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FACTORS IMPACTINGEFFECTIVE LAND TRANSPORTATION OF PULSES AND EDIBLE SEEDS: A CASE OF PAKISTAN

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Abstract

This study is conducted to examine and assesses the barriers to implementation of effective land transportation in the trading of pulses and edible seeds in Pakistan. To gain the knowledge of already identified barriers, a thorough review of existing literature was done. Also, c-level logistics business professionals and researcher of logistics field were contacted and a discussion, limited to variables and items related to the predictors and barriers to effective transportation system, was made. Based on these sources the four main predictors namely financial constraints, time constraints, training and development of the employees and land-transport infrastructure of the countrywere chosen to study as per the model given in the body of research. Although, transportation industry is very large in Pakistan, but it is still very informal so only the big transporter which are involved with the transportation of pulses and edible seeds in the metropolitan city of Karachi were considered as total population. A sample of 100 representative transporter, actively involved with the transport of pulses for trade in city areas, was chosen for survey purpose. A structured questionnaire based on valid items and questions was filled in and data analyzed using SPSS. The variables of the study having the positive reliability showed a strong and significant correlation with the dependent variable which was effective in-land transportation.All predictors showed a significant and positive impact

Key Words: *Effective Transportation, Barriers to Transportation, Infrastructure, Financial Constraints*

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BACKGROUND

Agriculture is regarded as an important economic sector for a country and an efficient steering wheel for trading. A country like Pakistan, whose economy is agro-based, agricultural resources form the basis for economic development and trade relations between sovereign states. There are a number of issues regarding agricultural production and transportation as a result of which the sector's progress remains underling.Effective transportation, as per the study of Engstrom (2016) is the control of driving efficiency and better flow of inventory by using technologies that serve the purpose of transporting goods from one place to another. In other words, effective transportation is the strategic look to its management entailing customer affinity and an ability to service distinct size orders. When it comes to land transportation of agricultural products,intercity and outside the country, the increate problems lie in their trading which include incapacity of trailers and containers to ply for longer hours efficiently, coupled with poor equipment, feeble pavement, deteriorated bridges, and congested traffic within cities. Being the largest trading hub of the country, Karachi is currently contending with a heap of socio-environmental issues one of which is ineffective trading of agricultural resources, particularly pulses and edible seeds. The carelessness and apathy of the provincial and local government in addition to lack of skills among labour workforce invokes the need for repair and proper maintenance of roads in the city so as so ensure effectiveness of trading with better land transportation (Shafique, 2017). Though other issues such as changing climate, deforestation and contaminated sewerage system also act as barriers in the way of agricultural exportation, in effective land transportation and deteriorated conditions of vehicles add more to the constraints of trading of pulses and edible seeds (Taneja, 2013).

Trade and Transportation of Pulses and Edible Seeds

Concerns for transportation have increased substantially over last few decades. Rapid economic progress and activities pose challenges for transportation systems to be updated for satisfying this increasing demand (Shen et. al, 2018). As defined by Mrníková et al. (2019) in their study that in-land transportation comprises vehicles on road as cars, buses, coaches and, also the railways. In context of supply chain management, it is inferred that in-land transport is one such mode which is used to supply materials from one place to another via roads and railways. In Pakistan and all over the world such transportation is generally carried out by trucks and heavy vehicles. With 9,574 kilometres of highway roads supporting 80% of total traffic in country, heavy road-carriers in Pakistan account for 96% of the total freight transport (Ministry of Finance, 2008). This leaves a meagre 4% of inland transport to a poorly structured Pakistan's railway line. Over the years, continued debts, exploitation, and ill management has driven Pakistan Railways in deep economic crises (Asim, Qanita & Nafees, 2014).

Pakistan is one of prime importers for pulses from the United States (Jabri, 2019). Large population with increasing trends presents a viable market for traders with ample buyers in bulk and smaller units for pulses and edible seeds. Domestic production of Pakistan accounts for 1.5 million hectares of land for pulses and edible seeds with Chickpeas dominating with

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76% production, farmers receive poor reparations for their production output and are shifting to other, more profitable crops (Junejo, 2016). This presents rationale for Pakistan satiating its demand from foreign imports. Amid such circumstances, a regulatory body for import of pulses, the Pakistan Pulses Importers Association (PPIA) was established in 2017 as a non-for-profit entity (Pakistan Pulses Importers Association, 2017). Headquartered in Karachi, the port city of Pakistan and economic capital hub, PPIA provides a platform for resolving and highlighting concerns for importers of pulses and edible seedsand their transportation for trading purposes.

In-Land Transportation Issues in Pakistan

At a stage when numerous emerging countries are quickly expanding their trade by the exports, Pakistan is continuously striving to fasten the trading of manufacturing goods with the help of export. It is commonly believed that in the international markets the exports of the country are not competitive and therefore Pakistan is incapable to increase its market share. The issues related to inland transportation are the poor infrastructure of road and rail, unnecessary documentation, deprived transportation service, the involvement of different agencies, slow processing of customs. Apart from the general importers, whose usage of railways estimated approximately 57.5% mainly the mode of transportation estimated were the roads. Companies related to the exports of chemicals are using only roads however the exports of auto industry use the air transport estimated at 52.5% which is the highest rate of all (Amjad et al., 2019).

Pakistan with the deficiency of basic structure, capability, and expertise in logistics and transportation is way behind the other countries to guarantee timely, appropriate, and cost-efficient exports of goods. One of the high-ranking officers of Pakistan Navy, who was also the top man of National Centre for Maritime Policy Research (NCMPR), in the debate on Education & Training of Logistics Professional (ETLP) in Pakistan pointed the important problems in the growth of inland transportation, that is lack of proper training. There is a high deficiency in understanding, information, and knowledge of modern disciplines of productions in logistics, distributions, processing of orders and procurement (Business Recorder, 2013).

Role of Authorities related to Land Transportation

Pakistan is improving its public sector dealing to trade and connect with maximum countries, initiates the transport and communication industry to Foreign Direct Investment (FDI) and improvement in National Trade Corridor (NTC). Connecting Pakistan to South Asia and Central Asia by rail and road network is the major plan of authorities of Pakistan. To enable connectivity, NTC started the program having worth of billion USD, which is probable to complete in upcoming few years, however, it may consume time more than the estimated and expected time due to fiscal restraints. This association has planned to provide connectivity of Pakistan with neighbouring states, and better incorporate the small and medium enterprises (SMEs), rural, suburban, and urban economies, urban wholesale, warehouse industries and retail with port cities. From this 9 billion USD allotted for NTC, 5 billion USD is to be spent on developing highways and 1.5 billion USD on updating the railway sector by spreading its

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lines to the boundaries of Iran and Afghanistan. The rest is to be capitalised in the expansion of airports, ports, and offering other amenities to enhance bilateral business. Trade regions are planned besides motorways to reduce the cost of doing trade and make products of Pakistan globally recognised and more valuable (Samad, & Ahmed, 2014).

The higher authorities of Pakistan have granted the high primacies to Transport and Logistics (T&L) industry. This industry is needed to develop by updating the continuous procedures of improvements assisted by focussed investments. The principal aim is to bring down the expenses of the operation of business by enhancing numerous sub-sectors of T&L. After some time of operations, authorities decided to invest more capital in this sector for the enhancement, but together the enhancement of regional prosperity and connectivity with the adjacent countries. Furthermore, struggle of reforms and public investment to be originating to promote Public-Private Partnership (PPP) and leverage greater investment for the development in the shortest period (Deng & Li, 2017).

In February 2017, Work on National Transport Policy(NTP) was started by the Ministry of Planning and Development and Reforms (MPDR) in association with the Asian Development Bank (ADB) and the Department for International Development (DFID). National Transport Policy (NTP) is a draft prepared by the Ministry of Communication in connection with all stakeholders. The NTP covers every transportation mode; this policy is reviewed by the ambit of NTCIP which is known as National Transport Corridor Improvement Program. The major aim of the NTP policy to deliver efficient, safe, sustainable, accessible, effective, affordable, and Public-Private integrated transport system that will match the requirements of passenger and freight mobility, enhanced service in fewer amounts that benefits the aim of government. The government aim is to enhance public welfare through the improved economy, the decline in poverty, infrastructure development and social improvement (Yousafzai, 2018).

Overview, Problems and Barriers inLand Transportation in Karachi

The transport industry is one of the key factors of any economy. However, it focuses on the transfer of goods from one end to another place. Whereas logistic also plays an important role in effective transportation, the flow, and movement of transportation handled by the logistics. Apart from transportation, logistics, as a whole, is also involved in the inventory, storage, and packaging of those particular goods, hence transport is the part of the entire logistics section of Pakistan. Transport and logistics industry consist of numerous segments containing air, road, a rail that is also known as the modes of transport (Transport, Report. 2019).

According to Ahmed (2016), it has been described that the Military and Civilian Leadership (M&CL) of Pakistan taking the same side during the testing of western route of China-Pakistan Economic Corridor (CPEC) and operationalization event of Gwadar Port. This was an inspiring array in the expansion linked to the port airports, railways, and road transportation. By listening to unorthodox voices, provincial administration and political forces have greeted the CPEC and decided to work collectively with CPEC to attain major benefits. An instant conclusion of development based on the corridor is a quick increase in land values among the rural and suburban areas.

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The conveyance of raw prepared goods and materials also performs a significant character. The recent miserable enactment of transport sector expenses the economy about 4-6 percent of GDP yearly. Enhanced external logistics would create saving expenses of nonfactor services projected at 525 million USD yearly (Yulin & Qazi 2018).An efficient and effective transportation system with contemporary infrastructure is measured as a crucial factor for economic growth. Roads are essential parts of the infrastructure in any emerging country. The speedy growth and economic safety are reliant on roads. The roads of Pakistan contain 92 % of traveller traffic and over 96% of inland freight which is certainly the strength of the economy. Mainly the transfers of goods in domestic regions or within the country are through the roads, by using huge trucks and then railway is used for transportation (Tong, & Nachtmann 2012). Karachi port is the busiest and biggest port of south Asia and busiest underwater seaports managing and carrying approximately 60% of dealings related to the cargo globally. In the year 1980, the International Freight Forwarding (IFF) trade developed in Pakistan and since seaborne business remains to expand the shipping sector that strengthens and increases particularly with the assistance of International Shipping Companies (ISC) that were being keenly involved in Pakistan. Transportation through shipping is the huge business calculated in multi-billion dollars sector that supports the global economy (Arifeen, 2018).

Interchange of goods, as well as other trade materials, are the individual right of freedom. Moreover, mobility and transport are constitutional factors of the cities which require to be well organised in a sustainable way. The growth of traffic continues due to enhance in mobility requirements caused by social and economic activities, individual behaviour patterns and residential and spatial structures. Recognising and solving transportation issues is one of the major tasks facing governments of growing countries like Pakistan. In spite of huge expenses on the urban transport system, the present transportation issues in developing nations are increasing and remain worsens. The continuing growth of Karachi city makes the regular or everyday movement of goods and people an ever-growing complex issue (Masood, 2011).

In light of study conducted by Raza (2016), it has been discussed that apart from environmental and health issues in Karachi, the city also loses combine rupees 663 million daily due to gridlocks and congestion in traffic that results in traffic jam. Problems of Karachi associated with demographic variations and the economic and social life of residents. Generally, a problem of traffic in Karachi creates hindrances to almost every business because the flow of traffic from city to ports and airports crosses the roads of the city.Institutional preparations for government transport initiatives for Karachi have been associated with the structure of governance at the period when the program was implemented and proposed. However, the structure of governance timely varies; transport programs have face problems the reason for this is the deficiency of continuity. Government officials, public and transporters all accept that Karachi needs better road network and equipment. Since the operation and purchase of these particular equipment are expensive and this cannot be reasonable to the public deprived of the provision of subsidy (Hassan & Raza, 2015).

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Karachi is presently amid a desperate situation with transportation system (The Nation, 2019). As described above, wholesome of pulses and edible seeds are imported in country therefore, present system of heavy traffic or container-carriers on roads present a case for studying barriers of in-land transportation in Karachi for pulses and edible seeds.Like many commodities, road transportation for pulses and edible seeds get affected by this structure and face issues as increased costs and untimely deliveries.Furthermore, workforce which operates such transport in Karachi is one that, propels traditional methods and mind-set in managing a fleet of heavy trucks and vehicles for transportation of pulses and edible seeds. This is a consequence of poor public training. Issues which lie in managing such populace of transporters is that, they are strong in numbers and do enjoy a certain position with regards to their impact on economy for the country. Such transporters have influence strong enough to call for strikes (Pakistan Today, 2019), which results in loss of millions.

Furthermore, role of authorities has not been decisive in any aspect for improving this present desperate situation. Situation for transportation of commodities as like pulses and edible seeds would not have been so perplexed if railways in Karachi (or in Pakistan) would have been developed. Poor management of railways have increased volume and significance of such transporters immensely, which impeded implementation of an efficient transportation system.Research by De Toledo et al. (2017) highlighted significance of time in supply of materials and reiterated that by reducing system's variances and by curtailing number of processes involved, shorter lead times and lower inventory levels are established.With vehicular congestions on ports becoming a part of daily business routine around the world, lower capacity and space for handling traffic at seaports has prompted establishments of 'in-land transport terminals. Such terminals operate as an extension of seaport (Fazi & Roodbergen, 2018). In Karachi, such road-terminals have no formal structure or maintenance which results in products as pulses and edible seeds facing greater lead times for reaching market, especially those areas which are distant from port in Karachi. Among many other reasons, distances from source and lead times play a considerable role in determining costs and prices for consumer products. Prices of pulses have increased by an estimate of PKR 15 per kilogram (Khan, 2019) this year. It can be inferred that along with production and hoarding issues, costs due to poor transportation systems are being impactful for trading in pulses and edible seeds.

Comparison of Barriers with Other Regions

In their report of 2017, Association of Southeast Asian Nations (ASEAN) Centre for Energy declared that this region will experience a growth of 60% from 2013 to 2040 and transport sector accounted for 29% of region's total energy demand in 2015 (ASEAN Centre for Energy, 2017). This illustrates growth potential of Asian regions including Pakistan. Karachi being economic hub of Pakistan, accounts for substantially more volume of in-land transportation then compared with an accumulative volume by activities from all cities.

In Sweden, due to environmental concerns and congestions, use of electric vehicles by their 'triple-helix' project is being considered for city logistics, it was highlighted that such

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vehicles are not ideal in addressing all demands for logistics presently but in future their utility and demand will escalade (Engström, 2016).

For India, Somani and Rajhans (2019) highlighted workforce's aspect in their study on in-land transportation. Described in the research work, an operator of a heavy vehicle was considered central for the Indian economy who spends several days away from home, a 'relay' model was examined, which enabled changing of drivers at specific terminals with load-carrying vehicles not stopping its continuous movement.

In Germany, truck traffic accounts for 73% of transport traffic for freight (commodities as pulses and edible seeds) logistics, recommendations were made upon shifting from road to railways for movement of goods which would require investments and it was declared that railways are a preferred mode of in-land transportation in Germany (Plötz, 2018).

An efficient system for transportation for pulse and edible seeds is the one where, along with numerous factors of infrastructure, lead times, inventory levels and proximity from seaport storage to marketplace, all factors contribute in reducing overall costs of pulses and edible seeds. Literature suggests that authorities around the world are altering transportation structures due to environmental reasons and, concerns for efficiency. Karachi on other hand is not progressing in the same direction. No concern, whatsoever, has been placed by authorities for workforce training and better operations of heavy vehicles. Unlike an application of 'relay model' (Somani & Rajhans, 2019), terminals are not maintained. Moreover, the extent of dependency on such private transporters' association by authorities is alarming. As mentioned above a huge area which seems to be lacking for in-land transportation of commodities as edible seeds and pulses is that of railway infrastructure. Transport via heavy trucks does not only increase lead times but also is a cause for environmental degradation. An increase in freight transit by in-land heavy vehicles causes issues in transportation system such as traffic congestion and maintenance costs (Shin, Roh & Hur, 2019).Such deficiencies in Karachi's transport system along with unwillingness of authorities dictate barriers in implementation of an efficient transportation system by roads and trains for commodities as pulses and edible seeds.

This research is significant in a manner that infrastructure and transportation system in Pakistan is below par than what is required for effective trading of agricultural goods and specially for the transportation and trading of pulses and edible seeds.. Taking into account the extent to which pulses and edible seeds are produced, they form a large conglomerate for import purposes within and outside of Pakistan (Herrendorf and Teixeira, 2011). The importance of this research also lies in the fact that the condition of roads and transportation facilities in the country, especially in Karachi which is regarded as the largest business hub, are progressively worsening and consequently, the time and cost incurred for shipment and land exportation suffer numerous constraints. Though greater significance has been paid to improve road construction of Karachi by public-private investment, much focus is required to be paid on transportation facilities and incentives to the labor workforce with a view to making trading of pulses and edible seeds effectives (Binswanger and Lutz, 2000). The barriers like financial constraints, pursuit of personal interest by important stakeholders, and

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improper training of workers signify the need for seeking pragmatic measures for the effectiveness of land transportation to ensure timely and efficient trading of pulses and edible seeds (Pankaj and Ramyar, 2019).

RESEARCH OBJECTIVE AND HYPOTHESES

Taking into consideration the above explanation of the issue the objective of this research is to determine the effect of poor infrastructure, lack of skills, delivery of transport time and financial constraints on land transportation of Pulses. For this purpose, the following hypotheses are formulated:

H_1: Infrastructure has a significant impact on the effective land transportation of pulses.

H_2: Lack of skills has a significant impact on the effective land transportation of pulses.

H_3: Financial Constraints have a significant impact on the effective land transportation of pulses.

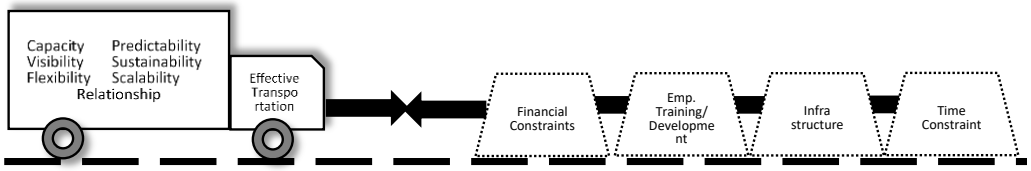
H_4: Time constraints have a significant impact on the effective land transportation of pulses.

The primary reason of taking these four areas vis-à-vis transportation is that the impact of transportation, whether directly or indirectly, affects the national economy in terms of delaying the process of supply coupled with lack of labour skills which further exacerbate industrial operations of the country. When the government fails to address the increasing transportation issues and remains indifferent to resolve it, it ends up with bearing of more cost from the government's side as a result of which it compels to earmark less possible budget which cannot resolve the issues highlighted in the above hypothesis

METHOD AND RESULTS

This study entails a quantitative research design, with the help of a survey of both primary as well as secondary sources of data. The design is supported by literature in which various independent variables were emanated to associate them with a dependent variable or to study them as barriers. Independent variables involve deteriorated infrastructure, coupled with ineffective labor training, financial constraints, and time constraints and effective land transportation of pulses and edible seeds in Pakistan is taken as dependent variable.

Conceptual Model



Dependent Variable: Effective Land Transportation

Independent variables: Infrastructure, Labor Training, Financial Constraints, and Time Constraints

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For this study, a close-ended questionnaire was usedwith five-point Likert Scale with distinct responses from a sample of 100 respondents involved with hard-core activity of transportation of pulses and edible seeds in the metropolitan city of Karachi. The items of the survey were extracted from the discussion and agreement of active logistics researchers in the country and owners of logistics and freight forwarding business owners and these items were mostly supported by the literature reviewed and discussed above. This process helps ensuring validity of items. Table 1 below shows the reliability of data gathered and processed. The value of Cronbach's Alpha is higher than 0.9 for dependent variable and all predictors in the model and the values are very much in acceptable range.

Table 1: Reliability Analysis

Reliability

Constructs	Number	Cronbach's
Transportation	7	0.901
Financial Constraints	4	0.980
Employee Training and	3	0.967
Infrastructure and its Items	3	0.995
Time Constraint	3	0.979

The correlation analysis of all the independent variables and dependent variable has been conducted in this study. On the basis of correlation figures shown in Table 2, the correlation between dependent variable i.e. transportation and all the independent variables that include financial constraints, employee training and development infrastructure and time constraints have been provided. It can be identified that there is a high and statistically very significant correlation between all variables used in the model.

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Table 2: Correlation Values

Correlation

		Transportation	Financial constraints	Employee training and development	Infrastructure	Time constraints
Transportation	Pearson Sig (2- N	1	.913** .000	,957** .000	.940** .000	.921** .000
Financial constraints	Pearson Sig (2- N	. 913** .000	1	.934** .000	.904** .000	.891** .000
Employee training and development	Pearson Sig (2- N	.957** .000	.934** .000	1	.951** .000	.923** .000
Infrastructure	Pearson Sig (2- N	.940** .000	.904** .000	.951** .000	1	.992** .000
Time constraint	Pearson Sig (2- N	.921** .000	.891** .000	.923** .000	.992** .000	1

The value of R square is shown in Table 3 is 0.927 which shows that all the predictors used as independent variables which include time constraint, financial constraints, infrastructure and employee training and development predict the 92% changes on the dependent variable which is transportation.

Table 3: Model Summary

Model Summary

Model	R	R Square	Adjusted R Squared	Std Error of the Estimate
1	.963[a]	.927	.924	.25718

In addition to this, the model inclusive of all the independent variables and dependent variable is also significant. In this regard, the statistical significance (p-value)shown is below 0.05 which shows that the model of regression is significant for the purpose of assessment of impact of predictors on the dependent variable.

Table 4: Regression

ANOVA[a]

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Model		Sum of Squares	df	Mean Square	F	Sig
1	Regression	79.717	4	19.929	301.318	.000[b]
	Residual	6.283	95	.066		
	Total					

Table 5: Coefficients

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	3.406	.378		9.010	.000
	Time Constraints	-1.054	.111	-.407	-9.475	.000
	Infrastructure	.308	.056	.238	5.450	.000
	Employee training and development	.461	.166	.120	2.776	.006
	Financial constraints	.361	.190	.212	2.388	.008

a. Dependent Variable: Transportation

However, the coefficientstable shows the individual impact of all the independent variables on transportation which is the dependent variable. In addition to this, pertaining to the individual effect of independent variables, it can be identified on the basis of figures appearing in Table 5, that all values are significant as the P value of all predictors is less than .05. However, the predictor named Time Constraint has a negative Beta value.

CONCLUSION AND RECOMMENDATIONS

This study was conducted to examine and assesses the barriers to implementation of effective land transportation in the trading of pulses and edible seeds in Karachi Pakistan. As far as, objectives of the study are concerned, the statistical analysis and research through previous literature prove that lacking the presence of four indicators is a real barrier to the implementation of an effective transportation system for the trade of agricultural grains within city areas. Nonexistence of efficient land transport infrastructure, unavailability of due financial support, and longer travel time along with ineffective skills and training of people involved in the transportation adversely affect the trade of pulses within city areas.

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Impact of financial constraintson land transportation of pulses, is the greater barrier for in-land transportation. The employee training affects the effective land transportation hence the relationship between the in-land transportation and training effects of employees is strong and higher having the value of 0.957. The exchange of goods, along with the other materials, is the individual right of any organisation. For sustainable development, mobility and transport are the legitimate elements of the cities which require well-organised development of transportation (Masood, 2011). Furthermore, the other objective of the study was to analyse the impact of infrastructure on effective in-land transportation. The instant growth in the development and actions pose some issues and challenges for the transportation system. This will be updated for sustaining this an enhancing demand (Benz, 2016). One of the major objectives of the study is focused throughout the study which is to determine the impact of infrastructure on effective in-land transportation. The impact of infrastructure on effective inland transportation is also very significant. The following is recommended for the implementation of effective land transportation in the trading of pulses and edible seeds in Pakistan.

- For the training and development of the employees, the companies should arrange the pieces of training and workshops for the employees for effective land transportation. Provide training about the comprehension of Google maps to take a better way for the delivery of goods and services.
- The government of Pakistan needs to change the policies and procedures for transportation and provide the path to stockholders for the investment in the transportation system and to remove the barrier related to the financial constraints.
- The government of the country should invest in the research and development (R&D) for the implementation of the modern infrastructure of in-land transportation which eradicates the barrier related to the infrastructure of the country.
- The transportation companies which provide the delivery of pulses and edible seeds in Karachi Pakistan implement the technologies which help them to save time in the delivery of the pulses. By following these suggestions companies can confront the time constraints related barrier which impacts the in-land transportation.

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