

Impact of Rural and Urban Road on Poverty Reduction and Economic Growth

Abstract

The most important measure of economic welfare is economic growth and development. The national wealth is measured by GDP and growth in GDP is an indicator or measure of the rate of overall economic growth. The GDP is the monetary value of goods and services produced by any country in a specific time period within that country. This study is based on literature review and this study based on secondary data. The finding of this study is positive impact of urban and rural roads on economic growth and poverty reduction.

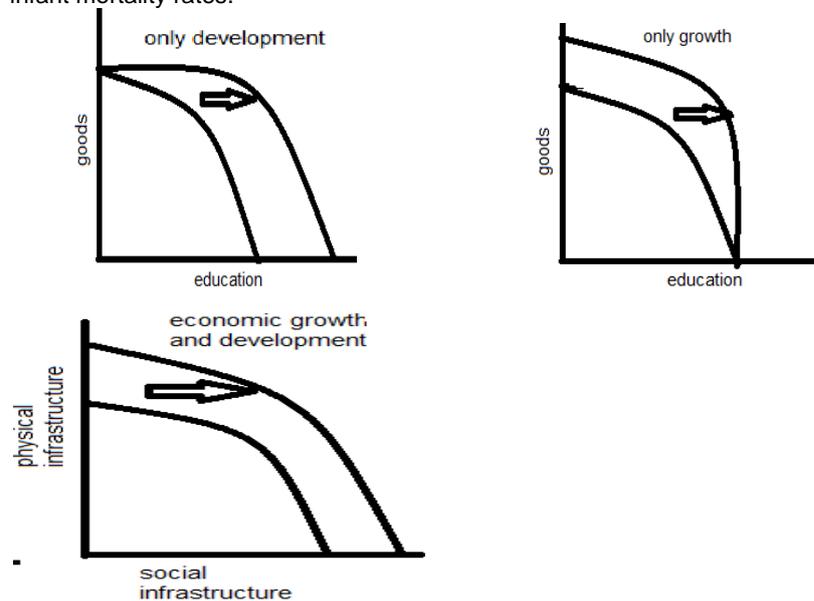
Keywords: Road Development, Economic Growth, Poverty and India.

Introduction

The most important measure of economic welfare is economic growth and development. The national wealth is measured by GDP and growth in GDP is an indicator or measure of the rate of overall economic growth. The GDP is the monetary value of goods and services produced by any country in a specific time period within that country. Economic growth means increase in GDP while the terms economic development is more comprehensive and involves increase in standard of living of population, literacy growth, life expectancy improvement, reduction in poverty and infant mortality rates.



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Economic development is not possible without economic growth. And for the economic growth basic requirement is the development of infrastructure. Infrastructure has two components including social infrastructure and physical infrastructure. The social infrastructure consists of education, health, nutrition etc. while physical infrastructure includes roads, highways, railways, energy, water for drinking, industry and irrigation, etc.

Objective of the Study

Main objective of this study is to evaluate the impact of urban and rural road on economic growth and poverty reduction in India.

Physical Infrastructure

Physical infrastructure is the basic structure of any country, which is a requirement to its operation and survival. Physical infrastructure is lumpy and involves huge sunk investment. Physical infrastructure has a positive externalities and third party consequences. If the infrastructure increases, then other economic activities also get a boost. It has interdependencies such as accessibility (transport) and land value. Physical infrastructure accessibility can be related to changes in income sources and increase non-agricultural income opportunities, especially from wage-employment sources. Investment in physical infrastructure plays an important role in addressing economic deprivation (Khumalo, 2013). This means that the nature of infrastructure development is not only beneficial for business, but also in creating a common good for a country's residents. The importance of transport infrastructure is different in rural and urban areas. In rural areas, transport mainly plays an important role in promoting agricultural production and commercialization. A reliable transport system in rural areas significantly decreases the time distance from arable land as well as reduces shipping costs of agricultural products. It has also been noted that economic interactions are in closer proximity in urban areas, as this allows more efficient use of space due to ease of access to nearby public facilities, employment opportunities and housing (Seetanah, 2012). In countries like Romania, Nigeria and Spain contribution of road infrastructure generally more than any other infrastructures (Pogorletchi, 2014). Transport infrastructure creates connectivity between the business to business and markets. It is a basic facility which increases the level of production and economic condition and it facilitates easy movement of the raw materials to companies and delivers the final goods from company to retail sellers and distributors. A proper level of infrastructure move human capital to and from their places of works to educational center, hospitals, social events and markets where human can purchase products and services. Productivity increase depends on better rural infrastructure and

Budget allocation for the Road Transport

| | Actual(2016-17) in crore | Revised(2017-2018)in crore | Budget (2018-19)in crore | BE 2018-19/RE 2017-18 |
|------------------|--------------------------|----------------------------|--------------------------|-----------------------|
| Revenue expenses | 11039 | 10136 | 11560 | 14% |
| Capital expenses | 41193 | 50864 | 59440 | 17% |
| Total | 52232 | 61000 | 71000 | 16% |

Source: Ministry of Road Transport and Highway, (2018-19)

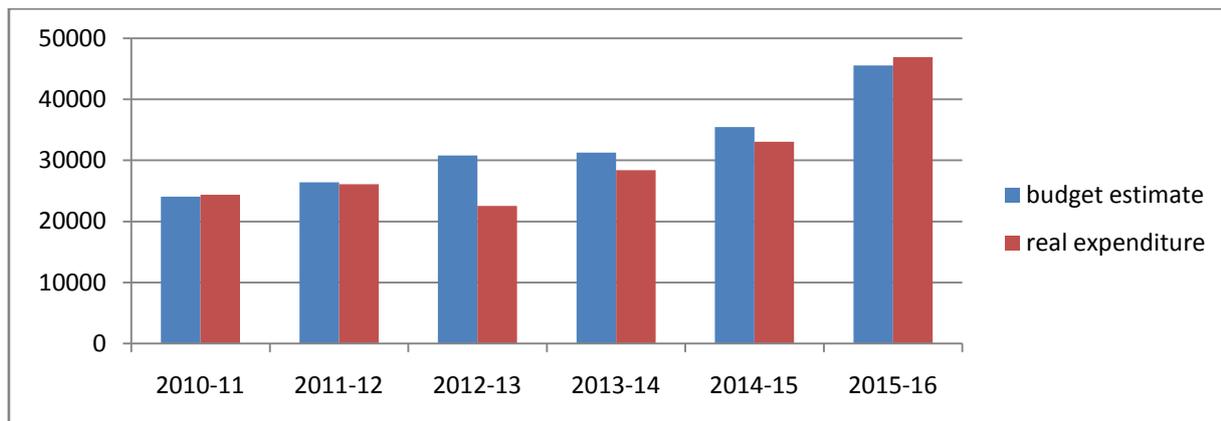
The total expenditure for 2018-19 on the road transport and highways is estimated at Rs 71,000 crore and this is 16% higher than the 2017-18 revised estimated. The ministry has increased its capital expenditures in last few years. In 2018-19 capital expenditure is expected at Rs 59,440 crore

access domestic market. Road transport plays a vital role in agricultural development. This is because it is the major connectivity between agricultural fields and urban communities as it helps in transporting agricultural produce from the farms to the various urban communities as well as markets. Modern businesses, factories, trade, agricultural and general activities depend on transport. Countries that have better infrastructure, their citizens are happier and have longer lifespan. Many companies would like to invest in countries who have good road infrastructures because of good infrastructure they would get easier markets, supplier, electricity and connectivity. Among infrastructure, roads are considered of first interest to reduce poverty due to the widely accepted consensus that transport infrastructure has a positive significant and substantial impact on poverty and economic growth as it enhances the connectivity of remote and isolated areas (Gachassin, 2010).

Road Development in India

India has been experiencing high growth rates over the last two decades. Till a decade ago, compared to other developing countries, in India road Infrastructure was severely deficient. Since the 1995s India has been investing largely in road infrastructure. The freight and passengers roads are primary mode of transport in India. More than 87% of passenger traffic movement and 65% of the freight in India is currently carried on road network (NHAI, 2015-16). There are various types of roads in India like National Highways, State Highways, Other PWD (public work department) Roads, Panchayat Raj Roads, JRY & PMGSY Roads, Urban Roads and Project Roads. The length of Panchayat Raj Roads was 33.46%, JRY (Jawahar Rozgar Yojana) & PMGSY Roads (Pradhan Mantri Gram Sadak Yojana) was 27.53%, Project Roads was 5.70%, Rural roads was 70.23%, Urban Roads was 9.10%, state highways 3.14 % and national highways 1.80% of the total road length in India on 2016 (Ministry of Road Transport and Highway, 2015-16). India is the second largest road network in the world with 5,603,293 km road network and India has done a lot of expenses on road development.

and revenue expenditure of the Ministry is expected at Rs 11,560 crore and ratio between revenue and capital expenditure is 16:84. In comparison, for the year 2015 the ratio between revenue and capital expenditure was at 41:59.



Source: NHA (National Highway Authority of India, 2015-16)

The table shows that road expenses increase every year. It is evident from the graph above that the real expenditure and budget estimate has increased since 2010-11. And it is to be noted that the real expenditure more than budget estimate in 2010-11 and 2015-16. In 2011-15 actual expenses is less than the budget estimate. The Indian government has decided to invest 7 trillion for the construction of new roads and highways for next 5 years.

However, as on March 31, 2016, around 40% villages do not have access to roads and only 62.5% of Indian roads were paved (Basic Road Statistics of India (BRSI), 2015-16). Shortage of investment in infrastructures creates transportation shortage and urban congestion (Démurger, 2001). Many countries are growing fast because they invest

in infrastructure for example: Australia, Canada, France, Germany, Italy, Japan, South Korea, Spain, the United Kingdom, and the United States. History of Argentina, Brazil, and Mexico showed that the decrease in infrastructural investment resulted in decrease in total factor productivity (TFP) since the 1970s (Teles, 2012). Thus, productivity slowdown relates to the decrease in infrastructure. When businesses are clustered with each other, it becomes quicker and easier for them to reach out to their suppliers and customers. This phenomenon has a positive impact on delivery scheduling. Easier access to materials and supplies and faster delivery to customers can help lower inventory carrying and transportation cost while increasing both profitability and productivity (Dowell, 2017).

Road Awards and Construction in India

| Year | Award (kms) | Construction (kms) |
|---------|-------------|--------------------|
| 2014-15 | 7972 | 4410 (55.3%) |
| 2015-16 | 10098 | 6061(60%) |
| 2016-17 | 15948 | 8231(51.6%) |
| 2017-18 | 25000 | 8088(33%) |

Source: Press Information Bureau, Govt. of India, (2014-18)

Road Targets and Achievement of India

| Sr. No. | Parameter | Targets (2017-2018) | Achievements(2017-2018) |
|---------|--|---------------------|-------------------------|
| 1 | Road length to be awarded (km) | 25000 | 8088 (33%) |
| 3 | Highway length tolled(km) | 4000 | 2156 (54%) |
| 4 | Collection of toll revenue by NHA (Rs. Crore) | 8000 | 8140 (102%) |

Source: Ministry of Road Transport and Highways, 2017-2018

India has largely been investing in road infrastructures for economic growth and poverty reduction but the above table shows that India is far away with its road length target (awarded). India has attained 33% of its road length target. Despite not achieving this road length target, India has collected its revenue more than target. Though there are two reasons for collecting more revenues, either the road length target was set higher or the revenues target was set very low. No doubt, construction of road is not slow as India has achieved 50% of the constructions. The roads which India has not completed had some reasons like delay in land acquisition, utility shifting, environment clearance, permission for cutting of trees etc.

Impact of Road Development on Poverty Reduction

In India 60 percent population was poor in 1950-1960. The world had 872.3 million people below the new poverty line; of which 179.6 million people lived in India in 2011. It is 21.9 percent of the total world population. Instead of using official poverty line India still more than 21.9 percent population are poor (World Bank, 2015). Poor people suffer from inadequate access to human capital facilities that are essential for their life. In India, poverty differs in urban and rural areas. Poverty is higher in rural areas than urban area due to inadequate infrastructure. Government plays an important role in poverty reduction and economic growth by developing infrastructures, delivery of public goods and generates

knowledge through education. Investing in infrastructure generate jobs and creates income opportunities. Where the infrastructure is not up to the mark, people will leave their place and shift to where the infrastructure is growing. The reason for the lack of availability of work, employment, lack of proper education, facilities of various types, healthcare, transportation, higher earnings, good life styles and infrastructures people migrating from one place to another. If road infrastructure is growing everywhere, the people will prefer to stay and earn rather than migrating. The impact of roads on poverty defines three main channels, the human capital, the market access and the labor activities channel. Over 50% of the population depends on agriculture in India. Agricultural development is essential for economic growth, rural development, and poverty alleviation in developing countries. Productivity increase in agriculture is the main factor of economic growth and poverty alleviation. Road development reduces poverty not only in rural area but also in urban area and it is a significant and has a positive impact on national poverty reduction. Attaining extension in roads can increase up to 7.1 % point consumption growth and poverty reduction by 9.8 % point .Access to all weather roads increase consumption growth by 16.3 % point and reduce the poverty by 6.9 % point in Ethiopian villages (Dercon, 2009). Between 1997-1998 and 2002-2003 9.5 % of poverty was reduced in Lao PDR and 13 % of them were due to improved road access alone (Peter Warr ,2005). Rural roads rehabilitation in Vietnam improved primary school completion rates and enhanced the treatment of broken bones. Road development in Bangladesh led to higher girls' and boys' schooling. There is a link between areas with insufficient accessibility and poverty, indicating that transport infrastructures is an important component of poverty reduction [World Bank, 2001]. In China 6.37 Yuan return for 1 Yuan invested in rural road, Vietnam 3.01 Dong agricultural production for 1 dong invested in rural roads; \$63,000 invested would bring 132 people out of poverty and in India, per Rupee spent on rural roads had an impact higher than the impact of R&D, irrigation, education, rural development on poverty (John Hine, 2007). (Fan, 2005) evaluate the contribution that roads make to poverty reduction and economic growth in China, and they find that it is more effective to invest in low-quality and rural roads in the sense that such investment will generate bigger marginal returns, alleviate poverty more effectively, and reduce regional development disparity to a larger extent. Reliable adequate and economic transport is essential for the economic and social development of rural areas especially in developing world (Carapetis *et al*, 1984).

Economic Growth, Road Development and Poverty Reduction

By investment in road infrastructures we can improve human capital and that is the main factor in economic growth. Economic growth one crucial objective is to remove poverty. When economic growth happens then poverty will be overcome. Road Infrastructure has a very important role in it. We

analyzed the economic growth from 2001 to 2017 and poverty reduction from 2000 to 2014. Road length increased from 3373520 km in 2001 to 56.03 lakh km in 2016 and as a result, economic growth rate increased from 4.8 percent in 2001 to 7.1 percent in 2016 and poverty rate decreased from 40 percent in 2000 to 15 percent (\$1.90 a day, 2011 PPP) in 2014 in India (World Bank).

Road Development and Economic Growth in India

Road transport infrastructure facilitates the direct provision of services to consumers and provides intermediate inputs that enter into the production of other sectors and raise factor productivity and opens up new areas of economic activities, increases agricultural production, and revitalizes trading activities and impacts positively on urbanization process. Aschauer (1989) in his seminal article; concluded that insufficient investments in infrastructure during the 1970s and 1980s were one of the main causes of productivity slowdown in the USA. The fact that Chile, during this period their sufficient investment in infrastructure, did not slowdown the productivity. The State Planning and Development Commission (China) estimated that highway construction has increased economic growth by up to 0.4 percentage points and has absorbed 4 to 5 million workers in the construction industry per year (Fan, 2003). There is a long term positive relationship between transport and economic growth (UK Government, 2006). Efficiency of a road transport system is more important than the scale of the road infrastructure in Nigeria (Olamigoke, 2013). Road access provides the means to bring the rural population on to the main stream. A better road network reduces the transport cost ,leads to efficient delivery of farm inputs and enhances special agricultural production and distribution. A better network of roads will expand the distribution of agricultural goods as well as open up additional opportunities for agricultural trade (Inoni, 2009). Agriculture forms the major element of the gross domestic product of many developing or low - income economies including Nigeria, the achievement of economic growth would depend on transportation. In this context, for developing nations the creation of adequate and state of art infrastructure becomes very important for economic growth. India is also a developing country and it needs to build a large infrastructure for economic growth and poverty reduction. In 20th century, GDP growth rate in India is comparatively lower than that of China because of low level of investment in infrastructure development.

Review of Literature

Donaldson (2018) examined the impact of India's vast railroad network by using general equilibrium trade model. They found that railroads reduced the cost of trading, reduced inter-regional price gaps, real income volatility, increased trade volumes, and brought India's district economies close to the small open economy limit where local prices are unresponsive to local productivity shocks.

Ali *et al*. (2018) investigated the local resident's attitude toward road and transport

infrastructure (China-Pakistan economic corridor (CPEC)) and the wider economic, social, cultural and environmental impact on local people. The result discovered road infrastructure has significant socio-economic and cultural impacts which significantly affect the local people support for CPEC development and more promotion and awareness regarding benefits of the project for the dwellers lead to more support of the local residents in the study area.

Vidyarthi (2017) examined the relationship between banking outreach, infrastructure development and regional growth in 23 Indian states during 2000 – 2012 within multivariate panel data framework. The analysis reveals that banking penetration and infrastructure are positively correlated to regional growth in long run and results confirm bidirectional causality between income and aggregate infrastructure and unidirectional causality running from banking penetration to income and aggregate infrastructure respectively in long run.

Chotia and Rao (2017) investigated the link between infrastructure development and poverty reduction in India over 1991 to 2015 by using ARDL-bounds testing approach. Inefficient and inadequate infrastructure (Transport, Water and Sanitation, Telecommunications and Energy) leads to high transaction costs which can prevent the economy from realizing its full potential irrespective of the progress on other fronts. The empirical results of the study show long run positive relationship between infrastructure development, economic growth and poverty reduction. Sun (2016) worked on the role of transport infrastructures in rural development in China over 1980 to 2013 by using the ARDL model. On the one hand Increase in transport infrastructures further increases economic growth and increase in industrial development and on the other hand decrease the income gap. If there is 1% increase in road length then the income of the rural household increases by 0.14% .

Lokesha and Mahesha (2016) studied the Impact of road infrastructure on agricultural development and rural road infrastructure development programmes in India. The rural road connects the people and their agriculture field to the main transport system and market. Farmers loss 15% crop produce between the farm gate and the consumer in the world due to lack of rural road transport system. Rural road essential for the providing food to nation, agriculture releases labor, provides saving, contributes to market of industrial goods and earns foreign exchange which is the part of economic growth. Rural road development reduces the transaction cost.

Ritwik and Joydeb (2016) examined the impact of public expenditure on economic growth and poverty alleviation in developing countries like India by using fixed effects and random effects models. Economic growth has a positive impact on poverty alleviation and development of infrastructure has important role in economic growth and poverty alleviation. In states where the road, irrigation, power, transport and communication infrastructure is higher,

per capita income is also higher and incidence of poverty is lower.

Pogrletchi (2014) studied the impact of transportation infrastructures on economic growth in Roman over 1995 to 2010 by using the panel data. They conclude that the different types of transportation infrastructure are important drivers for economic growth in Romania. Its impact is sensitive to the quality of the road covering and administrative status of roads and the quality of local government. They found that the GRP per worker was more sensitive for overall stock of roads with national status, since such roads usually got larger load of traffic.

Vidyarthi and Sharma (2014) studied the impact of infrastructure development on economic growth in India for the period 1971 to 2010 by using the fully modified ordinary least square and Granger causality test. Infrastructure has a positive impact on economic growth .The empirical literature shows that better quality infrastructures reduce the transaction cost and trade cost and improves the competitiveness, higher productivity and efficiency of firms against the peer groups in national and international markets. They also found that the effects of infrastructure in India are relatively higher than the rest of the world because of comparatively a low base and found that the causality is running from GCF and economic growth to electricity consumption in India. Results also indicate that higher economic growth induces greater GCF.

Research Gap

Indian government is investing huge amount of capital on road development per annum. As result of this investment in 1950-51, India has road length of 399942 km, in 1980-81 has length of 1485421km, in 2000-01 has length of 3373520km and in 2015-16 has length of 5603293km (Basic Road Statistics of India, 2015-16). The relationship between infrastructures, economic growth and poverty reduction is well documented in a number of research works. But there is no research conducted on road development and how much it has impact on poverty reduction and economic growth. Therefore we decided to undertake a road development, economic growth and poverty reduction in India.

1. There is no study conducted on impact of road development on economic growth and poverty reduction in India.
2. Quality of roads has received a little attention. Rural and urban roads differently impact economic growth and poverty reduction.
3. Most studies have focused only on rural poverty but urban poverty is also an important and growing problem in India.
4. There is no study conducted on impact of road development on local area.

Conclusion

On the basis of reviews, there is a positive impact of rural and urban roads on economic growth and poverty reduction.

References

1. Aschauer, A., D. (1989). *Is public expenditure productive?* *Journal of Monetary Economics*, 23(2), 177-200.
2. Mitra, A., Varoudakis, A., and Veganzones-Varoudakis, A., M. (2002). *Productivity and technical efficiency in Indian states' manufacturing: The role of infrastructure.* *Economic Development and Cultural Change*, 50(2), 395-426.
3. Calderón, C., Moral-Benito, E., and Servén, L. (2011). *Is infrastructure capital productive? A dynamic heterogeneous approach.* *The World Bank*, 1-32
4. Fan, S., and Chan-Kang, C. (2005). *Road development, economic growth, and poverty reduction in China.* *Intl Food Policy Res Inst* (12), 1-52
5. Gachassin, M., Najman, B., and Raballand, G. (2010). *The impact of roads on poverty reduction: a case study of Cameroon.* Retrieved on May, 2018 from https://papers.ssrn.com/sol3/papers.cfm?abstract_id=1559726##
6. Démurger, S. (2001). *Infrastructure development and economic growth: an explanation for regional disparities in China?* *Journal of Comparative economics*, 29(1), 95-117.
7. Canning, D., and Pedroni, P. (2004). *The effect of infrastructure on long run economic growth.* *Harvard University*, 1-30.
8. Luiz, J. (2010). *Infrastructure investment and its performance in Africa over the course of the twentieth century.* *International Journal of Social Economics*, 37(7), 512-536.
9. Minten, B., and Kyle, S. (1999). *The effect of distance and road quality on food collection, marketing margins, and traders' wages: evidence from the former Zaire.* *Journal of Development Economics*, 60(2), 467-95.
10. Monteiro, G., and Turnovsky, J., S. (2008). *The composition of productive government expenditure: Consequences for economic growth and welfare.* *Indian Growth and Development Review*, 1(1), 57-83.
11. Dash, K., R., and Sahoo, P. (2010). *Economic growth in India: the role of physical and social infrastructure.* *Journal of Economic Policy Reform*, 13(4), 373-85.
12. Lall, S., V. (2007). *Infrastructure and regional growth, growth dynamics and policy relevance for India.* *The Annals of Regional Science*, 41(3), 581-99.
13. Sharma, A. K., and Vohra, E. (2009). *Critical evaluation of road infrastructure in India: a cross-country view.* *Engineering, Construction and Architectural Management*, 16(1), 73-91.
14. Crafts, N. (2009). *Transport infrastructure investment: implications for growth and productivity.* *Oxford Review of Economic Policy*, 25(3), 327-43.
15. Vidyarthi, H. (2017). *Banking outreach, infrastructure development and regional growth: Empirical evidence from Indian states.* *World Journal of Entrepreneurship, Management and Sustainable Development*, 13(2), 114-27.
16. Sahoo, P., Dash, K., R. and Nataraj, G. (2012). *China's growth story: The role of physical and social infrastructure.* *Journal of Economic Development*, 37(1), 53-75.
17. Pereira, A., M. and Andraz, J., M. (2005). *Public investment in transportation infrastructure and economic performance in Portugal.* *Review of Development Economics*, 9(2), 177-96.
18. Esfahani, H., S. and Ramirez, M., T. (2003). *Institutions, infrastructure, and economic growth.* *Journal of development Economics*, 70(2), 443-77.
19. Sasmal, R., & Sasmal, J. (2016). *Public expenditure, economic growth and poverty alleviation.* *International Journal of Social Economics*, 43(6), 604-18.
20. Chandra, A., and Thompson, E. (2000). *Does public infrastructure affect economic activity. Evidence from the rural interstate highway system.* *Regional Science and Urban Economics*, 30(4), 457-90.
21. Donaldson, D. (2018). *Railroads of the Raj: Estimating the impact of transportation infrastructure.* *American Economic Review*, 108(4-5), 899-934.
22. Snieska, V., and Simkunaite, I. (2009). *Socio-economic impact of infrastructure investments.* *Inzinerine Ekonomika-Engineering Economics*, 63(4), 16-25.
23. Kühl Teles, V. and Cesar Mussolini, C. (2012). *Infrastructure and productivity in Latin America: is there a relationship in the long run?.* *Journal of Economic Studies*, 39(1), 44-62.
24. Ali, L., Mi, J., Shah, M., Shah, S. J., Khan, S., Ullah, R., and Bibi, K. (2018). *Local residents' attitude towards road and transport infrastructure (a case of China Pakistan economic corridor).* *Journal of Chinese Economic and Foreign Trade Studies*, 11(1), 104-20.
25. Newell, G., Wing Chau, K., and Kei Wong, S. (2009). *The significance and performance of infrastructure in China.* *Journal of Property Investment & Finance*, 27(2), 180-202.
26. Chotia, V. and Rao, N., M., N. (2017). *An empirical investigation of the link between infrastructure development and poverty reduction: The case of India.* *International Journal of Social Economics*, 44(12), 1906-18.
27. Waters, C., D., J. (1999). *Changes to road transport in Poland during a period of economic transition.* *International Journal of Physical Distribution & Logistics Management*, 29(2), 122-138.
28. Stephan, A. (2000). *Regional infrastructure policy and its impact on productivity: A comparison of Germany and France.* *Konjunkturpolitik – Berlin*, 46(4), 327-56.
29. Binswanger, H., P. Khandker, S., R. and Rosenzweig, M., R. (1993). *How infrastructure and financial institutions affect agricultural output*

- and investment in India. *Journal of development Economics*, 41(2), 337-66.
30. Bryceson, D., F. Bradbury, A. and Bradbury, T. (2008). Roads to poverty reduction? Exploring rural roads' impact on mobility in Africa and Asia. *Development Policy Review*, 26(4), 459-82.
 31. Olamigoke, A., E. and Emmanuel, A., A. (2013). The role of road transportation in local economic development: A focus on Nigeria transportation system. *Developing Country Studies*, 3(6), 46-53.
 32. Boarnet, G., M. (1996). The direct and indirect economic effects of transportation infrastructure.
 33. Holtz-Eakin, D. (1992). Public-sector capital and the productivity puzzle. *Review of Economics and Statistics*, 76(1), 12-21.
 34. Wang, Z. and Sun, S. (2016). Transportation infrastructure and rural development in China. *China Agricultural Economic Review*, 8(3), 516-25.
 35. Vidyarthi, H. and Sharma, C. (2014). Estimating impact of infrastructure development on economic growth in India. *International Journal of Business Continuity and Risk Management*, 5(4), 261-71.
 36. Duffy-Deno, K., T. and Eberts, R., W. (1989). Public infrastructure and regional economic development: a simultaneous equations approach. *Federal Reserve Bank of Cleveland, Research Department*. 1-28 <http://clevelandfed.org/research/workpaper/index>. cf.
 37. Lokesh, M., N and Mahesh, M. (2016). Impact of road infrastructure on agricultural development and rural road infrastructure development programmes in India. *International Journal of Humanities and Social Science Invention*, 5(11), 1-7
 38. Pogreletchi, M. (2014). Transportation infrastructure and economic growth: The case of Romania.
 39. www.kse.org.ua/download.php?downloadid=397, 1-38