5-2022

The Last Leg: A Social Sustainability Assessment of Ovine Agriculture

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THE LAST LEG: A SOCIAL SUSTAINABILITY ASSESSMENT OF OVINE AGRICULTURE

An Honors Thesis submitted in partial fulfillment of the requirements for Honors Studies in International and Global Studies

By

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Spring 2022

International and Global Studies: Peace, Security, and Human Rights

Fulbright College of Arts and Sciences

The University of Arkansas

ACKNOWLEDGMENTS

It is my great pleasure to present this thesis as it culminates years of ambitions and earnest edification. I owe my deepest gratitude to Dr. Jared and Lindi Phillips, for without their guidance and knowledge, this project would not have been possible. As a professor and my advisor, Dr. Jared Phillips helped me to channel a whirlwind of ideas into creating this exploratory passion project. His lessons are challenging in precisely the right way, and I am walking away from this campus a better, more discerning human because of them. This study would hardly have been completed without Lindi's continuous encouragement, support, and sisterhood. I would also like to thank Dr. Ken Coffey for teaching the UA Sheep Production course and bringing an "off-farm(er)" into the fold.

I am profoundly grateful to all the United Kingdom and the United States survey participants. It is an honor for me to learn from your insights, and I hope you feel respect and support within this contribution to our efforts. Finally, thank you to my loved ones for your unwavering confidence in me—a source of strength for me during this process.

ABSTRACT

Post-war agricultural transformations and the rise of Sustainability discourses have dictated the trajectory of sector industries. The implications of agriculture in lateral policy schemes have neglected the careful consideration of the social health of farmers in decision-making processes, creating a greater divide between the interests of the state and our once revered providers. This study aims to capture the complexity of social matters in agriculture within the specific context of sheep farming in the United Kingdom and the United States and how the concurrent systems have adapted considering the impacts of relevant contemporary historical contexts. The principles of Janker, Mann, and Rist's (2019) system-based framework for social sustainability in agriculture are applied to evaluate social health within each country's industry through the augmentation of the collective voice of its sheep farmers.

First, a historical review of each country's ovine agricultural sector examines how influential social dynamics have evolved. Insights from this review inform the application of the social sustainability framework and its subsequent analysis. A deductive self-assessment survey was disseminated through informal channels to gather qualitative data on social sustainability indicators. Survey questions were designed to receive participant input on the well-being of their lives as farmers, the vitality and longevity of their farm operation, and their views on the needs and priorities of the industry. Thematic analysis linking theory and qualitative data and rational induction are employed to identify the response data patterns.

The results of the social sustainability assessments reveal that UK and US farmers' interests primarily align under three main themes: security, equity and inclusion, and market engagement and accessibility. Deviations in reports of personal needs and industry priorities depict the influential effects of embedded culture within their changing systems.

TABLE OF CONTENTS

1 INTRODUCTION

Agriculture has undergone extraordinary transformation since the end of World War II. The world's food and fiber systems adapted to the rapid onset of second-wave globalization, the first beginning around the mid-19th century and ending with the commencement of World War I. Industry productivity soared due to new technology, mechanization, availability of chemical inputs, specialization, and government policies that showed a preference for maximizing production and reducing food prices. This shift to productivism farming—described as "a commitment to an intensive, industrially-based, and expansionist agriculture with state support based primarily on output and increased productivity"[1]—has come with considerable costs to economic resilience, environmental health, and social equity.

Post-war concerns about food security and self-sufficiency have arguably been replaced by concerted efforts in managing and disposing of surplus food, the costs of farm subsidies, and environmental degradation caused by intensive farming practices. At the close of the 20th century, 'Sustainability' emerged onto the stage of public discourse as a key term used to counter the then normative notions of progress and connecting science, policy, and moral value. While first thought to be a strategy against ecological disaster, the concept was extended to understand economic and social complexities. Along with the classical pillars of sustainability—the environment, economics, and society—culture, the fourth pillar, described by Jon Hawkes, has become increasingly significant and publicly relevant.[2]

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[1] Philip Lowe et al., "Regulating the New Rural Spaces: The Uneven Development of Land," *Journal of Rural Studies* 9, no. 3 (July 1993): p. 221, https://doi.org/10.1016/0743-0167(93)90067-t.

[2] Marco Spalda, "Sustainability," Sustainability | Special Issue: The Fourth Pillar: Culture in Sustainability, accessed April 13, 2022, https://www.mdpi.com/journal/sustainability/special_issues/culture_sustainability.

Within these conceptions and their application to agriculture, what can be understood as the social pillar varies drastically, especially regarding its scope and applied sustainability principles. Whereas rural inhabitants have been the subject of various 'sustainability studies,' the consideration of the social dimension in agriculture is comparatively underrepresented. Pasture-based sheep (ovine) farming systems are multifunctional, and their economic, environmental, and social roles are equally important and recognized by policymakers and society.[3] Sheep husbandry is deeply embedded in some traditional and indigenous cultural heritage and connected to the sanctity of the human-nature relationship. A deeper look at the social dynamics that constitute ovine production systems could provide valuable insights into the realities of farmers and farming communities and how a confluence of factors has played a role in the adaptation, for better or worse, of these systems and the lives of those involved.

This thesis investigates how the ovine agriculture industry has evolved in the United States and the United Kingdom and how influential events and policies have shaped the welfare state of sheep farmers. First, a brief history is developed for the sector in each country. Relevant discussion focuses on events and policies within the period beginning post World War II with the necessary restructuring of the global economy until approximately 2008 when the financial crash prompted the modification of the United Nations directives and the questioning of free trade. Next, the principles of Janker, Mann, and Rist's (2019) system-based framework for social sustainability in agriculture are applied to create a social sustainability self-assessment survey and subsequently evaluate positive and negative indicators from the response data. The final part of this project is the synthesis of assessment findings and discussion of the future of US and UK sheep sectors from farmers' perspectives. This

[3] R. Ripoll-Bosch et al., "An Integrated Sustainability Assessment of Mediterranean Sheep Farms with Different Degrees of Intensification," *Agricultural Systems* 105, no. 1 (2012): 46-56, https://doi.org/10.1016/j.agsy.2011.10.003.

thesis intends to contribute to the greater wealth of interdisciplinary research and its specific application to social sustainability while simultaneously expanding current literature on the social dimensions of agriculture by prioritization of farmers' voices and their value in academic discourse.

1.1 The Elusive Third (and Fourth) Pillar

Social Sustainability blends traditional social policy areas and principles, such as equity and health, with emerging issues concerning participation, needs, social capital, the economy, and the environment. Recently, notions of happiness, well-being, and quality of life have been recognized as essential dimensions of the social pillar.[4] Stemming from Johannesburg's Circles of Sustainability, the concept of social sustainability embodies interactions with and between the four quadrants (economics, ecology, politics, and culture). It encompasses human rights, labor rights, and corporate governance. Social sustainability, like ecological sustainability, is the idea that future generations should have the same or greater access to social resources as the current generation ("inter-generational equity"), while there should also be equal access to social resources *within* the current generation ("intra-generational equity"). Social resources include ideas as broad as other cultures and basic human rights.

Sustainability assessments have historically, though finite, neglected the social dimension as a central objective with tangible indicators, generally reduced to a framework condition for successful environmental sustainability strategies.[5] The qualitative and contextual nature of evaluating social indicators is the greatest challenge to its assessment, as well as the range in scope, study duration, and the gravity of ensuring a holistic consideration of discussion participants and execution of research.

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[4] Susanne Ricee. "Social Sustainability – Everything You Need to Know," Diversity for Social Impact, May 13, 2021, https://diversity.social/social-sustainability/#0-what-is-social-sustainability.

[5] Joachim H. Spangenberg and Ines Omann, "Assessing Social Sustainability: Social Sustainability and Its Multicriteria Assessment in a Sustainability Scenario for Germany," International Journal of Innovation and Sustainable Development1, no. 4 (2006): p. 318, https://doi.org/10.1504/ijisd.2006.013734.

Inclusivity and equity should be present within the institution that fosters these as principal social health indicators. Advancement of the social ecology framework, amplified by eco-feminist, eco-socialist, indigenous movement theories, shifted public debate toward an understanding that most of humanity is vulnerable to impending environmental externalities; linking it to the inequality discourse by establishing that these externalities are differentially and disproportionally distributed both geographically and among groups.[6] Sustainability efforts occur within cultural contexts. Culture is a driver of development, with an aptitude for promoting economic growth and environmental stewardship through its activities and values. Sustainability's extension to include culture as a fourth pillar was a critical development for the success of achieving a healthy and sustainable society. Culture stands alone as a pillar; however, it is inextricable from a targeted assessment of social sustainability, as sustainability values are determined within localized contexts.

There is no distinction between what is considered social and cultural sustainability for this project. Rather, cultural, economic, and social elements are evaluated in tandem under social sustainability. Consideration of the environmental pillar is present in the discussion and priorities of surveyed farmers; however, thematic analysis is organized by precedence of its according constituents. Social sustainability in this context is defined as "the extent to which social relationships promote equity, justice, and a high quality of life."[7] The reason for this generalization is to reinforce that the realities of each pillar are interdependent, with compounding ramifications on societies. Isolation of any one category of objectives in assessment or practice is incapable of realizing true sustainability. Everything is connected.

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[6] Efrat Eizenberg and Yosef Jabareen, "Social Sustainability: A New Conceptual Framework," *Sustainability* 9, no. 1 (May 2017): p. 68, https://doi.org/10.3390/su9010068.

[7] Guptill, Amy. "Understanding and Measuring Social Sustainability." SARE. Quality-of-Life Working Group, January 10, 2022. https://www.sare.org/resources/understanding-and-measuring-social-sustainability/.

1.2 Overview of Ovine Agriculture

Sheep are raised throughout the world, with most production constrained by temperature and rainfall to islands, coastal regions, and the fringes of continental deserts.[8] Farm management methods vary globally to cater to different systems of input and types of output; some regions graze sheep on marginal agricultural lands, while others utilize them in a mixed farming approach alongside arable crops. The international sheep industry produces four major products: wool, sheep meat (mutton and lamb), milk, and skins. A sheep in its first year is a lamb, and its meat is also referred to as lamb. Older sheep meat is classified as mutton. A lambing system involves when and how often ewes, a female sheep, give birth and how and where lambing will occur.[9] There is not a universal set of best practices for raising sheep. The seasonality of the sheep meat market largely dictates the systems' behavior of sheep farm businesses. Farmers must match their lambing system to their goals and objectives, cultural norms, resources, ecology, and market demand accessible to them. The same farm may utilize different lambing systems for different groups of sheep.

There are two types of sheep production:

1) **Purebred Sheep** supply genetics for the development of commercial sheep production systems. Starting a purebred sheep business is generally more expensive than a commercial one, depending on the breed and availability. Their production cost is often higher due to specialized nutrition and medical needs, and more expenses are involved in advertising and marketing. Ordinarily, purebred sheep are fed at a higher nutrition level than commercial

[8] Neil Sargison, *Sheep Flock Health: A Planned Approach* (Oxford: Blackwell Publishing, 2008), 451.

[9] Susan Schoenian, "Lambing Systems," Sheep 101: A Beginner's Guide to Raising Sheep, April 2021, http://www.sheep101.info/201/lambingsystem.html.

flocks. A well-fed purebred flock is more productive and attractive to prospective buyers than sheep maintained on lower nutrition levels.[10]

2) **Commercial Sheep** farming is a process of rearing sheep for the commercial production of meat, milk, wool, or skins. Many management alternatives are available to the commercial sheep producer. One major distinction among these alternative production systems is the season in which lambing occurs. These include fall, winter, spring, and accelerated, which requires year-round management.[11]

Traditional production systems across Asia, the Middle East, Africa, and Europe include sheep as prominent production animals. Sheep operations are often small-scale, with flocks of less than 100, and, in some cases, nomadic foraging is still present. This is a sharp contrast to the majority shares of industrialized production in pork, poultry, and beef industries.[12] Several critical structural changes in sheep industries have been identified over the last three decades, leading to the adaptation of farming systems and the associated markets. These include but are not limited to reductions in total sheep numbers, reduction or conversion of sheep farms, an increase in the specialization of wool and meat production, intensification and increases in productivity, sheep production systems concentrated on

[10] James M. Sachse, "Sheep Production and Management - New Mexico State University," ed. Clay P. Mathis and Tim Ross (Mexico State University, August 2000), https://aces.nmsu.edu/pubs/_b/100B15.pdf.

[11] Ibid.

[12] "Global Sheepmeat Industry and Trade Report," Meat and Livestock Australia.

more marginal soils, aging of farmers, and less qualified labor force available to work in sheep farming.[13]

Major Market Themes

In many developed markets, the driver of consumer demand for sheep meat is shifting from quantity to quality, as many high-income countries are reaching saturation levels in terms of per capita meat consumption.[14] In the United States, lamb remains a niche and unfamiliar protein to around 40 per cent of consumers due to taste concerns and limited knowledge of preparing it; however, they are progressively increasing their willingness to try lamb as flavor and experience become increasingly important to the consumer base.[15] Regions with high demographics of Middle Eastern, Caribbean, and African consumers are major markets for lamb products. Demand for sheep meat in the United Kingdom is seasonal with annual peaks aligning, with certain religious festivals (e.g., Ramadan and Eid al-Fitr, Easter, and Eid al-Adha). UK lamb is generally regarded as a high-quality product within European trade and perceived as 'natural', being produced on mainly pasture-grazing systems.[16] Typical market bases for both nations are focused on older, more affluent consumers; a trend exacerbated by increased processing costs to avoid supply chain issues faced by other livestock markets using large-scale processors during the COVID-19 pandemic.

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[13] F. Montossi et al., "Sustainable Sheep Production and Consumer Preference Trends: Compatibilities, Contradictions, and Unresolved Dilemmas," *Meat Science* 95, no. 4 (2013): 772-789, https://doi.org/10.1016/j.meatsci.2013.04.048.

[14] Ibid.

[15] "2020 Sheep Industry Review," Market Reports (American Lamb Board, American Sheep Industry Association, March 2021), https://www.lambresourcecenter.com/market-reports.

[16] "Opportunities for the Sheep Sector," Horizon Report (Agriculture and Horticulture Development Board, April 2021), https://ahdb.org.uk/knowledge-library/opportunities-for-the-sheep-sector.

1.3 Methodology

Research Approach

This thesis sought to capture the complexity of social matters in agriculture within the specific context of sheep farming in the United Kingdom and the United States and how the concurrent systems have adapted considering the impacts of relevant contemporary historical contexts. An interdisciplinary approach was used in this study due to the multiplex nature of social sustainability. For this project, interdisciplinary research can be defined as research based upon a conceptual model that links or integrates theoretical frameworks from two or more distinct disciplines which use study design and methodology that is not limited to any one field and requires the use of perspectives and skills of the involved disciplines throughout multiple phases of the research process.[17] Methods used in this investigation draw from history and sociology as the predominant disciplines. Historical social science procedures allowed for the substantive application of interpretive principles in assessing sustainability complexities.

Research Methods

In the quest to extract themes, the qualitative case study approach was adopted to develop a social sustainability assessment. This included the application of Janker, Mann, and Rist's (2019) system-based framework to create a deductive self-assessment survey, which was disseminated through informal channels, to gain insights into the personal accounts of sheep farmers in the UK and US. Survey questions were designed to receive participant input on the well-being of their lives as a farmer, the vitality and longevity of their farm operation, and their views on the needs and priorities of the industry. The inquiry focused on what the farmers, as actors within their agriculture social

[17] Sally W. Aboelela et al., "Defining Interdisciplinary Research: Conclusions from a Critical Review of the Literature," *Health Services Research* 42, no. 1p1 (2007): 329-346, https://doi.org/10.1111/j.1475-6773.2006.00621.x.

system, view as weaknesses within the sector and significant influences on their quality of life. An initial understanding of ovine agriculture was necessary before any analysis was organized. Thematic analysis linking theory and qualitative data was used to identify patterns in the response data. Rational induction was used in the synthesis of the study's findings. Both techniques are nested within interpretive methodology; in applying an interpretive method, acknowledging the presence of imperfect information and limitation to their applications is critical for the validity and reproducibility of the study.

The countries of analysis were identified based on their propitious qualities for comparison and availability of source material. According to the most recent data published on the US Food and Agriculture Organization global database, the United Kingdom ranked sixth in overall global sheep meat production, while the United States was not included in this list of top ten.[18] Researcher residency and its general prominence in international trade factored into the US inclusion in this study. The UK was selected based on its relative similarity to the US market and its social structures. Interest in how this sector changed since its withdrawal from the European Union was also a factor. Top ranking metrics were not a priority consideration due to the study's focus on dynamic social analysis. Accessibility to case study participants through direct and indirect channels also played a central role in selecting country comparisons; the alignment of social structures between the UK and US allowed for a clearer understanding of their differences related to the commonalities. The case studies settled upon do not intentionally disregard other key players in global ovine agriculture; in addition to the motives mentioned above, reasonable feasibility within the scope of this thesis dictated their omission.

[18] "Production of Meat, Sheep: Top 10 Producers," FAOStat (Food and Agriculture Organization of the United Nations, 2019), https://www.fao.org/faostat/en/#data/QCL/visualize.

2 THE UNITED KINGDOM

Agricultural systems are situated within social and political environments that hold authority over how they operate and evolve. Since prehistory, sheep have been an integral part of Britain's social and economic constitution. When people think of the United Kingdom, many are met with imagery of idyllic lush countryside speckled with wooly flocks and the great shepherd. The long and rich history of UK sheep farming has solidified its place of influence in British culture. Despite this stronghold in the collective national identity, rural realities continue to deteriorate, as does its significance and direct support in policy decisions.

2.1 Stratified Sheep Production

Britain's sheep industry stands apart from its global counterparts in employing the stratified three-tier breeding structure. The three tiers are hill, upland, and lowland. Each level is home to typical breeds with documented and refined traits for their given purpose within the system. This structure enables efficient and productive sheep farming throughout the UK's wide range of climates and landscapes and is best suited to traditional breeding management. The preservation of native and rare breeds and systematic crossbreeding is the basis for the vast number of sheep breeds Britain plays host to—approximately 90 breeds and crosses, according to the National Sheep Association (NSA). While the stratification system is widespread, not all UK farms are involved. They instead operate a 'closed flock' that does little to no exchange of breeding animals with other farms.[19] Stratified farms may also be involved in more than one tier, with a small number having all three. Sheep may stay in the same tier their whole lives while others are moved down the system. Stratification allows producers to tailor their products and management practices to the needs of the market and suitable breed

[19] "UK Sheep Farming," UK Sheep Farming (National Sheep Association), accessed April 17, 2022, https://www.nationalsheep.org.uk/for-the-public/culture/uk-sheep-farming/.

selection for the area's land use. The collapse of any level of the system would profoundly change the industry.

2.2 Post-war Agriculture Reform

Farmers' contribution to the war effort put them in good stead when it came to the post-war settlement; public acceptance of the strategic importance of productive agriculture and a determination to avoid the inter-war years depression laid the foundation for subsequent British farm policy.[20] Principles of agricultural support evolved during the war toward guaranteed prices and assured markets by allocating provisions to secure efficient agricultural production and proper farm conditions. The passing of the 1947 Agriculture Act reflected this shift and the elevated importance of farmers, citing, "Proper remuneration and living conditions for farmers and workers in agriculture and an adequate return on capital invested in the industry"[21] as a primary objective of the legislation. Annually fixed price guarantees were established for main products, including cattle, sheep, milk, eggs, barley, wheat, oats, rye, potatoes, sugar beet, and wool. 'Deficiency Payments,' representing the difference between the guaranteed price of the product and an average market price, were paid by the exchequer as the mechanism for achieving legislative objectives to preserve access to domestic markets for foreign supplies and maintaining food prices to consumers at world levels. The Review to set annual price guarantees involved closed negotiation between the Ministry of Agriculture, Forestry, and Fisheries and the National Farmers' Union in considering the economic condition and prospects of

[20] J. K. Bowers, "British Agricultural Policy since the Second World War," *The Agricultural History Review* 33, no. 1 (1985): 66, https://www.jstor.org/stable/40275421.

[21] "Agriculture Act 1947," Legislation.gov.uk (Statute Law Database, May 1, 1981), https://www.legislation.gov.uk/ukpga/Geo6/10-11/48/contents.

the industry.[22] Data collection and other agricultural interest groups also participated in the price-fixing ritual. Government-funded research results in improved techniques and market trends were disseminated through the now Agricultural Development and Advisory Service (ADAS). Farmers' participation in agricultural governance and the cooperation between agricultural interests over the development of the industry was a product of post-war dynamic changes in their social environment.

During the 1950s and 60s, the popular focus was on food security and improved self-sufficiency, alongside Balance of Payments arguments. Domestic agriculture was strongly promoted as a result. The 1952 Review set the objective to raise net output to some 60 per cent above pre-war levels by 1956. Priority was given to the development of livestock industries to increase the supply of meat in the domestic market, "Above all to raise to the utmost the production of beef and veal, mutton and lamb."[23] By 1964 support for wool in the cumulative price guarantees system continued its downward trend into the negative due to the rising and unpredictable deficiency payments rates influenced by the falling world prices for agricultural products in the second half of the 1950s.[24] Public debate and international trade agreements made in the ensuing years marked the abandonment of securing agriculture through making it competitive on the world market and the effective change to a market management approach.

Removing the pressure of deficiency payments on public expenditure also removed the limitations on output. Throughout the mid-1960s into the 1980s, UK agriculture operated on expansionist objectives. The Ministry of Labour's National Plan of 1965 delineated its strategies for

[22] David Harvey, "An Abbreviated UK/EU Agricultural Policy History," Newcastle University Staff Publishing Service, 2006, https://www.staff.ncl.ac.uk/david.harvey/AEF372/History.html.

[23] Bowers, "British Agricultural Policy," 69; 1952 Review, Cmnd 8556, para 12.

[24] Ibid., 70.

economic development with clear contributions from agriculture sectors— to release labor for other industries by increasing productivity at a rate of 5 per cent per annum and to reduce import reliance by meeting the estimated increase in consumer expenditure on food, of which 50 per cent was expected to be for meat.[25] The industry's holdings structure changed under the selective expansion plan; grant funding was used to persuade small farmers to exit the industry or consolidate with cooperation assistance through the Central Council for Agriculture and Horticulture Co-operation. Livestock headage payments were made long-term and increased in value (1965), further expanding meat production support with major priority given to Beef.[26] Under this benign policy regime, this period also witnessed the acceleration of major technical, mechanical, and chemical advancements, further reducing labor and machinery requirements and increasing the specialization of farming systems.[27]

2.3 The CAP to UK Sheep Farming

When the UK entered the European Community (EC, now European Union) in 1973, its accession to the Common Agricultural Policy (CAP) opened a vast new market and effectively centered sheep meat production within the industry. National flock numbers increased, and prospects from the new market opportunities stimulated a renewed interest in the trade, not only from farmers but also researchers and commercial companies.[28] The sheep meat regime was introduced in 1980, designed to preserve the status quo between competing EU sheep producers with widely varied

[25] Ibid., 73.

[26] Ibid.

[27] Harvey, "An Abbreviated History."

[28] Alan West and Share: "A Brief History of Sheep Keeping," South East Farmer, June 24, 2020, https://www.southeastfarmer.net/section/writers/a-brief-history-of-sheep-keeping.

production systems, market prices, and policy objectives.[29] Support under the regime set an annual basic price for carcasses based on sheep meat marketed during the current year; prospects for production and consumption of sheep meat; sheep production costs; the market situation for other meats; and past experience.[30] When prices fell below a certain level, most EU countries chose direct intervention, buying lamb to take it off the market. The UK deviated from this scheme, initially adopting a variable premium support system corresponding with the weekly average UK market price and the guide price due to previous experience with deficiency payments.[31] Additionally, annual ewe compensations were remunerated as a ewe headage payment. These support mechanisms ensured sheep farmers received a reasonable income and advanced insight into what their finished lambs would be worth.

The sheep meat regime was reviewed in 1990 because of rising costs attributed to the increased total number of sheep and goats from new EU states. As a result, the variable premium support system was overturned, bringing the UK in line with the rest of the European Union.[32] Changes introduced in 1992 made the annual ewe premium the primary source of aid for the sheep industry. Sheep quotas were created for the number of eligible ewes for support, which had to be maintained within a defined retention period. Additional subsidies, only partially funded by the EU, were made available for producers in less favored areas (LFA) in the form of hill livestock compensatory allowances, with

[29] A. T. Cahn, "The EC Sheep Meat Regime — the Political Dimension," *BSAP Occasional Publication* 14 (1990): 1-5, https://doi.org/10.1017/s0263967x00001993.

[30] "Appendix B: Overview of the Structure and Economics of the UK Sheep Industry, Highlighting the Increasing Need for Efficient Flock Health Management," *Sheep Flock Health*, n.d., 451-456, https://doi.org/10.1002/9781444302592.app2.

[31] Ibid.

[32] Ibid.

different rates according to the quality of the land and suitability of the ewe breed.[33] This support scheme took the focus away from progressive animal production, limited the potential for farmers to expand, and did little to encourage flexible farm management; instead, the farmer's ability to manipulate subsidy income dictated the efficiency of their system. The 2001 foot and mouth disease epidemic—a highly infectious, frequently fatal ailment that affects cloven-footed animals—was devastating to the UK sheep industry, among other livestock sectors. In the effort to control the spread, an estimated 5.5 million sheep were slaughtered, 2.4 million of which came from the breeding flock.[34] Animal health and parasite management remain a priority concern among sheep producers today.

CAP reforms from the mid-term review of Agenda 2000 led to the decoupling of subsidy support from production and the implementation of a single payment per farm, combing all existing arable, beef, and sheep aids.[35] From this point on, Sustainability was a driving force in the objective strategies of the CAP, with three clear environmental goals: tackling climate change, protecting natural resources, and enhancing biodiversity. Disbursement was determined by compliance with environmental animal welfare, food safety, and good farming practices—criteria known as cross-compliance linked to EU rules. The effects of climate change discourse are evident in this policy change. Aligned with the World Economic Crisis and building off the 2003 reform, the European Commission introduced the 'Heath Check' in 2008. Adjustments continued to decouple subsides from production, abolished the Set-aside scheme for the overproduction of cereals, and increased the transfer of resources from direct income support (pillar 1) to rural development (pillar 2) within the

[33] Ibid.

[34] Ibid.

[35] Ibid.

CAP, a process known as modulation.[36] This extension had little impact on the UK arable and livestock sectors, given the inclusion of most arable area payments in the Single Farm Payment and retention of the Suckler Cow Premium and Ewe Annual Premium. Agricultural policy measures at the EU level limited the financial exposure of farmers during the economic crisis due to minimal reliance on borrowing in agriculture.

The UK sheep industry was particularly vulnerable to the ramifications of a no-deal Brexit scenario. Domestic consumption of lamb has steadily declined since the 1980s, a near parallel to the longer-term rise of chicken[37]—price and pressure from evolving consumer needs and preferences being the main influences. Since 2018, production exports have exceeded imports by volume, with exports to EU countries accounting for 90 per cent in 2020.[38] Fortunately for producers, a new deal was reached and entered into force in May 2021. In conjunction with new trading relationships and the long-term economic pressures on supply chains brought on by COVID-19, the agriculture transition plan intends to gradually phase out direct payments by 2028. A new Environmental Land Management (ELM) approach was adopted, which will incorporate a Sustainable Farming Incentive. Government funds will focus on paying farmers to deliver public goods around environmental stewardship, animal health and welfare, and reducing carbon emissions.[39]

Post-war transformations within its agricultural sector signify the historical importance of basic payments on the profitability of UK farming, especially for lowland and LFA sheep production. At present, UK producers face significant challenges in their contracting domestic market; connecting

[36] Mark Allen, "Cap Reform 2014-20: EU Agreement and Implementation in the UK and in Ireland," Cap reform 2014-20: EU Agreement and implementation in the UK and in Ireland § (2014), 3-4.

[37] "Opportunities for the Sheep Sector," ADHB, 10.

[38] Ibid., 6.

[39] Ibid., 4.

with next-generation shepherds; accessing new governmental income sources and priority overseas markets; unsustainable production and processing costs; and innovation needs around animal health, decision support technologies, export certification requirements, and consumer profiling.

3 THE UNITED STATES

The US relationship with its sheep industry is far more removed than the UK. Until the turn of the twentieth century, sheep were raised primarily for their wool, particularly Merino breed fine wool. The Merino Era, marked from 1797 to 1900, was a long history of wool merchandising, technological development, and manufacturing.[40] Westward expansion brought the heart of US sheep production outward to its ranges. Then came the Crossbreeding Era, 1900 to 1942, which effectively launched the domestic lamb meat market, though wool still furbished up to 50 per cent of gross income for many producers.[41] Sheep and lamb numbers and value frequently fluctuated in this period of political and economic turmoil, peaking in 1945 at the close of World War II. Sheep's role during the war, sector changes from the following great agricultural transition, and post-war shifts in the economic and socio-political environments have caused the industry to fall out of public favor, continuing its long-term decline.

3.1 A Century of Agricultural Transformation

The post-World War II national abandonment of farming as a primary form of subsistence drastically changed the US economy and society. During the seventeenth, eighteenth, and nineteenth centuries, most Americans populated rural areas with livelihoods based on farming and other related activities. The number of farms increased from 1850 to 1935 as newly acquired land was settled; however, the unparalleled growth of urban populations meant that the number of farmers subsequently declined. Inflated prices for farm products brought on by World War I dropped steadily during the 1920s due to large agricultural surpluses. With the onset of the Great Depression, the

[40] Donald S. Bell, "Trends in the sheep industry of the United States: effects of breed type and economic circumstances." (1970), 6.

[41] Ibid., 13.

bottom dropped out of the agricultural markets.[42] The federal approach to dealing with this rural economic crisis was commodity-specific price supports and supply controls. In 1933, the Agricultural Adjustment Act (AAA) was enacted to alleviate economic strain on America's farmers, which played an important role in solidifying rural and southern support for the New Deal.[43] Parity farm prices remained a prominent part of farm policy discussions until the 1970s. Other essential features of the AAA were non-recourse loans that established price floors by offering farmers loans at times when prices usually fell and the voluntary reduction of utilized acreage or animal numbers for basic commodities as a form of supply management.[44] By the 1960s, government price and income support eligibility was directly tied to supply-side demand manipulation. The AAA and its successor programs nurtured the agricultural sector, especially larger farms. In this way, it continued the long-term trend in modern agribusiness toward the competitive elimination of small farms, tenant farms and sharecropping, the migration of the rural population to the cities, and the transformation of rural America.[45]

Farm numbers peaked in 1935 with a record 6.8 million, sustained by approximately 44 per cent of the US population that lived in rural areas and 24.4 per cent of the U.S. labor force employed in agriculture.[46] In the years immediately following, the world witnessed the rise and fall of World War

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[42] Willard Cochrane, *The Development of American Agriculture,* Minneapolis: University of Minnesota Press, 1979.

[43] Carolyn Dimitri, Anne Effland, and Neilson Conklin, "The 20th Century Transformation of U.S. Agriculture and Farm Policy," The 20th century transformation of U.S. agriculture and farm policy § (2005), 9.

[44] E. Wesley F. Peterson, "U.S. Agricultural Policy: How Not to Save The Family Farm," in *A Billion Dollars a Day: The Economics and Politics of Agricultural Subsidies* (Malden, MA: Wiley-Blackwell, 2009), 134.

[45] Paul Conkin, A Revolution Down on the Farm: The Transformation of American Agriculture Since 1929. Lexington KY: University of Kentucky Press, 2008.

[46] Peterson, "U.S. Agricultural Policy," 124.

II, a period that marked the decline in the number of farms, farmland populations, and amount of land in farms in the United States. Wool prices were frozen after Pearl Harbor Day, which also happened to be a low point in the business cycle, and civilian use of wool was restricted.[47] Exports of US meat significantly increased during the war due to shipping shortages and increased demand by the American armed forces and other Allied armies in the Pacific under the 1941 Lend-Lease Act.[48] Sheep producers supplied meat and wool to the military, despite a shrinking labor force as shepherds entered the armed forces.[49] Consequently, breeding stock numbers fell alongside the number of men that returned to farm life, and those that did turned to less-demanding crops and cattle.[50] The American G.I. experience with Australian canned mutton permanently altered domestic sheep consumption when troops returned with the lingering bad taste.

Amid Cold War tensions, the transformation of farms into modern businesses within federal farm policy resulted in monumental developments in production technologies, agricultural policy, political rhetoric, and farmer mentality. Consumer abundance, agricultural productivity, and "humanitarian" exports became a symbol of power—produced by American "free enterprise"—and a propaganda tool in the ideological battle with communism. The emergence of supermarkets can be understood as a product of the Cold War Farms Race and the "endpoint of a supply chain dependent

[47] Larry W. Van Tassell and Glen D. Whipple, "The Cyclical Nature of the U.S. Sheep Industry," *Journal of Agricultural and Resource Economics* 19, no. 2 (1994): 274, http://www.jstor.org/stable/40986845.

[48] Grover J. Sims, "Meat and Meat Animals in World War II," Meat and meat animals in World War II § (1951), 6.

[49] Van Tassell and Whipple, "Cyclical Nature of U.S. Sheep," 274.

[50] Ibid.

upon industrialized agriculture."[51] This new standard of industrialized production and distribution processes undoubtedly propagated American consumer capitalism and our disconnectedness from food systems.

Encouragement for the hyper-production of foodstuffs was extended to fibers under the Eisenhower administration and the 1954 National Wool Act. New technology from the war sparked an increase in synthetic fibers, radically changing America's fiber use and reducing the consumption shares of wool and other natural materials. Instead of implementing tariffs on wool imports, the program offered price support to sheep producers based on a percentage of their market sales. The more they produced, the more federal funding they received. Through the middle of the century, farm policy debate focused on whether to continue high price and supply supports or remove the government from agricultural matters. The passage of the Food and Agricultural Act of 1965 was delivered as a compromise, making it clear that a more market-oriented policy was necessary to help American farmers take advantage of the rising export demands of global markets.[52]

In the early 1970s, the demand for farm commodities significantly increased conjunct with farm prices and real farm income. More "disposable" income and high inflation rates caused farmland value to skyrocket. Eager to stake their claim and whet from the prospects of substantial capital gains, total farm debt rose sharply due to the near-unlimited availability of credit from banks, used to buy up land and invest in new farm technology.[53] This period of speculative excess set the stage for the inevitable market bust and farm financial crisis of the 80s. Many agriculture-specific banks closed,

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[51] Shane Hamilton, "Supermarket USA: Food and Power in the Cold War Farms Race," in *Supermarket USA: Food and Power in the Cold War Farms Race* (New Haven: Yale University Press, 2018), 2.

[52] Dimitri, Effland, and Conklin, "The 20th Century Transformation," 9.

[53] "Banking and the Agricultural Problems of the 1980s," in *History of the Eighties Lessons for the Future* (Washington: Federal Deposit Insurance Corporation, 1997), 259.

primarily in the Midwest, due to industry concentration and the effects of the 70s export boom on crops produced in those states.[54] Banking became more difficult for farmers after their experiences in the 80s, with larger down payment requirements and extensive loan default risk analyses. The great liquidation of sheep in the US coincides with the unabated rise in the index of wholesale commodity prices since the end of World War II.[55] Sheep producers have encountered an unparalleled duration of cost-squeeze pressures since the 70s boom, spurring continued efforts to improve productivity and prospects for the industry.

3.2 An Industry in Transition

Following the rapid rise in lamb imports in the 90s, temporary import relief was implemented in 1999 under Section 201 of the 1974 Trade Act, imposing a three-year tariff-rate quota (TRQ) on lamb meat imported from Australia and New Zealand. Additional sheep industry improvement efforts were designed to allow domestic producers to adjust to foreign competition. The Lamb Meat Adjustment Program instituted in 2000 was a four-year assistance package comprised of direct payments to producers, animal health initiatives, marketing and promotion assistance, and government purchase of lamb meat.[56] The Ewe Lamb Replacement and Retention Program succeeded the lamb meat package in 2004. This program aimed to assist producers who reduced production and flock size due to unfavorable market conditions, including low prices.

[54] Ibid., 289.

[55] Bell, "Trends in the Sheep Industry," 15.

[56] Keithly G. Jones, "Trends in the U.S. Sheep Industry," Trends in the U.S. Sheep Industry § (2004), 28.

Further efforts to make agriculture more market-oriented centered on the 90s policy discussion concerning farm policies seriously distorting farmers' decisions.[57] The Wool Act was subject to public media criticism of government spending leading to its repeal in 1993 under the Clinton administration, citing the continued decline in sheep numbers in the years after its passing. Payments were phased out by 1995; however, the Farm Security and Rural Investment act of 2002 reinstituted federal support for wool and mohair for the next five years in marketing assistance loans and loan deficiency payments.[58] Farm Bills 2008, 2014, and 2018 continue these support measures through crop year 2023.

The contemporary state of the US sheep sector is one of the most complex in animal agriculture.[59] Efforts to modernize and expand demand through product diversification have resulted in its multifaceted structure where the dividends of each element of the industry are inextricably linked and depend on the economic security and prosperity of the sheep production enterprise. Elemental commodities vary in utility and include lamb meat for US domestic consumption (retail, hotel, restaurant, and institutional trade) and some exports, mutton, exports of live mature animals, wool, pelts, and a variety of byproducts. A recent and growing industry element is sheep dairy, which offers cheese varieties, yogurt, and bovine-blend products. Today, the industry's most significant challenges are labor management and labor shortages across sectors, including a lack of experienced veterinarians and processors; flock health and parasite management; predation control, facilities, and fencing;

[57] Peterson, "U.S. Agricultural Policy," 134.

[58] Jones, "Trends in the U.S. Sheep Industry," 24.

[59] National Research Council, Changes in the Sheep Industry in the United States: Making the Transition from Tradition (Washington, D.C: National Academies Press, 2008).

grazing and forage management; direct marketing; and government regulation/compliance.[60] Lack of public funding for research and development of industry solutions and insufficient or incomplete government data collection and publication poses significant difficulties for innovation strategies and decision making.

[60] Larry Miller et al., "U.S. Sheep Industry Research, Development, And Education Priorities" (American Sheep Industry Association, 2016), p. 6.

4 SOCIAL SUSTAINABILITY ASSESSMENT

The traditional knowledge and production skills of sheep farming are a cultural lifeway for people all over the world. The persistence of shepherds in their ever-changing environments and circumstances in an economic culture that threatens to leave them behind is worthy of further exploration. Understanding the extent to which sheep farmers' needs are met within their agricultural social system is essential for informing sustainable industry change and creating a path toward social-ecological resilience.

4.1 A System-based Framework

Janker et al.'s (2019) framework identifies three central concepts for the understanding and measuring of social sustainability and the *agriculture social system*[61]*:*

Human Hierarchy of Needs, according to Maslow (1943). This concept (fig. 1) is complementary to evaluating social sustainability by connecting a human rights approach. This method allows for the consideration of both the institutional and individual perspectives as they are correlative.

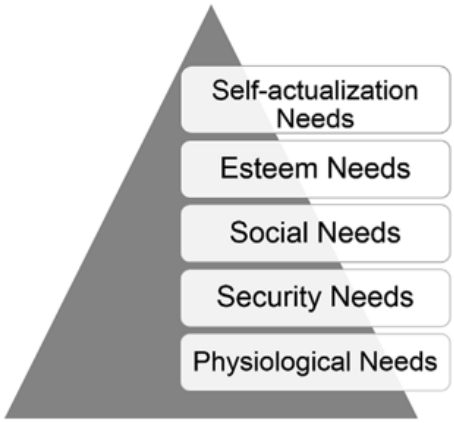

Figure 1. Maslow's Hierarchy of Needs.

[61] Judith Janker, Stefan Mann, and Stephan Rist, "Social Sustainability in Agriculture – a System-Based Framework," *Journal of Rural Studies* 65 (2019): 32-42, https://doi.org/10.1016/j.jrurstud.2018.12.010.

Social Culture is a complex set of relative meanings, traditions, values, and behaviors adopted by one or more social formations. A **sociocultural system** is a physical and theoretical structure where humans interact in society using their culture.

Parsons' Social System of Change is composed of individual actors, the interactive system, and a system of cultural patterning, which are respectively influenced by personality systems, social systems, and cultural systems (fig. 2). These subsystems determine individual, collective, and institutional motivations and actions which at the same time influence each other (Janker et al., 2019).

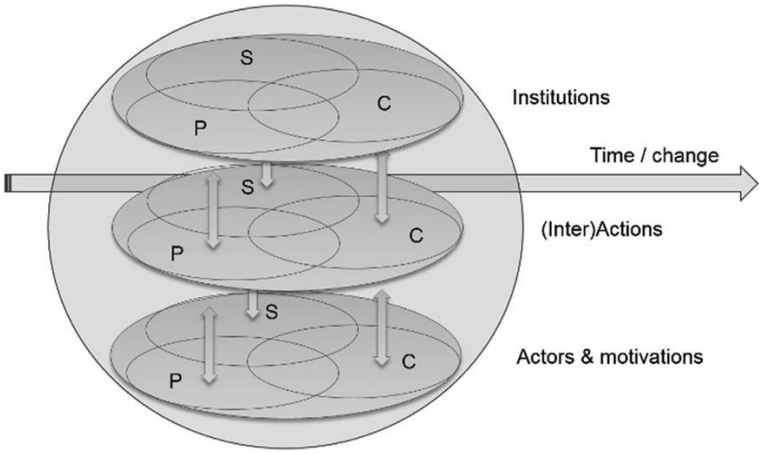

Figure 2. Parsons' social system of change, Janker et al.'s illustration of system elements and interconnections (P = Personality, S = Social, C = Cultural Systems).

In the agricultural social system, common levels include[62]:

- **Personal and household**: Farmer self-regard and relationships within the household
- **Farm level**: Relationships among farmers, employees, interns, landowners, and service providers

[62] Guptill, "Understanding and Measuring Social Sustainability."

- **Local community**: Ties between farmers and the communities to which they belong (including non-farm), including shared cultural identities
- **Agri-food & fiber networks**: Ties among farmers, customers, suppliers, lenders, and service providers
- **Society at large**: How farmers influence public policy and society's views of agriculture, food, and sustainability

Analysis of this system starts from the center and moves towards the "edges," accounting for direct and indirect influences on each subsystem. The operationalization of Janker et al.'s conceptual framework necessitates the identification of local system elements, as the rights and needs of all actors can only be established within localized contexts.

Due to constraints of distance, time, and access to regional sheep farmers in both the US and UK, the exploration of influential events and policies within the critical post-war agricultural period served to develop an understanding of the broader contexts in which their agricultural social system is set. Survey questions[63] were designed to receive participants' input on the well-being of their lives as farmers, the vitality and longevity of their farm operation, and their views on the needs and priorities of the industry. The three central concepts from Janker et al.'s framework were included with the distribution of the survey form as visual aids intended to guide participants' understanding of the complexities of assessing their social sustainability. Self-assessment focused on what the farmers, as actors within their agriculture social system, view as weaknesses within the sector and significant influences on their quality of life.

[63] See Appendix A.

4.2 United Kingdom Results

Among UK survey participants, the average length of farm operation was 36 years, with a maximum of 82 and a minimum of 15. The average flock size was 146, ranging from 12 to 300 breeding ewes. Regional regulations enforce farm holding licenses, animal welfare standards, medicine administration, chemical usage, and disease control. There are also laws for animal identification and movement permits, among others, that influence the industry. A majority of UK producers operate purebred flocks within the stratified breeding system and with diverse commercial production of meat, wool or raw fleece, tanned skins, and breeding stock. All but one producer receives 70 per cent or more of their total net income from off-farm revenue streams, and all respondents operate small, family-run businesses. Survey results show that positive sustainability indicators among participants include: an overall satisfaction in their fulfillment of rights, physical and mental health, community relations, cultural appreciation, and the ability to participate in civil society.

A thematic analysis of the social sustainability survey data revealed three major themes of priority concerns among UK farmers:

Security

Blanket recognition of their contracting domestic mutton and lamb market compared to global growth prospects was observed, with 40 per cent relating their experience to a toxic market economy for small producers created by large-scale retailer monopolies. An additional 20 per cent reported that this financial insecurity discourages farmers from uniting to enforce change due to the risks of strong action against buyers, especially supermarkets. When asked what direct institutional influences needed to be changed or implemented to ensure economic sustainability, 80 per cent of respondents identified problematic pricing structures and the impacts of high-level imports from Australia and New Zealand on price determination as their principal concerns for the industry. Animal traceability regulations were specified as a research need or industry priority in 20 per cent of responses. Another 40 per cent

recognized the need for farmland preservation, limitations on development, and increased clarity and payment for ecosystem services as an industry priority. Other needs regarding production efficiency included long-term evaluation of production systems (e.g., impact on animal fertility, wildlife contribution to farm health, soil health, etc.) and animal medicines.

Equity and Inclusion

40 per cent of respondents described the UK sheep sector as a white male-dominated industry that has seen improvements regarding gender inclusivity and acceptance in recent years. Entrance barriers for young and new farmers are a primary consideration among survey participants, accounting for 60 per cent, regarding the encouragement for and participation of future generation shepherds. Capital costs and land prices, lack of industry mentorship, and public perception of farmers were distinguished as having the greatest influence. Supplementary commentary described the impacts of government eco-schemes, urban encroachment, and tax-purpose land ownership on land price inflation. Another 20 per cent reported the continued decline of public and private support for new technology developments and educational activities received by the sheep industry as a chief influence on the prospects of new sheep farmers or generationally continued operations.

Market Engagement and Accessibility

A general need for retail demand research and consumer profiles was perceived from the response data. UK farmers link the effects of the warped perception of climate change and the anti-farming agenda on policy and public views to their struggle with government eco-schemes. 20 per cent of responses detailed the need for increased awareness of how native and rare breeds can contribute to their commercial sheep industry.

4.3 United States Results

The average length of farm operation of US survey participants was 12 years, the longest being 36 and the shortest 3. Flock size ranged from 12 to 120, with an average of 50 head. Few participants specified the need for special permits or regionally enforced regulations; those that did included animal welfare standards, feedlot permits, and scrapie tags. All surveyed operations participate in the commercial sale of various products, including lamb meat (live and direct market cuts), breeding stock, raw wool, wool products, and semen. Purebred stock accounted for exactly half of surveyed operations. Off-farm income makes up 50 to 99 per cent of reported total net income, with an average of 67 per cent. All respondents operate small, family-run businesses. Survey results show that sustainability indicators among participants include overall satisfaction with their physical and mental health, fulfillment of rights, and the ability to participate in civil society. Average to below-average self-assessment scores were reported for cultural appreciation, access to available public resources, and growth opportunities.

Thematic analysis of US assessment data revealed similar trends in industry priorities and needs under three major themes:

Security

In every respect, problematic pricing structures were the paramount concern among US sheep farmers. 88 per cent of respondents specified issues with processing costs and USDA site accessibility as an industry priority. Survey participants provided further contextualization, citing disparities between packer profits and producer incomes and the need for publicly negotiated private packer pricing to be made available to producers. 25 per cent also indicated asymmetrical trade regulations between inputs (e.g., fuel, fertilizer, lumber, etc.) and farm outputs as a reason for stricter sheep product import limits. Half of the responses touched on the effects of agricultural intensification that continue to deteriorate the soil and forage quality. These concerns align with the expressed need for

research on how diets impact environmental issues (e.g., runoff and volatilization caused by nutrient excretions from supplemental feedstuffs), farmland preservation, and limitations on development. An additional 25 per cent mentioned that farmland development disrupts wildlife habitats leading to their relocation and escalated issues of predation for producers. Increasing public funding and investment into innovation for the sheep sector were comprehensively acknowledged. Areas of improvement specified were the high costs of electronic tagging for animal traceability, reassessment of Lamb Check-off spending, and the need for animal health companies to study and create solutions for producers' priorities.

Equity and Inclusion

75 per cent of respondents reported entrance barriers for young and new farmers as primary societal changes or policy implementations needed for future generations' encouraged participation and sense of support in the system. Factors listed included upfront capital costs, inflated land prices, lack of industry mentorship, accessing social resources, and public perception of farmers. 60 per cent also commented on the advanced decline in public and private support for new technological developments and public recognition received by the sheep industry.

Market Engagement and Accessibility

Improving the domestic market access through retail demand research and consumer profiling was an industry priority for 75 per cent of respondents, emphasizing the necessity of changing the public perception of mutton and lamb. These needs were linked to the broader call for improving the public's understanding of food production costs. Limitations to the discussion of animals, especially sales, on online platforms and social media were identified as a significant hurdle for the modern market in 38 per cent of responses. 25 per cent also described the effects of climate change mitigation efforts and anti-farming lobbying on policy, indicating the need for continued research on regenerative agriculture claims (e.g., soil health, carbon sequestration, etc.).

5 DISCUSSION

The findings of the social sustainability assessment showed that the interests of sampled farmers from both the United Kingdom and the United States broadly align under three main themes: security, equity and inclusion, and market engagement and accountability. Outlier specifications stem from their regional systems' contexts. UK farmers, on average, had longer-term operations, larger flock sizes, and lower percentages of total net income sourced from off-farm revenue streams than those in the US. In both countries, all respondents described their businesses as small and family-run. This is congruent with national reporting data for each case study. UK farmers also appear to be subject to more established regulatory structures than US producers.

US farmers self-reported lower on average scores for social sustainability indicators for cultural appreciation, hope for the future of their farm, opportunities for economic growth, and accessibility to public resources. Respondents cited the distribution of government funding and industry investment as reasons for their low ratings. In general, producers in both cases feel satisfied with their physical and mental health, fulfillment of rights, and ability to participate in civil society. Corresponding needs and priorities regarding farm and industry security are stricter import limits, problematic pricing structures, animal traceability innovation, industrial agriculture impacts on soil and forage quality, farmland preservation, and limitations on development. UK accounts differ in their concern for increased payments and clarity around providing ecosystem services. Responses from US producers emphasized their need for animal health solutions and reassessment of the Lamb Check-off program spending. Equity and inclusion priorities for the industry identified by both countries included entrance barriers for young and new farmers (e.g., capital costs, land access, lack of mentorship, and public perception of farmers), continued decline of public and private support for industry innovation and education, and efforts to increase respect and promote the diversification of

sheep farmers. The effects of urban encroachment into rural areas and tax-purpose land ownership are significant detriments to the prospects of new generations of farms. In the UK, eco-schemes contribute to the reduced availability of farmland. Parallel responses for market engagement and accessibility identified retail demand research and consumer profiling, warped perception of climate change, and the impacts of anti-farming lobbying on policy and public views as needs and priorities in both industries. US farmers emphasized their need to change public perception of mutton and lamb and education on the actual costs of food production. UK farmers expressed concerns about increasing awareness of native and rare breeds in commercial markets and the limitations of discussing animals on online media platforms.

The similarity of industry structures between the UK and US is evident from their predominately congruent personal needs and views on their respective industries. Deviations in the qualitative data and demographics show the influence of embedded culture within regional sheep farming. More prolonged farm operations and higher scores of social sustainability indicators depict the more established relationship and public acceptance of sheep farming within UK society. Recurrent expression of the disparities of accessible support for sheep farmers compared to other livestock sectors within US responses depicts a clear image of public priority within their system, further corroborated by farmers' reporting and researcher's experience with the insufficient or incomplete collection and limited availability of government-collected sheep sector data. It is evident how historic agricultural and societal transformations within each country have played a role in shaping the contemporary state of UK and US sheep industries and the lived experience of their farmers.

6 CONCLUDING REMARKS

Qualitative data collection stems from the human experience, an essential tool for assessing social sustainability. A primary objective of this project was the prioritization and amplification of farmers' voices in academic research. By designing a guided yet open-ended survey, participants were able to assert agency in the direction of further discussion and representation of their experience. The very nature of qualitative data collection is time and labor-intensive. Delays in survey distribution and responses limited the sample size and constricted data processing capabilities and statistical representation. Most UK and US producers were at the height of lambing season when the survey was completed and distributed, which understandably inhibited survey participation. In conjunction with the reliance on informal communication channels, significant limitations were posed on access to farmers. Advanced preparation and fewer constraints on the research timeframe would allow subsequent investigations to address these issues. The greatest challenge for this research was the complex nature of the questions and bystander understanding of the material due to its subjectivity and pronounced interpretation differences. Defining critical assessment terms (i.e., well-being, equity, justice, quality of life, etc.) for an equitable understanding between researchers and participants is essential for more comprehensive and replicable investigations, as well as more expansive demographic data collection to better explicate assessment representation. Further studies would also benefit from a more robust, experienced research team with greater access to funding and regional sheep associations to aid in connecting with farmers.

Limited and asymmetrical sample sizes between the UK and US do not allow for a generalized understanding of agricultural social system complexities; however, the exploration of farmers' perceptions of systematic influences proved valuable insight into their social health as sheep farmers. I enrolled in the UA Sheep Production course to address the potential limitation posed by my lack of

knowledge and experience with sheep farming. I felt it necessary to comprehend what goes into raising sheep before interpreting the social health of others and making claims about the industry. My experience with that class, and the connections I have made with farmers during this process, established a more profound personal respect and interest in the well-being of farmers.

APPENDIX A

Social Sustainability Survey

Farm System Demographics

- Name or Pseudonym:
- Length of Operation:
- Farm Location (country and region):
    - Do you need special permits or have regulations?
- Commercial or Purebred Operation:
    - Breed(s):
    - Size of Flock:
- What products do you sell?
- Off-farm Income Sources:
    - Percentage of Total Net Income:

Farmer and Farm System

1. **Who else besides yourself and/or partner works on the farm?**
2. **What are off-farm things that have an impact on your production needs and goals?** (e.g., Value Chain Activities/Actors, etc.)
3. **How would you describe the sociocultural system that your farm takes part in?**
4. **What are your priority concerns regarding the working conditions for on and off-farm actors within your farm system?**

Rate the following categories of need in order of personal concern. A (5) meaning you can clearly identify categorical issues or areas of weakness within your comprehensive farm system. A (1) meaning it is an area of little to no concern. Use the 'Other' section to elaborate and identify needs not listed.

- Health and Safety

(1) Not important; (2); (3); (4); (5) Very Important

- Communication and Conflict Management

(1) Not important; (2); (3); (4); (5) Very Important

- Recognition of Social Roles and Fulfillment of Rights

(1) Not important; (2); (3); (4); (5) Very Important

- Other
  - Explain/Comments:

5. To the best of your ability, assess your state of well-being as a sheep farmer.

Rate your level of agreement. Use the 'Other' section to elaborate and identify factors not listed.

- Healthy (Including Mental, i.e., stress levels, finding work meaningful, etc.)

(1) Strongly disagree; (2) Disagree; (3) Neither agree nor disagree; (4) Agree; (5) Strongly agree.

- Financially Secure

(1) Strongly disagree; (2) Disagree; (3) Neutral; (4) Agree; (5) Strongly agree.

- Access to Public and Commercial Services

(1) Strongly disagree; (2) Disagree; (3) Neutral; (4) Agree; (5) Strongly agree.

- Opportunities for growth and Hope for the future of your farm

(1) Strongly disagree; (2) Disagree; (3) Neutral; (4) Agree; (5) Strongly agree.

- Other
  - Explain/Comments:

Industry, Institutions, and Society

6. What informal and formal institutional changes are needed to fulfill the rights and needs of all actors on all levels?

Rate the following categories of need in order of concern. A (5) meaning you can clearly identify categorical issues or areas of weakness within your farm system and the industry. A (1) meaning it is an area of little to no concern. Use the 'Other' section to elaborate and identify needs not listed.

- Diversity and Inclusion matters

(1) Not important; (2); (3); (4); (5) Very Important

- Human and Animal Welfare

(1) Not important; (2); (3); (4); (5) Very Important

- Equitable Access to Available Public Resources

(1) Not important; (2); (3); (4); (5) Very Important

- Other
  - Explain/Comments:

7. **What regulatory systems and/or value chain elements need to be changed or implemented to ensure economic sustainability/profitability?** (e.g., operation regulations, pricing structures, ways retailers and processors can contribute to consumption, etc.)
8. **What societal changes or policy implementations are needed for future generations to be encouraged and supported in the system, so that they can participate and have at least the same opportunities as the present generation?**
9. **What research, data collection, or technological developments are needed to improve production efficiency, market trends/consumer profiles, animal health, environmental sustainability/innovation, etc.?**
10. **What do you believe are the priorities for the industry?**

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