livestock programming, and most support is project- based, sporadic, and poorly maintained. In years like 2024, 2025 marked by below, average rainfall and increased water demand due to heat stress, this absence is felt even more acutely. Water-related expenses can now exceed those of feed in some locations, particularly where tanker delivery is long-distance or shared among several producers. The lack of structured, affordable, and reliable water access for livestock reflects a deep policy and infrastructure gap in Jordan’s small ruminant sector. While isolated initiatives—such as the Suwaylima well or potential spring rehabilitation in Fu’oura—offer hope, they remain stalled by administrative inertia and lack of coordination. Without decisive action to institutionalize livestock water planning—through community wells, pumping networks, cistern maintenance, and cross-governorate infrastructure cooperation—water insecurity will continue to erode the productivity, profitability, and resilience of smallholder dairy systems in Jordan’s northern governorates.

Veterinary Services: Although the Ministry of Agriculture officially maintains a network of veterinary field units within its directorates, farmers across the study area consistently reported insufficient access to essential veterinary medicines, delayed vaccination campaigns, and rising dependence on costly private-sector providers. While the Assistant Secretary for Animal Production at the Ministry of Agriculture affirmed that tenders for medicines and vaccines had been secured for the current year, farmers in Doqra, Fu’orah, and Saham noted persistent shortages, particularly of vaccines for foot, and, mouth disease—the most common diseases affecting their herds. Alarming, in multiple cases, vaccinations were administered after disease outbreaks had occurred, rather than being delivered preventively. In addition to logistical delays, there are structural issues with how services are distributed. In Sharhbeel and Bani Kinanah, for example, livestock owners reported that treatments and vaccines were provided selectively and based on personal relationships, undermining transparency and equity. Moreover, the public veterinary workforce is insufficient to meet seasonal demands during peak disease periods. While the Ministry claims that the number of veterinarians and technicians is adequate at the national level, the field realities suggest an imbalance in allocation and prioritization, particularly for animal production versus plant agriculture. For farmers unable to access government services in time, the private sector remains the only alternative. However, veterinary medications in private clinics are prohibitively expensive, often exceeding the financial capacity of smallholders. As a result, some farmers resort to self-treatment or delay interventions, which can exacerbate herd mortality and lower milk productivity. This is especially critical in drought years, when nutritional stress and immune suppression increase animals’ susceptibility to disease. Additionally, trust in veterinary service quality is low in some areas like Saham and Aqraba, where breeders expressed concerns about misdiagnoses and improper treatments.

Extension services: Access to extension services remains deeply inadequate and poorly aligned with the realities and needs of small ruminant producers in northern Jordan. Despite the existence of government institutions mandated to support livestock producers—such as the Agricultural Extension Departments within the regional directorates and the Agricultural Credit Corporation (ACC)—the actual reach, responsiveness, and relevance of these services are

minimal, particularly in remote or livestock-dependent areas. In terms of extension, nearly all surveyed farmers, including those in Hawsha, Sakhra, Rajeb, Sharhbeel, and Fo'oura, reported having never received any formal training or advisory visits from government or private actors. This was corroborated during focus group discussions, where producers consistently emphasized the absence of technical support—whether in herd management, disease prevention, milk hygiene, or marketing. While the Agricultural Extension Department in Mafrq noted that Hawsha was the subject of a training program in 2019, none of the participating farmers were aware of or had benefited from it, underscoring the disconnect between official programming and actual field engagement. Directorate representatives often cited a lack of equipment, low farmer requests, and budgetary limits as barriers to broader outreach. Moreover, program planning was described as top-down and reactive, driven more by public relations or pre-determined agendas than actual farmer needs. In some cases, course selection was based solely on requests from “clients” already engaged with the Directorate, effectively excluding marginal farmers, especially women and unregistered producers. This disconnect is exemplified in villages like Sakhra, where producers expressed strong demand for integrated training covering the entire value chain, from lambing to milk processing, yet received only occasional sessions focused narrowly on food manufacturing. The directorate’s emphasis on plant production, particularly in areas like Saham, further compounds the neglect of animal production systems, especially where livestock engineers are understaffed or absent altogether. Despite these gaps, local willingness to engage is strong. Associations like Abq Al,Sahra, which operates a small dairy plant in the Mafrq governorate, have publicly offered to host onsite training programs for sheep milk processing. Similarly, women and youth in underserved areas such as Halawa and Aqraba voiced a clear interest in training programs related to herd management, dairy hygiene, product diversification, and marketing, yet no pathways currently exist to operationalize this demand. Field schools, where they have occurred, such as a recent one in Halawa, were well received, yet remain isolated initiatives with limited follow-up or expansion.

Financial services: On the financial side, the Agricultural Credit Corporation (ACC) remains the primary institutional lender to small ruminant producers. However, the structure and terms of its loans are widely perceived as inaccessible and misaligned with the financial realities of smallholders. ACC loans often require land or property mortgages, post-dated checks, and third-party guarantors—a bundle of guarantees that most livestock keepers, particularly tenant herders or informal producers, simply do not possess. Moreover, for the level of collateral required, the loan amounts are extremely modest. Alternative financial providers, such as the Jordan River Foundation (JRF), offer small grants or soft loans targeting women or microenterprises. However, access remains limited. Many women are unaware of these programs or lack the documentation and invoice-based proof of business operations required to qualify. In communities like Sharhbeel and Fo'oura, this disconnect is especially pronounced: while the need for equipment and working capital is high, few producers possess the business literacy or institutional links needed to tap into available funding streams. Some targeted products do exist—such as the interest-free fodder loan from the Ministry of Agriculture, which provides 20 JD per head of registered sheep. However, even these require extensive guarantees, including property mortgage and bank instruments, and are available only to producers listed in the Ministry’s registry. Informal producers, small-scale women dairy processors, and seasonal herders are thus structurally excluded from access. This dual absence of relevant extension supports and accessible finance creates a negative feedback loop: without technical guidance, producers are unable to improve productivity or adopt best

practices, and without affordable credit, they cannot invest in the infrastructure needed to scale or sustain their businesses. Meanwhile, the broader financial system remains skeptical of the sector, often viewing it as high-risk and low-profit, particularly in the wake of past cooperative defaults and low repayment rates. In sum, the current architecture of extension and credit services in northern Jordan is poorly adapted to the structure of the small ruminant sector, which is characterized by informal production, gendered labor, and geographic dispersion. Farmers and women dairy processors remain under-supported, under-trained, and under-capitalized. If small ruminant production is to become a viable livelihood pathway within the framework of ALDNT or broader rural development initiatives, significant institutional reforms are needed. These include community-based extension agents, mobile training units, simplified loan instruments, and blended finance models that can bridge formal systems with informal producer realities.

3.3.2 Production

Production Systems: Small ruminant milk production across northern Jordan is primarily organized around semi-intensive systems, in which farmers combine seasonal grazing (when available) with supplementary feeding using subsidized or market-purchased barley and wheat bran. This production model is the most prevalent in the study area, with approximately (70%) of producers following semi-intensive methods, while only (29%) maintain seasonal or transhumant grazing systems. Access to natural pastures is increasingly limited due to environmental degradation, land use restrictions, and climate variability, making feed supplementation an essential aspect of the system.

Herd Size: Herd sizes vary across regions. While some producers maintain larger flocks (up to 165 head), especially in areas with more grazing land, a significant portion—particularly in marginal or mountainous zones—are smallholders managing fewer than 100 animals. Overall, small-scale production dominates the sector, with most producers relying on family labor for daily herd management and feeding activities.

Seasonality and Feeding: Milk production is seasonal, typically beginning in February, peaking in March and April, and gradually declining by July. According to producers, the average daily milk yield for sheep is around 0.75 liters per head, though this amount varies depending on feed availability, breed characteristics, and animal health. Animals are generally fed twice per day, but some farmers reduce feeding to once daily during favorable seasons when natural pasture is accessible. These seasonal fluctuations in pasture availability and feed costs significantly influence milk volumes and overall herd productivity, making small ruminant dairying a highly variable and risk-prone livelihood activity.

Breeds: The selection between raising sheep or goats is influenced by factors such as terrain, access to inputs, and reproductive traits. In Mansoura and Hosha (Mafrqa Governorate), farmers predominantly raise Awassi sheep, a breed favored for its milk quality, adaptability, and dual-purpose function (milk and reproduction). These herds are seen as both a livelihood source and a form of traditional wealth accumulation. In contrast, in mountainous and marginal areas such as Sakhra, Halawa, Kufranja, Rajeb, Orjan (Ajloun Governorate), and Saham and Aqraba (Irbid Governorate), farmers primarily raise Baladi goats, valued for their lower feed requirements, disease resistance, and higher reproductive rates—with many producing two kidding cycles per

year. These traits make Baladi goats more resilient and productive under resource-constrained conditions. Despite the advantages of these locally adapted breeds, breed selection practices are informal, with farmers depending on inherited herds, occasional market purchases, or informal exchanges within their communities. The choice between raising sheep or goats is influenced by terrain, input access, and reproductive traits. In lower-altitude and plain areas, farmers predominantly raise Awassi sheep, known for their high milk quality and adaptability. These sheep are primarily kept for both milk and reproduction, with herd expansion considered a form of economic security and social status. In mountainous and more resource-constrained areas, Baladi goats are preferred due to their low feed needs, higher disease resistance, and ability to reproduce twice a year. These characteristics contribute to more consistent milk output, especially under stress conditions.

Gender and Youth Roles: Milk production is a family-based activity, with clear gendered divisions of labor. Women are primarily responsible for milking, and milk processing, while men manage herd health, breeding, and market-related tasks. Livestock ownership is typically inherited, reinforcing the role of family identity and tradition in small ruminant production. According to survey data, 43% of producers identified sheep farming as their primary source of income, underlining the sector's importance for rural household livelihoods. Despite their active participation, women have limited access to training, credit, and formal decision-making channels. Similarly, youth involvement is minimal, as many younger individuals seek off-farm in.

3.3.3 Milk Collection and Transport

Milk collection practices across the northern governorates of Mafraq, Ajloun, and Irbid show clear regional disparities, largely shaped by infrastructure availability, herd sizes, and the presence—or absence—of organized market linkages.

In Mafraq, especially in Mansoura and Hosha, milk collection is relatively organized. Approximately 71% of farmers sell directly to a cheesemaker based in Ramtha (Irbid Governorate), who collects milk twice daily at the farm gate using medium-sized transport tanks. This system is largely credit-based, where cheesemakers provide advance payments before the milking season, allowing farmers to cover input costs, such as fodder. However, this arrangement also limits farmers' bargaining power, as the cheesemaker sets the purchase price (around 0.70 JD/liter) and defines the terms of collection unilaterally. The dependency on credit makes this model both beneficial and risky for producers, particularly in case of payment delays or quality disputes.

In Ajloun, milk collection tends to be less structured and more decentralized. In areas such as Rajeb and Orjan, farmers often transport their own milk to nearby markets or dairies, including locations in Jerash or Irbid, incurring higher transport costs and quality risks due to lack of cooling. In Kufranja, where milk production is relatively abundant, the market is saturated, causing prices to fluctuate between 0.40 and 0.75 JD/liter depending on supply levels and demand. One positive exception in Ajloun is a cooperative in Sakhra, which operates a refrigerated truck, helping maintain milk quality during transport and offering an improved collection alternative—though such infrastructure remains rare across the region.

Milk collection in Irbid Governorate is characterized by informality and fragmentation. In Saham and Aqraba, milk collection is highly informal. Farmers often deliver milk themselves to local dairies, facing logistical burdens, spoilage risks, and market uncertainty. In Sharhbeel, the situation is particularly fragile: foreign traders and collectors operate sporadically and typically use non-refrigerated transport, leading to poor milk quality and post-harvest losses that directly affect producers' incomes. In Fu'arra and Doqar, local collectors function as key intermediaries, but often act as price-setters, purchasing milk at low rates and reselling it to processors at a profit. This leaves farmers with marginal returns, while bearing most of the market and quality risk.

3.3.4 Dairy Processing

Dairy processing in the northern governorates of Ajloun, Irbid, and Mafraq is predominantly informal and home-based, with production conducted on a small scale using traditional methods. Women are the primary actors in this segment of the value chain, undertaking the preparation of products such as labneh, yogurt, white cheese, Shanina, and occasionally Jameed. However, only a limited portion of livestock-owning households engage in milk processing, as many prioritize selling fresh milk to intermediaries and dairies offering advance payments and more consistent market access.

Across villages including Halawa, Sakhra, Orjan, Deir Abi Said, Kufranja, Rajeb, Fu'arra, Doqar, and Sharhbeel, women involved in dairy processing face recurring challenges in accessing raw milk, particularly during peak season. Farmers often prioritize selling to large buyers such as dairies and cheesemakers, limiting the availability of milk for local processors. This dynamic is especially restrictive for women, who are also burdened with time constraints and childcare responsibilities, reducing their ability to engage consistently in dairy transformation activities.

Processing infrastructure remains basic and underdeveloped. In most villages, women rely on domestic kitchen tools and household refrigerators, with limited access to semi-automated equipment. The absence of large-capacity boiling and cooling systems means milk must be handled in small batches, increasing labor demands and decreasing efficiency. Knowledge gaps in hygiene standards, food safety laws, and packaging practices further constrain the potential for product formalization and market expansion. Due to these limitations, products such as ghee or jameed, which require extended labor and expertise, are rarely produced.

The seasonality of sheep and goat milk also restricts processing activities. In many areas, including those with multiple dairies like Sakhra, the inconsistency of small ruminant milk supply leads processors to favor cow's milk for its year-round availability. Mixing cow and sheep milk is a common practice used to adjust product taste and yield, though this tends to reduce the distinct market value of small ruminant milk.

Regarding private dairy shops, no official figures were obtained on their number or scope within the study areas. However, under the current Jordan Food and Drug Administration regulations, the licensing of private village-based dairy shops is prohibited. Where they still operate under previous licenses, such as in Sakhra or Kufranja, these shops mainly depend on cow's milk and are generally not linked to the small ruminant value chain. In several villages—Mansoura in Mafraq, and Rajeb and Arjan in Ajloun—such shops have entirely disappeared.

Furthermore, acquiring home-based dairy processing licenses requires semi-automated equipment and adherence to strict health regulations, which are financially out of reach for small-scale and marginalized producers. As a result, the majority of dairy processing in these areas remains informal, unregulated, and excluded from formal market systems.

3.3.5 Marketing and Distribution

Informal networks dominate the marketing and distribution of dairy products. Home-based producers often sell directly from their homes, through village stores, or via personal networks in larger cities like Amman, Salt, and Irbid. In Sharhbeel, women personally transport soft cheese to Salt or Irbid's central markets. However, without licenses, many are forced to operate under the radar.

In Fu'arra, Kufranja, and Deir Abi Said, milk and dairy sales are restricted due to regulatory tightening. New rules by the Jordan Food and Drug Administration require that processing units be semi-automated and licensed, a standard too costly for small-scale producers. As a result, many existing dairies were closed or forced to cease operations, particularly those run by Syrian refugees or women's associations.

In Mansoura and Hosha, demand for homemade products remains strong, but processors are unable to meet demand due to limited milk supply and outdated production methods. Meanwhile, large dairy units, such as the one operated by the Abq Al-Sahra Association in Sama Al-Sarhan, have self-sufficient milk supply chains and are reluctant to expand procurement without external support or incentives.

Pricing is also highly seasonal and volatile. In Fu'arra, cheese made from sheep's milk can sell for 13 to 19 JD per 4 kg, but prices drop dramatically in peak season when supply overwhelms demand. Across many villages, goat milk remains less preferred by consumers due to its higher price and richer taste, further narrowing the market for small ruminant dairy products.

3.2 SWOT Analysis of the Small Ruminant Dairy Value Chain in Northern Jordan

Table 3: SWOT Analysis of the Small Ruminant Dairy Value Chain in Northern Jordan

Strengths:	Weaknesses:
- Existing Smallholder Livestock Systems: Widespread small-scale and semi-intensive herd management practices with established traditional breeds like Awassi sheep and Baladi goats. - High Cultural and Livelihood Importance: Significant socio-economic role for rural	- Limited Access to Quality Inputs: Insufficient, unreliable, and costly feed, water, and veterinary services. - Poor Infrastructure & Market Linkages: Fragmented, informal milk collection, lack of cold chain, and limited processing facilities

households, especially women and marginalized groups. - Community Engagement & Willingness: Strong local interest in capacity building, cooperative models, and value addition activities. - Natural Resources: Presence of natural water sources (e.g., Yarmouk River, springs) that, if managed properly, could support livestock needs. - Traditional Knowledge & Breeds: Adapted breeds resilient to local environmental conditions, suitable for low-input systems.	- Seasonal & Low-Value Production: Milk seasonality and low processing capacity hinder product diversification and market stability. - Weak Institutional Support: Inadequate extension services, limited technical training, and ineffective support for women and youth. - Financial Barriers: Rigid loan requirements, limited financial literacy, and exclusion of informal and women producers from credit schemes. - Environmental & Land Use Restrictions: Land privatization, grazing restrictions, and protected areas limit sustainable land management. - Geopolitical Constraints: Border and water resource restrictions, especially in border regions, impacting resource access.
Opportunities:	Threats:
- Infrastructure Development: Establish community-based water infrastructure, feed storage, and affordable processing units. - Capacity Building & Extension: Expand gender-sensitive, community-based extension and training programs. - Climate-Resilient Practices: Promote drought-resistant breeds, sustainable grazing, and climate-smart land and water management.	- Climate Variability & Droughts: Increasing frequency and severity threaten feed and water availability. - Land Degradation & Land Use Restrictions: Land privatization, protected areas, and environmental policies limit grazing and land management options. -Market Volatility & Regulatory Barriers: Price fluctuations, licensing, and quality standards restrict small-scale formal market participation.

- Market & Value Addition: Develop formal markets, product branding, and diversify dairy products (cheese, yogurt, Jameed). - Cooperative & Collective Models: Foster cooperatives for processing, marketing, and resource sharing. - Policy & Land Use Reforms: Advocate for policies that balance land conservation with productive land use, grazing rights, and resource access. - Financial Innovation: Introduce tailored microfinance, blended finance, and capacity-building to improve credit access for smallholders and women.	- Water Scarcity & Geopolitical Tensions: Border restrictions and water resource conflicts limit access to vital water sources. - Weak Institutional Capacity & Funding: Insufficient support for extension, veterinary services, and infrastructure investment. - Socioeconomic Exclusion: Marginalized groups, especially women and informal producers, face exclusion from support services, limiting sector growth.
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This SWOT provides a comprehensive overview of the internal strengths and weaknesses, as well as external opportunities and threats, informing strategic interventions to strengthen the small ruminant dairy value chain in northern Jordan.

Conclusion and Targeted Recommendations for the ALDNT Project

The small ruminant dairy value chain in northern Jordan operates under multiple, interconnected constraints—ranging from insufficient feed and water access to underdeveloped veterinary, extension, and market systems. These systemic gaps not only limit the economic potential of smallholder producers, women, and youth, but also drive unsustainable land use practices, including overgrazing, rangeland degradation, and herd underperformance linked to climate stress.

Within the framework of the **Achieving Land Degradation Neutrality Targets through Restoration and Sustainable Management of Degraded Land in Northern Jordan (ALDNT)** project, addressing these gaps is essential. The sustainability of the dairy value chain is deeply tied to land health, ecosystem resilience, and the adoption of Sustainable Land Management (SLM) practices. Without strengthening the enabling environment for livestock-based livelihoods, especially in marginalized and dryland areas, broader goals of land restoration and degradation neutrality cannot be achieved.

To align economic resilience with environmental sustainability, the following priority actions are recommended:

1- Enhance Water Access, Management, and Feed Production for Livestock

- Implement pilot community water infrastructure projects, such as rehabilitating springs or establishing small shared water points, to ensure reliable water sources with minimal technical and financial inputs.
- Facilitate coordination among local stakeholders, including women and youth groups, to plan, maintain, and sustainably operate these water points, leveraging local knowledge and community participation.
- Promote rainwater harvesting and small-scale water conservation practices to improve seasonal water availability for both livestock and crop production.
- Develop community-based alfalfa cultivation projects aimed at reducing feed costs and increasing resilience to climate variability, utilizing improved water management practices to optimize water use efficiency.
- Integrate water management with forage production by implementing efficient irrigation techniques and drought-tolerant alfalfa varieties, ensuring year-round, affordable feed supply for smallholders.

Justification: Addressing water insecurity not only supports livestock productivity but also reduces feed costs through local alfalfa production, creating a synergistic approach that enhances climate resilience, improves land management, and lowers production expenses within project timelines.

2- Strengthen Extension Services with a Focus on Women and Youth

- Establish mobile outreach teams or community-based extension agents trained specifically on small ruminant management, dairy hygiene, and land conservation.
- Develop simple, locally adapted training modules, including gender-sensitive approaches, to increase participation of women and youth.
- Facilitate peer-to-peer learning and farmer field schools on sustainable practices, dairy processing, and land management.
- Leverage existing community groups and local NGOs to expand outreach and knowledge dissemination.

Justification: Mobile and community-based extension activities are cost-effective, scalable, and directly address gaps in knowledge and skills.

3- Improve Access to Basic Veterinary Support

- Distribute basic veterinary kits and vaccines (e.g., for foot-and-mouth disease) to trained community members for routine use.

- Provide simple training on herd health and disease prevention tailored to smallholders' capacities.

Justification: These low-cost, community-led veterinary interventions can improve herd health with minimal infrastructure.

4- Develop Long-Term, Sustainable Dairy Value Addition Focused on High-Quality International-Standard Goat Cheese

- Support the establishment of small-scale, innovative cheese-making enterprises dedicated to producing high-quality, internationally competitive goat cheeses that meet global standards for flavor, safety, and branding.
- Provide technical training and capacity building on advanced cheese production techniques, hygiene, and quality assurance tailored to create premium goat cheese products suitable for export markets.
- Encourage the use of local, indigenous goat breeds and modern, artisanal cheese-making methods to develop unique, high-value cheese varieties that can appeal to international consumers.
- Assist producers in branding, packaging, and marketing these specialty goat cheeses to position Jordan as a producer of distinctive, high-end dairy products for export and premium local markets.
- Facilitate linkages with international buyers, specialty food shops, and tourism sectors to develop sustainable demand for high-value goat cheese products.
- Support the formation of producer cooperatives or collective processing facilities that can meet international quality and safety standards, improve market access, and share resources.
- Promote sustainable land management practices that support grazing and pasture health, ensuring consistent high-quality milk supply and long-term viability of goat dairy farming, aligned with land restoration and conservation goals.

Justification: While traditional sheep cheese remains preferred locally, developing high-quality, internationally marketed goat cheese can open new markets, add value for smallholders, and create a premium product that supports land stewardship and sustainable land use in grazing areas.

These interventions not only improve the productivity and inclusiveness of the dairy value chain but also create the enabling conditions for land stewardship, biodiversity protection, and climate resilient rural development.

By embedding value chain development within the ALDNT's broader landscape restoration strategy, the project can catalyze transformative change, where healthier land supports stronger livelihoods, and resilient producers become stewards of sustainable land use.

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DAIRY VALUE CHAIN CONSULTANCY REPORTS

Report 2: Capacity Development Needs and Training Recommendations Report

Consultant: Rula Awad

April, 2025

Achieving Land Degradation Neutrality in Northern Jordan:

**Capacity Development Needs and Training Recommendations
Report for Small Ruminant Dairy Sector in Northern Jordan**

Prepared for:

The ALDNT Project – GEF, FAO, RSS

Prepared by:

Dr. Rula Awad, Value Chain Consultant

April 2025

Amman, Jordan

Executive Summary

This report presents the second phase of the ALDNT Small Ruminant Dairy Consultancy in Northern Jordan, focusing on identifying capacity development needs and training recommendations for small ruminant producers, processors, and support institutions across Ajloun, Irbid, and Mafrq. Unlike the first phase, which analyzed the value chain structure, this report centers on the people behind the chain—women, youth, smallholders, and cooperatives—who face persistent challenges such as limited access to training, financial exclusion, and weak institutional support.

Through consultations in 15 villages and a mixed-methods approach (including FGDs, KIIs, and institutional interviews), the report highlights regional differences and priority needs—from women-focused home-based processing training in Mafrq to youth-led cooperative development in Ajloun, and traditional product enhancement in Irbid. The findings show strong demand for localized, gender- and youth-responsive training in areas like herd management, milk hygiene, marketing, and climate-smart production.

Tables 1 and 2 summarize village-specific training topics and practical delivery approaches such as Farmer Field Schools, mobile training units, and peer learning. The report also outlines principles for sustainable capacity development, emphasizing localization, inclusion, and alignment with Sustainable Land Management (SLM) goals. To ensure implementation, it calls for coordinated institutional support and a community-embedded Monitoring, Evaluation, and Learning (MEL) framework. Together, these interventions aim to build a more inclusive, resilient, and sustainable small ruminant dairy sector in Northern Jordan.

المخلص التنفيذي

يقدم هذا التقرير المرحلة الثانية من استشارة مشروع "القدرات التنموية لقطاع الألبان من المجرات الصغيرة" التابع لـ ALDNT في شمال الأردن، ويركز على تحديد احتياجات بناء القدرات والتوصيات التدريبية لمربي ومنتجي الألبان، والمصنّعين، والمؤسسات الداعمة في محافظات عجلون، إربد، والمفرق. بخلاف المرحلة الأولى التي ركزت على تحليل سلسلة القيمة، يسلط هذا التقرير الضوء على الفاعلين البشريين في السلسلة—وخاصة النساء، والشباب، والمزارعين الصغار، والتعاونيات—الذين يواجهون تحديات مستمرة مثل ضعف فرص التدريب، والاستبعاد المالي، وضعف الدعم المؤسسي.

من خلال مشاورات ميدانية في ١٥ قرية، وباستخدام منهجيات مختلفة (مثل مجموعات النقاش، والمقابلات الفردية، والمقابلات المؤسسية)، يبرز التقرير الفروقات الإقليمية والاحتياجات ذات الأولوية، مثل التدريب المنزلي للنساء في المفرق، وتطوير التعاونيات بقيادة الشباب في عجلون، وتحسين المنتجات التقليدية في إربد. وتُظهر النتائج وجود طلب كبير على برامج تدريب محلية، تراعي الفوارق بين الجنسين والفئات العمرية، وتغطي مجالات مثل إدارة القطعان، ونظافة الحليب، والتسويق، والإنتاج المقاوم للتغيرات المناخية.

تلخص الجداول (١ و ٢) الموضوعات التدريبية الخاصة بكل منطقة، وأساليب التنفيذ المناسبة مثل مدارس الحقول الزراعية، والتدريب المتنقل، والتعلم من الأقران. كما يقدم التقرير مبادئ للتنمية المستدامة للقدرات، تؤكد على التوطين، والشمول، والمواءمة مع أهداف الإدارة المستدامة للأراضي. ويدعو إلى تنسيق مؤسسي فعال، وإرساء إطار للرصد والتقييم والتعلم (MEL) ضمن البنى المجتمعية القائمة، لبناء قطاع ألبان مجرّات صغيرة أكثر شمولاً ومتانة واستدامة في شمال الأردن.

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LIST OF ABBREVIATIONS

Abbreviation Full Term

ALDNT	Achieving Land Degradation Neutrality in Northern Jordan
AV	Audio-Visual
FAO	Food and Agriculture Organization of the United Nations
FFS	Farmer Field Schools
FGDs	Focus Group Discussions
G	General Training (inclusive of all, especially women and youth)
GEF	Global Environment Facility
JEDCO	Jordan Enterprise Development Corporation
KII	Key Informant Interviews
LDN	Land Degradation Neutrality
MEL	Monitoring, Evaluation, and Learning
MoA	Ministry of Agriculture
MoY	Ministry of Youth
MIT	Ministry of Industry and Trade
MSMEs	Micro, Small and Medium Enterprises
NARC	National Center for Agricultural Research
NGO	Non-Governmental Organization
RSS	Royal Scientific Society
SLM	Sustainable Land Management
ToT	Training of Trainers
VTC	Vocational Training Corporation
W	Women-specific Training

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1. Introduction

This report, "Capacity Development Needs and Training Recommendations", represents the second phase of the ALDNT Small Ruminant Dairy Consultancy in Northern Jordan. It builds on the first report, which mapped the structure and performance of the small ruminant dairy value chain across the governorates of Ajloun, Irbid, and Mafraq. While the initial phase focused on understanding value chain functions—from input supply to marketing—this second phase shifts focus toward the people who sustain it: producers, processors, extension agents, cooperative members, and women entrepreneurs. This phase examines the human capacity gaps that limit productivity, innovation, and equitable participation—particularly among women, youth, and informal producers, who are often underserved by conventional training and extension systems. Drawing on field consultations conducted in 15 villages including Mansoura, Hosha, Sakhra, Al-Hashemiyah, Halwah, Rajeb, Kufranja, Orjan, Rakeb, Dair Abe Sead, Sharhbeel, Fu'arra, Doqar, Saham, and Aqraba—the report explores how current skills, practices, and institutional support structures either enable or constrain sector development.

Communities across these areas face a number of persistent challenges: high dependency on subsidized feed, limited veterinary coverage, price volatility, and poor market access. Women contribute significantly to dairy management and processing, yet their opportunities for training and financial inclusion remain limited. Similarly, youth are increasingly disengaged, citing low returns and a lack of innovation as barriers to participation in the sector. Against this backdrop, the report aims to identify priority training needs and capacity development opportunities that can support a more inclusive, climate-resilient, and land-conscious dairy system. The findings are framed within the broader objectives of Sustainable Land Management (SLM) and Land Degradation Neutrality (LDN), ensuring alignment with ALDNT's dual commitment to rural livelihoods and environmental sustainability. Rather than proposing one-size-fits-all solutions, the report emphasizes practical, community-driven interventions tailored to the specific needs of different actor groups. In doing so, it seeks to inform the design of training programs and institutional support mechanisms that invest in people—those best positioned to lead change within the small ruminant dairy value chain.

2. Methodology and Data Collection Approach

The capacity development needs assessment for the small ruminant dairy sector in Northern Jordan employed a participatory, evidence-based methodology designed to capture the lived experiences, challenges, and training priorities of key value chain actors. This analysis builds directly on the Dairy Value Chain Analysis conducted in February 2025, which revealed that the sector is largely informal and fragmented, facing challenges such as limited access to quality feed, water, veterinary and extension services, weak market linkages, infrastructure gaps, seasonal production, and land use restrictions. Women play a vital role but face barriers to training and support. This assessment extends those findings by focusing on specific operational and institutional gaps, with targeted capacity-building interventions for key actors—especially women and marginalized groups—to promote sector resilience, productivity, and sustainable land management.

2.1 Study Area and Sampling Framework

The assessment covered the same three governorates—Mafraq, Ajloun, and Irbid—that collectively represent over 38% of Jordan’s sheep and 22% of goat populations, based on the 2023 Agricultural Census. Fieldwork was conducted across 15 strategically selected villages representing diverse agro-ecological zones, production systems, and market access conditions. These included Mansoura and Hosha (Mafraq); Sakhra, Al-Hashemiyah, Halwah, Rajeb, Kufranja, Orjan (Ajloun); and Rakeb, Dair Abe Sead, Sharhbeel, Fu’arra, Doqar, Saham, Aqraba (Irbid). These areas are home to more than 10,000 registered small ruminant holders, with Mafraq alone hosting 796,050 sheep—over 70% of the sheep in the three governorates.

2.2 Data Collection Methods

The assessment followed a mixed-methods approach combining primary data collection with a secondary literature and policy review, allowing for triangulation of findings and identification of both perceived and structural gaps. The methods included:

- Focus Group Discussions (FGDs): Seven FGDs were held across the 15 villages, engaging smallholders, women dairy processors, and local cooperative members. Approximately 36% of participants were women, reflecting their vital role in dairy management, processing, and household income generation. FGDs explored themes including training access, knowledge gaps, production practices, market access, and institutional support needs.
- Key Informant Interviews (KIIs): Semi-structured interviews were conducted with 25 small ruminant dairy producers and 10 local processors to gather deeper insights into skill gaps related to milk hygiene, animal health, feed management, processing techniques, and marketing. Respondents also provided feedback on climate variability, labor constraints, and gender roles in daily operations.
- Institutional Consultations: Targeted interviews with representatives from the Ministry of Agriculture—specifically the Assistant Secretaries for Marketing and Animal Production—offered perspectives on policy alignment, training infrastructure, and extension services.
- Secondary Literature Review: The analysis incorporated national strategies, donor-funded project evaluations, livestock development policies, and extension service reports to contextualize the field data and identify systemic training and support gaps.

2.3 Analytical Framework

Findings from all sources were synthesized through a thematic gap analysis aligned with five core pillars: production, processing, infrastructure, marketing, and institutional support. The priorities across these areas were determined through a qualitative assessment that considered not only the frequency of issues raised by stakeholders but also the severity of the gaps, potential impact of capacity-building interventions, feasibility, and strategic relevance to the sector’s

development. This comprehensive approach enabled the identification of targeted capacity development priorities and actionable training recommendations for smallholders, women entrepreneurs, cooperatives, and extension personnel. Cross-cutting issues such as gender equity, youth inclusion, and climate resilience were integrated throughout the analysis to ensure relevance to the ALDNT project's broader objectives of inclusive and sustainable rural development.

3. Regional Capacity Development Needs

a. Mafraq (Hosha and Mansoura):

The region notably lacks structured guidance programs and dedicated training equipment, as confirmed by the Agricultural Extension Department at the Mafraq Agriculture Directorate. While there is a milk press available within one of the associations in Hosha, a significant challenge remains in the absence of trained personnel capable of operating and maintaining this machinery effectively. The community's social dynamics pose additional barriers; women, who are vital to the sector's development, face cultural resistance to participating in training sessions outside their homes. Consequently, targeted capacity-building initiatives for women are urgently needed to enhance their technical skills and empower their active involvement in dairy processing and farm management.

Furthermore, there is a limited understanding of licensing policies, standards, and regulations governing dairy production, which hampers compliance and market access. Women and local entrepreneurs also lack awareness of how to connect with donor institutions or access financial support through loans. Fortunately, there is a dairy factory affiliated with the Abq Al-Sahra Association in Sarhan, which is fully equipped and available to host training courses, presenting an excellent opportunity for practical, hands-on capacity development.

b. Ajloun:

Ajloun benefits from active associations and existing infrastructure capable of supporting training initiatives. Priority should be given to enhancing skills in traditional goat milk processing, with an emphasis on producing high-quality, long-lasting goat cheeses that meet international standards. Developing marketing competencies tailored to specific target groups will also be essential to expand market reach and increase product visibility. The region's existing associations can serve as effective training venues, facilitating the dissemination of best practices and fostering innovation in dairy product development.

c. Irbid:

In the Sharhabeel region, there is currently no formal training infrastructure or programs focused on traditional dairy product production. Women in the area predominantly produce unboiled white cheese, which is a staple local product, but they lack access to structured training that could enhance their skills in traditional processing techniques or introduce new, value-added products. There is a notable interest among women in receiving training specifically on traditional

dairy products such as ghee and Jameed, aiming to improve product quality and explore market opportunities. Facilitating targeted training in these areas would empower women, enhance product diversification, and support local economic development. Establishing field schools and workshops tailored to the needs of women producers could significantly advance the sector's potential in this region.

In Rakeb, Dair Abe Sead, the establishment of field schools for herd management and dairy processing is vital. Despite the clear need, there appears to be limited genuine interest or motivation among farmers to fully engage in these training opportunities, largely due to distrust in cooperative management and skepticism about the benefits of formal training programs. Many farmers are also concerned about competition from cow's milk and seek solutions that enable them to sell their milk without necessarily processing it.

Fu'arra and Doqra: These areas possess considerable experience in traditional dairy production; however, there is a need for practical field schools focused on herd management in forested grazing areas, as well as training in effective marketing strategies. Such capacity-building efforts will help optimize herd productivity and improve market access, ensuring producers can better capitalize on their existing skills.

Saham and Aqraba: Women in these border regions have expressed a strong interest in diversifying into non-traditional dairy products, indicating a readiness to adopt innovative processing techniques. The presence of multiple cooperatives highlights the potential for organized training programs. Farmers and cooperative representatives have voiced enthusiasm for field schools that focus on herd management, especially tailored to the unique conditions of border areas. There is a clear willingness among local stakeholders to participate in training initiatives that can enhance productivity, improve quality, and expand market opportunities.

3.1 Summary of Regional Differences

Table 1: Comparative Overview of Key Features in Mafraq, Ajloun, and Irbid

Aspect	Mafraq	Ajloun	Irbid
Existing Infrastructure	Limited; some associations and a fully equipped dairy factory in Sarhan	Active associations and supportive infrastructure	Limited formal training; experience in traditional dairy
Capacity Needs Focus	Machinery operation, regulatory knowledge, women's empowerment	Traditional goat milk processing, marketing skills	Traditional processing, herd management, product diversification
Cultural/Social Barriers	Resistance to women's participation outside the home	Not specifically noted; focus on skills development	Interest from women in new products; farmer motivation challenges

Opportunities	Dairy factory as training site; need for targeted women's programs	Use of associations for training; emphasis on quality and marketing	Field schools, innovation; build on traditional knowledge
Key Challenges	Lack of trained staff, social barriers, low awareness of policies/finance	Improving product quality and market access	Farmer trust issues, low motivation, local competition

4. Training Priorities and Approaches – Northern Jordan Small Ruminant Dairy Sector

Building on the regional assessments outlined in Section 3, this section identifies location-specific training priorities and corresponding delivery approaches tailored to the needs of smallholder farmers, women processors, youth entrepreneurs, and cooperative members across the 15 surveyed villages. Training topics were selected based on a synthesis of field data, stakeholder feedback, and existing capacity gaps related to production, processing, market access, and institutional support.

Particular attention is given to ensuring gender-responsive and youth-inclusive programming, with women-specific interventions designed to accommodate social and mobility constraints, especially in more conservative or underserved areas like Mafraq and parts of Irbid. Likewise, climate resilience and sustainable land management (SLM) are embedded across training themes—ranging from herd management in forested grazing zones to feed planning and water use efficiency—to reinforce the ALDNT project’s dual objectives of ecosystem protection and rural livelihood improvement.

The tables below summarize the training priorities by location (Table 1) and outline the most suitable training approaches and methods (Table 2), providing a blueprint for the implementation of practical, inclusive, and climate-smart capacity-building interventions across Northern Jordan.

Table 2: Localized Training Priorities and Approaches

Gov.	Village(s)	Priority Training Topics	Target Groups (Gender/Age)	Proposed Implementing Entity	Training Type
Mafraq	Mansoura, Hosha	Home-based dairy processing	Women, especially. home-bound	Local women's associations, MoA	W*
		Milk equipment operation & maintenance	Youth, men (cooperative members)	VTC, MoA	G**
		Licensing, market access & financial literacy	Women, new entrepreneurs	MIT, NGOs supporting MSMEs	W
		Group marketing & coop-based production models	All, with focus on women-led groups	Cooperatives Directorate, local NGOs	G
Ajloun	Al-Hashemiyah, Halwah, Rajeb, Kufranja, Orjan	High-value goat cheese production (artisanal techniques)	Women & youth processors	Dairy specialists (independent experts), MoA, rural NGOs	G
		Branding and traditional product marketing	Women-led enterprises, youth	JEDCO, private sector consultants	G
		Youth-led ToT in cooperative training	Educated rural youth	Cooperative Directorate, MoY	G
Irbid	Sharhbeel	Traditional dairy enhancement (especially ghee and Jameed), hygiene and storage	Women, especially informal producers	MoA extension services, women's NGOs	W
	Rakeb, Dair Abe Sead	Herd management field schools	General farmers, youth	MoA, FAO, (NARC)	G
		Introduction to marketing for raw milk (non-processing route)	Farmers (esp. skeptical/older men)	MoA, experienced local cooperatives	G

Fu'arra, Doqar	Grazing-based herd improvement & disease control	Mixed-gender herders, youth	Veterinary Directorate, herder associations, FAO	G
	Product pricing and seasonal marketing planning	Women, cooperatives	MoA, financial literacy NGOs, rural development programs	G
Saham, Aqraba	Non-traditional dairy product innovation	Women processors	Dairy innovation consultants, local incubators	W
	Women-led cooperative development (leadership, governance)	Aspiring women leaders	Cooperative Directorate, women's empowerment NGOs	W

***W:** Women-specific training (designed exclusively or preferentially for women)

****G:** General training (open to all, but inclusive of women and youth)

Table 3: Training Approaches (Applied Across All Villages)

Approach	How It's Applied	Gender / Age Sensitivity	Climate / SLM* Sensitivity	Proposed Implementing Entity
Farmer Field Schools (FFS)	Outdoor, hands-on training cycles for herd care and dairy production	Inclusive; supports mixed-gender participation	Promotes adaptive practices (e.g., grazing rotation)	MoA, FAO, NARC
Home-Based/Mobile Training	Delivered in-home or through traveling trainers (especially for women)	Tailored for women with mobility constraints	Encourages local resource use	Local women's associations, NGOs, VTC
Demonstration & Practice Labs	Real-time equipment use, dairy processing, and quality checks	Inclusive, hands-on for all ages	Teaches efficiency and hygiene under climate stress	Dairy cooperatives, MoA extension units

Peer-to-Peer Learning Circles	Knowledge-sharing facilitated by experienced local producers	Builds confidence in women/youth	Leverages indigenous knowledge and land-use experience	Local producer associations, experienced farmers, NGOs
Digital & AV Microlearning	Short video/audio content via WhatsApp or radio	Youth-friendly; supports non-literate users	Enables rapid dissemination of climate-related responses	Ministry of Digital Economy, NGOs, rural media networks
Training-of-Trainers (ToT)	Empowers educated youth as local trainers within cooperatives	Youth-focused, scalable training structure	Supports ongoing learning under environmental change	Cooperatives Directorate, MoY, academic institutions

*SLM – Sustainable Land Management

Principles for Effective Capacity Building

- **Localization:** Trainings should reflect local realities (herd size, language, cultural roles).
- **Inclusivity:** Target **women, youth, and informal producers** with tailored entry points.
- **Sustainability:** Embed trainings into existing structures (coops, associations, village committees).
- **Follow-up:** Integrate mentoring, refresher sessions, and access to services post-training.
- **Alignment with SLM:** Link all trainings to sustainable land and water use practices.
- **Flexibility:** Ensure programs are adaptable to market fluctuations and climate changes to remain relevant and effective.

Conclusion

To ensure the successful rollout and long-term sustainability of the proposed training initiatives, coordinated institutional action and a robust implementation framework are essential. Ministries, cooperatives, donor agencies, and community-based organizations must align roles and responsibilities to localize training delivery, strengthen rural institutions, and ensure that gender- and youth-sensitive interventions are meaningfully implemented. Piloting in high-readiness areas—such as Ajloun and Saham—should pave the way for scalable field schools, peer-to-peer models, and digital outreach across Northern Jordan. Equally critical is the establishment of a practical Monitoring, Evaluation, and Learning (MEL) system that goes beyond activity tracking to assess behavioral change, inclusion, and environmental impact. This includes community feedback loops, simple adoption indicators, and mobile-based progress monitoring. By embedding these tools within existing cooperative and extension networks, the ALDNT project

and its partners can drive a people-centered, climate-smart transformation of the small ruminant dairy value chain—building not only skills, but also trust, resilience, and opportunity in some of Jordan’s most underserved rural communities.

DAIRY VALUE CHAIN CONSULTANCY REPORTS

Report 3: Prioritized Interventions Report

Consultant: Rula Awad

Date: April 2025

Project Title: Achieving Land Degradation Neutrality Targets through Restoration and Sustainable Management of Degraded Land in Northern Jordan

Assignment Title: Assessment of the Dairy Value Chain in the Ajloun, Mafraq, and Irbid Governorates

Executive Summary

This report presents a set of three top-priority interventions for strengthening the small ruminant dairy value chain in Northern Jordan. These interventions have been selected based on field-level consultations, stakeholder feedback, and the capacity and structural gaps identified in Reports 1 and 2 of the ALDNT consultancy. Each intervention is aligned with the principles of Sustainable Land Management (SLM) and Land Degradation Neutrality (LDN) and aims to foster inclusion, economic resilience, and environmental sustainability.

The top three interventions are:

1. **Integrated Community-Based Feed and Water Management Initiative**
2. **Women-Led Dairy Processing and Marketing Cooperatives**
3. **Youth Training and Enterprise Support in Climate-Smart Dairy Production**

Each intervention responds to systemic constraints in the value chain and offers scalable, locally adapted solutions that enhance productivity while protecting land and water resources.

Proposed Interventions in the Targeted governorates:

Proposed Interventions in Ajloun governorate:

1. Name of the Intervention: Goat Cheese Production Line for Export

- **Overview and Description of the Intervention:** This intervention seeks to utilize surplus goat milk from rural areas in Ajloun to produce high-value, long-shelf-life goat cheese that meets international (EU) export standards. The initiative will establish a fully operational cheese production line, focusing on training and employing women and youth, promoting inclusive economic empowerment. By turning underutilized local resources into marketable products, the

intervention will increase rural household income, create climate-resilient livelihood opportunities, and reduce milk wastage.

- **Targeted Area:** The intervention will benefit all target villages in Ajloun, beginning with those surrounding the Sakhra Association and designed for scalable expansion across the entire Ajloun governorate.

- **Potential Partners (Cooperatives):** The Sakhra Association will lead implementation, drawing on its existing capacity and strong community ties. Local cooperatives and women's groups across Ajloun will be engaged to: Supply goat milk; participate in training; and help in local distribution and promotion.

- **How the Intervention Is Delivered:** The intervention will be delivered through the existing infrastructure of the Sakhra Association, which is well-equipped and centrally located:

- Fully equipped with industrial refrigerators for milk and cheese preservation
- Owns a refrigerated truck to maintain cold-chain logistics, even in remote areas
- Has designated space for a dairy production line, ready for immediate activation
- Includes a packaging unit, ensuring that final products meet commercial standards
- Prepared to host inclusive training programs with a focus on women and youth empowerment

The project will ensure that women have equitable access to leadership, training, and income-generating roles. At the same time, youth will be prioritized for technical skill-building, innovation, and entrepreneurship within the dairy value chain.

- **Equipment and Training Needs:** To operationalize the production line and ensure international competitiveness, the following are required:

- Cheese vats and molds for controlled, standardized production
- Cold storage units to maintain quality and comply with safety regulations
- Packaging machines for labeling, sealing, and branding products for local and export markets
- Training programs, including:
 - Good hygiene and food safety practices, particularly tailored for women-led production
 - EU-compliant cheese production techniques
 - Cold-chain management for climate-sensitive logistics
 - Entrepreneurship and cooperative governance with a focus on gender equity and youth leadership
- Climate-smart dairy processing approaches to minimize environmental impact

This intervention builds on the existing capacity of the Sakhra Association, harnesses the potential of rural women and youth, and aligns with climate adaptation strategies by promoting value-added, low-waste dairy production. It represents a scalable and inclusive for sustainable rural development across Ajloun.

2- Name of the Intervention: Revitalization of Orjan Dairy Facility

- **Overview and Description of the Intervention:** This intervention aims to reduce milk waste, empower women and youth, and strengthen the rural dairy value chain by supporting the rehabilitation and operation of the Orjan Dairy Facility. The Orjan Association already owns essential infrastructure—including dairy plant equipment and a refrigerated truck—but these assets are currently out of service. With targeted support to repair and reactivate the facility, this intervention will allow the association to process milk collected from northern Ajloun and the Koura District, producing value-added dairy products such as cheese and yogurt. This initiative also supports the training of women and youth in cheese making and home-based dairy projects, fostering inclusive, climate-resilient income opportunities in rural areas.
- **Targeted Area:** Primary area: Orjan, Ajloun
Secondary reach: Northern Ajloun villages and Koura District in Irbid
The intervention is designed to serve as a regional processing hub, reducing dairy losses and improving market access across multiple underserved rural zones.
- **Potential Partners (Cooperatives):** The project will be implemented in partnership with the Orjan Cooperative Association, which will manage plant operations and community engagement. Additional partners include: Local milk-producing cooperatives from Koura and northern Ajloun; Women's and youth associations offering outreach and training opportunities; and Home-based entrepreneurs interested in micro-scale dairy production. These partners will collaborate to create a networked supply chain and community-based training program.
- **How the Intervention Is Delivered:** The intervention will reactivate Orjan's dairy plant through a series of strategic steps:
 1. Infrastructure repair and rehabilitation
 2. Training and capacity building: Conduct inclusive training programs focused on cheese production, hygiene, and small-scale processing. Partner with local associations to reach women and youth interested in employment or starting home-based dairy projects
 3. Product development and cooperative branding: Develop local product lines using traditional and modern techniques; and support cooperative marketing and branding strategies to reach local and regional markets

The delivery model is highly inclusive, offering accessible training and economic participation for women and youth—both in the centralized facility and through home-based extensions of the value chain.

- **Equipment and Training Needs:** To fully restore the dairy facility and ensure sustainable operations, the following are required:
 - 1- Rehabilitation materials and services for plant equipment and infrastructure
 - 2- Training modules, with a strong focus on: Cheese making and dairy hygiene; Climate-smart processing techniques; Cold chain management; Home-based business models for women and youth; and Cooperative governance and entrepreneurship

The Revitalization of the Orjan Dairy Facility represents a transformative opportunity to reactivate underused rural infrastructure, reduce milk loss, and empower marginalized groups. With functioning equipment and a community-driven model, the project will deliver climate-

conscious, gender- and youth-inclusive economic development for Orjan, northern Ajloun, and the Koura District—helping turn rural potential into long-term resilience and prosperity.

3- Name of the Intervention: Women-Centered Home Dairy Projects

- **Overview and Description of the Intervention:** This intervention directly addresses the growing preference among women in Ajloun for home-based income-generating activities by establishing Women-Centered Home Dairy Projects. It will provide women with home dairy starter kits and offer structured, hands-on training in traditional and hygienic dairy production, with ongoing support from local women's cooperatives. This decentralized approach creates safe, culturally appropriate, and flexible livelihood opportunities for women—particularly those with caregiving responsibilities or mobility constraints—while increasing household income, strengthening local food systems, and contributing to climate-smart dairy production.
- **Targeted Area:** The project will be implemented throughout Ajloun, with a focus on rural communities in villages with high female participation in cooperatives. This wide reach ensures equitable access and fosters regional solidarity and market coordination among women-led dairy microenterprises.
- **Potential Partners (Cooperatives):** This initiative will be implemented in collaboration with multiple women's cooperatives across Ajloun. These cooperatives will help identify participants, host training sessions, and coordinate cooperative marketing and branding activities.
- **How the Intervention Is Delivered:** The intervention follows a community-based, inclusive delivery model that empowers women at the household level while building collective market power:
 1. Distribution of home dairy starter kits to selected participants
 2. On-site and doorstep training in: Basic dairy production and pasteurization; Hygiene and food safety; Low-cost packaging and labeling; and Cooperative marketing and sales.
 3. Establishment of peer learning groups and cooperative marketing channels to allow women to pool products for local sales, festivals, and markets
 4. Ongoing mentoring and support through local women's cooperatives and extension agents

This model ensures women's autonomy while providing community-based support and market access. It also opens opportunities for young women to acquire skills in processing, entrepreneurship, and cooperative governance. The project integrates climate-conscious practices by promoting: Low-energy, small-scale dairy processing; Reduction of milk waste through proper hygiene and preservation; and Use of locally available materials for packaging and storage

- **Equipment and Training Needs:** To launch and sustain the home dairy microenterprises, the following items and training components are essential:
 1. Home pasteurization kits, including thermometers and basic dairy tools
 2. Hygiene starter kits with gloves, aprons, sanitizers, and storage containers; Packaging supplies for safe and market-ready products; Mobile and in-home training sessions on: Traditional cheese and yogurt production; Food safety and quality control; Small-scale business planning; Branding and cooperative marketing; Climate-smart home-based processing practices; and Branding and marketing workshops will help women collectively develop product labels and reach local and regional buyers.

The Women-Centered Home Dairy Projects intervention offers a flexible, low-cost, and highly replicable solution to increase rural women's income, build local food resilience, and promote inclusive and climate-smart dairy practices across Ajloun. By combining home-based empowerment with cooperative support, this initiative creates sustainable pathways for women and young people to thrive within their communities—while strengthening the local economy and reducing environmental impact.

Proposed Interventions in Irbid governorate:

1- Name of the Intervention: Improving Access to Water

- **Overview and Description of the Intervention:** This intervention aims to improve sustainable water access for livestock farmers in the mountainous regions of Sharhabil and in Fu'ora, and Douqra villages. Many sheep and goat farmers in these highland areas face severe water shortages, which threaten animal health, reduce productivity, and limit income opportunities—especially among women and youth who depend on livestock for their livelihoods. The project will support a cost-sharing model to install water pumps or extend pipelines from existing sources in Sharhabil or Ajloun. In Fu'ora, a partially functioning well will be reclaimed and maintained, which has the potential to provide 20 water tanks per day, significantly easing the pressure on nearby communities. Farmers have expressed strong willingness to contribute financially—committing up to 1,000 Jordanian dinars per household—to co-finance water access infrastructure. This level of local ownership ensures both sustainability and community engagement, while enhancing the resilience of rural production systems in the face of climate stress.
- **Targeted Area:** The intervention will focus on underserved highland communities in Sharhabil; Fu'ora and Douqra. These areas are characterized by difficult terrain, limited infrastructure, and high dependence on livestock. The water intervention will directly benefit isolated farming households, many of which are led or supported by women and youth.

-**Potential Partners (Farmer Groups, Municipalities):** The project will be implemented in collaboration with: Local farmer groups; Ministry of Water, Municipalities (particularly for maintenance and oversight of the well in Fu'ora), and Community-based organizations and youth volunteers, supporting water use monitoring and awareness.

- **How the Intervention Is Delivered:** The intervention follows a community-led, cost-sharing model, blending public support with farmer contributions to ensure long-term ownership and care. Implementation will involve:
 1. Installation of water pumps and/or extension of water pipelines to reach remote livestock farms from: Sharhabil's water sources, via raised pumping or Ajloun's gravity-fed systems, via pipe extensions
 2. Rehabilitation of the existing well in Fu'ora, including mechanical maintenance and community-level water tank management
 3. Training farmers in water-efficient usage for livestock and small-scale irrigation
 4. Promotion of community-based monitoring and solar-powered solutions, to ensure low environmental impact and cost-effective water delivery

This intervention is designed to be inclusive and sustainable. It empowers women and youth through involvement in water management training and household-level livestock production. It also addresses climate change adaptation by enabling communities to: Secure alternative water sources; Reduce dependency on erratic rainfall; and Improve overall drought preparedness

- **Equipment and Training Needs:** To activate and sustain the intervention, the following equipment and capacity-building components are required: Water pumps (electric and solar-powered) suitable for mountainous terrain; Solar panels to reduce energy costs; Pipe extension materials from Sharhabil or Ajloun; Rehabilitation tools for the Fu'ora well; Community-led monitoring tools, such as flow meters and maintenance kits; Training modules on efficient water use for livestock, Well maintenance and pump operation, household-level water safety, climate-resilient livestock management, and gender-inclusive community governance of water resources.

The Water Pumping Support for Mountain Farmers intervention addresses a critical gap in basic services for highland livestock producers in Irbid Governorate, while promoting climate resilience, gender equity, and youth participation. Through a community-driven cost-sharing model, this initiative enhances local ownership, restores vital water infrastructure, and enables more sustainable and productive livelihoods for some of the region's most vulnerable rural populations.

2- Name of the Intervention: Strengthening Local Fodder Production and Supply Chains

- **Overview and Description of the Intervention:** This intervention aims to enhance local fodder production capacity and reduce the high transportation costs faced by livestock farmers in Shuna al-Shamalia, Rakeb, and Deir Abi Saeed. It builds on the potential of the Shuna al-Shamalia Association, which is well-positioned to produce alternative, locally grown fodder crops that are both cost-effective and climate-resilient. By supporting irrigation infrastructure, providing equipment, and linking producers to nearby buyers, this initiative will improve fodder availability, stabilize prices, and support livestock productivity in the surrounding communities. The project will also create employment opportunities for youth and women,

particularly in fodder processing, transport logistics, and cooperative marketing. This intervention addresses both climate adaptation and economic inclusion by diversifying fodder sources, reducing dependence on imported feed, and strengthening regional feed supply chains.

- **Targeted Area:** The intervention covers key agricultural and livestock areas in the northwestern part of Irbid Governorate, specifically: Shuna al-Shamalia (production hub); Rakeb and Deir Abi Saeed (target beneficiary areas and fodder buyers).

- **Potential Partners (Associations and Cooperatives):** The lead implementing partner is the Shuna al-Shamalia Association, which has access to land, technical knowledge, and a strategic location for distribution.

Additional partners may include:

- Livestock cooperatives and buyers in Rakeb and Deir Abi Saeed

- Youth groups and agri-logistics service providers

- Local agricultural extension offices for training and technical support

- **How the Intervention Is Delivered:** The intervention will be implemented through a partnership model between Shuna al-Shamalia Association and surrounding livestock communities, using a market-oriented and climate-smart approach:

1. Support the production of alternative fodder crops
2. Improve irrigation systems to ensure consistent production, including possible use of solar-powered solutions
3. Distribute seeds and baling equipment to support efficient harvesting and storage
4. Link producers with buyers in nearby villages through structured contracts or cooperative agreements
5. Involve youth in logistics, marketing, and digital tracking of supply and distribution chains

Women will also be engaged, especially in roles related to post-harvest processing, quality monitoring, and cooperative administration. Youth participants will be equipped with skills in agri-business operations, value chain logistics, and climate-resilient fodder production. This decentralized, partnership-based approach enables cost reduction, market stability, and greater income generation for rural households.

The Strengthening Local Fodder Production and Supply Chains intervention provides a sustainable, inclusive solution to one of the region's most pressing livestock challenges. By empowering the Shuna al-Shamalia Association to serve as a regional production and distribution hub—and involving youth and women in every stage of the value chain—this project will improve feed security, reduce costs, and build climate resilience for farmers across northwestern Irbid Governorate.

3- Name of the Intervention: Strengthening Traditional Dairy Skills and Local Processing

- **Overview and Description of the Intervention:** This intervention aims to revitalize traditional dairy practices while promoting rural employment and value addition by training women and youth in the production of high-value, culturally significant dairy products such as jameed and ghee. Building on the unique qualities of local sheep and goat milk, the initiative will combine hands-on training with support for local processing infrastructure and cooperative branding. In areas like Sahm, Aqraba, Sharhabil, Fo'ura, and Douqra, there is strong interest from local associations in both training women and operating small-scale milk processing units. Farmers and cooperatives in Fo'ura and Douqra have expressed particular interest in connecting women and girls to dairy factories for both milk supply and employment opportunities. This presents a strategic opportunity to blend training with actual production, creating pathways for economic participation while preserving Jordan's rich dairy heritage.
- **Targeted Area:** This intervention will be implemented in: Sharhabil; Sahm; Aqraba; Fo'ura; and Douqra. These communities are selected based on local demand for dairy-based livelihoods, the presence of active cooperatives, and the availability of goat and sheep milk resources.
- **Potential Partners (Women/Youth-Focused Cooperatives):** The intervention will be delivered in partnership with: Women and youth-focused cooperatives and associations in all five target areas; Existing or emerging dairy units with potential for local milk sourcing and product manufacturing; and Local municipalities and training centers to provide space and support for practical sessions. These partners will help recruit participants, host apprenticeships, and manage the transition from training to production.
- **How the Intervention Is Delivered:** The intervention follows a hands-on, skills-based model combined with light equipment support to enable real-time production and future employment. Key components include:
 1. In-person training courses on the preparation of jameed, ghee, and other traditional products, with a focus on: Shelf-life extension, Hygienic production techniques; Basic food safety compliance
 2. Training of trainers (ToT) model to ensure sustainability within local cooperatives
 3. Local apprenticeships and practical training within community-run processing units
 4. Provision of essential dairy equipment to partner cooperatives to support small-scale production of traditional dairy products
 5. Branding, packaging, and marketing workshops to improve product visibility and market access

The model is designed to empower women and engage youth, particularly in communities where girls and young women are seeking safe, local employment options in dairy production.
- **Equipment and Training Needs:** To implement this intervention effectively, the following resources are required: Dairy processing tools, including molds, drying racks, mixing containers, and thermometers; Basic dairy equipment for cooperatives

in Sahm, Aqraba, and Fo'ura; Milk testing and hygiene kits to ensure safe production; Training manuals and visual guides for traditional product preparation; Packaging materials and labeling design support for cooperative products; Apprenticeship toolkits for new trainees (especially youth and girls)

Training content will also include modules on: Local milk value chains and seasonal planning; Branding and cooperative marketing; Food preservation and packaging techniques; Climate-resilient and hygienic processing practices.

The Strengthening Traditional Dairy Skills and Local Processing intervention will preserve and modernize traditional dairy production while creating inclusive economic opportunities in rural Irbid and adjacent areas. By training women and youth in culturally valued skills—and equipping cooperatives with the tools to process, package, and sell—this initiative will enhance household incomes, promote rural entrepreneurship, and connect milk producers with local processing hubs. It also supports climate adaptation by encouraging shelf-stable dairy production that reduces waste and ensures income stability.

Proposed Interventions in Mafraq governorate:

1- Name of the Intervention: Enhancing Livestock Water Access through Sweilem Well Operationalization

- **Overview and Description of the Intervention:** This intervention aims to reduce water scarcity for livestock farmers in Sweilem Village, Mafraq, by operationalizing an existing artesian well that remains underutilized due to incomplete infrastructure. The Sweilem well—initially drilled under an environmental compensation initiative—holds significant potential to support local herders and small-scale livestock producers, many of whom face growing pressures due to climate variability and the rising cost of water transport. The intervention will focus on the completion and activation of the well by installing solar-powered pumps, reservoirs, and water tanks, and by establishing a community-based water management system. This will allow for efficient, locally governed, and sustainable water access tailored to the needs of both men and women involved in animal husbandry. By improving water security in this semi-arid region, the project directly supports livelihood stability, animal welfare, and drought resilience for Mafraq's vulnerable livestock-reliant households.
- **Targeted Area:** The intervention targets Sweilem Village in the Mafraq Governorate, a rural area heavily dependent on livestock production and severely affected by chronic water shortages and over-reliance on costly trucking solutions.
- **Potential Partners (Local Cooperatives and Institutions):** The intervention will be coordinated in collaboration with:
 1. Local livestock cooperatives and herder associations in Sweilem
 2. The Ministry of Water and Irrigation, responsible for technical oversight
 3. The Environmental Compensation Program, which initially funded the well
 4. Community-based organizations to facilitate the formation of inclusive water user committees

These partnerships will ensure that both the infrastructure and the governance mechanisms are community-owned, gender-responsive, and sustainably managed.

- **How the Intervention Is Delivered:** The intervention follows a community-based, infrastructure-completion model, combining technical upgrades with institutional capacity-building. Core activities include:
 1. Installing solar-powered pumps, connected to the artesian well
 2. Constructing water reservoirs and livestock-grade tanks for secure storage and easy access
 3. Forming and training community water committees, with inclusive participation from women and youth
 4. Delivering hands-on training on: Seasonal water budgeting; Pump and reservoir maintenance; Equitable water access rules and community dispute resolution
 5. Developing simple monitoring tools for daily usage and maintenance tracking

This model enhances community ownership, improves cost-efficiency, and ensures that both men and women livestock keepers can participate in and benefit from the water system. Moreover, by using solar energy, the intervention aligns with Jordan's climate adaptation priorities, reducing fuel dependency and operating costs while lowering the system's carbon footprint.

- **Equipment and Training Needs:** To activate and sustain the well, the following equipment and training components are required: Solar-powered water pumps and controllers; Water storage reservoirs and distribution tanks; Simple pipe networks to connect tanks and troughs; Water flow meters and maintenance toolkits; Training packages on: Community-led water governance, Solar pump maintenance and troubleshooting, Livestock water management under climate stress, and Women and youth participation in water committees.

The Enhancing Livestock Water Access through Sweilem Well Operationalization intervention addresses a critical infrastructure gap in Mafrqa's livestock economy. By completing a strategic water resource and empowering local communities—especially women, youth, and small-scale herders—to manage and sustain it, this initiative builds long-term resilience, equity, and climate-smart water access for one of Jordan's driest livestock-reliant areas.

2- Name of the Intervention: Expanding Sustainable Fodder Production and Land Restoration

- **Overview and Description of the Intervention:** This intervention supports the scaling-up of climate-resilient fodder cultivation in Mafrqa's dryland areas, with a focus on clover (Ilkyder)—a high-protein, water-efficient forage crop well-suited to local conditions. Led by the Abq Al Sahra Cooperative, the initiative will expand clover cultivation by investing in land preparation, irrigation infrastructure, and the construction of collective feed storage units. The goals are to reduce dependency on costly imported feed, enhance local fodder security, and restore underutilized or

degraded rangelands through sustainable farming techniques. The project also provides practical employment opportunities for youth in land and irrigation work, while engaging cooperative members—particularly women—in seed handling, processing, and marketing. The intervention supports broader goals of climate adaptation, livestock productivity, and rural economic resilience in Mafrq Governorate.

- **Targeted Area:** The project will be implemented in Hosh district, a rural area in Mafrq characterized by: Dryland grazing systems; Limited feed access; Growing interest in cooperative-based land restoration and fodder self-sufficiency
- **Potential Partners (Cooperative and Local Actors):** The lead implementing partner is the Abq Al Sahra Cooperative, with support from: Local youth groups and land laborers for fieldwork and irrigation setup, Agricultural extension offices for technical guidance, and Feed buyers and livestock cooperatives for downstream market linkages. These partnerships help ensure both practical implementation and a strong local market base for the fodder produced.
- **How the Intervention Is Delivered:** The intervention is delivered through a phased, cooperative-led model focusing on production scale-up, skills transfer, and storage readiness. Key components include:
 1. Land rehabilitation and preparation, involving youth for labor-intensive clearing and leveling
 2. Expansion of irrigation infrastructure, using climate-smart and water-efficient systems (e.g. drip irrigation)
 3. Provision of drought-resistant clover (Ilkyder) seeds and planting support
 4. Construction of silage and dry-feed storage silos, allowing year-round availability
 5. Training sessions for cooperative members on: Clover agronomy and seed selection, Water-saving irrigation and soil conservation, Silage preparation, preservation, and cooperative sales strategies.

Women's participation will be actively encouraged, particularly in post-harvest processing, storage management, and marketing, while young men and women will play a vital role in field operations and cooperative logistics.

The Expanding Sustainable Fodder Production and Land Restoration intervention offers a practical, climate-aligned solution to fodder scarcity in Mafrq. By scaling up Ilkader clover cultivation through cooperative action and youth engagement, the initiative improves feed self-sufficiency, revitalizes degraded lands, and empowers local producers—especially youth and women—as key actors in Jordan's sustainable livestock systems.

3- Name of the Intervention: Empowering Women through Home-Based Dairy Production and Cooperative Linkages

- **Overview and Description of the Intervention:** This intervention responds directly to the expressed interest of women in Hosh and Mansoura who prefer to work from home rather than join formal factory environments. It aims to support home-based dairy production by providing women with the tools, training, and cooperative

linkages they need to process milk into marketable products like labneh, ghee, and jameed—while maintaining their traditional roles and privacy. The initiative will be implemented with technical and training support from the Awassi Dairy Factory, operated by the Abq Al-Sahraa Association, which has expressed readiness to host trainings and provide mentoring. Women will receive starter kits, doorstep or local group training, and be connected to cooperative-led sales and marketing channels, ensuring that their products reach the market without the need for them to leave home. This flexible, gender-sensitive approach promotes economic empowerment, local food security, and value addition from available sheep and goat milk, while respecting cultural norms and boosting rural livelihoods.

- **Targeted Area:** Hosha and Mansoura, Mafraq Governorate (Surrounding communities supplying milk or with interest in home-based production). These areas have a strong tradition of dairy use, available milk sources, and a clear interest among women in starting or scaling dairy-based microenterprises from home.
- **Potential Partners (Associations and Cooperatives):**
 - 1- Abq Al-Sahraa Association / Awassi Dairy Factory – serves as a hub for: Training and technical support for women in dairy production; Product aggregation and cooperative branding, helping standardize, package, and market home-produced dairy goods; and Acting as a marketing and distribution platform for wider sale in Mafraq and beyond
 - 2- Local women’s groups and informal cooperatives – support outreach, local coordination, and peer mentoring
 - 3- Municipal and agricultural extension offices – assist with logistics, monitoring, and small-scale support
- **How the Intervention Is Delivered:** The intervention is delivered in three coordinated stages:
 1. Outreach and Identification: Identify interested women and assess milk availability, production space, and basic needs; Form small local groups for peer support and learning
 2. Provision of Equipment and Hands-on Training: Distribute starter kits with essential tools for home production: small pasteurizers, strainers, hygiene supplies, and basic packaging materials; Offer localized, women-only training sessions facilitated by trainers from Awassi Dairy Factory, either on-site or in nearby community spaces. Training includes: Traditional dairy product techniques; Safe processing and hygiene; Shelf-life extension and storage; Basic pricing and household budgeting
 3. Cooperative Integration and Market Linkages: Link women to Abq Al-Sahraa Association or nearby cooperatives to: Supply milk if they lack animals, Sell their products through joint marketing platforms, Join branding or packaging schemes managed by the cooperative

This approach allows women to produce in the comfort of their homes while being fully integrated into cooperative value chains and supported through shared infrastructure.
- **Equipment and Training Needs:** Home-based dairy kits; Packaging and labeling materials. Training materials and delivery (Illustrated manuals or videos tailored for

low-literacy audiences; Female trainers (when possible) to ensure cultural appropriateness; Transportation or meal allowances for women attending optional factory-based sessions)

The Empowering Women through Home-Based Dairy Production and Cooperative Linkages intervention offers a culturally appropriate, economically impactful solution for increasing women's participation in Mafrq's dairy economy. By providing tools, training, and trusted cooperative connections—while respecting women's preferences for working at home—this initiative will unlock stable, dignified income opportunities for rural women and support inclusive, climate-smart dairy development in Hosha, Mansoura, and surrounding areas.

Recommendations for Implementation

The following recommendations are aimed at enhancing the impact, sustainability, and scalability of the initiatives:

1. Strengthen Stakeholder Coordination and Partnerships
2. Ensure Inclusive and Gender-Responsive Approaches
3. Align Interventions with Climate-Resilient Practices
4. Focus on Market Linkages and Value Addition
5. Invest in Capacity Building and Technical Training
6. Promote Community Ownership and Sustainability
7. Integrate Climate and Land Degradation Objectives
8. Facilitate Access to Finance and Market Opportunities
9. Monitor, Evaluate, and Scale Successful Models

Implementing these recommendations will maximize the interventions' effectiveness, promote inclusive development, and contribute meaningfully toward Jordan's land degradation neutrality and climate resilience objectives.

Conclusion

The prioritized interventions presented in this report offer actionable, high-impact pathways for transforming Northern Jordan's small ruminant dairy sector. By focusing on feed security, women's empowerment, and youth-driven innovation, these initiatives not only address urgent capacity and market gaps but also reinforce the ALDNT project's vision for land stewardship and inclusive prosperity. With the right investment and implementation partnerships, these interventions can serve as scalable models for climate-smart dairy development in dryland contexts across Jordan and beyond.

DAIRY VALUE CHAIN CONSULTANCY REPORTS

Report 4: Market Access Policy Report

Consultant: Rula Awad

Market Access Policy Constraints for Smallholders in the Small Ruminant Dairy Value Chain in Northern Jordan – Assessment Report

Introduction

Despite the vital role of smallholder producers in the small ruminant dairy sector in northern Jordan, numerous policy-related constraints significantly hinder their access to formal markets and limit sector growth. These constraints are rooted in regulatory frameworks, market infrastructure, and institutional support systems that disproportionately affect small-scale, informal, women-led, and marginalized producers. This assessment identifies key policy-related barriers impeding market access for smallholders and offers strategic recommendations to foster an enabling environment for inclusive, sustainable market participation.

Key Policy Constraints – (Al-Mafraq)

1. Regulatory Barriers and Licensing Requirements

- *Stringent Licensing and Quality Standards:* Current Jordan Food and Drug Administration (JFDA) regulations require dairy processing units to be semi-automated and adhere to strict health and safety standards. In areas like Al-Mansoura, the updated Food and Drug Law has led to a blanket ban on licensing new dairy shops ("malabens"), following the closure of previously licensed Syrian-operated units. As a result, no operational dairy shops currently exist in Al-Mansoura, severely restricting local dairy processing capacity. This limitation disproportionately affects women, many of whom operate small-scale dairy activities from home, and challenges the community's ability to adapt dairy production practices amid climate variability.
- *Zoning Restrictions for Dairy Factories:* Investors and cooperatives seeking to establish formal dairy processing facilities in rural areas such as Housha and Al-Mansoura face structural barriers, as current zoning regulations require factories to be located on officially designated commercial streets. Since such infrastructure does not exist in many rural villages, factory licensing becomes impossible even when technical and financial requirements are met. This reduces opportunities for inclusive economic growth.
- *Excessive Requirements and Tax Burden for Home-Based Activities:* Rural women engaged in home-based dairy processing face overly complex licensing procedures, and even when they manage to fulfill all regulatory and safety conditions, they become subject to income tax. This creates a strong disincentive for formalization, especially considering the small profit margins of most home-scale dairy activities, which serve as an important livelihood buffer in the face of climate stresses.

2. Market and Trade Policy Limitations

- *Exploitative Market Intermediaries:* In Mafrq, informal cheesemakers (locally referred to as "al-jabban") provide pre-season financing to dairy farmers, in exchange for exclusive rights to their milk at significantly reduced prices. This practice undermines farmers' financial independence and reduces their ability to negotiate fair terms, indirectly impacting women processors who rely on steady milk supplies for their small-scale businesses.
- *Price Competition and Consumer Preferences:* Local consumer preferences are heavily driven by cost rather than quality, which favors mass-produced cow milk products over higher-cost, traditional sheep milk products, reducing competitiveness for artisanal producers who often include women preserving traditional dairy practices.
- *Disrupted Local Supply Chains:* Women processors in Al-Mansoura report irregular milk supply because most farmers prefer to sell to cheesemakers due to upfront payments and mistrust in the continuity of women's demand. This unpredictability limits the ability of women to maintain steady dairy production or grow their businesses, hindering local economic resilience in a changing climate.

3. Land Use and Land Management Policies

- *Restricted and Unequal Access to Grazing Lands: Conditional Access in Protected Rangelands:* In areas such as the Al-Sorah rangeland reserve, grazing is officially restricted. However, limited access is granted under informal arrangements, often favoring farmers with personal relationships with the patrolling officer ("al-Tawwaf"). This discretionary access leads to unequal grazing rights and undermines transparency in land management. Reduced access to grazing land increases vulnerability to climate impacts, especially for small-scale livestock keepers who often rely on communal rangelands.
- *Prohibited Grazing in Military Zones:* Grazing is not allowed in designated military areas, further reducing the already limited available land for pastoral use in Mafrq. This adds pressure on communal rangelands and increases the vulnerability of small-scale livestock keepers.

4. Financial Policy and Support Gaps

- *Inaccessibility of Formal Credit:* Small producers in Mafrq face prohibitive borrowing conditions—complex application procedures, collateral requirements, and multiple guarantors—rendering formal credit inaccessible for most, especially women and informal producers. This restricts their capacity to invest in adaptive technologies and climate-resilient production practices.

5. Extension and Advisory Policy Gaps

- *Demand-Driven Extension Deficits:* In Mafrq, extension services are provided only upon formal request. However, communities in Housha and Al-Mansoura often lack awareness of how to submit such requests. As a result, they are excluded from extension

plans and do not benefit from training or technical support that could improve climate adaptation strategies.

- *Social Barriers to Participation:* Women in the region often choose individual work over cooperative models due to family responsibilities and prevailing social norms. Moreover, the negative perception of dairy processing roles further discourages youth from entering the sector, reducing innovation and long-term sustainability in a context where adaptive capacity is increasingly critical.

Key Policy Constraints – (Ajloun)

1. Regulatory Barriers and Licensing Requirements

- *Stringent Licensing and Quality Standards:* As in other governorates, small-scale dairy processors in Ajloun struggle to meet licensing requirements set by the JFDA. In Rajeb, for example, no licensed dairy shops (malabens) exist, and most production remains informal. Similarly, producers in Thughret al-Zubeid manufacture dairy products at home without regulatory oversight, leaving them outside formal market structures. This limits women's opportunities to scale their businesses and respond effectively to climate-related challenges.
- *Barriers to Home-Based Business Formalization:* Home-based dairy entrepreneurs face compounded licensing barriers. In Rajeb, producers reported being unable to market their products in formal outlets unless they obtain a commercial registration and labeling license, which requires trademark registration and additional permits. These requirements are often disproportionate to the scale and income of such home-based producers.
- *Cost-Prohibitive Product Testing Requirements:* In Sakhra, rural producers noted that the mandatory lab testing of products intended for formal markets is both expensive and geographically inaccessible, as testing facilities are centralized in Amman. This effectively blocks rural producers, many of whom are women balancing household and production responsibilities, from entering regulated distribution channels.

2. Market and Trade Policy Limitations

- *Lack of Marketing Channels and Dairy Shops:* In Halawa and Rajeb, dairy marketing is largely restricted to local informal networks due to the absence of dairy shops and formal retail channels. Producers rely on household production and direct sales, with little to no opportunity for market expansion. This situation limits economic resilience for women producers who rely on dairy income amid increasingly variable climate conditions.
- *Producer-Borne Transport Costs:* In many parts of Ajloun, including Rajeb and surrounding rural areas, farmers must transport milk to processors or consumers at their own expense, reducing profitability—especially for goat herders whose primary income is derived from milk.
- *Market Entry Barriers Due to Packaging and Labeling Standards:* As reported in Kofranjah, dairy products without formal labeling (including trademarks) are often

rejected by retailers. This creates a bottleneck for small producers unable to afford branding and licensing costs.

3. Land Use and Land Management Policies

- *Restricted Access to Grazing Lands:* Across Ajloun (notably in Sakhra, Halawa, and Kofranjah), rangelands are increasingly limited due to forest protection laws and expanding urbanization. Farmers often resort to grazing in forest areas where it is prohibited, leading to conflicts with environmental regulations and exposure to legal penalties. These land pressures heighten the vulnerability of small-scale pastoralists to climate change impacts.
- *Land Ownership Fragmentation and Urban Encroachment:* In areas like Sakhra, much of the land is privately owned or undergoing urban development, further reducing available grazing land and forcing herders to seek unauthorized access to protected areas.

4. Financial Policy and Support Gaps

- *Difficult Access to Agricultural Credit:* Farmers in Ajloun, particularly in Halawa and Hashimiyah, report difficulty in accessing agricultural loans due to complex procedures and limited institutional support. These constraints limit their ability to invest in equipment, cold chains, or small-scale processing improvements that would support climate resilience.

5. Extension and Advisory Policy Gaps

- *Misaligned Extension Content:* In Sakhra, livestock farmers expressed frustration with extension programs focused largely on crop production. Because animal producers often interact with the animal production department rather than the extension unit, their needs are not captured in the planning of training topics. As a result, existing training programs do not meet their actual priorities, including those related to climate adaptation in livestock management.
- *Geographic Barriers to Accessing Services:* In Halawa, farmers reported challenges accessing core agricultural services due to the physical distance from the Directorate of Agriculture. This geographic gap leads to exclusion from advisory services and weak engagement with government-led development programs.
- *Insufficient Veterinary Services:* In Kufranjah, the only veterinary clinic serves a broad rural population, and there is no veterinarian present in the Directorate of Agriculture. This undermines timely diagnosis and treatment, particularly critical during lactation and disease outbreaks, which may be exacerbated by climate stressors.

Key Policy Constraints – (Irbid)

1. Regulatory Barriers and Licensing Requirements

- *Licensing Restrictions on Traditional Dairy Processing:* In areas such as Aqraba and Saham, policies prohibit the establishment of small-scale traditional dairy units, effectively excluding home-based producers from obtaining licenses. This limits women's economic participation and hinders household-level income generation, which plays an important role in community resilience to climate variability.
- *Overregulation and Enforcement Pressure on Informal Producers:* In Deir Abi Saeed and Kufr Rakeb, licensed dairy shops (malabens) have filed complaints against unlicensed home-based producers. However, attempts to obtain licenses are met with complex regulatory requirements, including the need for a commercial registration and adherence to strict food safety rules, which are disproportionate to the scale of household production.

2. Market and Trade Policy Limitations

- *Unequal Milk Purchasing Practices:* Across Fu'ara, Duqra, and Sahm, local dairy shops and intermediaries (jabban) purchase milk primarily from cow farmers, neglecting goat and sheep milk, which is more common among smallholders. When sheep milk is purchased, it is often under exploitative arrangements such as deferred payment or steeply reduced prices. This undermines producers' financial sustainability and their capacity to adapt to climate impacts affecting herd composition.
- *Lack of Cold Chain Infrastructure:* In Deir Abi Saeed and Duqra, milk is collected without refrigeration. Farmers bear the cost of spoilage if the milk deteriorates during transport or storage—a common issue due to the absence of cold chain systems, which is especially challenging for women managing small-scale production.
- *Weak Market Access and Price Pressures:* In Sharhabeel, small-scale sheep milk products are not competitive in local markets due to high poverty rates and consumer price sensitivity. As a result, products must either be transported to neighboring governorates—often at the farmer's own cost—or sold to traders at very low prices.
- *Discriminatory Retail Practices:* In Kufr Rakeb, home-based producers reported that retailers reject unlabeled dairy products. Obtaining an acceptable label requires a registered trademark and license, which are beyond the financial and administrative reach of most rural producers.
- *Low Consumer Willingness to Pay for Quality:* Across multiple districts (e.g., Fu'ara), consumers consistently opt for lower-priced dairy products regardless of origin or quality. This makes it difficult for smallholders producing premium or traditional goods to compete.

3. Land Use and Land Management Policies

- *Restricted Grazing Access in Border and Forested Areas:* In Sharhabeel, Saham, and Aqraba, grazing is prohibited near border zones and water sources and heavily restricted in forest reserves unless special permits are granted. Farmers report that these permits are typically issued through informal networks, leading to perceived favoritism and limited transparency. Reduced grazing availability heightens vulnerability to climate-induced pasture scarcity.

- *Encroaching Urbanization and Forestry Initiatives:* In Deir Abi Saeed and Kufr Rakeb, urban expansion and government-led afforestation projects (e.g., roadside tree planting) have significantly reduced available grazing land. Farmers were not consulted in the planning process, leading to tension between conservation goals and pastoral needs.
- *Prohibition of Livestock in Residential Areas:* In some urbanizing villages (e.g., Kufr Rakeb), local regulations prohibit sheep or goat rearing within residential zones, forcing farmers to keep animals in distant areas, increasing labor, costs, and exposure to theft.
- *Fire Hazards from Border-Security Operations:* In Aqraba, seasonal grass burning by border patrols for visibility purposes poses a serious hazard to nearby pastures and livestock operations.

4. Financial Policy and Support Gaps

- *Inaccessible Credit and Risky Loan Culture:* Farmers across Irbid (e.g., Halawa, Fu'ara, Sahm) face significant challenges accessing credit due to collateral requirements, small loan amounts, and complex procedures. In some areas, revolving loan schemes administered by local associations are undermined by high default rates, as borrowers delay repayment in anticipation of government debt forgiveness, leading to the collapse of these financial tools.
- *Lack of Access to Project Funding for Women's Associations:* In Kufr Rakeb, although women's associations exist, most are categorized as social organizations and are therefore ineligible to access agricultural or value chain project funding. This limits women's capacity to scale activities that could enhance resilience to climate variability.

5. Extension and Advisory Policy Gaps

- *Neglect of Livestock Producers in Extension Programs:* In Sahm and Aqraba, most extension activities focus on plant production. Farmers report that extension departments are under-resourced in livestock expertise, and animal producers are not systematically engaged in training design. Farmers in Dair Abe Saeed also noted that training programs are often predetermined and not based on actual demand, limiting opportunities to build adaptive capacity.
- *Geographic and Institutional Accessibility:* In many rural districts (e.g., Kufr Rakeb), producers have limited access to extension services due to the physical distance from directorates or lack of active outreach. Field schools and training programs are sometimes perceived as allocated through favoritism rather than transparent need assessments.

6. Water and Infrastructure Constraints

- *Inadequate Water Infrastructure for Livestock:* In Sharhabeel, while water sources exist, livestock farmers in elevated areas lack access due to the absence of extended water networks. In Fu'ara, a public water spring has become contaminated due to neglect and overuse, and local farmers call for municipal intervention. Given the critical role of water in livestock health, these deficiencies exacerbate climate vulnerability, with women often responsible for water management at the household level.

Recommendations to Address Policy Constraints

1. Simplify Licensing Procedures for Small-Scale Producers

→ *Linked to: Regulatory Barriers & Licensing Requirements (Al-Mafraq, Ajloun, Irbid)*

- o **Action:** Introduce a simplified, tiered licensing system for small/home-based dairy producers, allowing them to operate legally with basic compliance.
- o **Rationale:** This addresses the excessive requirements that block rural and women-led processing units, especially in places like Al-Mansoura and Rajeb.

2. Deploy Mobile Licensing and Certification Services

→ *Linked to: Geographic Barriers, Cost-Prohibitive Testing (Ajloun)*

- o **Action:** Establish mobile government units to deliver licensing, food safety inspections, and product testing services directly to rural villages.
- o **Rationale:** Reduces time and cost burdens on producers who currently must travel to Amman or central directorates for certification.

3. Launch Local Export Support Hubs for Smallholders

→ *Linked to: Market Entry Barriers, Discriminatory Retail Practices (Irbid)*

- o **Action:** Provide on-ground export training and marketing support via hubs hosted at agricultural directorates or women's associations.
- o **Rationale:** Helps small producers meet packaging and labeling standards and navigate export channels, especially for goat/sheep milk products.

4. Create Community-Governed Grazing Zones with Legal Access Rights

→ *Linked to: Land Use Restrictions, Informal Access Systems (Al-Mafraq, Ajloun, Irbid)*

- o **Action:** Formalize grazing cooperatives or community rangeland user groups with negotiated access to public or reserve lands.
- o **Rationale:** Reduces discretionary access and favoritism, ensuring small-scale herders — especially those without personal connections — have equitable land use.

5. Upgrade Rural Water Infrastructure for Livestock Needs

→ *Linked to: Inadequate Water Access (Irbid)*

- o **Action:** Extend water pipelines to highland grazing areas and rehabilitate contaminated springs in partnership with local municipalities.
- o **Rationale:** Enhances resilience to climate variability and ensures livestock health, particularly during dry seasons.

6. Introduce Women-Focused Microcredit Schemes Without Collateral

→ *Linked to: Financial Policy and Credit Barriers (All Governorates)*

- o **Action:** Partner with local NGOs and MFIs to launch low-interest, group-based microloans for women in dairy processing and marketing.
- o **Rationale:** Empowers women processors who are excluded from formal finance due to lack of collateral or guarantors.

7. Deploy Extension Agents with Dairy and Livestock Expertise

→ *Linked to: Extension Gaps and Misaligned Training (Ajloun, Irbid, Mafraq)*

- o **Action:** Recruit and train specialized extension staff focused on dairy quality, herd management, and cooperative business skills.
- o **Rationale:** Aligns technical support with the actual needs of dairy producers — especially small ruminant herders and women.

8. **Support Formation of Women-Led Dairy Cooperatives**

→ *Linked to: Social Norm Barriers, Irregular Supply Chains (Al-Mafraq, Irbid)*

- o **Action:** Facilitate the creation of small, trust-based cooperatives with flexible work models for women balancing family duties.
- o **Rationale:** Encourages more consistent milk supply, enhances bargaining power, and reduces isolation in fragmented rural markets.

9. **Subsidize Branding and Labeling for Rural Producers**

→ *Linked to: Labeling Standards, Retail Rejection (Ajloun, Irbid)*

- o **Action:** Offer subsidized access to trademark registration and professional branding design, especially for women and goat milk producers.
- o **Rationale:** Allows producers to meet retail requirements and position traditional products competitively without bearing the full cost.

10. **Pilot Dairy Formalization Incentives in Underserved Areas**

→ *Linked to: Informality, Enforcement Pressure (Irbid, Mafraq)*

- **Action:** Implement pilot programs that reward informal producers who formalize (e.g., access to subsidized inputs, market space, or cold chains).
- **Rationale:** Encourages voluntary transition into the formal sector without immediate punitive enforcement.

Conclusion

The current policy environment in Jordan presents significant barriers to smallholder market access in the dairy value chain, particularly for women and informal producers. Addressing these constraints requires a comprehensive reform approach that simplifies licensing, promotes land use policies aligned with sustainable land management, enhances market facilitation, and improves access to finance and extension services. Creating an enabling policy framework will be crucial for unlocking the full potential of smallholder producers, fostering inclusive market participation, and supporting land restoration goals under the ALDNT project.