Exploring the Path to Constructing a Green Supply Chain within the Perspective of Shared Prosperity - With SCOR as a Reference Model

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Abstract: Under the backdrop of shared prosperity, the smooth realization of the rural common prosperity goal relies on leveraging agricultural development as a breakthrough. However, rural logistics stands as a critical component of agricultural advancement. This paper aims to address the deficiencies in rural logistics by constructing a green supply chain. Building a green supply chain for rural logistics based on the SCOR model extends the lifecycle of agricultural products and enhances logistical efficiency. Building upon an overview of the green supply chain and the SCOR model, this paper analyzes the significance of a green supply chain for rural logistics within the SCOR model framework. Subsequently, it outlines the obstacles encountered in the development of rural logistics within the shared prosperity perspective. Finally, it delves into the practical pathway of the operational model for a green supply chain in rural logistics within the shared prosperity perspective. The intention is to guide relevant stakeholders.

Keywords: Shared prosperity; Green supply chain; Construction pathway; SCOR reference model

1 Introduction

The green supply chain model was developed based on the SCOR model (supply chain operation reference model), based on rural logistics to build a green supply chain, promote the high-quality development of rural logistics, and accelerate the pace of rural common prosperity. Sun Fei & Zhang Liping's (2022) research perspective put in the northwestern region of Lu, around the green supply chain of the fresh agricultural products industry under the cloud logistics model to carry out research, and put forward effective measures for risk mitigation[1]. Chain Xie Siqian, Fan Shuqi, and other scholars (2023) analyze the impact of green supply chains on rural logistics under the strategy of rural revitalization and explore the optimization process of green supply chains of rural logistics by combining theory and practice. Currently, the development of rural logistics encounters some resistance, which reduces the quality of rural logistics to varying degrees, and to make up for the gap in the development of rural logistics as soon as possible, we must inevitably refer to the SCOR model to explore a suitable green supply chain for rural logistics. Thus, this thesis has the importance and urgency of exploration[2].

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2 Overview of Green Supply Chain and the SCOR Model

2.1 Green Supply Chain

The concept of a green supply chain involves the integration of sustainable development, resource conservation, ecological economics, and the application of innovative management practices throughout the entire supply chain[3]. When applied in the realm of rural logistics, a green supply chain can lower transportation costs, expedite transportation speed, and foster the intelligent development of logistics transportation services.

2.2 SCOR Model The SCOR model,

short for Supply Chain Operations Reference model, comprises four levels: process, configuration, practice, and execution. It encompasses five stages: plan, source, make, deliver, and return [4]. When employed within specific industries, the SCOR model can be slightly adapted to enhance business processes, thereby better supporting strategic management within enterprises. The modern SCOR model has integrated green manufacturing concepts, forming a green supply chain operational model, as depicted in Figure 1.

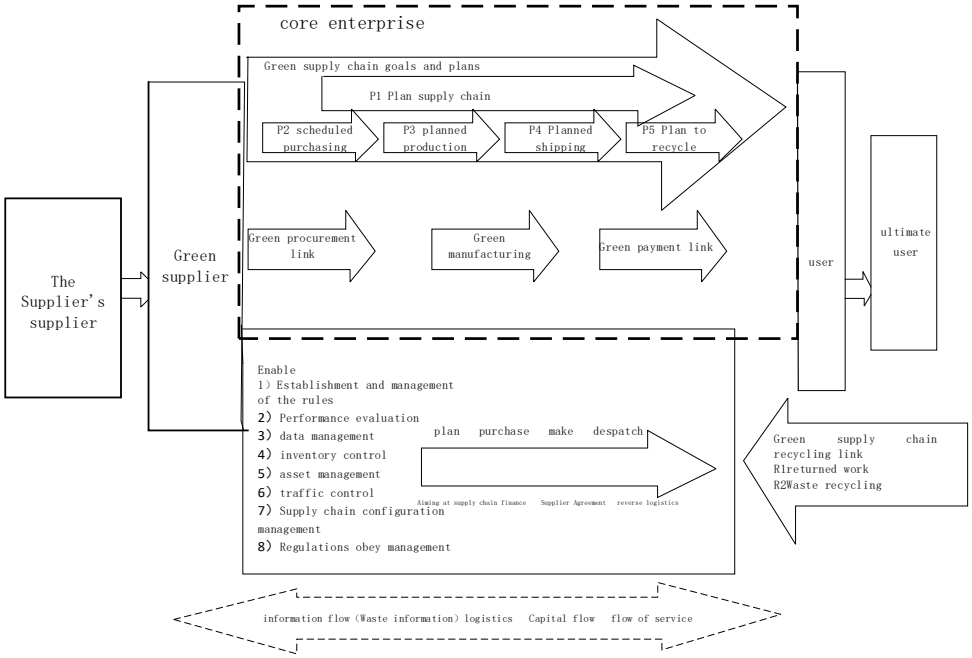

Figure 1. Operational Model of Green Supply Chain

3 Significance of Green Supply Chain for Rural Logistics Based on the SCOR Model

Implementing a green supply chain in rural logistics using the SCOR model means integrating eco-friendly practices from farming to resource reuse. Supply chain planners must consider the

entire lifecycle of agricultural items, overseeing green design, sourcing, production, packaging, transportation, marketing, and recycling[5]. This holistic approach aims to meet eco-standards, reduce environmental impact, and maximize agricultural resource efficiency. Integrating rural logistics into a green supply chain model establishes a unified system. It helps farmers access markets, manage oversupply losses, improve delivery rates, partly cut logistics expenses, and scale up production. This comprehensive approach empowers farmers to better serve society, fostering positive contributions to overall societal development.

4 Challenges Encountered in the Development of Rural Logistics under the Perspective of Shared Prosperity

The key to the work of rural commonwealth is agricultural development, yet the weak point in promoting rural commonwealth is rural logistics development. Evaluation indicators and weights for rural logistics development are summarized in table form and scores are calculated.

Table 1 Evaluation indicators, weights, and scores of rural logistics development

Level 1 indicators	Secondary indicators	weights	score
The basis for development	Business Networks	0.46	62.38
	Number of Employees	0.54	
Development drivers	Logistics Park	0.24	61.02
	Service Area	0.38	
	Mileage of rural roads	0.38	
Development effectiveness	Capital productivity	0.45	59.86
	Rate of technological progress	0.55	

The data show that the evaluation results of rural logistics development, the development of a foundation score of 62.38, meaning that fewer business outlets and the number of employees is insufficient; the development of a driving force score of 61.02, indicating that the level of construction of logistics parks needs to be improved, and the business network needs to expand the scope of services, the construction of rural roads can not be delayed; the development of the efficiency score of 59.56, indicating that the rural logistics of the high cost of production, the level of technology The development efficiency score of 59.56 indicates that the high production cost and low technical level of rural logistics are not conducive to the green transformation of rural logistics. The following summarizes the problems of rural logistics development, to provide direction for the development of measures to solve the problems and build a smooth green supply chain for rural logistics:

4.1 Inadequate Logistics Connectivity

Efficient logistics operations rely on smooth coordination across stages like warehousing, transportation, and distribution. However, rural areas face challenges due to a lack of standardized logistics parks and an incomplete transportation network, hindering effective rural

logistics. Persistent deficiencies in infrastructure and expertise impede progress towards eco-friendly rural logistics. Weakened logistics functions can harm agricultural product circulation, impacting sales and farmers' economic interests, thereby hindering agricultural prosperity. Inadequate rural logistics infrastructure, shortage of professionals, limited coverage, and lack of innovation in logistics technology all contribute to the challenging development of rural logistics.

4.2 Suboptimal Supply Chain System

The level of perfection in the logistics supply chain is pivotal for evaluating rural logistics development. Currently, rural logistics supply chains have relatively low-quality control standards, lacking unified criteria for agricultural products. Most local agricultural products are made in small family workshops, resulting in low efficiency and compromised quality. Moreover, the limited coverage of rural logistics chains only supports short-distance transportation, leading to agricultural product supply shortages. Individual farmers have limited productivity, and consolidating them is necessary to form a larger productive force. Otherwise, the inability to sustainably supply agricultural products due to small-scale operations will weaken the capability to serve agricultural products and reduce market competitiveness.

4.3 Incomplete E-commerce Service System

The incomplete e-commerce infrastructure in rural areas of China poses challenges in achieving open and shared logistics data in the short term. This deficiency adversely impacts agricultural production and sales, disrupting the supply-demand balance. Delays in rural e-commerce development are evident in slow software advancements, inefficient warehousing and courier services, and a shortage of skilled personnel. Additionally, the lack of influential e-commerce enterprises capable of supporting rural logistics development exacerbates the situation. Over time, this may hinder the establishment of a green supply chain for rural logistics, limiting its contribution to shared prosperity initiatives.

5 Practical Pathway of Green Supply Chain Operational Model under the Perspective of Shared Prosperity – A Case of Rural Logistics

In the pursuit of rural prosperity, establishing a green supply chain for rural logistics takes center stage, aligning with the SCOR model. This involves a comprehensive logistics system encompassing seven elements: green design, procurement, manufacturing, and packaging. Enhancements in logistics connectivity, supply chain optimization, and e-commerce services significantly elevate the management of this green supply chain.

5.1 Strengthening Logistics Connectivity

Ensuring agricultural supply meets demand is crucial for implementing a green supply chain in rural logistics. To prolong agricultural product shelf life, strategies like constructing storage facilities, developing cold chain logistics, and enabling low-temperature distribution to ensure product freshness. Improving connectivity between logistics systems at different administrative levels (provincial, municipal, and township) necessitates expanding rural logistics service points,

including logistics parks, cold chain bases, and comprehensive service platforms.

Skilled professionals and specialized technologies are vital for seamless rural logistics operations and continuous green supply chain development:

Personnel Support: Establishing a green supply chain requires logistics experts with knowledge of green logistics, supply chains, the SCOR model, and operational aspects. Recruiting and training should emphasize their competence in building and using a green supply chain for rural logistics[6].

Technological Support: Advanced technologies are key for efficient green logistics management. Integrating information and supply chain management in rural logistics provides essential data for decision-making and cost reduction. For instance, QR code technology on product packaging streamlines logistics, reducing time and ensuring timely deliveries. Green technology integration drives rural logistics development, ensuring connectivity across the green supply chain phases.

5.2 Optimizing the Supply Chain System

Establishing a green supply chain in logistics involves several key stages:

1. Green Design: The initial step focuses on developing viable plans to produce agricultural products that meet consumer demands and environmental standards.

2. Material Selection: Crucial to green supply chain management is refining procurement standards aligned with agricultural characteristics, and assessing suppliers based on green performance, safety, and credibility to ensure quality raw materials.

3.Green Production: Implementing high standards in various aspects of agricultural production ensures adherence to green manufacturing concepts, equipment, environmental conditions, and practices.

4. Green Packaging: Employing eco-friendly materials and maximizing recyclable packaging reduces waste, saves costs, and aligns with societal benefits.

5. Green Transportation: Implementing joint distribution systems through multiple centers improves efficiency, shortens logistics timeframes, and focuses on green energy sources for conservation and environmental protection.

6. Green Marketing: Building relationships between enterprises and consumers involves conveying environmentally friendly concepts, creating a green brand image, and guiding consumer behavior toward green consumption.

7. Green Recycling: Encouraging consumer participation in recycling aligns with the SCOR model's reverse logistics, maximizing resource reuse and environmental protection. A sustainable approach to constructing a green supply chain involves incorporating green consumer ideologies, encouraging participation in green logistics, and establishing reliable recycling systems. Gradually expanding economic profits within the green logistics industry promotes effective and standardized green supply chains in rural logistics. Ultimately, engaging consumers in green recycling practices through reverse logistics models reflects a commitment to green supply chain principles, optimizing logistics, and maximizing benefits at minimal costs[7].

5.3 Improving the E-commerce Service System

In the digital era, enhancing rural logistics for e-commerce must align with current trends. Utilizing e-commerce platforms for agricultural sales not only expands the online market reach but also drives growth in the logistics industry[8]. Creating a rural logistics network in China involves establishing online shopping zones, strengthening physical infrastructure, and advancing intelligent warehouse systems. This enables managers to use supply chain data for agile planning, enhancing efficiency[9].

Furthermore, involving e-commerce firms in agricultural product selection, sorting, and rural logistics cultivates high-quality brands, building consumer trust[10]. Supervision through information technology ensures balanced logistics resource allocation on e-commerce platforms, aligning with regulations essential for successful rural e-commerce. E-commerce companies commit to regulatory compliance, fostering a favorable rural e-commerce environment. Logistics enterprises refine regulatory requirements, aligning with enhancements in rural e-commerce services to elevate the e-commerce system.

In summary, achieving common prosperity is a gradual process, requiring addressing rural logistics' shortcomings and improving agricultural development's quality. Opting for the green ecological route in rural logistics development involves constructing a green supply chain. This approach ensures the green design, procurement, production, packaging, transportation, marketing, and recycling of agricultural products, ultimately achieving high-quality rural logistics development.

6 Conclusion

Efficient rural logistics development is crucial for achieving shared prosperity. Establishing a green supply chain is vital to extend the lifespan of agricultural products and improve logistics efficiency, especially by implementing a rural logistics-based green supply chain rooted in the SCOR model. However, challenges like insufficient integration, suboptimal supply chains, and incomplete e-commerce services hinder rural logistics' green advancement. Addressing these issues requires key measures: enhancing logistics integration through facility construction and network optimization, optimizing the supply chain by greening processes, and improving e-commerce by leveraging online platforms and intelligent warehouse systems. Building a green supply chain, particularly rooted in the SCOR model for rural logistics, promotes green practices, efficient transportation, and agricultural product recycling, supporting sustainable agricultural development and common prosperity goals.

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