

Problems in Road Construction at Local Level

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Abstract

Any nation's infrastructure development encompasses social infrastructure as well as economic infrastructure, or the growth of diverse sectors. Simultaneously created social infrastructure can lead the economic infrastructure in total development at the appropriate level. The capabilities and technical advancement of social infrastructures like retail centers, restaurants, medical facility zones, and schools are well defined, as are the evolving requirements of economic infrastructures like roads, sewage, electricity, open spaces, and gardens. To maintain effective social infrastructure, it is necessary to develop sectors such as education, health, social security, water supply, housing, and sanitation.

The study would like to suggest that adequate budget allocation should be conducted during planning process; proper road design, implementation and effective procurement system should be carried out, and management of enough construction materials, suitable equipment, and coordination with local people should be performed. Furthermore, provision of drain while constructing rural road must be included during preparation of DPR along with the watershed management is necessary and establishment of laboratory for material test is necessary in Municipality to assure quality construction along with provision of training for the user committee to provide technical knowledge is necessary.

Keywords: Infrastructure, Development, Drains, Test, Roads

Introduction

As a landlocked nation, Nepal is among the least developed nations in the world. It has the total land area of 1, 47,516 Sq. Km, out of which nearly 23.1% (33998.8sq.km) of land lies in terai region and lies at an elevation of between 67m to 300m. Nepal has a population of 3, 01, 71,430 Sq. Km. and out of which 53% of population reside in the terai region (CBS, 2022).

Road plays vital role in primary infrastructure. Other primary infrastructure such as building, water supply, railways, electricity, telecommunication are dependently connected with roads. Development of road infrastructure is most importance in any country to provide essential facilities as well as crucial for economic growth and productivity (NPC-2013). In context of Nepal road development work faces too many challenges such as rugged topographic in mountains and hilly region and embankment and filling problem in terai region.

Providing high quality infrastructure at an appropriate level, is difficult job due to project delays, cost overrun, poor quality of materials and workmanship. On the other hand, this task has become even more challenging in the local level due to compound effect of demand and ambitions, more complex technologies, improper planning, environmental impact, low budget; socio-political pressure, procurement system and user committee etc. are elementary challenges for road infrastructure.

A road standard is a set of instructions or guidelines that engineers are supposed to follow. The majority of nations publish their own standards for roadway geometric design. The recommendations offer an excellent place to start for any new road design projects in their nation.

This local road network in the local level is merely under the jurisdiction of the Office of the District Development Committee (DDC) and technically assisted for its construction and maintenance by District Technical Office (DTO), a district level organization of DOLIDAR.

From the standpoint of construction methodology, rural road construction in Nepal can be divided into two categories. One type is the use of equipment like excavators and dozers for building roads, while the other type is the labor-based, environmentally responsible, and participatory (LEP) method to building roads. One way to improve safety, operations, and the cost-effectiveness of road infrastructure is through an effective geometric design process.

Study Area

On March 12, 2017, the government of Nepal put into effect a new local administrative structure. The study area, Shuddhodhan Rural Municipality is situated in Rupendehi district in Lumbini Pradesh of Nepal. 53417 people were residing in Shuddhodan as per the 2011 Nepal census. 26,258 (49.2%) of them are men, and 27,159 (50.8%) are women (CBS, 2011).

Methods

Mixed method was adopted during this research, the questionnaire of this study will be designed to get the reliable information about local practices in managing construction materials in construction projects. A structured questionnaire was used to collect the massive information for the proposed study. Total 135 questionnaires were distributed for data collection; among them 100 questionnaires will be returned back to researcher. A pilot study was conducted to evaluate the questionnaire by distributing the questionnaire to the selected respondents of different construction sites.

Literature Review

Introduction of infrastructure and road development:

Any nation's infrastructure development encompasses infrastructure as well as economic infrastructure, or the growth of diverse sectors. If the social infrastructure is not simultaneously created, the economic infrastructure cannot lead to total development at the appropriate level. The capabilities and technical advancement of social infrastructures like retail centers, restaurants, medical facility zones, and schools are well defined, as are the evolving requirements of economic infrastructures like roads, sewage, electricity, open spaces, and gardens. To maintain effective social infrastructure, it is necessary to develop sectors such as education, health, social security, water supply, housing, and sanitation (Meso et al., 2006).

Road classification

According to the Nepal Road Standards (Second Revision) 2050 of Department of Roads (DOR)/ Transport of Government of Nepal and Ministry of Works, roads are classified as follows:

- National Highway(NH)
- Feeder Roads(FR)
- District Roads(DR)
- Urban Roads(UR)

Village Roads (VR): According to the government's current policy, following 1993, the DDCs in question received control of the district and village level roadways. The Nepal Rural Road Standard (NRRS), which is applicable to all roads other than the "strategic road network" (i.e., national highways and feeder roads) and urban roads, was released by DOLIDAR in 1999.

Problem and issues of rural road construction in Nepal

The national road networks are still not accessible in fifteen districts across the nation. The fifteen districts that are not connected to the national road system are all located in a mountainous or hilly area. The Himalayas are one of the most complex fold mountain belts in the world and have some of the highest rates of erosion.

In humid subtropical and humid warm temperature zones, where quick rock weathering and significant rainfall act to cause land slide and erosion, the challenges given by unfavorable geology, topography, and land usage are rendered more accurate. So the country's geology must be properly taken into account when building. The country's topography and physical features make it challenging to create transportation infrastructure.

The geology of Nepal is fragile and is currently stabilizing. The natural environment might become unstable as a result of even a minor mistake. Numerous issues, both social and economic as well as environmental, can arise, particularly in the context of large-scale projects with wider catchments. The environment was not taken into account when planning and carrying out development operations in the past because the plans were made to increase economic value generation.

Rural development and local level government:

Infrastructures are back bone of development. Without development of infrastructure, life standard of people cannot be developed. For the proper life standard of people, local infrastructure such as road, water supply, electricity, buildings should be properly developed. Authority, responsibility, power, resources, and accountability are passed from the federal to the municipal and regional levels through the process of local governance.

Promoting excellent governance and forming partnerships with the local community, commercial sector, and governmental entities are the ultimate goals of local governance (Local Self Governance Act [LSGA], 1999).

Results

1 Construction problems

The result of response on construction problems is prepared in bar chart with construction problems in Y-axis and RII in X-axis(**Figure 1**).

The lack of proper training and instructions is most important problem (RII=0.78) and improper planning is least important problem (RII=0.59)(**Figure 1**).

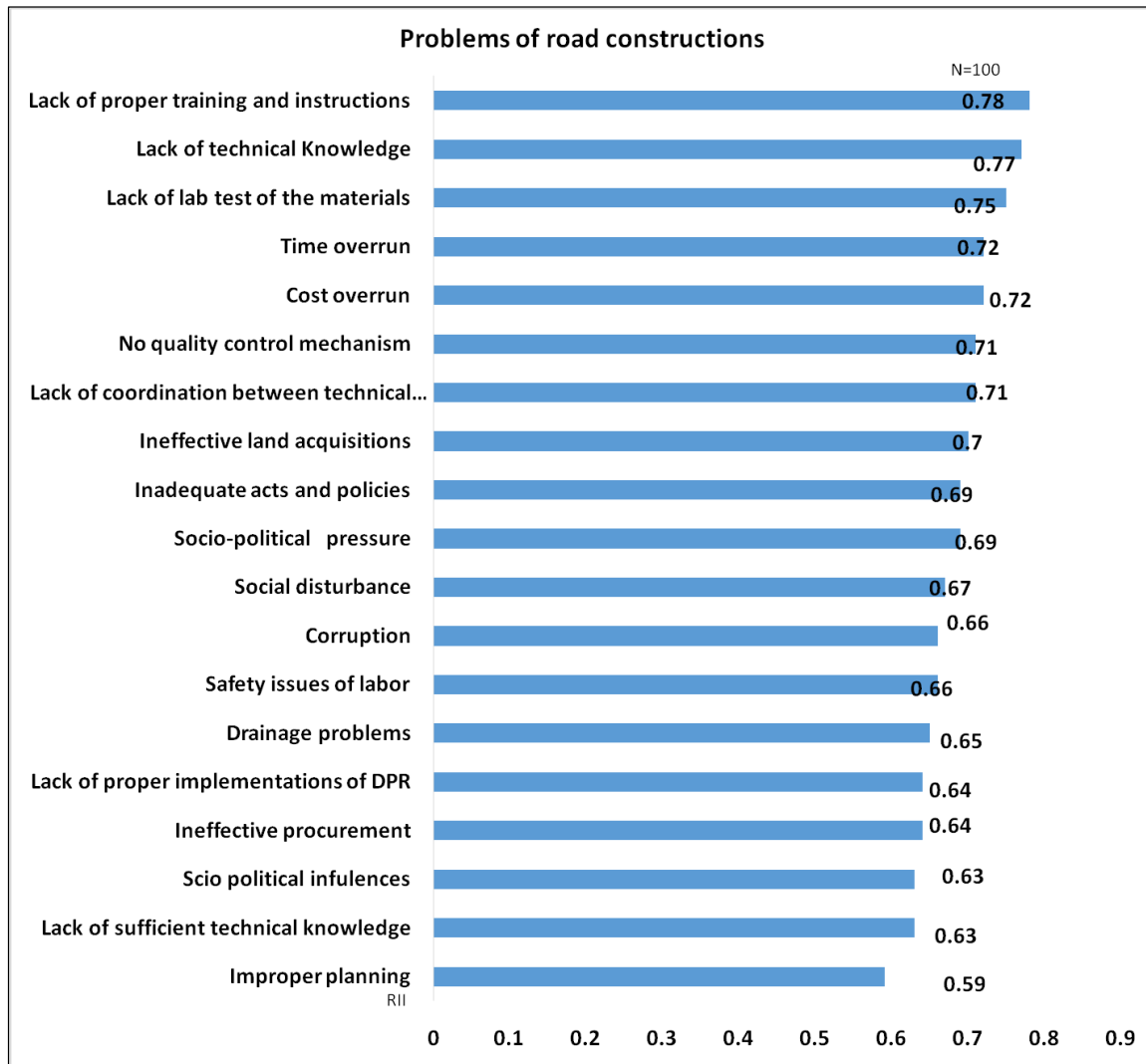


Figure 1 : Respondents on major construction problems(Field survey, 2022)

2 Causes of improper implementation of DPR

The result of response on causes of improper implementation of DPR is prepared in bar chart with causes in Y-axis and RII in X-axis (Figure 2).

The lack of detailed project planning is most important cause (RII=0.71) and failure to control procurement rules and regulations is least important cause (RII=0.68)(Figure 2).

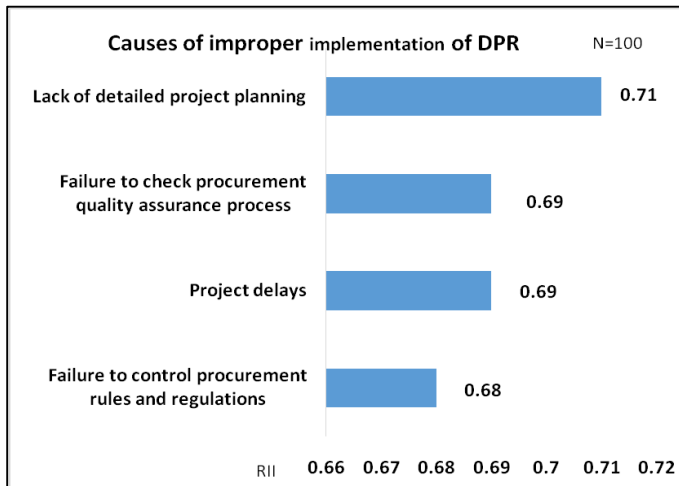


Figure2: *Respondents on causes of improper implementation of DPR*(Field survey, 2022)

3. Effects of improper planning of DPR

The result of response on effects of improper planning of DPR is prepared in bar chart with effects in Y-axis and RII in X-axis (*Figure 3*).

The no accurate data is most important effect (RII=0.74) and poor quality is least important effect (RII=0.69)(*Figure 3*)

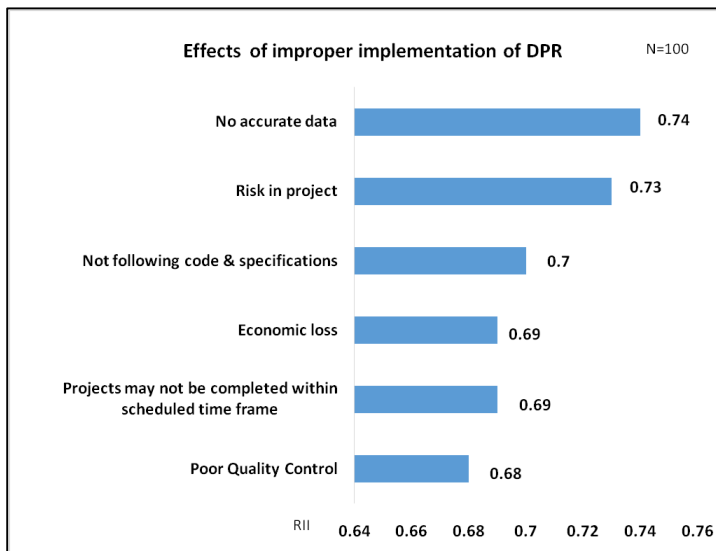


Figure 3: *Respondents on effects of improper implementation of DPR* (Field survey,2022)

4. Causes of Drainage problems

The result of response on causes of drainage problems is prepared in bar chart with causes in Y-axis and RII in X-axis (*Figure 4*).

The low level of public awareness is most important cause (RII=0.739) and insufficient capacity of drainage structure is least important cause (RII=0.724)(*Figure 4*).

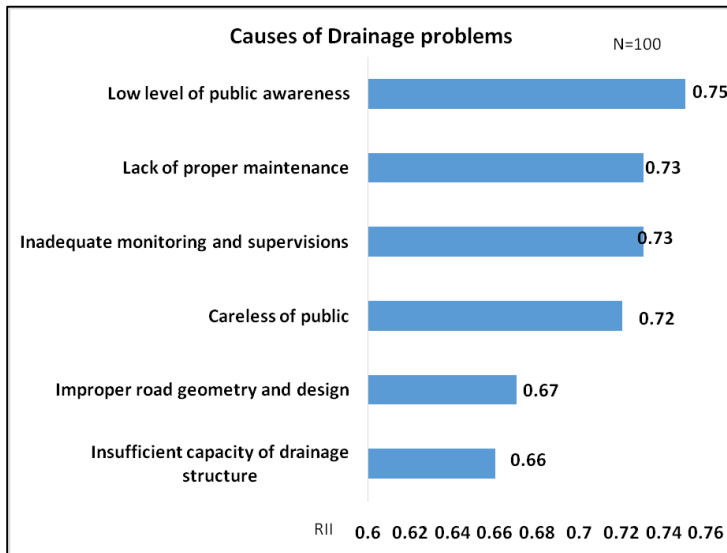


Figure 0: *Respondents on causes of drainage problems* (Field survey, 2022)

5. Effects of drainage problems

The result of response on effects of drainage problems is prepared in bar chart with effects in Y-axis and RII in X-axis (Figure 5). The increase in moisture content is most important effects (RII=0.75) and defunct of drains is least important effect (RII=0.67)(Figure 5).

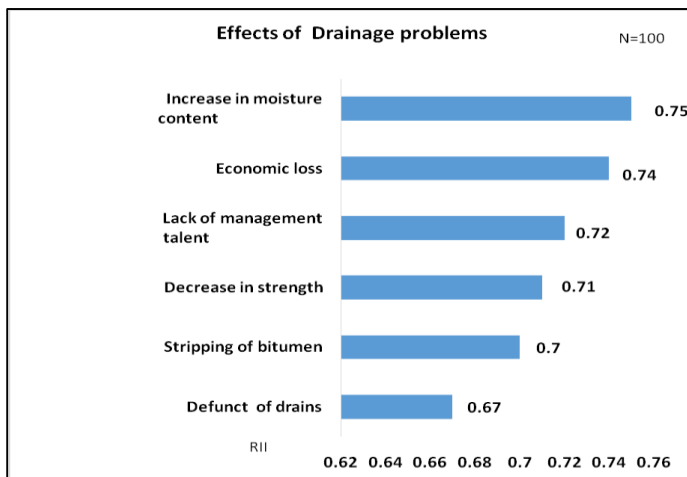


Figure 5 : *Respondents on effects of drainage problems* (Field survey, 2022)

6.. Causes of safety issues

The result of response on causes of social disturbance is prepared in bar chart with causes in Y-axis and RII in X-axis(Figure 6).The lack of awareness of PPE is most important cause (RII=0.732) and due to unfavorable weather and environment is least important causes (RII=0.726)(Figure 6).

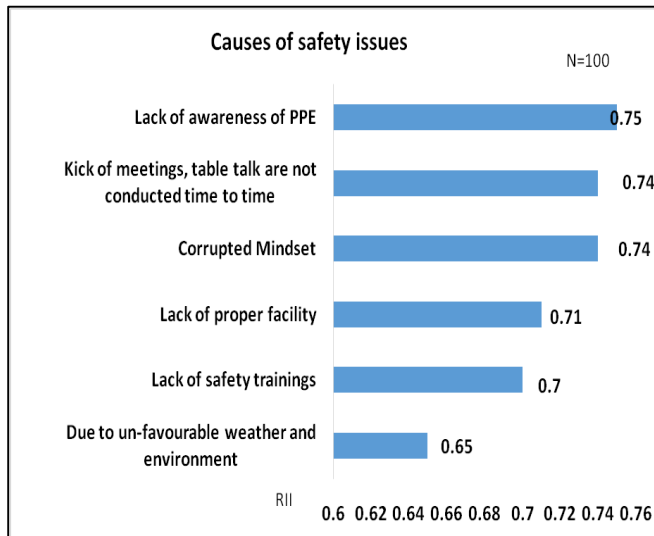


Figure6: *Respondents on causes of safety issues*(Field survey, 2022)

7. Causes of no quality control mechanism

The result of response on causes of no quality control mechanism is prepared in bar chart with causes in Y-axis and RII in X-axis (Figure 7). To no equipment lab in situ report cannot collect is most important cause (RII=0.73) and Proper training and instructions is least important cause (RII=0.69)(Figure 7).

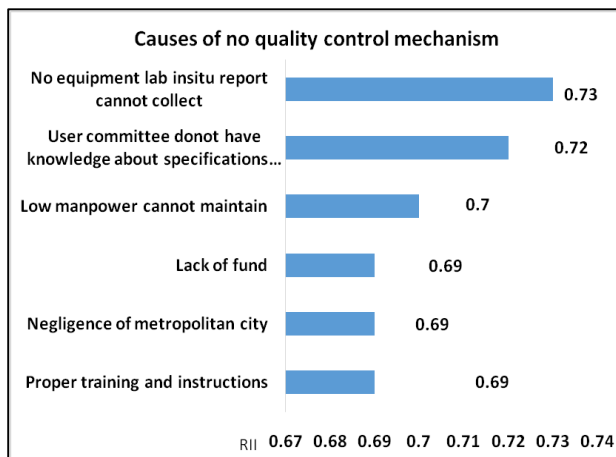


Figure 7: *Respondents on causes of no quality control mechanism* (Field survey, 2020/21)

8. Effects of no quality control mechanism

The result of response on effects of no quality control mechanism is prepared in bar chart with effects in Y-axis and RII in X-axis (Figure 8). The poor road design is most important effect (RII=0.74) and Negligence of metropolitan city is least important effect (RII=0.719)(Figure 8).

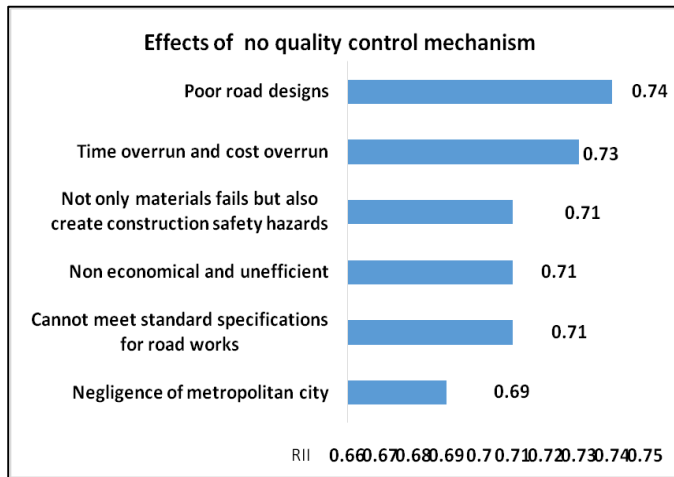


Figure 8: *Respondents on effects of* no quality control mechanism(Field survey, 2022)

9. Causes of cost overrun

The result of response on causes of cost overrun is prepared in bar chart with causes in Y-axis and RII in X-axis (Figure 9).Weak for policy is most important cause (RII=0.73) and corrupt mentality and incapable contractor is least important cause (RII=0.7)(Figure 9).

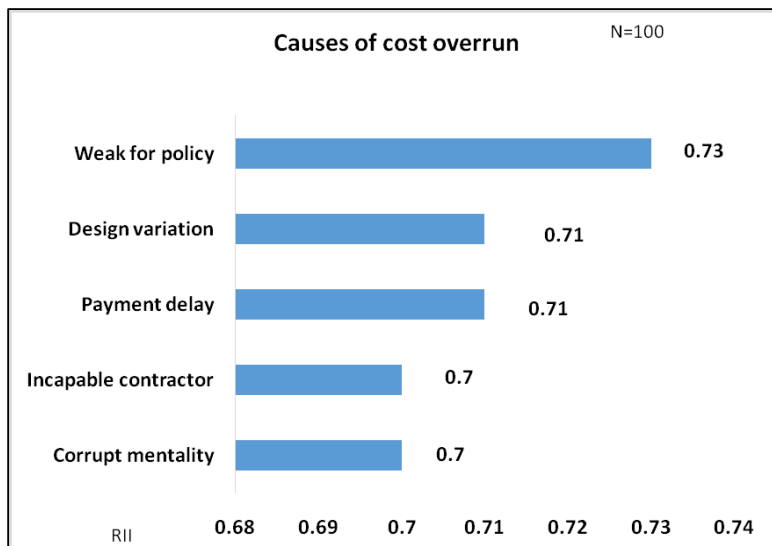


Figure 9: *Respondents on causes of* cost overrun (Field survey, 2020/21)

10.Effects of cost overrun

The result of response on effects of cost overrun is prepared in bar chart with effects in Y-axis and RII in X-axis (Figure 10).The slow development is most important effect (RII=0.73) and failure of future plan is least important effect (RII=0.67)(Figure 10).

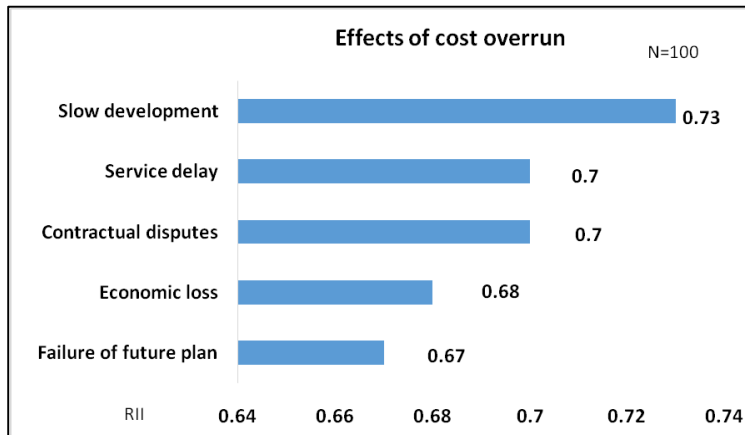


Figure 10 *Respondents on effects of cost overrun* (Field survey, 2022)

Conclusion

Based on field observations, in-depth interviews, focus groups, questionnaire surveys, and analyses of respondents' collective opinions using the Relative Importance Index (RII) method, the study examined construction problems, their causes, and effects in the Rural Municipality of Suddhodhan, Rupandehi, Nepal. The following conclusions are stated below according to road users and technical people based on survey and data analysis.

New tracks are opened in a haphazard way without doing feasibility study and EIA/IEE. As there is no adequate budget to prepare feasibility study and EIA/IEE report.

Sometimes engineer and sub engineers were pressurized by the representatives of the municipality to carry out the job beyond engineering rules and regulations. Thus, while preparing work completion report, sometimes users committee perform the work lesser than the estimated quantity. No seriousness in the procurement by the users. There is a problem of budget allocation in the multiplicity for the construction of qualitative work. Similarly, no lab test reports are submitted to the concern authority during construction of the work. Furthermore, there is no proper quality assurance plan (QAP) in the municipality. As a result, the work is not qualitative and the progress is slow. The main cause of slow work progress is poor construction material and main effects are cost overrun. Similarly, there is a problem of payment delay is due to lack of good communication between contractor and client. This accelerating the change.

Recommendations

- Adequate budget allocation should be conducted during planning process
- Appropriate road design, implementation and effective procurement system should be carried out,
- Management of enough construction materials, suitable equipment, and coordination with local people should be performed,

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- Establishment of laboratory for material test is necessary in Municipality to assure quality construction,
- Provision of training for the user committee to provide technical knowledge is necessary,
- Further research could be carried on Socio-economic study in this study area.

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