

Assessing Gains of stakeholders for Mega Project implementation: Learning from Beneficiary Assessment of Lahore Ring Road Project, Pakistan

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Abstract. The population is increasing rapidly globally, and urban expansion of the cities has become an extensive trend in developing nations. Urban expansion patterns, such as transportation structure and road networks, affect transportation planning. This research was conducted on a mega project in Lahore city of Pakistan, i.e., the Lahore Ring Road (LRR) project. Limited research focused on the beneficiary assessment of the road project, and this research was carried out to fill this research gap. This research aims to evaluate the beneficiary assessment of DHA Phase 8 and Halloki Settlement along the Lahore Ring Road. The simple Random Sampling technique was used to conduct the household survey in the study area. This study concluded that most of the residents did not modify their houses nor increase the built-up area and height after the introduction of the project. This study inferred that the rental potential was high at some locations and low at old existing settlements. This research further concluded that community participation was ignored, and public facilities were not improved in the study area. But a project of LRR was very much beneficial and alive for the residents of Lahore city. Community participation should be enhanced in such types of megaprojects, and allied facilities in the nearby community should be upgraded. This research will be helpful for policymakers, urban planners, transportation planners, development authorities, and other stakeholders in planning future road projects in the country.

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1. Introduction

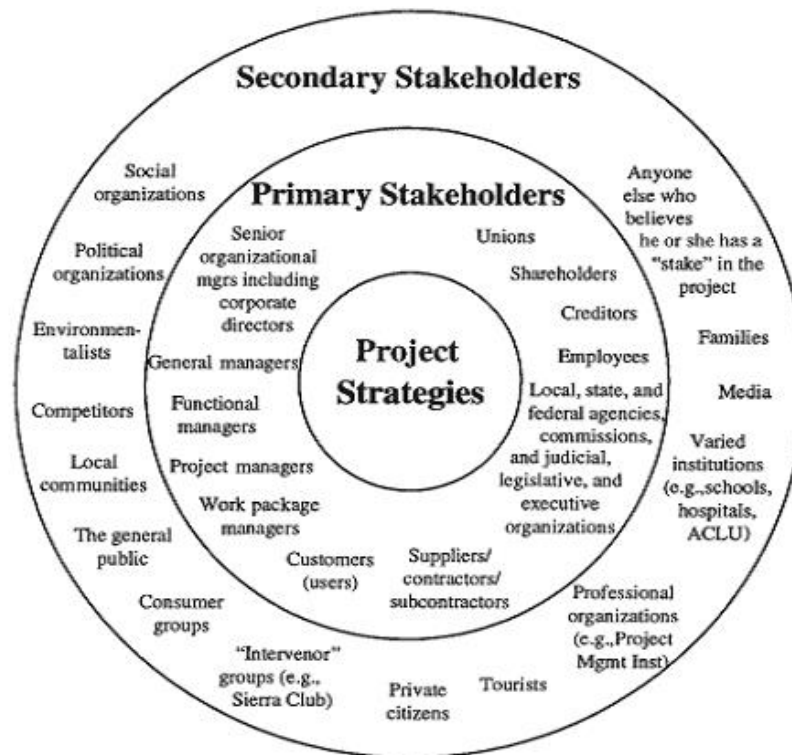
The population is increasing unprecedentedly in the world. It is estimated that the global urban population increased every year on average by 57 million inhabitants between the years 1990 – 2000 and by 77 million people from 2010 to 2015 (United Nations Development Program, 2010). It is also estimated that the Asia Pacific Region hosted 60% of the world's total population, which was grown by more than 1 billion between 1980 and 2010 (United Nations Development Program, 2010). Further, it is anticipated that two-thirds of region's population will live in urban areas by 2050. Pakistan is the most urbanized country in South Asia. According to the population census in 2017, the total population of Pakistan was recorded as 207.77 million (Pakistan Bureau of Statistics, 2017). It is estimated that 36.4% of the total population lived in urban areas in 2017, and 32.5% in 1998. On the other hand, based on a modified definition of urban settlement, it can be said that the ratio of urban to rural population could be 40.5% and higher. According to the United Nations Population Division, it is estimated that around half of the country's population will be living in urban areas by 2027 (United Nations Development Program, 2010).

Rapid urbanization is a major issue facing countries across the globe. Lahore is the capital of Punjab province. The population has been growing rapidly due to natural population growth and internal and external migration to the metropolitan area of Lahore. According to the population census 2017, it is calculated that the population of Lahore was recorded as

11.12 million people in 2017, which was 6.32 million in 1998. It means that the population was about doubled in 19 years. Lahore is spreading in an unplanned manner in all directions (Punjab Bureau of Statistics, 2020).

Urban expansion of the cities has become an extensive trend in developing nations. The pattern of urban expansion affects transportation planning, such as transportation structure and road networks (Pojani & Stead, 2015). Road networks are considered a vital element driving the expansion of urban areas (Zhao et al., 2017). It is a pivotal human activity that is closely related to the place. Roads represent a vital element of economic development (Asomani-Boateng et al., 2015). Roads play a very important role in connecting various places to fulfill the concept of movement (Pojani & Stead, 2015). Various studies have been conducted by various authors to assess the beneficiary assessment of urban roads, rural roads, and others. Van de Walle (2009) conducted a study on the impact evaluation of rural road projects and concluded that knowledge regarding the impacts of rural roads and the heterogeneity in those impacts continues to be very few. In the implementation of any project, several beneficiaries are to be involved. Every person is a beneficiary who is gaining benefits from any project directly and indirectly, such as citizens, politicians, offices, stakeholders, etc. Assefa et al. (2015) said that if stakeholders are the beneficiaries, the list is given in figure 1.

Beneficiary Assessment (BA) is an evaluation approach to boost learning, responsiveness, relevance, and effectiveness by highlighting the fair representation of beneficiary perspectives



Source: Assefa et al. (2015)

Figure 1: Project strategies of Beneficiary Assessment

in identifying and analyzing projects and programs. It is distinct from 'normal review evaluation' that relies on external expert views and self-evaluations that reflect staff views. BA has three essential ingredients –participation, learning, and responsiveness (Swiss Agency for Development and Cooperation, 2013). It also identified six principal of Beneficiary Assessment: participation and ownership, inclusion, representativeness, differentiation, self-critical reflexivity on the quality of methodology, and learning and responsiveness.

World Bank (WB), Asian Development Bank (ADB), and the Government of Australia (GOA) jointly conducted a study to compare the social and economic changes among the survey population caused by the road rehabilitation of "Kiribati Road Rehabilitation Project" in 2011 (Ministry of Finance & Economic Development, 2011). In this study, they evaluated the project's three types of impacts of the project including intermediate impact, medium-term, and longer-term. They used various indicators to measure the Beneficiary Assessment like demographic information (household size, household income), road transport overview (condition of the road, frequency of the travel, travel time and traffic, access road, road maintenance, transport vehicles, transport expenditures), road safety (highest safety concern, road safety features, accidents), environment (dust, water, rubbish), health (traveling to health facilities), and education (traveling to health facilities).

Assess, Transform & Reach Consulting (2016) conducted research entitled "Impact Study of SIDA-Funded Rural Access Improvement Project in Northern Afghanistan". The following data collection tools were suggested: traffic composition and density survey, vehicle origin and destination survey, transport owner survey, household survey, and focus group discussions. Kutter (2014) conducted a research study focused on beneficiary participation in development. The author defined beneficiary participation as direct beneficiaries of a given project, at least part of the project. The beneficiary

participation in various theories: Keynesian Development Theory; Modernization Theory; Dependency Theory; the proliferation of Citizen Participation; the proliferation of Beneficiary Participation; Sustainable Development; Post-Theories of Development.

Sum & Hackett (2007) conducted research on "Sierra Leone: The Road to Recovery-Result from Beneficiary Impact Assessment" and concluded the following recommendations i.e., community contributions, increasing women's participation, keeping things transparent, greater sustainability by community mobilization, and monitoring by the community. Tarefder (2015) presented the research entitled "Human Benefits of Road Improvements". In this research, the researchers evaluated the benefits of road improvements in the context of safety, vehicle operating costs, travel time, maintenance, and jobs in New Mexico. This research study concluded that travel time has been reduced on the rural portion of the road and vehicle operating coasts has reduced owing to mostly less fuel consumption. Further, this study inferred that 5% increase in the crash on Sunday and a decrease of 5% on Saturday. This study showed that some areas connected by this road to more attractive businesses, tourists, and industries.

United Nations Development Program (2010) conducted a research study entitled "Benefits of Improved Road Access" in selected districts in NAD and Nias. This study was conducted in June 2010 on the effects of road improvements on the livelihoods of the targeted beneficiaries. In this study, the following indicators were considered as a source of income, livelihood problems, distances to markets, schools, health care centers, and banks, reduction in travel times on main origin-destination routes, and accessibility benefits related to improved road access. Madu & Phoa (2012) conducted research on the evaluation of FADAMA II road infrastructure among rural communities in Nigeria, which inferred that 30% of the roads were funded by the FADAMA II Project and were found to be important for the beneficiaries' activities.

Haydar et al. (2016) conducted a study on the performance assessment of the municipal solid waste management model of Lahore and concluded that service delivery is satisfactory; however, it requires specific improvements. Oni et al. (2011) studied beneficiary assessment/impact evaluation of the FADAMA-II critical ecosystem management project. Ballesteros et al. (2017) conducted a study assessing livelihood success and implementation issues on the sustainable livelihood program (SLP) of the DSWD. They inferred that additional reforms in the delivery of program services are still needed.

To sum up, the limited studies found in the literature offered by various researchers/organizations on beneficiary assessment for the road project. In Lahore, after the implementation of LRR, no studies of its impacts were conducted except a few, including Abrar et al. (2014), which was about the health impact assessment study of the southern loop. Still, no study on its economic or other impacts has been found. So, there is an urgent need for this kind of beneficiary assessment study on its surroundings. This research fills this research gap, and to our knowledge, this research is the first study in Pakistan on beneficiary assessment for the road project. In this study, one planned (DHA Phase 8) and another unplanned location (Halloki settlement) was identified and evaluated the beneficiary assessment of the residents of both selected areas along the Lahore Ring Road through a household survey. While conducting a beneficiary assessment, there were gains and losses for the poor and rich owing to the development of the afore-mentioned project was identified too.

The remainder of this research is structured as follows: section 2 focuses on the study area; section 3 offers the research methodology; section 4 presents the results and discussion, which is followed by conclusions in section 5.

Study Area

Lahore Ring Road was idealized in 1992, involving a six-lane road with 177 kilometers. Currently, the Lahore ring road

has six lanes extending to 65 km. The construction of LRR is intended to ensure the efficient movement of vehicles/freight and passengers, remove traffic congestion in an urban area, and boost industrial development. Therefore, this road was not only a common development but an alternative route for the citizens to avoid the traffic load within the urban/city area.

There is one emergency lane on both sides of the Lahore ring road. Almost 425,000 vehicles pass through LRR daily. All link roads with Lahore Ring Road are almost improved and widened, besides repairing all important city highways to supply traffic flow. Many interchanges are erected along Ring road to provide better transport facilities and to avoid traffic congestion. Initiated in Nov 2004, the LRR Project consists of two phases, i.e., Northern and Southern Loop (refer to figure 2). Two locations were selected along Lahore Ring Road; one is planned as DHA Phase (latitude: 31.489831°, longitude: 74.449603°), and the second is Halloki (latitude: 31.372975°, longitude: 74.285066°) as unplanned settlement (refer to figure 2). Figure 3 shows the buffer within 800 meters and the location of DHA Phase 8 and Halloki along LRR in Lahore.

2. Method

This research is quantitative and qualitative. For this research, primary and secondary data were collected for the beneficiary assessment of Lahore Ring Road in DHA Phase 8 and Halloki settlement. The sample size was determined with known population formula. The formula for sample size used by Aziz et al. (2018) and Haroon & Aziz (2020) in their studies is given below:

$$n = \frac{N}{1 + Ne^2}$$

The total number of plots is about 1751 in DHA Phase 8. It is observed that the constructed housing units are about

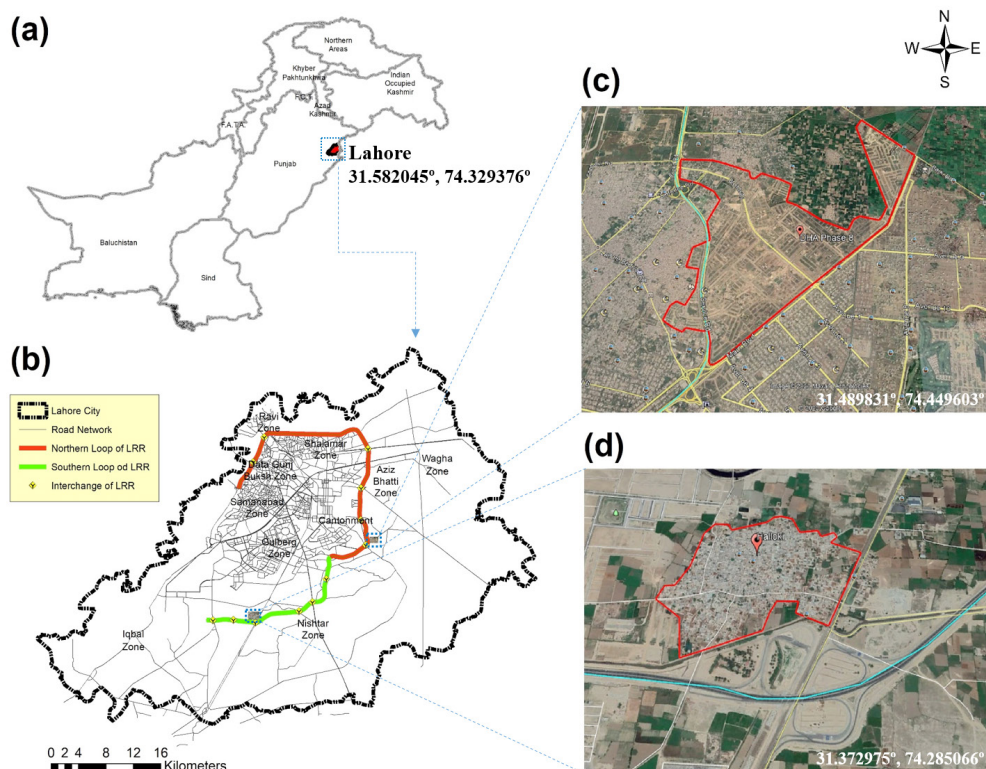


Figure 2: (a) Pakistan (b) Lahore city (c) location of DHA Phase 8 taken from google earth (d) location of Halloki taken from google earth

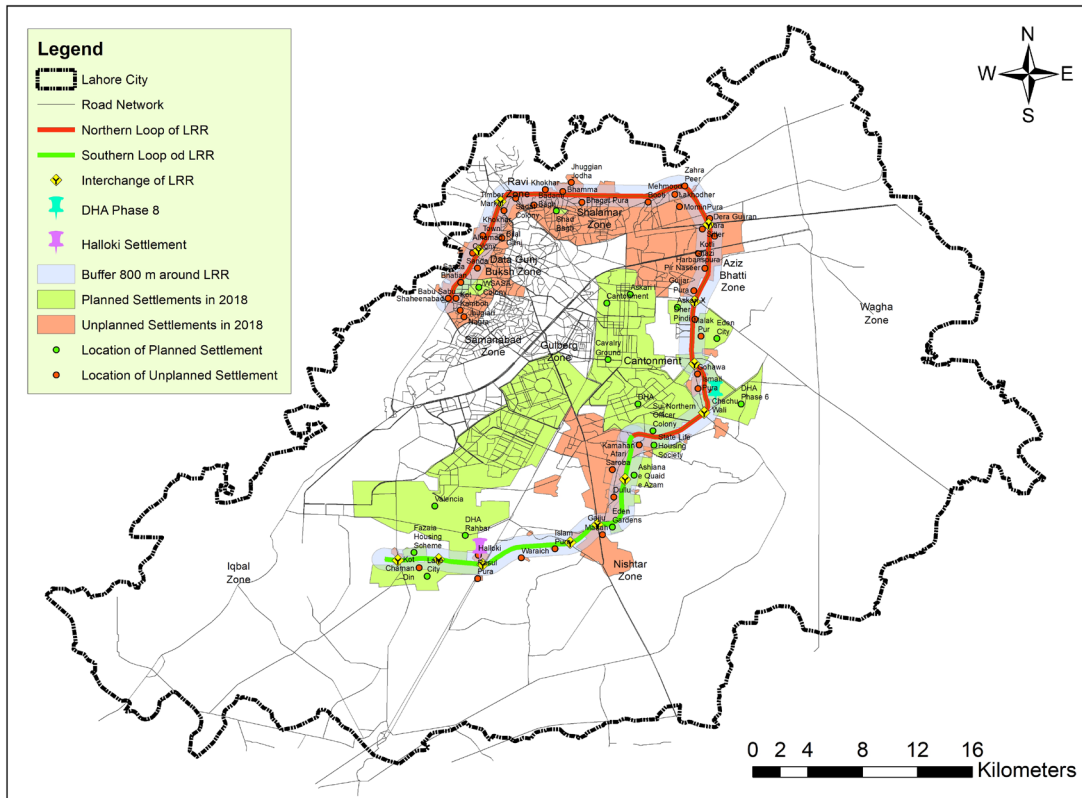


Figure 3: Buffer within 800 meters and location of DHA Phase 8 and Halloki along LRR

126. In Halloki, the total number of dwelling units is 252. The calculation of the sample size is in table 1.

Table 1: Calculation of Sample Size

Settlement	DHA Phase 8	Halloki
No. of housing unit	126	252
Sampling error	10%	10%
Sample Size	55.75 ≈ 56	≈ 72

The computed value of the sample size is 36 for DHA Phase 8 and 72 for the Halloki settlement along the Lahore Ring Road. The simple Random Sampling technique was used to complete the household survey in the study area according to the calculated sample size.

An observation survey was conducted along the whole route of Lahore Ring Road to observe the planned and unplanned development. Proximity analysis was performed within 800 meters along the Lahore Ring Road. After a detailed survey, DHA Phase 8, as planned, and Halloki, as an unplanned settlement, were selected to evaluate the beneficiary assessment. The boundaries of both above-mentioned settlements were demarcated by field survey and observation survey.

The primary data was collected by taking the sample size in planned and unplanned settlement from the household survey, and interviews with TEPA, LDA Lahore officials to take opinion regarding the policies and Lahore Ring Road and property dealers which deals the property matters of DHA Phase 8. The secondary data was collected from the TEPA, LDA, and other institutions. Also, data were collected from the Integrated Master Plan of Lahore (2001-2021), Lahore Urban Transport Master Plan 2012, Punjab Development of Statistics reports, Pakistan Bureau of Statistics reports, and other literature.

The collected primary and secondary data were analyzed by using Statistical Package for the Social Sciences (SPSS), MS Excel, Geographical Information System (GIS), and Google Earth. In this research, the most collected data was analyzed through SPSS to prepare different charts, graphs, and figures. The proximity analysis and other spatial maps of Lahore Ring roads were generated through GIS. The boundaries of the settlement were demarcated by using the freely available Google Earth. Findings and recommendations were drawn from the data analysis.

3. Result and Discussion

Demographic Characteristics/Socio-Economic Characteristics

In this research study, demographic characteristics include gender, education level, profession, household size, household income, mode of transport, and duration of residence in both selected locations.

Table 2 represents that predominantly of the respondents are male, which shared more than 87% of respondents in DHA Phase 8 and almost 82% in Halloki. Education has a direct relation with the employment rate in society, and its effect is so deep on society; the above table demonstrates that most people are graduates in DHA, which contributes 50% of respondents, whereas more than 36% of the respondents are passed the level of high and more than 19% are passed the level of the middle in Halloki. In DHA Phase 8, more than 62% of respondents are employed, almost 34% of respondents are a businessman, and the remaining respondents belong to the other profession. While more than 26% of respondents are unemployed in Halloki, and more than 37% are employed. This table represents that the size of a household of 65.45% of respondents is 2-4 persons in DHA and more than 50% of respondents for the same size. The most respondents (67.86%)

Table 2: Demographic characteristics of the respondents

Sr. No.	Indicator	DHA Phase 8	Halloki
1	Gender	Male (87.50%), Female (12.50%)	Male (81.94%), Female (18.06%)
2	Education Level	Primary (0.00%), Middle (3.57%), High (16.07%), Graduate (50.0%), Postgraduate (28.57%), Others (1.79%)	Primary (8.33%), Middle (19.44%), High (36.11%), Graduate (18.06%), Postgraduate (11.11%), Others (6.94%)
3	Profession	Employed (51.79%), Un-employed (7.14%), Businessman (33.94%), Student (5.36%), Labor (1.79%)	Employed (37.50%), Un-employed (26.39%), Businessman (15.28%), Student (8.33%), Labor (12.50%)
4	Household Size	2 – 4 persons (65.45%), 5 – 8 persons (25.45%), 9 – 12 persons (5.45%), > 12 persons (3.64%)	2 – 4 persons (51.39%), 5 – 8 persons (27.78%), 9 – 12 persons (12.50%), > 12 persons (8.33%)
5	Household Income	< 18000 (0.00%), 18001 – 30000 (1.79%), 30001 – 50000 (3.57%), 50001 – 75000 (8.93%), 75001 – 100000 (17.86%), >100000 (67.86%)	< 18000 (9.72%), 18001 – 30000 (22.22%), 30001 – 50000 (13.89%), 50001 – 75000 (19.44%), 75001 – 100000 (18.06%), >100000 (16.67%)
6	Mode of Transport	Cycle (0.00%), motorcycle (8.93%), Rickshaw (1.79%), Car (76.79%), Public Transport (7.14%), Others (5.36%)	Cycle (6.58%), motorcycle (32.89%), Rickshaw (18.42%), Car (17.11%), Public Transport (15.79%), Others (9.21%)
7	Duration of Residence	< 1 year (35.71%), 1 – 3 years (30.36%), 4 – 6 years (21.43%), 7 – 10 years (12.50%), 11 – 15 years (0.00%), > 15 years (0.00%)	< 1 year (2.78%), 1 – 3 years (9.72%), 4 – 6 years (12.50%), 7 – 10 years (18.06%), 11 – 15 years (34.72%), > 15 years (22.22%)

Source: Field survey, 2020

Table 3: House properties of the respondents

Sr. No.	Indicator	DHA Phase 8	Halloki
1	Landuse	Residential (89.29%), Commercial (3.57%), Mixed-use (7.14%)	Residential (75.00%), Commercial (9.72), Mixed-use (15.28%)
2	House Size	< 3 Marla (0.00%), 3 – 5 Marla (7.14%), 6 – 10 Marla (21.43%), 11 – 20 Marla (33.93%), 21 – 40 Marla (17.86%), > 40 Marla (19.64%)	< 3 Marla (15.28%), 3 – 5 Marla (29.17%), 6 – 10 Marla (22.22%), 11 – 20 Marla (16.67%), 21 – 40 Marla (9.72%), > 40 Marla (9.94%)
3	Ownership Status	Self-owned (78.57%), Rented (12.50%), Prefer not to say (8.93%)	Self-owned (80.56%), Rented (6.94%), Prefer not to say (12.50%)
4	Rental Potential	Low (16.07%), Medium (35.71%), High (48.21%)	Low (62.50%), Medium (31.94%), High (5.56%)
5	Age of House	< 1 year (30.36%), 1 – 3 years (42.86%), 4 – 6 years (16.07%), 7 – 10 years (10.71%), 11 – 15 years (0.00%), > 15 years (0.00%)	< 1 year (4.17%), 1 – 3 years (13.89%), 4 – 6 years (29.17%), 7 – 10 years (33.33%), 11 – 15 years (12.50%), > 15 years (6.94%)
6	Modification after LRR	Yes (23.21%), No (60.71%), Prefer not to say (16.07%)	Yes (18.06%), No (65.28%), Prefer not to say (16.67%)
7	Change in Build-up area after LRR	Yes (12.50%), No (73.21%), Prefer not to say (14.29%)	Yes (11.27%), No (71.83%), Prefer not to say (16.90%)
8	Change in Height after LRR	Yes (7.41%), No (79.63%), Prefer not to say (12.96%)	Yes (6.94%), No (77.78%), Prefer not to say (15.28%)

Source: Field Survey, 2020

were high-income earners with a household income of more than 100,000 PKR per month in DHA and almost 32% of respondents had an income of less than 30,000 PKR per month in Halloki. The car mode received the highest proportion of responses (76.79%) followed by motorcycle (8.93%), public transport (7.14%), and others (5.36%). In DHA Phase 8, no respondents answered regarding cycling. In Halloki, most of the respondents used the motorcycle as a mode of transport for their routine activities, whose share was almost 33% of the total mode of transport. DHA is a newly emerged planned settlement where the majority (35.71%) of respondents are residing for less than one year. Almost 35% of respondents resided from 11 to 15 years in Halloki owing to the existing unplanned settlement.

House Properties in DHA Phase 8 and Halloki

House properties include the following indicators such as land use, house size, ownership status, rental potential, age of the house, modification in a house after the introduction of LRR, change in the built-up area after the introduction of LRR, and change in height after the introduction of LRR.

Table 3 represents that majority of the respondents belong to the residential means that more than 89% and 75% of respondents select the option residential land use in DHA Phase 8 and Halloki settlement, respectively. House size is directly correlated with household income. The income level of the respondents of DHA Phase 8 is high compared to the respondents of the Halloki settlement. Almost 34% of respondents have a house of 11 -20 Marla in DHA Phase 8,

and in Halloki, the greater portion of 3 – 5 Marla houses have a share of 29.17% of the total because the household income of most respondents was low. In this research study, most of the respondents have their self-owned houses with a share of 78.57% and 80.56% in DHA Phase 8 and Halloki settlement. This study shows that rental potential was high (48.21% respondents) in DHA Phase 8, while the rental potential was low (62.50%) in Halloki due to unplanned settlement. In DHA Phase 8, the age of 42.86% of houses was 1 – 3 years old, while 33.33% of respondents responded the age of houses was 7 – 10 years in Halloki. It means that the age of houses was greater in the Halloki settlement than in the DHA Phase 8 because Halloki is an old settlement. This table illustrates that 23.21% and 18.06% of respondents had modified their houses after the induction of Lahore Ring Road in DHA Phase 8 and Halloki, respectively. More than 73% and 71% of respondents did not change the built-up area of their houses after the operation of Lahore Ring Road in DHA Phase 8 and Halloki, respectively. While a small portion of respondents has changed the built-up area of their houses in both settlements. This research shows that 7.41% and 6.94% of respondents had changed their building height in DHA Phase 8 and Halloki, respectively.

Improvement in Existing Roads

Improvement of the existing road was evaluated by taking the various indicators like provision of intersection, provision of an access road, condition of street improvement, and travel frequency of the residents of DHA Phase 8 and Halloki.

The Lahore Ring Road project is considered the most beneficial in providing intersections and access roads for the residents of both selected locations. Table 4 shows that 91.07% and 93.06% of respondents responded the intersection was provided nearby DHA Phase 8 and Halloki. The access road was provided at DHA Phase 8 and Halloki to enter the Ring Road directly. This table revealed 87.50% and 83.87% of respondents that access road was provided to facilities for the residents of DHA Phase 8 and Halloki, respectively. The improvement of the condition of roads also has an essential economic impetus. This study represents that the conditions of existing streets were not improved in the Halloki settlement after implementing the Lahore Ring Road project. The frequency of travel on Lahore Ring Road is a significant indication of the degree of impact the restoration of the main road could have on the population of DHA Phase 8 and Halloki. The higher the frequency of travel on Ring Road, the extra acute the social and economic impact of the rehabilitation will be. Around 70% of respondents travel on Lahore Ring Road on a daily basis in DHA Phase 8. Whereas only 1/4th of the respondents use Ring Road in Halloki for travel, and more than 40% of respondents never travel

through Ring road. We can say that mobility and connectivity were created for the residents by the LLR. Our study findings are consistent with those of Surya (2015). He evaluated the dynamics of spatial structure and spatial pattern changes in Makassar City. He found that dynamics of spatial structure contribute to changes in resident mobility. Another study conducted by Oluwole & Daful (2014) in Nigeria found that a city's road network achieved an average level of connectivity.

Improvement in Public Facilities

In DHA Phase 8, only 5.36% of respondents responded that the education facility was improved. In comparison, 21.43% of respondents show that the conditions of educational institutions were not upgraded after the induction of Lahore Ring Road, and almost 3/4th of the respondents was chosen the option not prefer to say about this question (refer figure 4). When talking about improving health facilities, around 9% of respondents said that the health facilities were improved, and 37.50% responded that the health facilities' condition was the same as before the Ring Road.

Figure 4 represents that 12.50% of respondents said that parks were improved, while 33.93% of respondents showed that parks were not improved, and 53.57% of respondents were not given a response "Yes" or "No." Almost 16% of responses were recorded related to the improvement in the shopping area, whereas 1/4th of the respondents showed that no improvement was seen in the shopping area. Around 59% of respondents chose the option "Not prefer to say". A study conducted in Poland concluded that 16.1% of the participants stated a change in the location of use of a shopping center (Wiśniewski & Komornicki, 2015). According to the surveys, 7.14% of respondents shows that public building was upgraded after the implementation of the Lahore Ring Road project, while almost 41% of respondents said the public building was the same as previous, and about 52% of respondents were not offered any comments about the public building-related question.

The same question was asked in the Halloki settlement, as mentioned above. Figure 5 represents that almost 95% of respondents said that educational institutions were not upgraded and the same as before the implementation of Lahore Ring Road, and around 5% used the option "Not prefer to say," while no response was recorded in favor of improvement of education facilities in Halloki. On the other hand, health facilities were the same as previous according to the response recorded as of 84.72%, and only 1.39% of respondents responded as "Yes." In comparison, 13.89% share of the respondents was answered: "Not prefer to say".

Table 4: Improvement in existing roads

Sr. No.	Indicator	DHA Phase 8	Halloki
1	Provision of Intersection	Yes (91.07%), No (0.00%), Prefer not to say (8.93%)	Yes (93.06%), No (0.00%), Prefer not to say (6.94%)
2	Provision of Access Road	Yes (87.50%), No (1.79%), Prefer not to say (10.71%)	Yes (83.87%), No (1.61%), Prefer not to say (14.52%)
3	Condition of Streets improve	Yes (8.93%), No (10.71%), Prefer not to say (80.36%)	Yes (1.39%), No (90.28%), Prefer not to say (8.33%)
4	Travel Frequency by LRR	Daily (69.64%), Twice a week (17.86%), Once a week (7.14%), Once a month (3.57%), Never (1.79%)	Daily (25.00%), Twice a week (12.50%), Once a week (9.72%), Once a month (12.50%), Never (40.28%)

Source: Field Survey, 2020

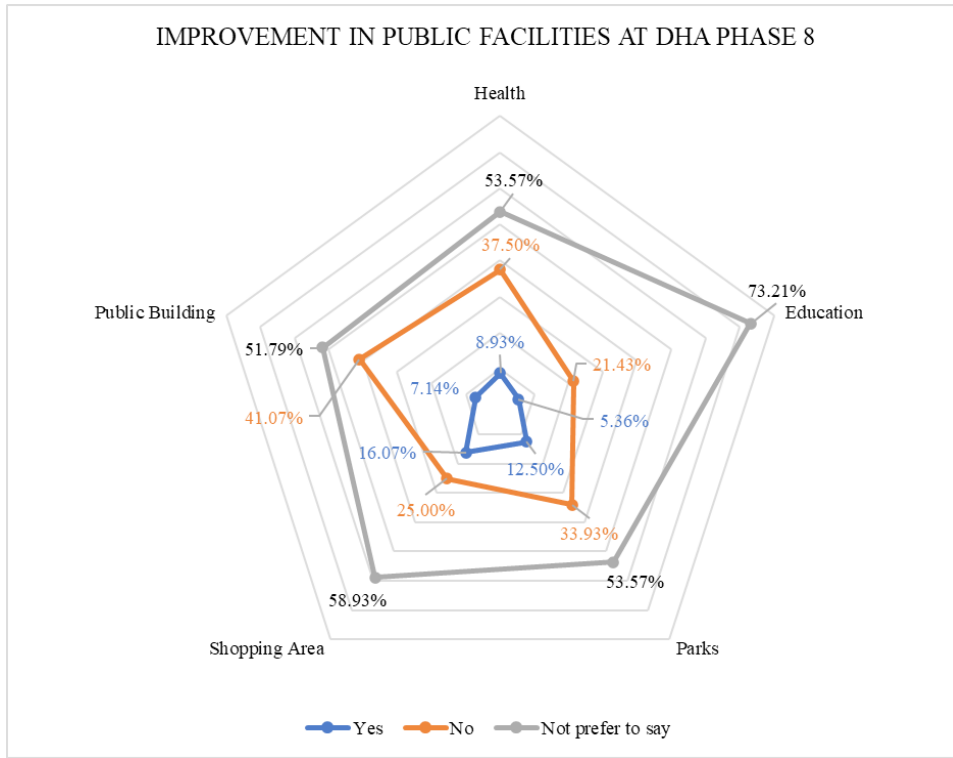


Figure 4: Improvement in public facilities at DHA Phase 8

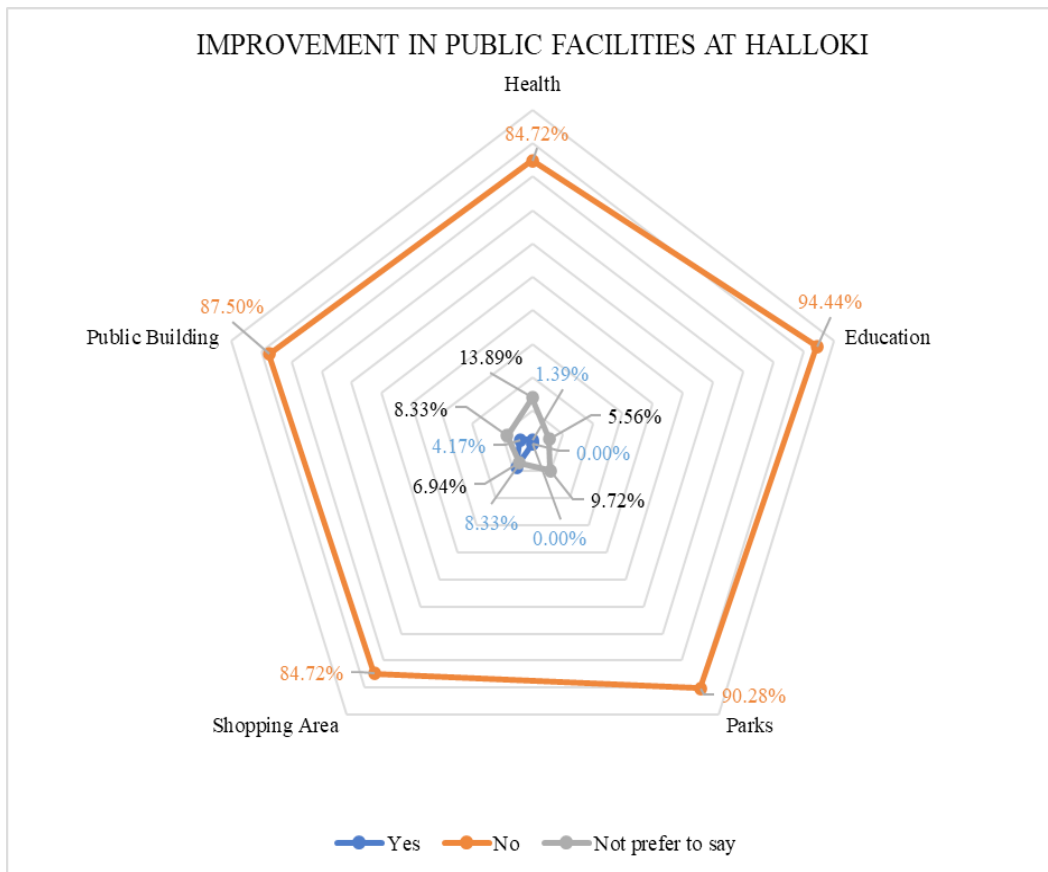


Figure 5: Improvement in public facilities at Halloki

Parks are the breathing space of the city and provide fresh air and recreational activities to the residents. This study revealed that parks were not improved as a response recorded of more than 90% and the same as earlier before. Further, almost 85% of respondents said that improvement and enhancement in the shopping area were not observed in the settlement, while 8.33% of respondents responded

"Yes" towards improvement in the shopping area. 87.50% of respondents said that public buildings were the same as before the introduction of the Lahore Ring Road, and 4.17% said that improvement was carried out in public buildings. Our study findings are inconsistent with those of (Surya, 2015). They evaluated the dynamics of spatial structure and spatial pattern changes in Makassar City. They concluded that the

Table 5: Beneficiary Assessment of Lahore Ring Road

Sr. No.	Indicator	DHA Phase 8	Halloki
1	Source of Information	Newspaper (41.07%), Television (28.57%), Radio (1.79%), Development Authority (3.57%), Friends & Family (17.86%), Other (7.14%)	Newspaper (30.56%), Television (37.50%), Radio (6.94%), Development Authority (1.39%), Friends & Family (15.28%), Other (8.33%)
2	LRR is Useful	Extremely useful (51.79%), Very useful (25.00%), Slightly useful (14.29%), No useful at all (5.36%), No answer (3.57%)	Extremely useful (16.67%), Very useful (12.50%), Slightly useful (26.39%), No useful at all (38.89%), No answer (5.56%)
3	Behavior of Staff	Normal (42.86%), Polite (17.86%), Rude (1.79%), No Interaction (37.50%)	Normal (16.67%), Polite (13.89%), Rude (31.94%), No Interaction (37.50%)
4	Quality of Infrastructure	Excellent (46.43%), Good (25.00%), Fair (10.71%), Bad (5.36%), Prefer not to say (12.50%)	Excellent (48.61%), Good (22.22%), Fair (9.72%), Bad (8.33%), Prefer not to say (11.11%)

Source: Field Survey, 2020

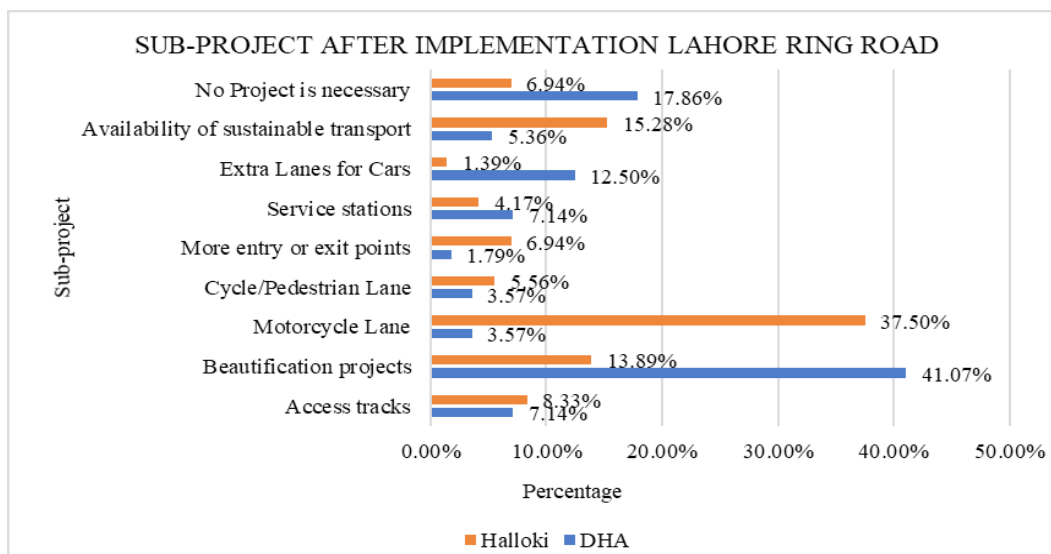


Figure 6: Sub-projects after implementation of Lahore Ring Road

development of the main road corridor significantly changes the spatial pattern of the city. Another study conducted by Surya et al. (2021) and found that transportation infrastructure development had an impact on morphological changes in Makassar City.

Beneficiary Assessment of Lahore Ring Road

Table 5 illustrates that more than 41% of respondents heard about the Lahore Ring Road from a Newspaper in DHA Phase 8. In comparison, 37.50% of respondents said that Television was a source of information regarding the introduction of Ring Road in Halloki. The Lahore Ring Road project was beneficial for the residents of DHA Phase 8 and somehow useful for the residents of Halloki. Most respondents (42.86%) responded that the working behavior was expected with the residents of the DHA Phase 8. In contrast, 31.94% of respondents said that the behavior of the staff was rude to the residents of Halloki. The majority of the respondents responded the quality of infrastructure of Lahore Ring Road was excellent in both selected locations.

Figure 6 illustrates that the beautification of the projects was demanded by 41.07% of respondents in DHA Phase 8. At the same time, 37.50% of respondents required the Motorcycle Lane because the motorcycle was the most used mode of transport among the residents of Halloki. In DHA Phase 8, 22.50% required extra lanes for cars, whereas sustainable transport was demanded by 15.28% of respondents in Halloki. This was similar to the study conducted by Wiśniewski

& Komornicki (2015) in Poland; the opening of the new motorways did not come up with new coach lines, which might have influenced the accessibility of services with public transport. Further, 17.86% of respondents did not require any project in DHA Phase 8.

Benefits/Gains of Lahore Ring Road

In DHA Phase, 48.21% of respondents responded that property values increased due to the Lahore Ring Road project and said this component gained the most importance on the Likert scale. Figure 7 illustrates that 41% of respondents responded infrastructural gains were more important. More than 30% of respondents said that accessibility benefits received more importance among the residents of DHA Phase 8. Accessibility of public services represents a vital element, describing the level of development of a whole region and the standard of living of its people (Wiśniewski & Komornicki, 2015). This study shows that 28.57%, 39.29%, and 39.29% of respondents respond neutrally regarding income generation activities, a rise in educational activities, and employment creation, respectively. This study was similar to the study conducted in Machakos County, mostly road projects have not created employment opportunities for the local community (Ndunda et al., 2017). Matu et al. (2020) showed that the community was involved in social and environmental studies and the economic and financial viability of the project in Kenya. Our study concurs with Amadi (2017), who notes that the community should be involved in the project's design phase.

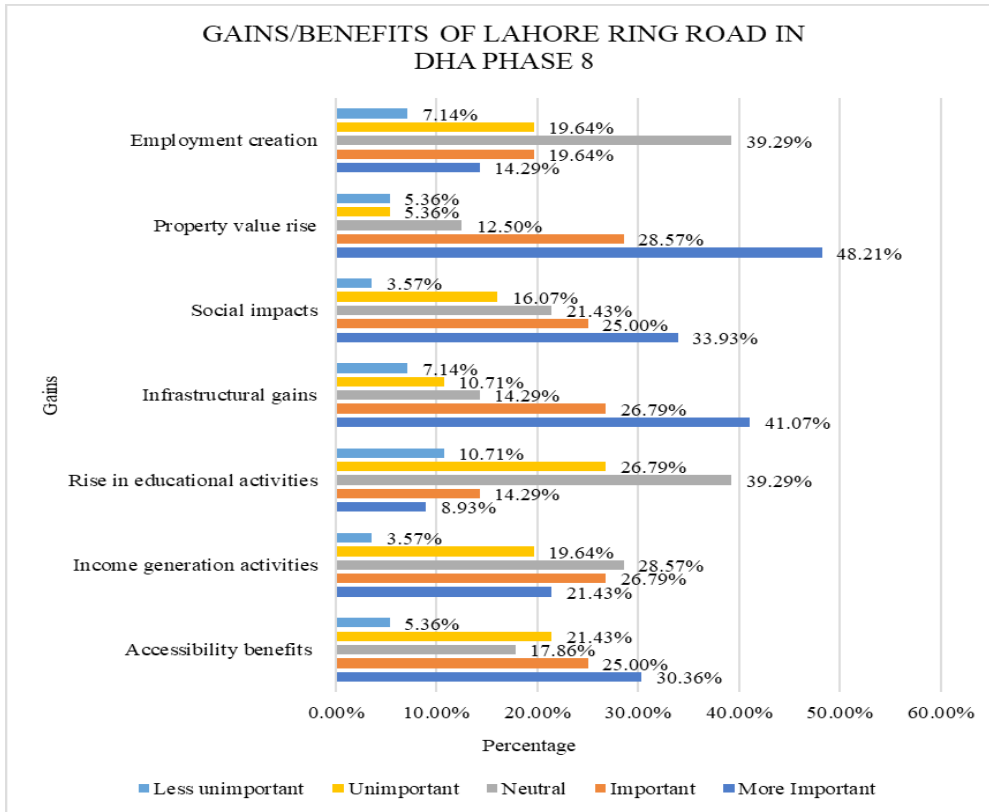


Figure 7: Gains/Benefits of Lahore Ring Road in DHA Phase 8

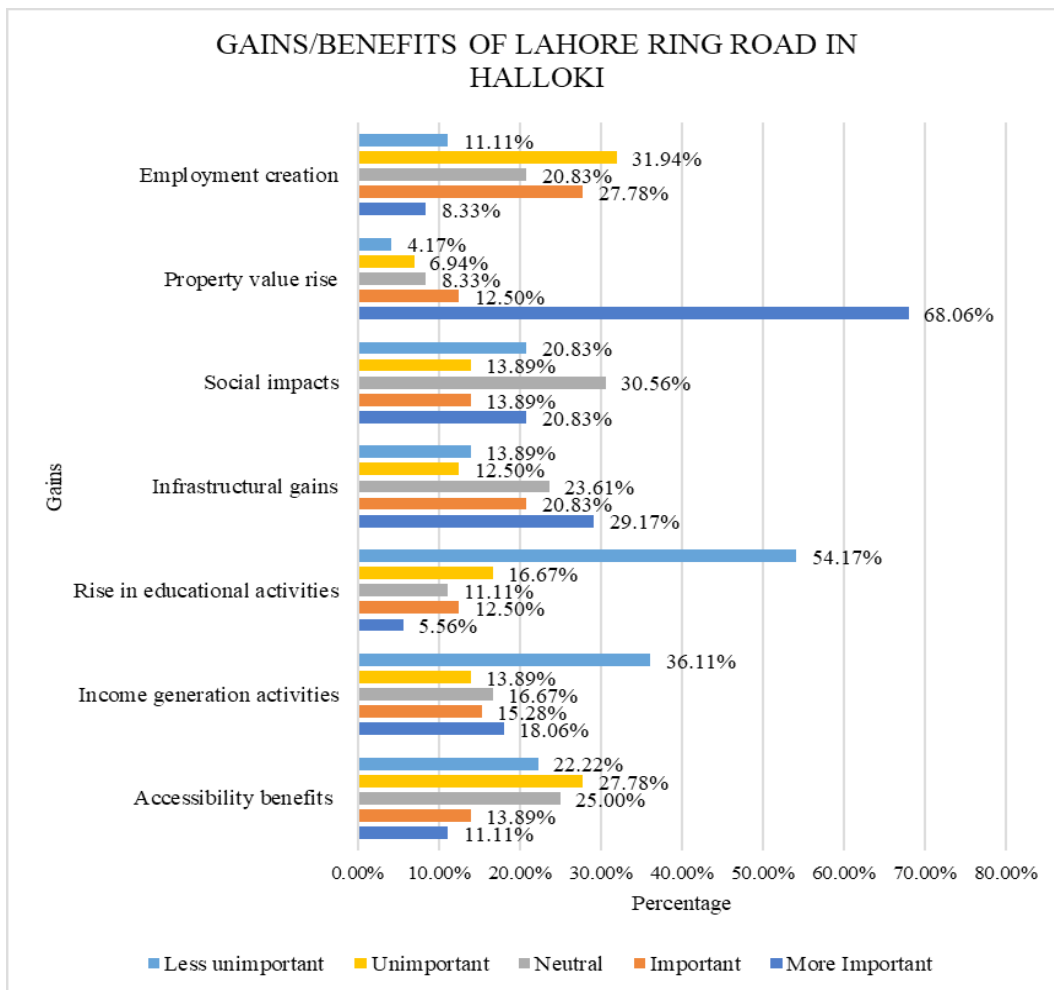


Figure 8: Gains/Benefits of Lahore Ring Road in Halloki

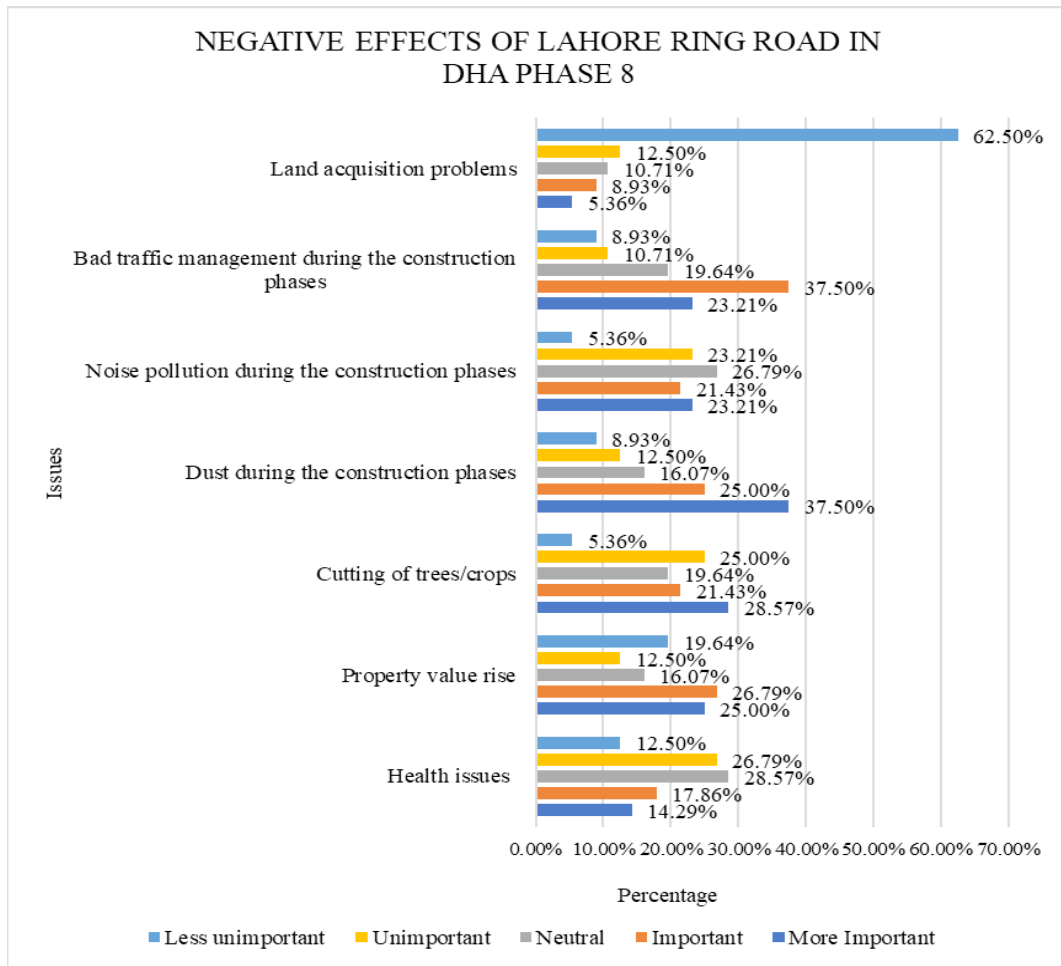


Figure 9: Negative effects of Lahore Ring Road in DHA Phase 8

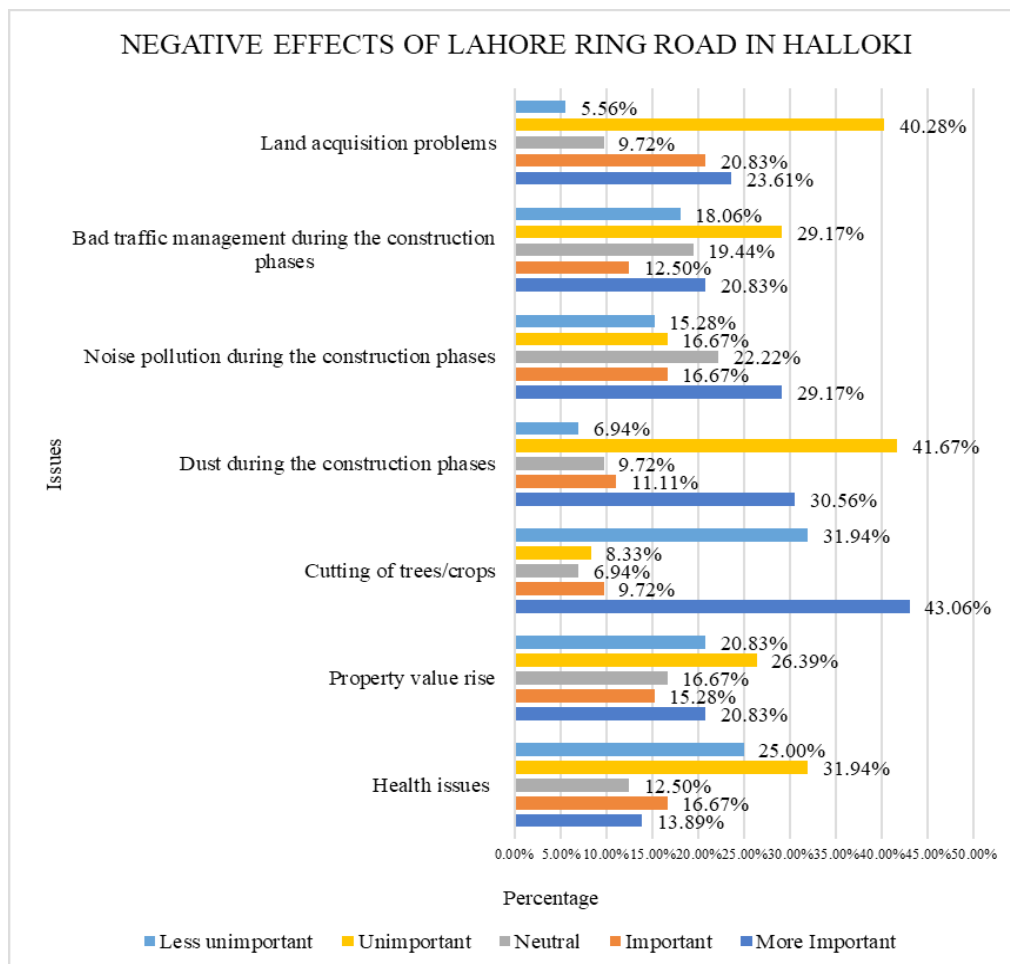


Figure 10: Negative effects of Lahore Ring Road in Halloki

Figure 8 represents the gains/benefits of Lahore Ring Road in the Halloki settlement. More than 68% of respondents gave more importance to the increase in property value due to Ring Road in Halloki. More than 54% of respondents chose the less unimportant for a rise in education activities. More than 36% of respondents mark the less unimportant income-generation activities. While 30.56%, 25%, 23.61%, and 20.83% of respondents remain neutral on social impacts, accessibility benefits, infrastructural gains, and employment creation in Halloki.

Negative Effects of Lahore Ring Road

Figure 9 shows the adverse effects of Lahore Ring Road in DHA Phase 8. This study revealed that 62.50% of respondents responded that land acquisition problems are less unimportant according to the residents' perception of DHA Phase 8. Dust was raised at the time of construction activities in any project. In DHA Phase 8, 37.50% of respondents responded dust during the construction phase was taken as a more critical issue. Bad traffic management during the construction phases was another important issue that the residents of DHA Phase 8 raised, and 37.50% of respondents were in favor of this issue. Cutting trees/crops was a more critical issue, gaining 28.57% of responses representing environmental degradation.

Figure 10 illustrates several adverse effects of Lahore Ring Road in the Halloki settlement. More than 43% of respondents responded that cutting trees/crops was an important issue that the authorities concerned ignored at the time of the construction of Ring Road. More than 30% and 29% of respondents said that dust and noise pollution were the more critical issues that were created by the construction of Ring Road in Halloki. More than 40% of respondents said the land acquisition was an unimportant problem. Almost 21% of respondents observed bad traffic management was a more crucial negative effect during the construction of Ring Road, while more than 29% of respondents responded bad traffic management was an unimportant issue among the residents of Halloki.

4. Conclusion

This research aims to evaluate the beneficiary assessment in two settlements along Lahore Ring Road. This study represents that most residents did not modify their houses or increase the built-up area and height after the introduction of the Lahore Ring Road. The rental potential was evaluated as high in DHA Phase 8 and Low in Halloki. This study shows that public facilities were not improved in both settlements. But the Lahore Ring Road project was beneficial for the residents of DHA Phase 8 and somehow beneficial for the residents of Halloki. The property's value was arisen due to the Lahore Ring Road project. This study evaluated that no disease was born/spread due to the project's construction in DHA Phase 8 and Halloki, respectively. The residents of DHA Phase 8 found that the behavior of the working staff was normal but found rude by the residents of Halloki. The residents of DHA Phase 8 demanded the beatification of Lahore Ring Road, whereas residents of Halloki required Motorcycle lanes in the Ring Road project. According to the residents of DHA, the management of the project was good, but Halloki residents said that the management was bad at the project's construction. Generally, more empirical research about beneficiary assessment is needed for the entire route of Lahore Ring Road. Community participation should be enhanced in such types of

megaprojects. And allied facilities in the nearby community should be upgraded at least in phases.

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