

# Analyzing the Role of Road Infrastructure for the Development of Fresh Fruit Industry in Gilgit-Baltistan, Pakistan

Yousuf Ali<sup>1</sup>, Dr. Arif Alam<sup>2</sup>, Sadaf Riaz<sup>3</sup>, Zulfiqar Ali<sup>4</sup>, Iftikhar Ali<sup>5</sup>

<sup>1</sup> Graduate Student, Department of Development Studies COMSATS University, Islamabad Pakistan (Abbottabad Campus)

<sup>2</sup> Assistant Professor, Department of Development Studies, COMSATS University, Islamabad Pakistan (Abbottabad Campus)

<sup>3</sup> MS Scholar, Department of Development Studies COMSATS University, Islamabad Pakistan (Abbottabad Campus)

<sup>4</sup> MS Scholar, College of Economics and Management, Zhejiang Ocean University, Zhoushan, Zhejiang, China

<sup>5</sup> Development Policy Scholar, KDI School of Public Policy and Management, South Korea

**Abstract:** - Gilgit-Baltistan (GB) is one of the major contributors to the fresh fruit industry in Pakistan however, the production of fresh fruits is low as compare to other parts of the country. This low production is attributed to several factors like remoteness, poor infrastructure (road), inadequate local markets and traditional practices by farmers, etc. This study was aimed to develop linkages between road infrastructure and fresh fruit industry of GB. The study employed a mixed-method based on primary and secondary data. Primary data was collected from the field through face to face interviews using a well-structured questionnaire and secondary data was collected from different sources i.e. books, articles and reports. The data was collected from 100 respondents comprised of farmers, shopkeepers and retailers. Finally, the collected data was analyzed on excel sheet and presented in the form of graphs and tables. The results have shown significant linkages between road infrastructure and the fresh fruit industry in GB. Furthermore, the findings revealed that the major hurdles for fresh fruits production in GB are lack of transportation, low price, climate change, lack of market information, lack of government services, lack of cultivatable land, a traditional method of production, pest and disease, lack of industries and lack of technical expertise. The opinion of respondents shows that improvement and development of road infrastructure will open new opportunities for local people to boost their fresh fruits production and uplift their livelihoods.

**Keywords:** Gilgit-Baltistan, Fresh fruit, Agriculture, Infrastructure

## I. INTRODUCTION

Fresh fruits have a major contribution to the agriculture sector of Pakistan. Across the year different regions of Pakistan produce different varieties of fresh fruits in different seasons. According to Sharif et.al (2005) Pakistan is blessed with an ideal agro-ecological environmental setting that is conducive to the production of nearly thirty types of fruits like citrus, mango, apple, cheery and dates are most common. The market value of these fruits produced during recent year is estimated at 73 billion Pakistani rupees, which is roughly 6.73 percent of agriculture value-added in the year. According to Pakistan's horticulture development & export board (2007), Pakistan is an agricultural country and the agricultural sector is still considered the main contributor in Pakistan's economy

with almost 21.6% share of GDP. This sector is also playing an important role in employment generation particularly in rural communities. Horticultural is also considered a sub sector of the agricultural sector in Pakistan which is contributing about 12% to the national agricultural GDP.

Northern mountainous Gilgit-Baltistan province of Pakistan has great potential for the production of fresh fruits. As Khan (2016) stated that Allah Almighty has blessed this region with the potential to produce delicious high-quality fresh fruits and vegetable which is considered as the primary source of income generation in whole GB. Khan's findings further revealed that the total fruit production in Gilgit-Baltistan is 149769 Metric tons (Apricot 108588, Apple 19054, Grapes 6413, Pear 2579, Peach 3308, Pomegranate 4287, Cherry 2256, Mulberry 9092, Walnut 5992, Almond 1700 and Sea buckthorn 3600). He argued that unfortunately pre and post-harvest losses of fruits are 50-70 % every year due to lack of processing, preservation, testing, transportation, communication and research. A large amount of fruit, vegetables go wasted and does not reach the market because fruits are highly perishable.

Fresh fruits are widely grown throughout the Gilgit-Baltistan. Fresh fruits production is constrained by different factors including the lack of cultivable land, poor rural road infrastructure, lacking awareness about improved agricultural management practices and a lack of quality seeds (Abbas et.al, 2011). There are no formal quality standards for fresh fruits and very little market information available in Gilgit-Baltistan. Due to the distance from final consumer markets, producers and local traders are unaware of consumer needs and traders continue supplying poor quality and low-value apricots to auction markets down the country (Mir et.al, 2013). Marketing functions are performed in a traditional method and markets for fruit products may not function efficiently. There are generally great differences between prices paid by the consumer and those received by producers (Khan, 1980 and Mohy-ud-Din, 1991).

### *Problem Statement*

The horticulture sector plays a vital role in both gross domestic product and gross national product of Pakistan's economy. The horticulture sector of Pakistan consists of fruits and vegetables. One problem for the small-scale farmers in Pakistan specifically in Gilgit is low profitability due to inefficiencies in road infrastructure. Output in terms of fresh-fruit is wasted because it does not reach the markets in time. The poor condition of roads also destroys the quality of the fresh fruits due to bumps for a long duration. This also increases the transportation costs and reduces the production margins for the small farmers of Gilgit-Baltistan. The eventuality of roads and infrastructure in general also affects regional price variations that reduce international competitiveness by not being able to offer a stable price. On the other side lack of organizing marketing system, farmers of Gilgit-Baltistan are not getting the suitable price and market information which also lower productivity and production of fruits.

### *Objectives*

- To find out the linkage between road infrastructure development and the fresh fruit industry of Gilgit-Baltistan.
- To analyze the effects of road infrastructure development on the fresh fruit industry of Gilgit-Baltistan.

## II. LITERATURE REVIEW

### *Role of Agriculture in Pakistan's Economy*

According to Sharif et.al, (2005) Pakistan is blessed with an ideal agro-ecological environmental setting that is conducive to the production of nearly thirty types of fruit like citrus, mango, apple, cheery and dates are most common. The market value of these fruits produced during recent year is estimated at Rs 73 billion, which is roughly 6.73 percent of agriculture value-added in the year. According to Pakistan horticulture development & export board (2007), traditional Pakistan is an agricultural country and the agricultural sector is still considered the main contributor in Pakistan's economy with almost 21.6% share of GDP. The sector is also playing an important role in employment generation particularly in rural communities. Horticultural is the sub-sector of the agricultural sector which also the main sector of the agricultural economy by contributing about 12% to the national agricultural GDP.

Khan (2016) stated that Allah almighty has gifted the suitable land that is most suitable for delicious fruit production with high-quality fruit and vegetable and considers the primary source of income generation in whole GB. The total fruit production in Gilgit-Baltistan is 149769 Metric tons (Apricot 108588, Apple 19054, Grapes 6413, Pear 2579, Peach 3308, Pomegranate 4287, Cherry 2256, Mulberry 9092, Walnut 5992, Almond 1700 and Sea buckthorn 3600. He also argued that unfortunately pre and post-harvest losses of fruit are 50-70 % every year due to lack of processing, preservation, testing,

transportation, communication and research a large amount of fruit, vegetables go wasted and do not reach in the market because fruits are highly perishable.

### *Importance of Market Infrastructure for Agricultural Growth*

Agricultural marketing infrastructure plays a vital role in improving the functioning of the agriculture marketing system. According to Tusneem (2009), effective logistic systems improve the functioning of the market system. If the transport services are infrequent, of poor quality or expensive then farmers will be at a disadvantageous position in selling their crops as an expensive service will lead to low farm gate prices (the net price the farmer receives from selling his product).

Seasonally blocked roads or slow and irregular transport services joined with poor storage, lead to huge losses of many agricultural products, especially the perishables) as they decline quickly resulting in lower prices to farmers. As such all-weather roads play a central role in enhancing market surplus for many of the agricultural products.

The Asian Development Bank (2007), found that poor infrastructure and lack of investment in infrastructure have constrained growth. Poor infrastructure, a major factor for increasing the cost of doing business, has a significant adverse impact on the perceived competitiveness and attractiveness of the Philippines as an investment destination. That there is a critical link between infrastructure and regional growth has been indicated in causality tests showing that the direction of causation runs from infrastructure to economic growth and that regional imbalance in infrastructure availability harms a region's economic growth prospects (Llanto, 2007a; Llanto, b2007)

### *Linking Infrastructure and Agricultural Output*

Recent literature indicates the significant role played by rural infrastructure in improving agricultural productivity in developing economies. While the availability and quality of rural infrastructure are never substituted to efficient macroeconomic and agriculture-specific policies and the effective implementation of such policies, inadequate infrastructure can be a significant constraint to growth and productivity. Research shows that productivity increase in agriculture, which is an effective driver of economic growth and poverty reduction, depends on good rural infrastructure, well-functioning domestic markets, appropriate institutions, and access to appropriate technology (Andersen and Shimokawa 2007).

Following Andersen et.al, (2007) deficiencies in transportation, energy, telecommunications, and related infrastructure translate into poorly functioning domestic markets with little spatial and temporal integration, low price transmission, and weak international competitiveness. The failure to invest in rural infrastructure would be a critical bottleneck for future growth in agricultural and economic output and poverty alleviation in developing countries.

Indeed, severe rural infrastructure deficiencies undermine the huge potential of the agriculture sector in developing countries to contribute to growth and poverty reduction. Improved rural infrastructure will reduce poverty through improved agricultural productivity and improved wages and non-farm employment. There are significant trickle-down benefits for the poor (Fan, Hazell and Thorat 2000).

### III. RESEARCH METHODOLOGY

#### Study Area

For this research study, District Nagar was selected which produces different types of fresh fruits with high quality. District Nagar consist of two tehsils, for this research Nagar-2, was selected because Nagar-2 is located along the side of Karakorum High Way and major infrastructure projects of China Pakistan corridor are going to be implementing near in future.

#### Target Population

A total of 100 respondents were selected for this research comprised of farmers, shopkeepers and retailers. Out of 100 sample size, 30 respondents (fresh fruit producers) from Minapin village and 30 from Phaker village were selected. Further, 20 Shopkeepers from the main market (City Gilgit) and 10 retailers from Minapin and Phaker villages were selected.

#### Sample Technique

Simple random sampling was used to collect data from fresh fruit producers and shopkeepers while the snowball technique was used to collect data from the retailer.

Table 1: Distribution of respondents

Type of Respondents	Male/Female	No of Respondent
Fresh fruit producers (Farmers)	60	60
Shopkeepers	25	25
Retailers	15	15
Total	100	100

### IV. RESULT AND DISCUSSION

Figure 1: Percentage distribution of the respondents

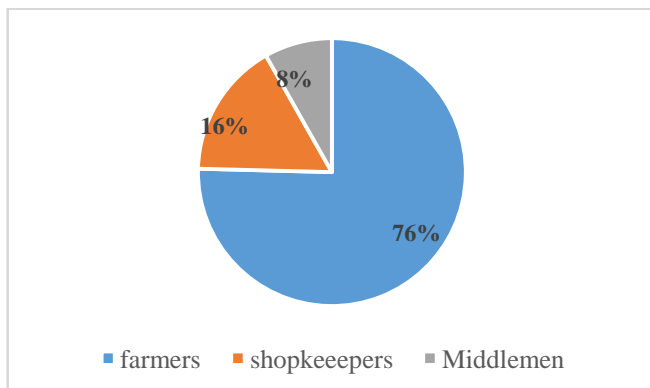


Figure 1 shows the percentage distribution of the respondents. According to figure 1 76% of respondent were fresh producers, 16% were shopkeepers and 8% were retailers.

Table 2: Responses of fresh fruit producers in percentage against fruit production and sales in the last five year

Statement	Decrease	Neutral	Increase
Fresh fruit sales for the last five years?	20%	20%	60%
Income from Fresh fruit for the last five years?	10%	20%	70%
With the development of road infrastructure development have you experienced any change in fresh fruit production in the last five years?	20%	10%	70%
With the development road of infrastructure have you experienced any change in fresh fruit sales in the last five years?	25%	20%	65%

Table 2 shows that the high percentages for the increase are 60 % against the statement with the gradual road infrastructure development have you experienced any change in fresh fruits production in the last five years. The table also depicts that a high percentage for the increase is 70 % against the statement what does the trend of income from fresh fruit for the last five years. The highest percentage for the increase is 70% against the statement with the gradual development of road infrastructure fresh fruit sales have been changed. The tables 2 further shows that the highest percentage of decrease is 20 % against the statement that with the gradual development of road infrastructure have you experienced any change in fruit production in the last years. The height percentage decrease 20 % against the statement of what was the trends of fresh fruit sales in the last five years. The high percentage of natural is 10 % against the statement what does the trends of your income from fruit for the last five years.

During focus group discussion it was asked from a group of farmers can you please explain what were reasons that compelled you to increase planting of trees. The farmers responded that *“As we experienced our fresh fruit production has been increasing incredibly since the last couple years and we are getting remarkable benefits out of it. The primary reason of increasing plantation is nowadays we have little land for cultivation and we can’t grow any other crop easily and monetary values of these crops are negligible, the only sector that sustains our livelihood is fruit trees plantation which takes lesser land and its monetary value is much high then other crops. As one of respondent said with the gradual development of road infrastructure we have experienced that our income and production both are increasing phenomenally that is why plantation of trees have been increasing.”*

Figure 2: Opinion of farmers regarding fruits marketing and production in percentages

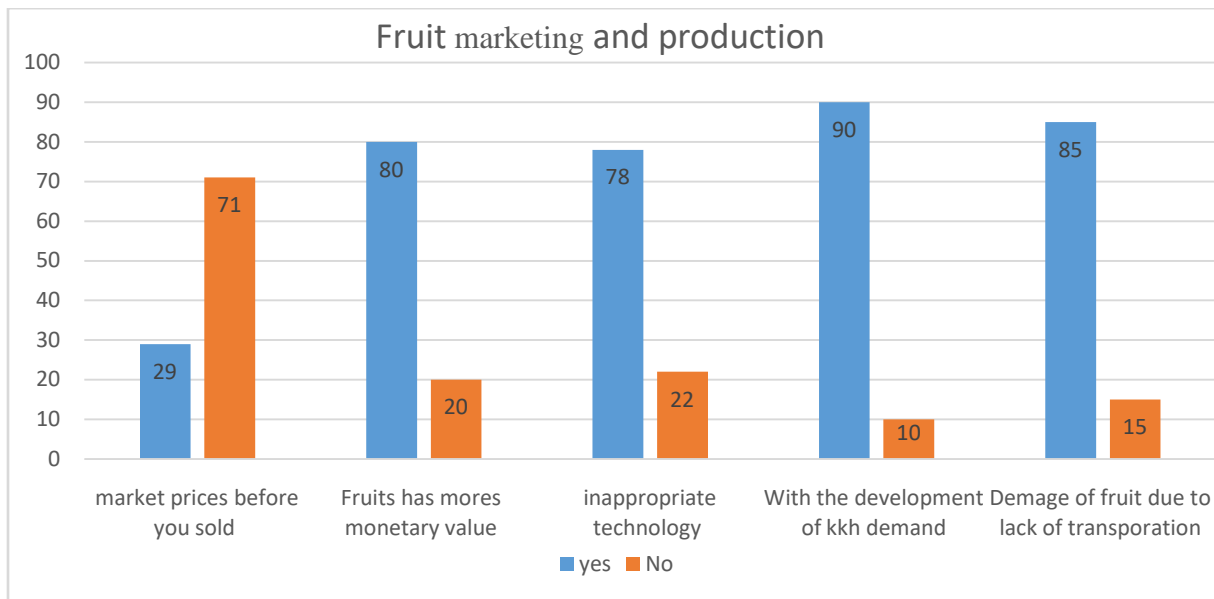


Figure 2 illustrates that 90% of local farmers claimed that fruit demand is increasing over the year. While 85% of local farmers claimed that due lack of transportation they are losing fruits. Figure 2 further shows that 80% of respondents agree that fruits have more monetary value as compare to other crops. The figure also presents that almost 71% of local farmers responded no against the question did you ask for the market price before you sold.

During focus group discussion most of the farmers claimed that they were unfamiliar with the price of their fruits and also they have no knowledge about the demand for fruits in the market.

*“The role of road infrastructure is the undeniable fact it connects GB with other parts of the country and changed modes of transportation. One respondent claimed that there was a time we had no vehicles to transport our commodities to other parts of the country in that situation we used different animals as means of transportation due to which we lose our fruits especially fresh fruits. One key respondent claimed that road infrastructure changed not merely mode of transportation it changed types of fresh fruits as well. There was a time in GB especially in district Nagar we were growing only dry fruits but now we can grow multiple types of fresh fruits”.*

Figure 3: Opinion of farmers, shopkeepers and middlemen regarding the accessibility of fruits to other parts of the country in percentages

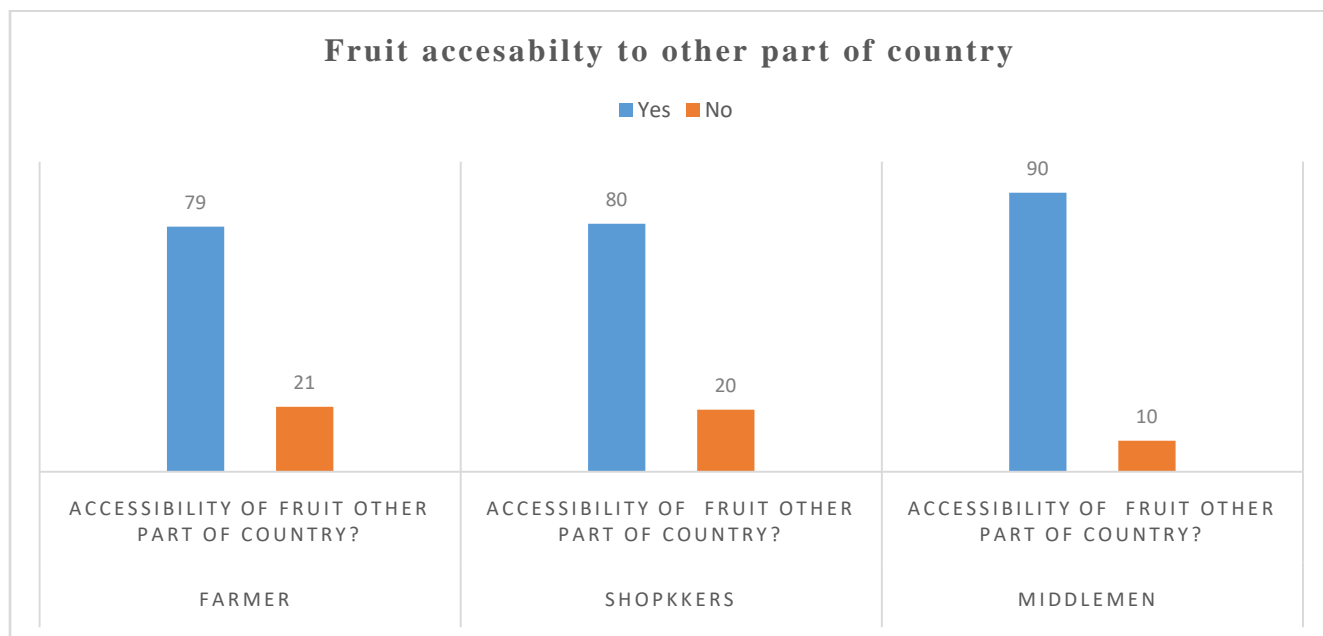


Figure 3 shows that 76% of local farmers were agreed with the question that road infrastructure improves accessibility to other parts of the country while 21% were not favored to this question. Figure 3 also shows that 80% of shopkeepers were agreed against the question that road infrastructure development will improve the accessibility of fruit to other parts of the country. Some of the Middlemen linked their income trends with KKH *“Since the last couple of years we have seen our income has been increasing constantly due to improving inaccessibility to farmer's field at right.*

*Middlemen from Minapin village claimed that KHH reduced transportation distance, transportation cost even it improves supply- chain of fruits. Now we can provide fruits to market at the right time”.*

*“Although our fresh fruits are unique as compare to fruits of other parts of the country but due to lack of modern technology and traditional methods our fruits are at high risk from the Chinese fruits that are occupying the local and national markets. So we are worried about that import of fruits from China”*

Figure 4: Opinion of farmers, shopkeepers and middlemen in percentages against the question do infrastructure improve living standard of farmers

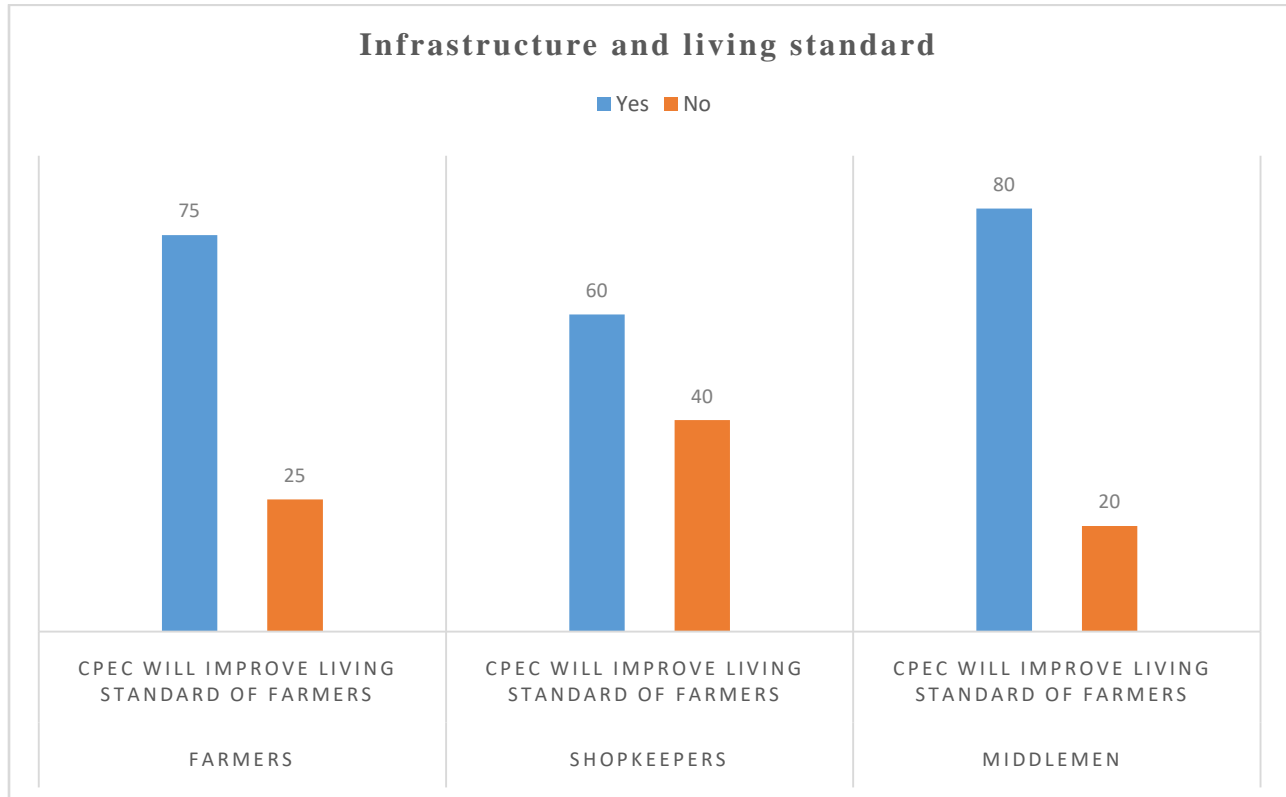


Figure 4 shows that 75% local farmers expected that the infrastructure will improve the living standard of local farmers after implementation. While answering this question some farmers were very excited said that due gradual development of road infrastructure our living standard is improving significantly and it expected that it will improve our living standard, while 25% of local farmers were not in favor of this question. Figure 4 also illustrates that 60% of shopkeepers claimed this infrastructure will improve the standard of living as we have already experienced with the gradual development of road infrastructure. Furthermore, 80% of middlemen claimed that this project will improve the living standard of farmers after implementation while 20% claimed that this project will not improve the living standard of living.

*Fruit demand and supply with the gradual development of road infrastructure development*

Table 3 presents that 60 % of shopkeepers agreed with the statement that with the development of road infrastructure sales of fresh fruits has been increased while 40 % of shopkeepers claimed that they haven't experienced any change. While 80% of shopkeepers argued that road infrastructure development improved the connectivity between consumers and shopkeepers. Furthermore, 70 % of middlemen claimed that the development of road infrastructure demand for fresh fruit has been increased while 85% of middlemen argued that the development of road improved connectivity between consumers and shopkeepers.

**Table 3: Distribution of response of retailer and shopkeepers against the demand and supply of fruit (in percentages)**

Type of respondent	Statement	Yes	No
Shopkeepers	Selling of fresh fruit in the market after the development of road infrastructure has increased?	60	40
	In the last five years did you feel the demand for fresh fruit has increased due to road infrastructure development?	70	30
	In your opinion road infrastructure improves connectivity between consumers and shopkeepers?	80	20
Middlemen	Selling of fresh fruit in the market after the development of road infrastructure has increased?	70	30
	In the last five years did you feel the demand for fresh fruit has increased due to road infrastructure development?	90	10
	In your opinion road infrastructure improves connectivity between consumers and shopkeepers?	85	15

## V. CONCLUSION

Infrastructure like roads, seaports, railroads' and communication networks play an important role in the economic growth of any region or country. After construction of Silk Road, the Karakoram high way in Gilgit-Baltistan specifically in district Nagar helped farmers to improve their production and productivity of fresh fruits. GB, particularly district Nagar is considered the gateway of China Pakistan Economic Corridor (CPEC) and it will get more benefits from CPEC. CPEC consists of many routes and channels which will be passing through a different part of GB it will also enable local farmers to export their agricultural products to other parts of the country, as they had experienced this previously with the development of KKH. The findings of this research revealed that there are strong linkages between road infrastructure development and the fresh fruit industry of GB. It will open new opportunities for local people to boost their production and uplift their livelihood sources. As 70% of farmers, 85 % of shopkeepers and 90% of middlemen responded that with the gradual development of KKH their incomes have been increased for five years. The results of this research further depict that 70 % of farmers, 75% of shopkeepers and 78% middlemen believe that road infrastructure development enhanced their production over time. Further 90% of farmers, 80%, of shopkeepers and 86% middlemen believe that road infrastructure will improve communication following to this question 87% local farmers, 80% shopkeepers and 85 % middlemen agreed that it will reduce transportation cost which further strengthens comparative advantage of our fruit industry. Furthermore, 75% of local farmers expected that road infrastructure development will improve the living standard of local farmers after implementation. While answering this question some farmers said that due to the gradual development of road infrastructure our living standard is improving significantly and it expected that it will improve our living standard further. While 25% of local farmers were not in favor of this question.

## REFERENCE

- [1] Sendall. A, Mir. M, Khabir.A, (2013). Apricot Value Chain Assessment: Final Report For The Agribusiness Project

- [2] Aftab, S. 2007. Retail Markets. Ministry Of Commerce, Islamabad. Pakistan.
- [3] Arish U. Khan January (2015) Pak-China Economic Corridor: The Hopes And Reality Institute Of Regional Studies, Islamabad
- [4] Development Authority, Manila, Philippines. World Bank. (2005). Philippines: Meeting
- [5] Dr. Ali Asghar Hashmi Shafiullah (2003) Agriculture And Food Security IUCN, Northern Areas Programme IUCN, Northern Areas Programme IUCN, Northern Areas Programmewing, Ministry Of Finance, Islamabad.
- [6] Golettie, F., A. Raisuddin, And N. Farid, 1995, "Structural Determinants Of Market Integration: The Case Of Rice Market In Bangladesh." *Developing Economics*, Vol. 33 (2) : 185-202.
- [7] Government Of Pakistan. 2008. Agricultural Statistics Of Pakistan 2007-08. Ministry Of Food, Agriculture And Livestock. Islamabad. Pakistan
- [8] Government Of Pakistan. 2009. Economic Survey Of Pakistan (2008-09). Economic Advisor's Naheed, G., D. H. Kazmi, & G. Rasul. Seasonal Variation Of Rainy Days In Pakistan) *Pakistan Journal Of Meteorology* (Vol. 9, Issue 18: Jan 2013)
- [9] Hanif, sM. And S. A. Khan. 2004. Agricultural Perspective And Policy. Ministry Of Food, Agriculture And Livestock, Islamabad. Infrastructure Challenges. The World Bank, Washington, D.C.
- [10] Khan. M., F. Abbas And K. Mushtaq. 2007. Improving Apple Cultivation And Marketing. *Business And Economic Review*. The Daily Dawn, Islamabad. 28.
- [11] Khushk, A. M. And Sheikh, A. D. 2004. Structure, Conduct And Performance Of The Marketing Systems Margins And Seasonal Price Variations Of Selected Fruits And Vegetables In Pakistan, Parc, Islamabad.
- [12] M Ziauddin <https://Tribune.Com.Pk/Story/1414256/Cpec-Boost-Agriculture/>
- [13] Mohyuddin, Q. 1989. Marketing Of Major Fruits (Citrus & Mango) In Punjab. Deptt. Of Agri. Marketing, University Of Agriculture, Faisalabad.
- [14] Muhammad Aurangzaib Khan (May 26, 2010) (Report On Enterprise Based Survey Of Horticulture Sector) United Nations Industrial Development
- [15] Muhammad Zafar Khan (2016) Agrobiodiversity In Gilgit Baltistan On Verge On The Verge Extension Research Gate Organization
- [16] Safdar Sail (The China-Pakistan Economic Corridor: An Assessment Of Potential Threats And Constraints)
- [17] Saiful Muhammad, Ali Javaid January. (2015) Mountain Fruits (MF): Assisting Mountain Fruits In Conducting A Feasibility Study Of Fruit Pulping/Processing In Gilgit Baltistan.
- [18] Saqlain Abbass & Abdul Tahir Wazir. (2011). ( Impact Of Fruit Production On The Wealth Of Farmer Of Gilgit-Baltistan ) International Islamic University Islamabad