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ANALYSIS OF DOMESTIC GOODS TRANSPORT AND LOGISTICS DYNAMICS WITHIN THE AGRICULTURAL SUPPLY CHAIN IN PAKISTAN

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ABSTRACT

For adequate farm management and an efficient value chain approach, properly managed transportation is the key element. Transport plays a very important role in every industry, including agriculture. In Pakistan fruit and vegetables are being transported to the city centers, i.e., Fruit and Vegetable Markets every day from the remote/rural area and sometimes from the other provinces, where it is sold out through the process of open auction. Hence, transportation also plays an important role in the competitive prices of fruit and vegetable commodities. A slight delay in the commodities in the market distorts the supply/arrival in the market and causes price fluctuations. Therefore, it is imperative to explore the relationships/role of transporters with the other stakeholders of the value chain. Another aspect of the study was to highlight the issues of post-harvest losses because it is reported in the literature that almost 25-30 percent of post-harvest losses occurred in fruit and vegetables. Therefore, it is again needed to explore the quality of transportation facilities. For the reasons recorded above the said study was carried out using – at first, a desk review and secondary sources about the overview of the sector. Secondly, to delve into the highlighted issue a field survey was carried out in the seven major Markets of Punjab. A sample of at least three and the maximum transport companies was interviewed. The results of the Logistic Performance Index (LPI) showed that Pakistan is only above Afghanistan in the region stating the poor condition and it is ranked 122 out of 160 countries in the International LPI results. The results of the field survey showed that in the agriculture supply chain, only 1% of reefers were used during transportation, and most of the transport facilities were traditional trucks. It was found that the transportation sector is governed by the commission agents indicating manipulation of the supplies in the market for price determination. The results of the study showed interesting facts to be noted by the policymakers that can support the development of the industry in Punjab and enhance the overall productivity and profitability of the agricultural sector in Pakistan.

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INTRODUCTION

In recent years, there has been a significant shift regarding the conventional description of the transport and logistics industry (Banerjee, 2018). Initially, it will encompass not just physical infrastructure like railways, roads, maritime trade, and associated freight, but also services including packaging, delivery, storage, and trade logistics. Secondly, factors including substantial freight charges, insurance, extended delivery times, and renewal fees would be considered as considerable supplementary expenses, requiring thorough scrutiny (Banomyong et al., 2015). The inclusion of external cumulative transport and logistics costs, such as opportunity cost, service standards, and trade facilitation, ultimately affects the efficiency of the transport and logistics sector, which was not addressed in this survey, as well as the cost of doing business in Pakistan (Gleser and Elbert, 2024; GOP, 2024b). Therefore, they will be the focus of reform, and for the sector, a detailed yet targeted action plan is being prepared. This would be a boost for the economy, which is the focal point of the Five-Year Plan (GOP, 2024b). In the field of trade, the term "Logistics" represents a wide variety of activities involved in the physical distribution of final goods from the end of the production line to the consumer but sometimes also encompasses the flow of raw materials from the source of supply to the start of the production line (Zgaya and Hammadi, 2016). These activities encompass freight management, transportation, warehousing, materials handling, protective packaging, inventory control order processing, market forecasting, and customer service. (Friedrich et al., 2014).

Global Trends in the Sector

Over the past decade, various trends have heightened interest in the advancement of logistics and supply chain management. Manufacturers have now acknowledged that the logistics function can serve as a strategic strategy for achieving competitive advantage (Monjur and Akon, 2023). Thus, the inclination to maintain minimal inventories to mitigate storage costs, as emphasized by production methodologies such as Just-In-Time and Zero-Inventory, became evident (MSU, 2023). Consequently,

logistics activities have emerged as a priority for senior management in numerous firms, rather than solely for logistics managers as in the past.

Furthermore, the delegation of the manufacturing function has resulted in the outsourcing of logistics operations. Numerous multinational corporations, including those in the automotive, electronics, and food sectors, have delegated their logistical operations to third-party logistics (TPL) service providers to concentrate on their main business activities (MSU, 2023).

Pakistan's Transportation and Logistics Landscape

With a population exceeding 220 million, Pakistan is the fifth most populous nation in the world (UN, 2024). The transport and logistics sector has a profound and enduring effect on the economic growth of Pakistan. For example, the transport sector contributes 22.3% of the services sector's Gross Domestic Product (GDP). Additionally, the sector also accounted for approximately 6% of the country's total employment in 2019 (GOP, 2024a). The transport and communication sector in Pakistan contributed accounting for 20.51 percent of its GDP in FY 2024 and the share in the services sector comes to 23 percent. The government of Pakistan has been investing in this sector, intending to develop a modern and well-integrated transportation and communication system. The development funds amounting to Rs 264.8 billion have been earmarked to the sector for the financial year 2024 (GOP, 2024a). The performance of the transportation services industry is highly correlated to fuel costs, labor costs, demand for services, geopolitical events, and government regulation (Hayes, 2021).

The sustainable economic development of Pakistan relies on a strong and cost-effective transport and logistics sector. The improved export competitiveness is contingent upon the sector's efficient functioning. Notwithstanding the economic downturn, the transport sector has sustained favorable growth trajectories (Sánchez-Triana et al., 2013). The government recognizes the crucial importance of industry in overall economic advancement and in enhancing export competitiveness. Consequently, it is dedicated to executing a comprehensive development effort aimed at modernizing the industry through an ongoing reform process bolstered by targeted investments in all its sub-sectors. The sector asserts a 25 to 30 percent allocation of the yearly Public Sector Development Programme (PSDP), although this investment level is insufficient to address the escalating demands. Investment has to increase by approximately two to three times to ensure the sector aligns with the demands generated by the growth of economic activity (GOP, 2024b). Consequently, coordinated initiatives will be undertaken to foster public-private partnerships to maximize private-sector investments.

Transport Industry Involved in the Agricultural Value Chain

In the Agricultural value chain, the proper management of transportation is an important element due to the perishable nature of fruits and vegetables. In Pakistan fruit and vegetables are transported to the city centers, i.e., Fruits & Vegetable Markets every day from the production area, i.e., remote/rural areas, or sometimes from the other provinces, where it is sold out through the process of open auction. Therefore, the transportation of fruit and vegetables also plays an important role in the competitive prices of these commodities. A slight delay in these commodities in the market distorts the supply/arrival and causes price fluctuations (Naseer, 2025). So, it is imperative to explore the relationships/role of transporters with the other stakeholders of the value chain, such as commission agents and farmers. How do they operate? With whom do they have a contract? How do their contracts work?

This study also aimed to emphasize the problems associated with post-harvest losses. In Pakistan, post-harvest losses of perishable goods, including fruits, vegetables, meat, and dairy products, are projected to be between 35 to 40 percent (Ahmad et al., 2021). A significant cause is the lack of suitable transport capabilities, including pack houses, cold storage facilities, reefer containers, and reefer yards for the selling of perishable goods produced both domestically and globally (ITC, 2024). Similarly, during the off-season, most of the fruits & vegetables (onion, tomato, apples, etc.) are being transported from neighboring countries like Afghanistan and Iran and it is assumed that due to more transport time and post-harvest losses may be high. Therefore, it is again needed to explore the quality of transportation facilities. What type of facilities do they have? How many losses occur during transportation? Who is responsible for the losses that occurred during transportation?

This study of the goods transport industry involved in the agricultural value chain in Punjab was conducted to shed light on the factors that can contribute to the growth and development of the industry, identify key challenges faced by transport, and provide insights into potential solutions that can help overcome these challenges. The specific objectives of the study are mentioned in Figure 1. Such a study can also inform policy and intervention decisions that can support the development of the industry in Punjab and enhance the overall productivity and profitability of the agricultural sector in Pakistan.

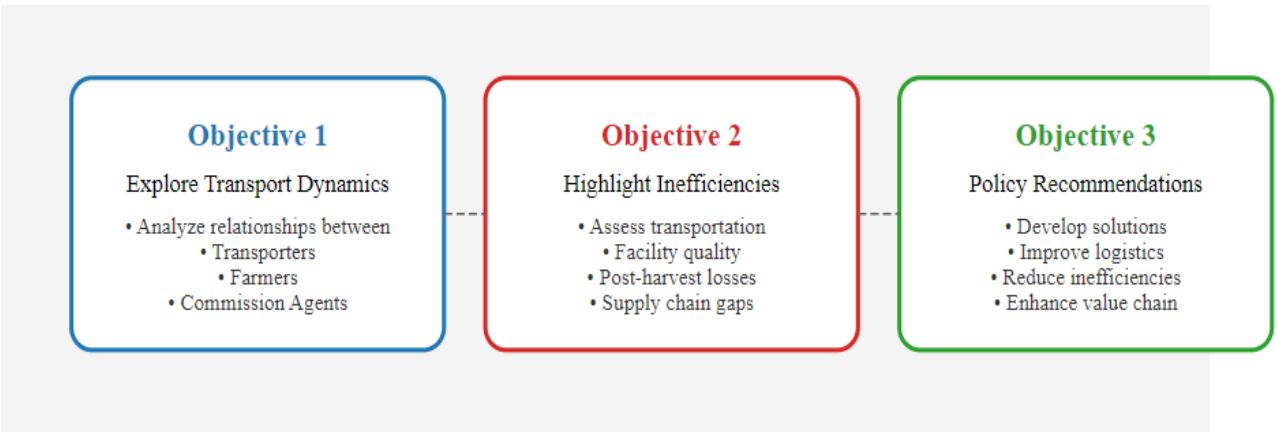

Figure 1. Specific objectives of the study.

METHODOLOGY

This study employs a mixed-methods approach, combining desk review, secondary data analysis, and field surveys to investigate the role of transportation in reducing post-harvest losses in the fruits and vegetables (F&V) value chain across Punjab, Pakistan. The methodology is structured into multiple phases to ensure a comprehensive understanding of logistics and supply chain dynamics.

Desk Review and Secondary Data Collection

The initial phase of the study involved an extensive desk review of existing literature, reports, and secondary data sources to develop an overview of the sector. This provided insights into key transportation challenges, existing logistics infrastructure, and supply chain inefficiencies in Punjab's F&V markets.

Field Survey and Data Collection

To complement the desk review, a structured field survey was conducted in seven major F&V markets of Punjab: "Rawalpindi, Lahore, Faisalabad, Gujranwala, Okara, Multan, and Dera Ghazi Khan (DG Khan)". A total of 25 goods transport companies were selected, with a minimum of three (3) and a maximum of five (5) transporters surveyed in each city. The selection was facilitated by local market coordinators who identified transporters involved in F&V logistics.

Data Collection Tools and Implementation

A structured questionnaire was developed, incorporating both quantitative and qualitative questions. The questionnaire aimed to capture:

1. The efficiency and reliability of transport services.
2. Challenges faced by transporters in handling F&V commodities.
3. The availability and adoption of advanced logistics facilities (e.g., refrigerated transport).
4. The role of superstores in ensuring quality preservation through logistics innovation.

Data Analysis

This study employs descriptive and thematic analysis to interpret the collected data. Since no statistical models were used, the analysis focused on: Quantitative data (e.g., percentage of transporters using cold storage, average transport costs, most common challenges) was analyzed using summary tables, percentages, and frequency distributions. Findings were presented in a structured format to highlight key trends in transportation and post-harvest losses.

Qualitative data (e.g., insights from transporters and superstore managers) was analyzed using a thematic approach, identifying common patterns and recurring themes. Responses were categorized into key themes such as Major transport bottlenecks; Cold chain infrastructure availability; and Policy gaps in the logistics sector. The thematic analysis helped in drawing meaningful conclusions about the efficiency and challenges of Punjab's F&V transportation network. All participants were informed about the study's purpose. Participation was voluntary, and responses were kept confidential. No personal identifiers were recorded to ensure anonymity.

The combination of desk review, field surveys, and thematic analysis provided valuable insights into Punjab's F&V transportation network. The findings will help stakeholders, policymakers, and market actors understand logistical inefficiencies and explore solutions to minimize post-harvest losses.

RESULTS AND DISCUSSION

Part 1: Desk Review and Current Status

Major Issues in Pakistan's Transport Sector

The government must recognize that, without a strong goods forwarding and logistics sector, ambitious export goals are unlikely to be achieved. The termination of preferential access to developed markets in the present global trade environment requires the government to consider the international goods forwarding sector as essential to the core economy (Naseer et al., 2023). The regulation of the Freight Forwarding and Logistics Industry deprives its members of a sufficient regulatory framework and access to optimal financial alternatives (GOP, 2024b).

The country's geographic position offers a strategic advantage in facilitating transit and transshipment trade for landlocked neighbouring nations, namely Afghanistan, the Central Asian Republics, and Western China. The existing custom transit laws are burdensome and result in procedural delays, preventing Pakistan from capitalizing on the enhanced commodities trade aimed at Central Asia (Khan, 2023). Recent governmental actions to implement the Transports Internationaux Routiers (TIR) Convention and the China-Pakistan Economic Corridor (CPEC) initiatives are expected to enhance business volumes for international freight forwarding firms due to better transit trade flows (GOP, 2024b).

The sector is negatively impacted by substantial infrastructure constraints. Inefficiencies at ports and the lack of covered storage facilities expose commodities to theft and environmental degradation. The challenges are intensified by limited working hours and the participation of numerous government agencies in document processing. - The implementation of road load regulations and the problem of overloading is damaging infrastructure and generating maintenance costs. There is an urgent need to establish more Container Freight Stations (CFS) as the existing facilities are operating at full capacity. Moreover, substantial infrastructural improvements are essential for the warehouse, transportation, and cold chain sectors.

The demand for working capital in the industry is escalating alongside rising business volumes. Upon the complete enactment of the World Trade Organization (WTO) convention, international purchasers will necessitate the delivery of ordered goods on duty-paid conditions (Giroud, 2023). This will significantly augment the capital obligations of goods forwarders. The conservative lending policies of commercial banks restrict the operational capital of the nation's international goods forwarding sector. Banks are reluctant to provide financing to the services industry in Pakistan, preferring to issue credit only on fully secured terms and at elevated interest rates. While the choice to extend credit is solely a corporate prerogative, an enhanced understanding of the industry and subsequently the implementation of a credit rating mechanism would facilitate enterprises' access to bank financing in accordance with the prudential standards set by the central bank.

A primary factor is the misconception of the function of Freight Forwarding within the local industry, conflating it with the Shipping Industry. Freight constitutes but one facet of the Freight Forwarders' responsibilities. In any industrialized nation, the Freight Forwarding Industry governs the entire movement of materials from ex-works to the end destination, providing several possibilities.

The transformation of Pakistan's transport and logistics sector, as depicted in Figure 2, highlights three key areas – expanded sector definition, cost considerations, and strategic objectives. The sector is evolving beyond traditional physical infrastructure (rails, roads,

and sea trade) to include packaging, delivery, storage, and trade logistics, reflecting the need for an integrated supply chain approach (Shami et al., 2023). Cost considerations, such as high freight charges, insurance expenses, and longer delivery times, necessitate careful financial planning and cost optimization. The strategic objectives emphasize comprehensive sector reforms by aggregating transport and logistics costs, improving service standards, and aligning development initiatives with national economic competitiveness and long-term planning. This transformation is essential for enhancing Pakistan's trade efficiency and reducing post-harvest losses in agricultural supply chains.

International Competitiveness

Logistics expenses significantly influence a nation's competitiveness in the global marketplace. Research indicates that these prices fluctuate between 10% and 30% among countries, contingent upon the efficacy of their transportation and international freight forwarding services (Shepherd, 2011). In numerous nations, an inadequate logistics infrastructure incurs far higher economic costs than tariff barriers that limit market access (Munim and Schramm, 2018). Logistics is an elevated priority for many member countries of the International Transport Forum (ITF). Because facilitating trade and transport is at the core of stimulating economic development, several countries have developed comprehensive national logistics strategies. Well-functioning domestic and international logistics is a precondition of national competitiveness. And fact-based metrics can provide reliable benchmarks, assess policy impacts, and compare global advances in logistics (Göçer et al., 2022).

It is also important to know where the country stands in the international scenario in the infrastructure setup of the sector. It will help to understand the existing capacity and the future room for development in the sector. For this purpose, the World Bank's Logistics Performance Index (LPI) is a unique benchmarking tool, providing the same measure for more than 160 countries (WB, 2024).

Logistics performance Index (LPI)

The worldwide score employs six essential dimensions to evaluate countries' performance and presents the resultant total LPI index. The scorecard facilitates comparisons with global standards (with the option to showcase the top performer worldwide) and with specific regions or income groups (with the option to highlight the best performer within the region or income group) across six indicators and the overall LPI index (WB, 2024) The Logistics Performance Index (LPI) is the weighted mean of a country's scores across six essential dimensions.

1. Efficiency of the clearance process (i.e., rapidity, simplicity, and consistency of procedures) by border control authorities, especially customs.
2. Quality of infrastructure associated with trade and transport (e.g., ports, railways, highways, information technology).
3. Facilitation of organizing competitively priced shipments.
4. Competence and quality of logistical services (e.g., transportation providers, customs agents).
5. Capability to monitor – track and trace the shipments.
6. Timeliness of shipments in arriving at the destination within the designated or anticipated delivery timeframe.

The scorecards illustrate the relative performance of all countries (World), regional, and income categories. It is evident from the radar graph in Figure 3 that Pakistan is only above Afghanistan in the region stating the poor condition of the sector in the country. Furthermore, Pakistan is ranked 122 out of 160 countries in the International LPI results in 2018 (WB, 2024). Therefore, it shows the importance of the sector's development in the country and making its product competitive in the world resulting in boosting the economic growth of Pakistan.

Figure 2. Transformation of the transport and logistics sector in Pakistan (finding from desk review).

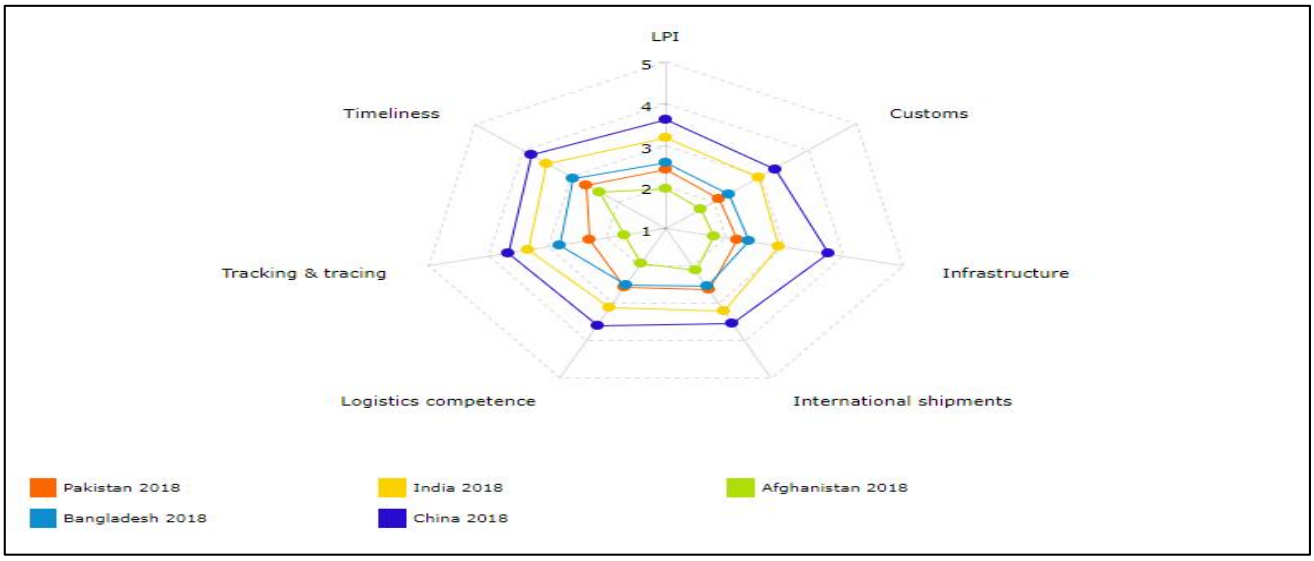

Figure 3. Logistic performance index (LPI) of Pakistan compared with regional countries; Data Source: WB (2024).

Logistics and Agriculture Supply Chain

Current issues

In Pakistan, post-harvest losses of perishable goods, including fruits, vegetables, meat, and dairy products, are estimated to be approximately 35 percent (Ahmad et al., 2021). A significant cause is the lack of suitable transport capabilities, including pack houses, cold storage facilities, reefer containers, and reefer yards for the selling of perishable goods produced both domestically and globally (ITC, 2024).

Future strategies

The establishment of a cohesive Cold Chain System (CCS) would serve as a crucial logistics service aimed at increasing the export volume of perishable commodities. The Pakistan Horticulture Development and Export Corporation (PHDEC) has been tasked with establishing CCS infrastructure via public-private partnerships to harness the significant potential of the horticulture sector in the global market. The private sector will be accountable for generating assets via specialized enterprises and the provision of services. The public sector will establish a conducive environment via supportive policies and regulations (GOP, 2024b).

Roads and bridges

The national road network, encompassing national and provincial roadways, spans 260,000 kilometers, with 68.4 percent classified as high-quality roads. Network expansion has been quite modest, averaging approximately 2,211 kilometers per year from 1996 to 2009. The emphasis was on consolidating the current network and upgrading low-grade roads to high-grade standards. To elevate the road density to 0.50 km/km^2, an estimated additional 138,000 km of road length is necessary, based on a surface area of 796,096 sq. km. This goal seems unfeasible through public sector investment alone; therefore, coordinated efforts to harness private-sector funding will be essential to meet the target (GOP, 2024a).

The National Highway Authority (NHA) oversees the development and maintenance of the national highway system, connecting population centers and economic hubs to ports and adjacent nations. The highway system spans over 12,000 km, accommodating 80 percent of the inter-provincial passenger and freight traffic in the nation (GOP, 2024a).

Trucking industry

The expanding economy needs a rapid and reliable road freight sector, which the current state of the nation's trucking industry cannot provide. The domestically manufactured trucks are of an open design, have restricted capacity, and are insufficiently powered. These trucks are unsuitable for containerized freight arriving at the ports. The containers must be emptied, and the product transferred onto open vehicles, leading to waste and delays. It is imperative to replace these obsolete types with high-capacity, globally standardized trucks. Due to fierce competition in the local market, tariffs remain minimal. To enhance their profitability, transporters partake in overloading, leading to road degradation, reduced speed, and heightened vehicle failures. The delivery of goods is ambiguous and often subject to delays. A 2005 survey revealed the existence of 35 checkpoints managed by various organizations and authorities along N-5 (National Highway) between Karachi and Lahore, resulting in disruptions and delays in vehicle traffic flow (GOP, 2024a).

Strategy, reforms, and programs - Modernizing the trucking industry

The primary objective is to reduce the external expenses linked to the existing trucking industry for the economy and enterprises by modernizing the sector and organizing it to deliver integrated road transport and logistics services that comply with international standards.

The primary reform enacted in the sub-sector is the development and approval of the Trucking Policy 2008. Reforms are presently being executed by the sponsors, particularly the Ministry of Industry. These enhancements correspond with the Trucking Policy, and their implementation will continue during the Plan period (GOP, 2024a).

Part 2: Analysis & Results of Domestic Goods

Respondent's company profile

During the field survey of goods transport companies, the respondents were either owners (17 respondents) or managers of the goods transport company (10 respondents). It was found during the survey that goods transport companies possess 5 to 500 vehicles with them. The average number of vehicles with the companies was 41. The detailed distribution of vehicle possession with the companies is shown in Figure 4. If we divide the vehicle

possession into small-sized (less than 25 vehicles), medium-sized (26 to 50 vehicles), and large-sized (more than 50 vehicles) companies the distribution can also be traced from Figure 4. It was found during the survey that goods transport companies operate with their vehicles and in most cases, the large companies expand their business by the vehicles of the investors. Anyone wants to join the company with its vehicles and do business on their platform. During our survey, it was found that only 10.5 percent of vehicles were owned by the good transport company itself and about 89.5 percent of vehicles were owned by different other operators.

Requirement for setting up goods transport company (business)

It was found during the survey that for setting up a new goods transport company business license/registration from the provincial government excise department is required which is renewed on an annual basis. According to the response of the transport companies, the cost of the license/registration varies from Rs. 10,000 to Rs. 25,000, averaging Rs. 16,815. The distribution of license/registration costs according to the responses is shown in Table 1.

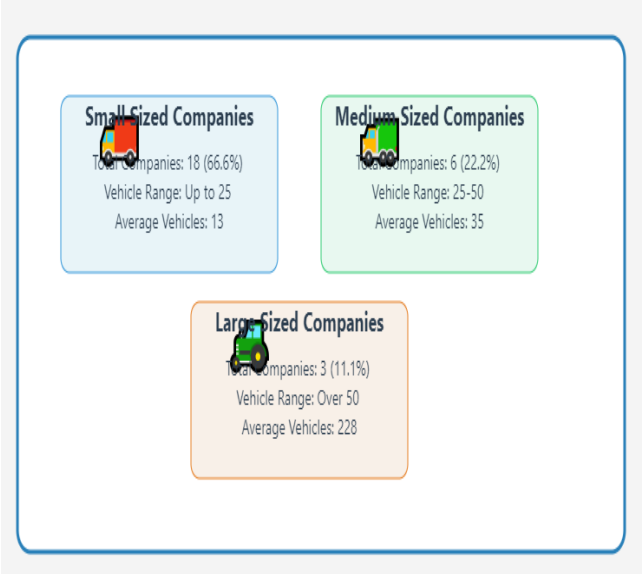

Figure 4. Distribution of goods and transport companies .

Table 1. Distribution of license/registration cost according to the responses of transport companies.

Sr. No.	Annual Cost (Rs.)	Responses by No. of transport companies
1	10,000	7 (25.9%)
2	12,000	2 (7.4%)
3	15,000	1 (3.7%)
4	20,000	16 (59.2%)
5	25,000	1 (3.7%)
Average	16,815	27 (100%)

The respondents were asked for the pre-requisites to obtain the license/registration by the department concerned, and these were as follows:

1. Computerized National Identity Card of the owner(s)
2. Visiting card
3. Letterhead of the transport company
4. Terminal location with complete address
5. Space required of at least 20 Marla (272 Square feet) with the basic facilities, i.e., rest area, washrooms, mosque, office, etc.
6. Goods transport company must have at least 5 vehicles

Respondents were also asked about the difficulties they faced in obtaining the license/registration of transport companies and it was found that 22 out of 27 respondents responded that they did not face any difficulty, and five respondents reported the following difficulties:

1. The documentation and the registration process are too lengthy
2. Rules or pre-requisites are so complex that it is impossible to be completely truthfully
3. Extra charges than the required government fee demanded by the officers to complete the registration process on a priority basis.
4. Vehicle conditions inspection is strict.
5. The paper-based documentation is cumbersome.

After getting the license/registration route permits of the vehicles are also required to be obtained by another provincial transport department. These route permits are for three years, and the fee varies with the desired route of the vehicle. It was found during the survey that the fee of these routes reported by the respondents is as follows shown in Table 2.

Table 2. Cost of obtaining route permit for vehicles.

Sr. No.	Route destination (Province)	Fees (Rs.)	Time period
1	Punjab	12,000	3 years
2	Sindh	9,500	3 years
3	Khyber Pakhtunkhwa	7,000	3 years
4	Baluchistan	4,500	3 years

Vehicle's capacity

All the respondents reported that they are bound to follow the axle load limit. But when they were asked whether they obeyed the axle load limit fixed by the department, 9 out of 27 respondents reported they obeyed the axle load limit and 18 out of 27 said they did not obey the axle load limit. Vehicles operated at the goods transport companies were also asked about their capacity and during the survey, it was found that most of the vehicles (41 percent) were medium sized having a load capacity of 3 to 10 tones followed by the small size vehicles (30 percent) having a load capacity of fewer than 3 tones and large sized vehicles (28 percent) having a load capacity of more than 10 tones as presented in Figure 5. During the survey, 1 percent refers were also found with some companies and they are mostly demanded to transport imported (long distance) perishable commodities mostly tomatoes, black currant (locally called Falsa), blueberries, etc.

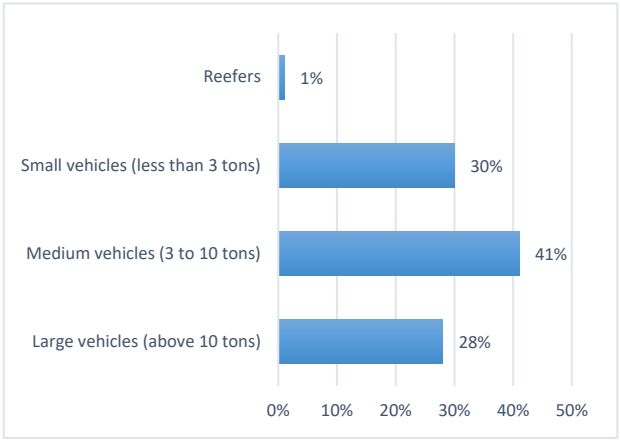

Figure 5. Distribution of vehicles with a load capacity.

Post-harvest losses during transportation

The good transport operators were also asked about the post-harvest losses that occurred during the transportation of agricultural commodities. According to the responses, the post-harvest losses that occurred during transportation are nearly zero and they claim it was due to mishandling by the laborers during loading and unloading. They are not concerned with these post-harvest losses. After probing it was also found that these are the minimal losses that occurred during transportation. It was found during the survey that transporters did not bear these losses, and the cost of these losses is borne by sellers in most cases or the buyers in some cases. There were several other reasons for post-harvest losses, and the responses to more causes of these losses are – at the time of packaging; overloading; road infrastructure, and vehicle condition respectively. The respondents of the good transport companies reported that the losses can be minimized by the following conditions during transportation:

1. Do not exceed the axle load limits
2. Better road infrastructure in rural/farm areas
3. Proper packing
4. Grading of the commodities
5. Better packaging material
6. Avoid mishandling during loading and unloading

Vehicle and transport commodity insurance

The respondents were also asked about whether the vehicle used for the transportation of agricultural commodities is insured or not and it was found that 33.3 percent of companies have an insurance plan for the vehicle and 66.7 percent of companies do not have insurance plans for their vehicles as depicted in Figure 6. It was also found during the survey that not a single respondent reported that they also have insurance for the commodities being transported. Therefore, during any road mishap (accident or theft-like condition) only the insured vehicle claims are accepted by the insurance firm, and the cost of the commodity lost during this mishap is borne by the buyer or seller.

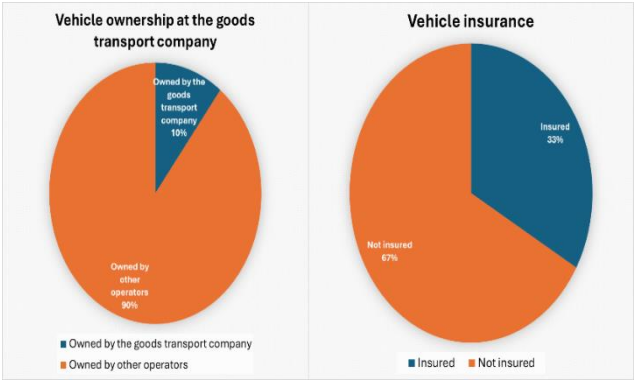

Figure 6. Vehicle ownership and vehicle insurance status.

Contractual arrangements

The distribution of contractual arrangements of the good transport companies is shown in Table 3. It is evident from the table that about 52 percent of companies have formal contracts with their customers, about 26 percent of companies have informal contracts and about 22 percent do not have any contractual arrangement with anyone. Therefore, it is clear that setting up this type of business contact with the customers of agricultural commodities plays a significant role. Similarly, when the good transport companies were asked about the contactors to transport agricultural commodities about 22 percent responded they have contacts with the farmer, about 52 percent of companies responded they have contacts with the commission agents in the fruit & vegetable markets and about 26 percent companies have contacts with both farmers and commission agents. The frequency distribution along with the percentage distribution is shown in Figure 7.

Table 3. Distribution of contractual arrangement of goods transport companies.

Sr. No.	Contact type	Frequency	Percentage
1	Formal contacts	14	51.9
2	Informal contracts	7	25.9
3	No contacts	6	22.2

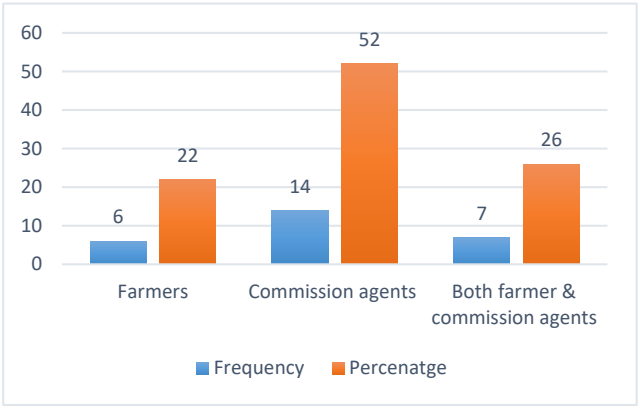

Figure 7. Contactors of goods transport companies.

Major issues faced during transportation (respondents' responses)

The goods transport companies were asked to narrate the major issue they face during the transportation of agricultural commodities and their responses were as follows:

1. Time management issue due to poor farm-to-market road infrastructure
2. Overloading by the contractors
3. High cost of diesel and vehicle management
4. No cooperation by the local traffic police
5. Theft issues in the big markets, e.g., Lahore & Rawalpindi
6. Manual loading and unloading technology
7. Traffic issues inside the fruit and vegetable markets
8. Excessive fines by the traffic police and demand for bribe
9. Custom issues for imported commodities in Peshawar and Quetta from Iran and Afghanistan
10. Late-night entry binding by the district administration in the cities
11. Poor road infrastructure in Khyber Pakhtunkhwa and Baluchistan

Need for Government support (respondents' responses)

Similarly, the goods transport companies were also asked to narrate the government support needed to improve the transportation sector for an efficient agricultural value chain approach. The respondents were very clear about it and suggested the following things that need to be addressed by the government to support the sector.

1. Improvement of the traffic control system inside and outside the fruit & vegetable markets
2. Proper parking space inside the fruit & vegetable markets
3. Improved technology for loading and unloading to minimize time delays and reduce post-harvest losses instead of manual

4. There should be government-sponsored truck terminals like bus terminals for proper stay and rest of the vehicle as well as drivers.
5. There should be some relaxation for heavy fines, especially for agricultural-loaded transport.
6. Ease for acquiring license/registration and route permits for the vehicles
7. Relocation of the fruit & vegetable markets outside of city centers
8. Improvement in the farm-to-market road infrastructure
9. Strong unions of the commission agents to avoid mishaps

CONCLUSIONS

The findings of this study underscore the pressing need for a comprehensive transformation in Pakistan's transport and logistics sector, particularly within the agricultural supply chain. The reliance on traditional trucking (99%) and minimal usage of refrigerated transport (only 1%) contributes to significant post-harvest losses of 25-30%, exacerbating food security concerns. Additionally, Pakistan's logistics performance ranking (122 out of 160 countries) and its position as the lowest in the regional Logistics Performance Index (LPI) indicate systemic inefficiencies that hinder economic growth and competitiveness. Addressing these challenges requires strategic policy reforms, investment in modern transport infrastructure, and the integration of efficient logistics solutions to enhance supply chain resilience. By improving transport quality, reducing costs, and aligning sectoral development with long-term economic goals, Pakistan can minimize agricultural losses, improve market efficiency, and support sustainable economic development.

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