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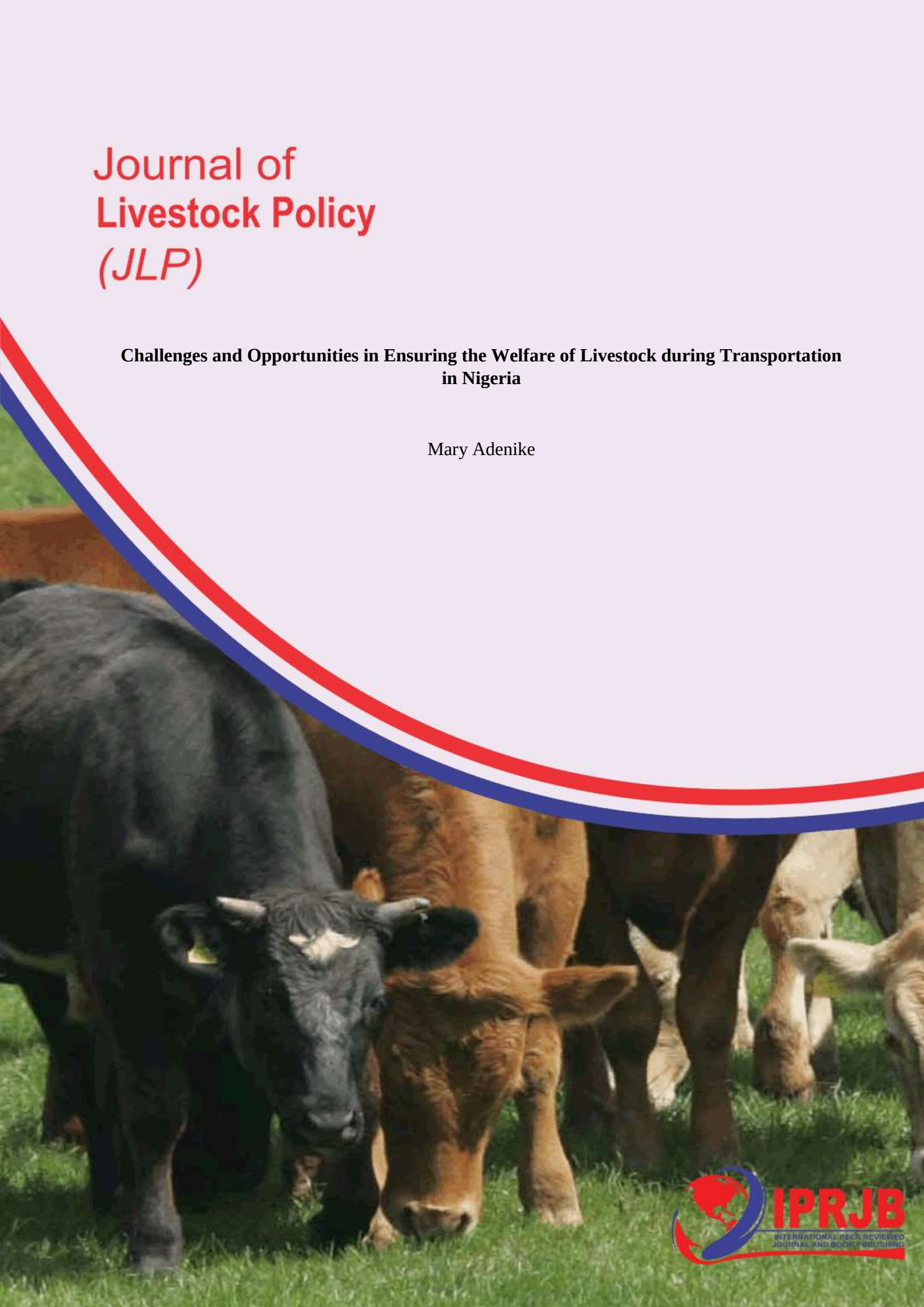
Mary Adenike



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Mary Adenike
Ahmadu Bello University

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Abstract

Purpose: The aim of the study was to examine challenges and opportunities in ensuring the welfare of livestock during transportation in Nigeria

Methodology: This study adopted a desk methodology. A desk study research design is commonly known as secondary data collection. This is basically collecting data from existing resources preferably because of its low cost advantage as compared to a field research. Our current study looked into already published studies and reports as the data was easily accessed through online journals and libraries.

Findings: The study identified challenges, ranging from overcrowding and rough handling to inadequate rest and water provisions, underscore the need for comprehensive interventions to address welfare concerns effectively. Additionally, contextual factors such as regulatory variability, transporter perspectives, and geographical disparities further complicate the landscape of livestock transportation welfare.

Unique Contribution to Theory, Practice and Policy: Theory of Planned Behavior & Social Exchange Theory may be used to anchor future studies on challenges and opportunities in ensuring the welfare of livestock during transportation in Nigeria. Promote the adoption of innovative technologies, such as GPS tracking, real-time monitoring systems, and automated watering and feeding systems, to improve the welfare of livestock during transportation. Advocate for the harmonization of welfare standards and regulatory frameworks across different jurisdictions to promote consistency and accountability in livestock transportation practices.

Keywords: *Transportation, Welfare, Livestock, Challenges, Opportunities*

INTRODUCTION

In the United Kingdom, the welfare of livestock during transportation is governed by regulations such as the Welfare of Animals (Transport) (England) Order 2006 and the Welfare of Animals (Transport) (Scotland) Regulations 2006. According to data from the UK Department for Environment, Food & Rural Affairs (DEFRA), there has been a concerted effort to improve the welfare standards for livestock transport, with initiatives focusing on driver training, vehicle maintenance, and journey planning. Research by Velarde (2015) emphasizes the importance of effective enforcement mechanisms and industry-wide collaboration in ensuring compliance with welfare regulations and promoting best practices in livestock transportation.

The welfare of livestock during transportation is governed by comprehensive regulations and guidelines. The Welfare of Animals (Transport) (England) Order 2006 and equivalent regulations in other parts of the UK set out detailed requirements for the transport of livestock, including provisions for vehicle design, loading densities, journey durations, and the provision of food, water, and rest. The UK government's Animal and Plant Health Agency (APHA) is responsible for enforcing these regulations and conducting inspections to ensure compliance. Efforts to improve livestock transportation welfare in the UK have also involved industry initiatives, such as training programs for drivers and transporters, as well as the development of best practice guidelines. Research by Knowles (2016) highlights the importance of effective enforcement mechanisms and industry collaboration in upholding welfare standards and minimizing stress and suffering during livestock transportation in developed economies.

In countries like Vietnam, where livestock production is an important source of income and nutrition for rural communities, the welfare of animals during transportation is a growing concern. The Vietnamese government has introduced regulations to address animal welfare issues, such as the Law on Animal Husbandry and regulations on transport vehicle standards. However, enforcement remains a challenge, particularly in remote rural areas where infrastructure and resources are limited. Research by Phuong (2018) highlights the need for improved education and training for livestock transporters, as well as investment in infrastructure and regulatory enforcement, to enhance the welfare of animals during transportation in developing economies.

In India, where livestock plays a significant cultural, economic, and agricultural role, the welfare of animals during transportation is governed by various regulations at the national and state levels. The Prevention of Cruelty to Animals (Transport of Animals on Foot) Rules, 2001, and the Transport of Animals Rules, 1978, set out guidelines for the transportation of animals, including provisions for vehicle design, loading densities, and journey durations. However, enforcement of these regulations can be challenging due to factors such as limited resources, inadequate infrastructure, and varying levels of compliance. As a result, instances of overcrowding, long journey durations, and inadequate access to food, water, and rest for animals during transportation are not uncommon in India (Jain, 2019).

Efforts to improve the welfare of livestock during transportation in India have included initiatives to raise awareness, enhance regulatory enforcement, and invest in infrastructure. Organizations such as the Animal Welfare Board of India (AWBI) work to educate stakeholders about animal welfare standards and promote humane transportation practices. Additionally, technological innovations, such as the introduction of mobile veterinary clinics and GPS tracking systems for transport vehicles, aim to improve animal welfare and ensure compliance with regulations. However, significant challenges remain, including the need for

greater coordination among government agencies, increased investment in veterinary services and infrastructure, and improved training for livestock transporters (Das, 2020).

The welfare of livestock during transportation faces unique challenges due to limited resources, infrastructure deficiencies, and often inadequate regulatory frameworks. For instance, in countries like Nigeria, where livestock transportation is a vital aspect of the agricultural sector, there is a lack of comprehensive regulations governing animal welfare during transit. While laws exist at the federal and state levels, enforcement can be weak, leading to instances of overcrowding, rough handling, and prolonged journey durations for livestock. The absence of standardized guidelines for vehicle design and loading densities further exacerbates welfare concerns, particularly for long-distance journeys. Research by Akinseye (2019) highlights the need for improved regulatory oversight, investment in infrastructure, and public awareness campaigns to address the welfare challenges associated with livestock transportation in Nigeria.

Similarly, in countries like Bangladesh, where livestock rearing is a significant source of livelihood for rural communities, the welfare of animals during transportation is a pressing issue. Despite efforts by the government to introduce regulations and guidelines for animal welfare, enforcement remains a challenge due to limited resources and capacity constraints. The lack of awareness among livestock transporters and inadequate training on humane handling practices contribute to welfare issues such as overcrowding, rough handling, and heat stress during transportation. Research by Hossain (2018) emphasizes the importance of capacity-building initiatives, stakeholder engagement, and investment in infrastructure to improve the welfare of livestock during transit in Bangladesh and similar developing economies.

In many developing economies, the welfare of livestock during transportation is often compromised due to a combination of factors such as inadequate infrastructure, limited resources, and lax enforcement of regulations. For example, in countries like Kenya, where livestock rearing is a crucial aspect of rural livelihoods, the transportation of animals faces significant challenges. While regulations exist to govern animal welfare during transport, enforcement is often weak, leading to instances of overcrowding, rough handling, and prolonged journey durations. Additionally, the lack of appropriate infrastructure, such as well-maintained roads and rest facilities, further exacerbates welfare concerns for livestock during transit. Research by Gangaiah (2019) underscores the need for improved regulatory enforcement, investment in infrastructure, and training for livestock transporters to enhance animal welfare standards in Kenya and similar developing economies.

Similarly, in countries like Brazil, where livestock production is a major contributor to the agricultural economy, the welfare of animals during transportation is a growing concern. Despite efforts to introduce regulations and guidelines for animal welfare, enforcement remains a challenge due to vast geographical distances and limited resources. Moreover, the sheer scale of livestock transportation operations in countries like Brazil presents unique challenges, including the need for better coordination among government agencies, industry stakeholders, and transporters to ensure compliance with welfare standards. Research by Garcia (2018) highlights the importance of stakeholder collaboration, public awareness campaigns, and investment in infrastructure to address the welfare challenges associated with livestock transportation in Brazil and other developing economies.

In sub-Saharan economies, the welfare of livestock during transportation is a pressing concern due to a combination of factors such as poor infrastructure, limited resources, and inadequate regulatory frameworks. For example, in countries like Ethiopia, where livestock plays a

significant role in the economy and livelihoods of rural communities, transportation of animals faces numerous challenges. Despite the existence of regulations governing animal welfare during transport, enforcement can be weak, leading to instances of overcrowding, rough handling, and prolonged journey durations. Moreover, the lack of well-maintained roads and transport facilities exacerbates welfare concerns for livestock during transit. Research by Bekele (2020) underscores the need for improved regulatory enforcement, investment in infrastructure, and training for livestock transporters to enhance animal welfare standards in Ethiopia and other sub-Saharan African countries.

Similarly, in countries like Nigeria, where livestock rearing is a vital component of the agricultural sector, the welfare of animals during transportation remains a significant issue. Despite efforts by the government to introduce regulations and guidelines for animal welfare, enforcement can be challenging due to limited resources and capacity constraints. Instances of overcrowding, rough handling, and heat stress during transportation are not uncommon, especially for long-distance journeys. Additionally, the lack of awareness among livestock transporters and inadequate training on humane handling practices further contribute to welfare issues. Research by Oladeji (2017) emphasizes the importance of capacity-building initiatives, stakeholder engagement, and investment in infrastructure to improve the welfare of livestock during transit in Nigeria and other sub-Saharan African countries.

Ensuring the welfare of livestock during transportation presents various challenges and opportunities that need to be carefully navigated. One of the foremost challenges is inadequate regulatory enforcement, particularly in developing economies where regulatory frameworks may exist but lack effective implementation (Bekele, 2020). This can lead to issues such as overcrowding, rough handling, and prolonged journey durations, compromising the welfare of animals during transit. Additionally, poor infrastructure, including poorly maintained roads and lack of rest facilities, poses a significant challenge, especially in remote areas where livestock transport is common (Garcia, 2018).

However, amidst these challenges lie opportunities for improvement and innovation. One such opportunity is the adoption of technology to monitor and improve animal welfare during transportation. GPS tracking systems and temperature sensors can provide real-time data on transport conditions, allowing for timely interventions to ensure the well-being of livestock (Akinseye, 2019). Furthermore, capacity-building initiatives and stakeholder engagement present opportunities to enhance awareness and knowledge about humane handling practices among livestock transporters, ultimately improving welfare standards (Oladeji, 2017).

Statement of the Problem

Inadequate regulatory enforcement and poor infrastructure pose significant challenges to ensuring the welfare of livestock during transportation (Bekele et al., 2020; Garcia et al., 2018). Despite the existence of regulations, particularly in developing economies, effective implementation remains lacking, leading to issues such as overcrowding, rough handling, and prolonged journey durations. Additionally, the absence of well-maintained roads and rest facilities exacerbates welfare concerns, especially in remote areas where livestock transport is prevalent (Garcia et al., 2018)."

Theoretical Review

Theory of Planned Behavior (TPB)

Originated by Icek Ajzen in 1985, the Theory of Planned Behavior posits that human behavior is influenced by three main factors: attitudes, subjective norms, and perceived behavioral control. In the context of ensuring the welfare of livestock during transportation, TPB can

provide insights into the attitudes and beliefs of stakeholders involved in the transportation process, such as farmers, transporters, and regulatory authorities. By understanding the factors that influence their intentions and behaviors towards animal welfare, policymakers and practitioners can develop targeted interventions to address challenges and capitalize on opportunities. For instance, identifying discrepancies between stakeholders' attitudes and actual practices can inform educational campaigns and training programs aimed at promoting humane handling practices during livestock transportation (Ajzen, 1991).

Social Exchange Theory

Developed by George Homans in 1958 and further expanded by Peter Blau, Social Exchange Theory posits that individuals engage in social relationships based on the principles of reciprocity and mutual benefit. In the context of livestock transportation, this theory can help elucidate the dynamics of relationships between different actors involved in the supply chain, such as farmers, transporters, and buyers. By examining the perceived costs and benefits associated with adherence to animal welfare standards during transportation, researchers can identify factors that motivate or deter stakeholders from prioritizing animal welfare. Understanding these dynamics can inform the design of incentive structures, collaborative initiatives, and regulatory frameworks aimed at promoting the welfare of livestock during transportation (Blau, 1964).

Empirical Review

Bekele (2018) evaluated current livestock transportation practices in Ethiopia and their welfare implications. A mixed-methods approach combining surveys, interviews, and direct observation of livestock transport practices was employed. The study found that overcrowding, rough handling, and inadequate rest and water provisions were common during livestock transportation, leading to significant welfare concerns. The study recommends improved regulatory enforcement, capacity-building initiatives for transporters, and investment in infrastructure to enhance animal welfare standards.

Oladeji(2017) aimed to compare livestock transportation practices and welfare challenges across different developing countries. A cross-sectional study design involving surveys and interviews with stakeholders in multiple developing countries was utilized. The study found variations in regulatory frameworks, infrastructure, and awareness levels among developing countries, leading to diverse welfare challenges during livestock transportation. The study recommends knowledge exchange, capacity-building initiatives, and harmonization of regulatory standards to address welfare challenges effectively.

Knowles (2019) explored stakeholders' perspectives on potential opportunities for enhancing livestock transportation welfare. Qualitative interviews and focus group discussions with stakeholders, including farmers, transporters, and regulatory authorities, were conducted. The study identified several opportunities, including technological innovations, stakeholder collaboration, and policy interventions, for improving livestock transportation welfare. The study recommends the development of comprehensive strategies that leverage identified opportunities to address welfare challenges effectively.

Garcia (2016) conducted an economic analysis of interventions aimed at improving livestock transportation welfare. Cost-benefit analysis and econometric modeling techniques were employed to evaluate the economic viability of various intervention strategies. The study found that investments in infrastructure upgrades, training programs, and regulatory enforcement yielded positive economic returns in terms of reduced livestock mortality and increased market

value. The study recommends targeted investments in cost-effective interventions that address key welfare challenges while maximizing economic benefits.

Akinseye (2018) investigated livestock transporters' perceptions of welfare challenges and opportunities during transportation. Surveys and semi-structured interviews were conducted with livestock transporters to gather insights into their experiences and perspectives. The study identified key welfare challenges such as lack of training, time pressures, and financial constraints, as well as potential opportunities for improving welfare through education and support programs. The study recommends tailored interventions that address transporters' specific needs and incentivize adherence to welfare standards.

Velarde (2019) evaluated the long-term impact of welfare initiatives implemented to improve livestock transportation practices. Longitudinal data analysis and stakeholder surveys were conducted over several years to assess changes in welfare outcomes and stakeholder perceptions. The study found that targeted interventions, such as training programs and infrastructure improvements, led to sustained improvements in livestock welfare and increased stakeholder satisfaction. The study recommends continued monitoring and evaluation of welfare initiatives to ensure their effectiveness and identify areas for further improvement.

Olsson (2017) compared regulatory approaches used by different countries to address welfare challenges in livestock transportation. Legal analysis and comparative case studies were conducted to examine the strengths and weaknesses of regulatory frameworks in various jurisdictions. The study identified variations in regulatory approaches, enforcement mechanisms, and stakeholder engagement strategies, highlighting the importance of context-specific interventions. The study recommends knowledge sharing and policy harmonization efforts to promote the adoption of best practices and enhance welfare outcomes globally.

METHODOLOGY

This study adopted a desk methodology. A desk study research design is commonly known as secondary data collection. This is basically collecting data from existing resources preferably because of its low cost advantage as compared to a field research. Our current study looked into already published studies and reports as the data was easily accessed through online journals and libraries

RESULTS

Conceptual Gaps

Integration of Stakeholder Perspectives: While several studies explore the welfare implications of livestock transportation, there is a conceptual gap in integrating the perspectives of different stakeholders, including farmers, transporters, regulatory authorities, and animal welfare organizations. Incorporating diverse viewpoints could provide a more comprehensive understanding of welfare challenges and opportunities, as well as facilitate the co-creation of effective solutions (Akinseye, 2018).

Long-Term Impact Assessment: Another conceptual gap lies in the limited exploration of the long-term impact of welfare initiatives on livestock transportation practices. While some studies assess immediate outcomes, such as changes in welfare indicators, there is a lack of focus on the sustained effectiveness and scalability of interventions over time (Velarde, 2019).

Contextual Gaps

Regulatory Variability: The contextual gap involves variations in regulatory frameworks and enforcement mechanisms across different countries. While some studies acknowledge these

differences, there is limited analysis of how contextual factors, such as political, cultural, and economic contexts, influence the effectiveness of regulatory interventions (Olsson, 2017).

Transporter Perspectives: Despite efforts to explore welfare challenges from multiple angles, there is a contextual gap in understanding the specific needs and constraints faced by livestock transporters. Further research is needed to delve into the socio-economic factors shaping transporter behavior and decision-making processes (Akinseye, 2018).

Geographical Gaps

Underrepresented Regions: The geographical gap involves the underrepresentation of certain regions or countries in the literature on livestock transportation welfare. While studies from Ethiopia and other developing countries are cited, there may be other regions with unique challenges and opportunities that warrant attention (Bekele, 2018; Oladeji, 2017).

Global Perspective: Additionally, there is a geographical gap in the lack of comparative analysis or knowledge exchange between developed and developing countries regarding livestock transportation practices. Bridging this gap could facilitate cross-learning and the adoption of best practices to improve welfare outcomes globally (Olsson, 2017).

CONCLUSION AND RECOMMENDATIONS

Conclusion

In conclusion, ensuring the welfare of livestock during transportation presents multifaceted challenges and opportunities that require concerted efforts from stakeholders across the livestock supply chain. The identified challenges, ranging from overcrowding and rough handling to inadequate rest and water provisions, underscore the need for comprehensive interventions to address welfare concerns effectively. Additionally, contextual factors such as regulatory variability, transporter perspectives, and geographical disparities further complicate the landscape of livestock transportation welfare.

However, amidst these challenges lie significant opportunities for improvement. Stakeholder collaboration, technological innovations, and policy interventions offer promising avenues for enhancing livestock transportation welfare. By integrating diverse stakeholder perspectives, leveraging technological advancements, and implementing targeted interventions, there is potential to mitigate welfare risks and promote humane treatment practices during transportation. Moreover, long-term impact assessment and global knowledge exchange can facilitate the adoption of best practices and foster continuous improvement in welfare outcomes.

In essence, addressing the challenges and embracing the opportunities in ensuring the welfare of livestock during transportation requires a holistic approach that combines regulatory reforms, capacity-building initiatives, and stakeholder engagement efforts. By prioritizing animal welfare, investing in infrastructure upgrades, and fostering a culture of responsibility and accountability, stakeholders can collectively work towards creating a more humane and sustainable livestock transportation system.

Recommendations

Theory

Interdisciplinary Research: Encourage interdisciplinary research to develop theoretical frameworks that integrate insights from animal welfare science, transportation engineering, behavioral economics, and sociology. This approach can deepen our understanding of the

complex interactions between physical, physiological, psychological, and socio-economic factors influencing livestock welfare during transportation.

Behavioral Science Insights: Integrate behavioral science principles into theoretical models to better understand the decision-making processes of stakeholders involved in livestock transportation. By incorporating insights from psychology and behavioral economics, theories can elucidate the underlying motivations and barriers driving behavior change among transporters, farmers, regulators, and consumers.

Practice

Technology Integration: Promote the adoption of innovative technologies, such as GPS tracking, real-time monitoring systems, and automated watering and feeding systems, to improve the welfare of livestock during transportation. These technologies can enhance transparency, traceability, and real-time decision-making, thereby reducing stress, injuries, and mortality rates among transported animals.

Training and Education: Develop comprehensive training programs and educational initiatives targeting transporters, farmers, regulatory authorities, and other stakeholders involved in livestock transportation. These programs should emphasize best practices in animal handling, loading and unloading procedures, emergency response protocols, and regulatory compliance to ensure consistent adherence to welfare standards.

Policy

Harmonization of Standards: Advocate for the harmonization of welfare standards and regulatory frameworks across different jurisdictions to promote consistency and accountability in livestock transportation practices. Policy efforts should focus on aligning regulations with scientific evidence, industry best practices, and international guidelines to ensure robust protection of animal welfare.

Incentive Mechanisms: Introduce incentive mechanisms, such as certification schemes, tax incentives, and subsidies, to reward compliance with welfare standards and encourage investments in infrastructure upgrades and training programs. By incentivizing good practices, policymakers can create a positive reinforcement loop that drives continuous improvement in livestock transportation welfare.

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