

RESEARCH ARTICLE

IMPACT OF SMALL RURAL INFRASTRUCTURE ON LIVELIHOOD (A STUDY OF KUDARI WARD OF TILA RURAL MUNICIPALITY, JUMLA, NEPAL)

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ABSTRACT

Proper development and management of small infrastructure in the rural area ensure livelihood welfare. The study was conducted in the Kudari ward of Tila rural municipality, Jumla district to examine the impact of small rural infrastructure on livelihood. The study focus to find out what types of effect occur after the infrastructure is built and what and how many opportunities grab by the local people after the project implementation. The research was conducted with a structured questionnaire with respondents. Exploratory and descriptive research design and random sampling procedure of the survey were conducted in 76 households of the Kudari ward. About 10 percent of a household were selected from a total households of the ward. Both qualitative and quantitative data were collected and analyzed by using computer software excel and SPSS. The analyzed data were reflected in the form of a graph, pie chart, percent and frequency. The majority of male respondents were 17-60 years of age category and lived in a nuclear family size. Brahmin, Chhetri and Dalit were the major caste group in the study area. Most households jointly decided on activities. Most of the essential infrastructures like schools, roads, bridges, drinking water; irrigation, health posts etc were built in the study area. Different government and non-government agencies like WFP, PAF, and KEP were involved to build infrastructure. A different opportunity was grabbed by local people in income-generating activities at a local level but some respondents argued increased road accidents after infrastructure development. As a result, this sort of development program has a positive impact on the livelihood of the people of the Kudari ward.

KEYWORDS

Rural area, Rural infrastructure, Rural Livelihood, Rural development Rural agencies

1. INTRODUCTION

Small rural infrastructure development practices in Nepal began with the first comprehensive program known as the Tribhuvan Village Development Program, which initiates in 1952 with the guidance and support of two major donors, the United States and India. This program was divided into three levels, with the lowest level referred to as "nucleus development" aimed to improve local infrastructure and facilities such as schools, playgrounds, roads etc. Before first five-year plan, a group of local people had been involved in the development of small rural infrastructure, also known as "Kulo banaune", "Goreto banaune" and so forth. Small rural infrastructures consist of roads, footpaths, mule paths, small bridges, culverts, rural drinking water, irrigation ponds, irrigation canals, planting of cash crops, and buildings (schools, health posts). One of the main causes of Nepal's high rate of rural poverty is the country's isolation and lack of access, which are exacerbated by the lack of properly maintained local roads and bridges that connect them. Lack of access (in the absence of motorable bridges) poses a serious barrier to economic and social development and results in high costs for individuals (such as travel, healthcare, and inflated prices for basic goods). Since there are no motorable bridges over the rivers during the monsoon and a sizable portion of the rural road network effectively closes (Pande, 2017). The Jumla district has been categorized by the government as one of the ninth backward districts of Nepal and is located in the North West part of the country. Geographic isolation and poverty are the main factors limiting Jumla's development, and people face a variety of difficulties in their daily

lives. The district contains 293 wooden bridges in addition to 14 suspension bridges. Nepal Telecom, Hello Nepal, and N-cell provide connections to telecommunications services for every rural municipality. Micro hydropower plants in Jumla generate approximately 526kw of electricity (DDC, 2013). Small-scale rural infrastructure development has been practiced at every stage, but due to a lack of effective coordination between various agencies and locals, rural societies are not accumulating its benefits. As a result, the studies examined how the livelihood of Kudari village in the Jumla district was affected by small-scale rural infrastructure and the extent to which disadvantaged and vulnerable groups of people benefited from it.

2. MATERIALS AND METHODS

2.1 Study Sites of Small Infrastructure

Jumla district is situated in the Karnali zone having a total area of 2531 sq. km. The district is surrounded by Dolpa in the east, Kalikot in the west, Mugu in the north and Jajarkot district in the south. The district is situated in Longitude between 81° 28' E to 82° 18' East and Latitude between 28° 58' N to 29° 30' North. Geographically the district is divided into three distinct regions from north to south, viz higher Himalayan region, Higher Mountain and Mid Mountains. The elevation of the district is range from 915 to 4679 m from the mean sea level. The average temperature varies from 12^{0c} to 30^{0c} in summer and -11^{0c} in winter with the annual rainfall ranging between 667 mm to 852 mm (DDC, 2009). Kudari ward of Tila rural municipality of Jumla district was selected as the study site. The

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average household size was 5.81 and which is 20 percent higher than the figure in Nepal (CBS, 2011). The climate in the study area ranges from subtropical to temperate, and most residents operate orchards of temperate fruits such as apples, peaches, and walnut. Medicinal herbs and legumes are also popular and have been transported to Surkhet, Nepaljung, and other districts. The commodities are also exported to India from the Jamuna border, where it generates a higher price, resulting in a higher economic return.

2.2 Research Design

This study followed exploratory and descriptive research design to study the impact of small rural infrastructure on the livelihood of Kudari Ward. According to Shields and Rangarjan (2013), exploratory research is conducted to problem study more clearly, to establish priorities, to develop operational definitions and to improve the final research design. This method is also appropriate where causal relationships are to be established, where multiple sources of evidence are examined and the researcher has little or no control over events (Lundquist, 1999). Descriptive research involves the collection of data to answer questions

concerning the current status of the subject under study.

2.3 Nature and Sources of Data

The study used both primary and secondary sources based on quantitative as well as qualitative data. The primary data were collected from, structured questionnaires related to small rural infrastructure and its impact to get accurate and actual information, observation, and structured interview. Secondary data sources, on the other hand, were used to review the literature on the importance of small infrastructure to socio-economic development, theories of small-scale business growth, among others and reviewed from different published and unpublished records, news reports, books, booklets, leaflet, journal, articles from different institutions.

2.4 Universe and Sampling Procedure

The study covered the role of small infrastructure in livelihood in the Kudari ward. A total of 76 households of respondents were selected. Simple random sampling methods were conducted to perform the study.

Table 1: Universe and Sampling Procedure

Target population	Samples	Research Design	Sampling Procedure	Instrument/ Technique
The livelihood of Kudari ward	76	Exploratory and descriptive research design	Simple Random	<ul style="list-style-type: none"> Household questionnaires personal interviews observation Focus group discussions

2.5 Data Collection Method and Tools

The data were collected systematically by adopting different tools and techniques such as structured questionnaires, unstructured interviews, key informant interviews, focus group discussion and observation.

2.5.1 Household Survey

A structured questionnaire was prepared to generate realistic and accurate data from respondents who were requested to fill up the questionnaire. Altogether 76 households were interviewed during the study. A questionnaire was based on small rural infrastructure and its impact on livelihood. The questions were asked to beneficiaries of the infrastructure program implemented in the ward and the answer was filled up. The data were collected through formal and informal interviews using structured questions.

2.5.2 Key Informant Interview

For key informant interview unstructured one-one directed conversations was held with infrastructure development committee members, social workers, local-level political leaders, and village group members. Key person interview was conducted among fifteen people related to the infrastructure and its impact. Although both women and men were interviewed as key informants, the information provided by those people was considered very reliable in many aspects.

2.5.3 Field Observation

The researcher visited several times to observe the activities and services of local people through the developed small rural infrastructure. During

the period of fieldwork, a researcher observed the condition of the infrastructure and noted relevant information.

2.5.4 Focus Group Discussion

The focus group discussion was held with the active participation of beneficiaries, local people, members of an organization, members of the infrastructure development committee and technical persons were gathered for the purpose. Related unstructured questions were asked to make the study more reliable.

2.6 Data Analysis and Presentation

The collected data were edited, coded manually and analyzed with the use of SPSS and excel on a computer. Data collected was presented in the form of tables and charts after critical analyses were made, using percentages and frequency distributions.

3. RESULT AND DISCUSSION

3.1 Socio-Demographic Characteristics

3.1.1 Age and Sex Structure of Respondents

The age composition of respondents ranged from 0-5 years to 60 and above. Approximately 13.5 percent of males and 15.1 percent of females were under the age of five. The age groups of 6 to 16 years were represented by 32.2 percent and 41.5 percent of male and female respondents, respectively. Male respondents predominately fell into the 17-60 age groups. Similarly, the majority of respondents were over 60 years old, with 12.1 percent being male and 8.3 percent being female.

Table 2: Age and Sex Structure of Respondents

Age Category	Number of HH Members	
	Male	Female
0-5	27 (13.5)	31(15.1)
6-16	64 (32.2)	85(41.5)
17-60	84(42.2)	72(35.1)
60 above	24 (12.1)	17(8.3)
Total	199 (100.0)	205 (100.0)

Source: Field Survey, 2018

3.1.2 Family Size of the Respondents

The study revealed that the ward had medium family sizes. About 46.1 percent of respondents had a medium-sized family, while 36.8 percent had a small family of fewer than 5 members. It was not surprising that some of

the respondents lived under the same roof with more than seven people. Large family sizes were reported by the minimum number of respondents (17.1%). These patterns demonstrate that respondents gradually shifted their preferences from joint families to nuclear families.

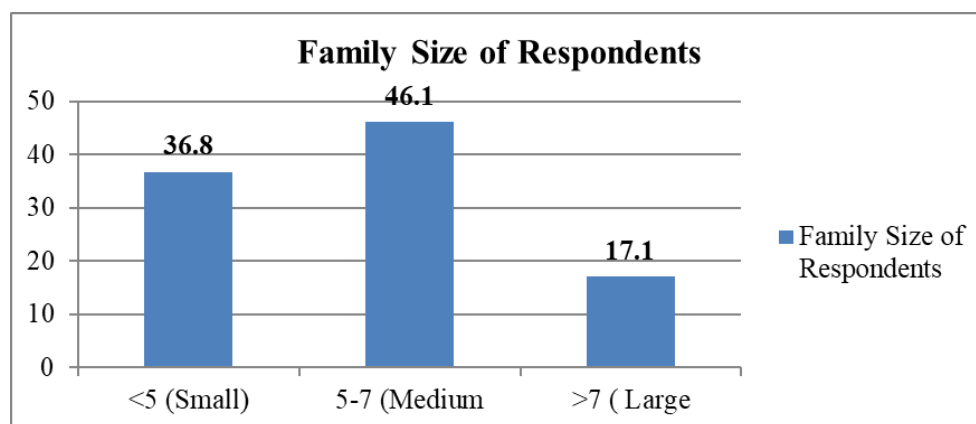


Figure in parenthesis indicates percentage. Source: Field Survey, 2018

3.1.3 Family Structure of the Respondents

Joint and nuclear family structures were classified as family types. About 42.1 percent of respondents had a joint family, while 57.9 percent had a nuclear family.

3.1.4 Educational Levels of Respondents

The educational status of respondents reveals that approximately 8 respondents (10.5 percent) did not have formal education. About 48.7% of respondents had only completed their primary education, while 28.9 and 1.9 percent had completed secondary and higher education, respectively.

3.1.5 Ethnicity of Respondents

The majority of respondents were Brahmins (44.7 percent) dominated the major caste group in the study area. Similarly, 30.2 percent of respondents were Chhetri and 21.2 percent were Dalit while very few (3.9 percent)

respondents were from Janajati group. However, the population in this district is dominated by Brahmin and Dalit (DDC, 2013) but a recent study shows the Chhetri ethnic groups become the second highest position in the study area.

3.1.6 Main Income Source of Sampled HHs

In the population, 31.6% of people reported that their primary source of income was from farming, 22.4% reported that their primary source of income was from business, 18.4% reported having a source of income from remittances, 11.8% reported having jobs at various public and private organizations, and 15.8% reported having other sources of income for their household.

3.1.7 Approximate HHS Income

A little over 56 % of the sampled households had annual incomes of more than Rs. 50,000, compared to 43.4 percent of households with annual incomes of less than Rs. 50,000.

Table 3: Family Structure of the Respondents in Kudari Ward of Jumla

Family structure	Frequency	Percent
Joint	32	42.1
Nuclear	44	57.9
Total	76	100.0

Source: Field survey, 2018

Table 4: Educational Attainment of the Respondents in the Kudari Ward of Jumla

Education level	Respondents Frequency	Percentage
Illiterate	8	10.5
Primary	37	48.7
Secondary	22	28.9
Above secondary	9	11.9
Total	76	100.0

Source: Field survey, 2018

Table 5: Ethnicity of Respondents in Kudari Ward of Jumla

Ethnicity	Frequency	Percent
Brahmins	34	44.7
Chhetri	23	30.2
Janajati	3	3.9
Dalit	16	21.2
Total	76	100.0

Source: Field Survey, 2018

Table 6: Main Income Source

Respondent occupation	Number of Respondents	Percentage
Agriculture	24	31.6
Business	17	22.4
Employment	9	11.8
Remittance	14	18.4
Others	12	15.8
Total	76	100.0

Source: Field survey, 2018

Table 7: Approximate Annual Household Income

Indicators	Frequency	Percent
Less than 50 thousand	33	43.4
More than 50 thousand	43	56.6
Total	76	100.0

Source: Field Survey, 2018

3.1.8 Food sufficiency of HHs

The household's food sufficiency was classified as less than 3 months, 12 months, or surplus. Only a small percentage of households (5.2%) have reported being able to feed their families for 12 months or longer. The majority of respondents had food sufficiency for 3 to 6 months, followed by 6 to 9 months (27.6 percent), 9 to 12 months (17.1 percent), and 10.5 percent had food sufficiency for less than 3 months. Since the majority of households lack food, they must depend on other sources of income to support their families.

3.1.9 Decision-Making of Household

In a household, decisions were made by both males and females. Only those decided by a man were twice as high as those decided by a woman. According to studies, 55.3 percent of males and females jointly make household decisions. The percentage of male respondents who participated in individual decision-making was 30.2%, compared to 14.5 percent for female respondents. Due to the male head of the household being employed abroad or being a widow, decisions about the household were made by a female person.

Table 8: Food Sufficiency of HHs

Food sufficiency months	Frequency	Percent
Less than 3 months	8	10.5
3 to less than 6 months	30	39.5
6 to less than 9 months	21	27.6
9 to less than 12 months	13	17.1
12-month or surplus	4	5.2
Total	76	100.0

Source: Field Survey, 2018

Table 9: Gender in Decision-Making of HHs

Indicator	Frequency	Percentage
Male	23	30.2
Female	11	14.5
Both	42	55.3
Total	76	100.0

Source: Field Survey, 2018

3.2 Infrastructure Built in the Study Area

Among the 76 respondents, 60.5 percent claimed a rural road had been built, 51.3 percent claimed a mule/foot trail, and 50 percent claimed drinking water. Similarly to this, 31.6 percent of respondents support building toilets, followed by support for building schools and irrigation systems at 27.6 percent and 25 percent, respectively.

similar vein, the ward supplied a total of 64% of inputs (cash and materials). DDC also contributed 32% of the cash, 67% of the materials, and 1% of the labor. I/NGOs contributed cash (83%) and materials (17 percent). As a result, the study discovered that various agencies played a supportive role in the development of various rural infrastructures.

3.2.1 Supported Agencies to Build the Infrastructure

Financial contributions by I/NGO were highest (83 percent) compared to other agencies involved in the study area, while labor contributions by the community were highest (99 percent). DDC provided all of the inputs. In a

3.2.2 Mainly Benefited from Developed Infrastructure

Around 35.5 percent of all targeted people benefited, and 47.4 percent of sampled HHs argue that developed infrastructure benefited the majority of the targeted people. Only 17.1 percent of respondents claim that the community's developed infrastructure benefited a few of the targeted people.

Table 10: Infrastructure Built-in Study Area

Infrastructure	Total Respondent	Respondent Frequency	Percentage
Rural Road	76	46	60.5
Irrigation	76	19	25.0
Mule/Foot trail	76	39	51.3
Drinking Water	76	38	50.0
Support for School Constriction	76	21	27.6
Toilet Construction	76	24	31.6

Source: Field Survey, 2018

Table 11: Inputs Supported by Agencies

Agencies	Inputs			
	Cash (%)	Materials (%)	Labor (%)	Total (%)
Community	1	-	99	100
Ward	13	51	-	64
DDC	32	67	1	100
I/NGOs	83	17	-	100

Source: Field Survey, 2018

Table 12: Benefited from Developed Infrastructure

Indicator	Frequency	Percentage
Entire targeted people in the community	27	35.5
Most of the targeted people in the community	36	47.4
Few targeted people in the community	13	17.1
Total	76	100

Source: Field Survey, 2018

3.3 Impact of Small Rural Infrastructure on Livelihood

3.3.1 Impact on Seasonal Migration

The main reasons for seasonal migration were a lack of employment opportunities, education, natural disasters, and family responsibilities. Approximately 55.3 percent of respondents contend that seasonal migration has decreased, 27.6 percent contend that seasonal migration has increased, and 17.1 percent contend that seasonal migration has remained constant.

3.3.1.1 Reason for Seasonal Migration

The majority of respondents were seasonal migrants seeking education and training (70.8 percent). Similarly, respondents (4.17 percent) migrated due to natural disasters and job opportunities (4.5 percent). Because of family obligations, the respondents were seasonal migrants.

3.3.2 Impact on Local Food Market

The market is a key indicator of development and one of the most basic parameters for people's livelihoods in rural areas. The research seeks to determine the impact of the infrastructure development project on the local market. Approximately 42.1 percent of respondents claimed that the number of traders increased after infrastructure was built, followed by the

new market and no impact on the market at 27.6 percent and 9.2 percent, respectively. Only 3.9 percent of respondents argued about price increases and insufficient food supply (2.6).

3.4 Changes Bought Through Infrastructure

The majority of respondents argued that changes in transportation facilities brought more economic activity to the study area, and 60.2 percent of respondents believe that changes in market accessibility brought more economic activity to the study area. Comparable respondents report an increase in economic activity (38.2 percent), followed by an increase in traffic accidents and an increase in household expenses (36.6 percent and 31.6 percent, respectively). It demonstrates that changes brought about by infrastructure development have both positive and negative effects on the livelihood of the people in Kudari ward.

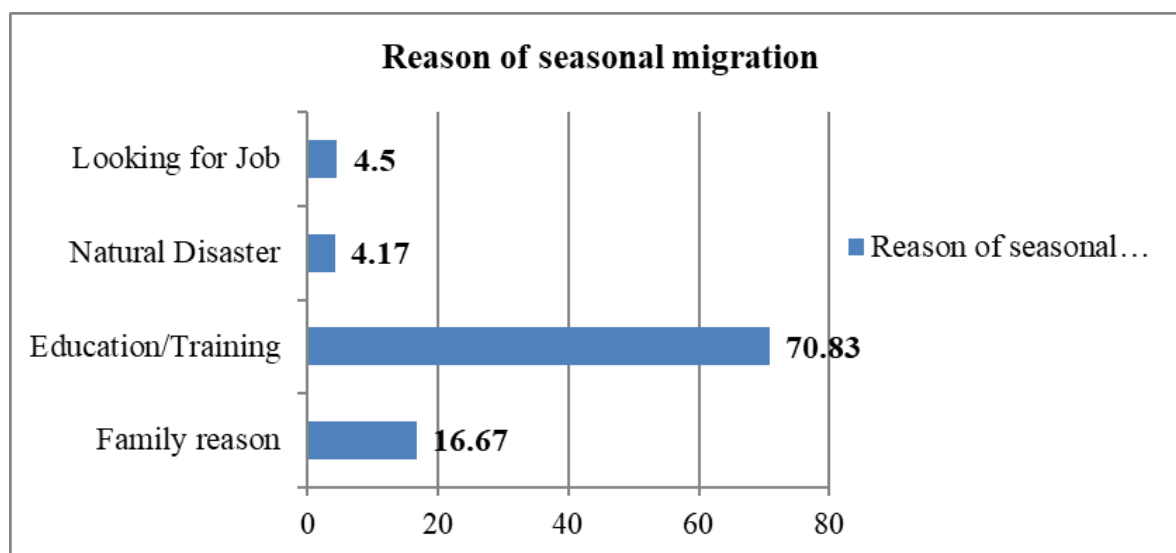
3.5 Benefits from the Developed Infrastructure

As a result of a rise in household income, 67.1 percent of the sampled HH accomplished benefits. Similarly, 63.2 percent of respondents argued for an increase in health and sanitation, followed by 61.8 percent for improved market access and 51.3 percent for increased employment opportunities. Similarly, only 19.7 percent of respondents advocated for less seasonal migration.

Table 13: Infrastructure Impact on Seasonal Migration

Indicators	Frequency	Percent
Increase	21	27.6
Decrease	42	55.3
Remain same	13	17.1
Total	76	100.0

Source: Field Survey, 2018

**Table 14: Infrastructure Impact on Local Market**

Impact Indicators on Local Food market	Total Respondent	Frequency of Respondent	Percent
Insufficient food supply	76	2	2.6
Increased availability of food	76	41	53.9
Increase in the number of traders	76	32	42.1
New markets	76	21	27.6
Price hiking	76	3	3.9
Remain same (No impact)	76	7	9.2

Source: Field Survey, 2018

Table 15: Changes Through Infrastructure

Changes Bought in Variables	Total Respondent	Respondent Frequency	Percent
Transportation facility	76	51	67.1
Increased in road accident	76	28	36.8
Market accessibility	76	46	60.2
More economic activity	76	29	38.2
Increased household expenses	76	24	31.6
Deforestation	76	16	21.1

Source: Field Survey, 2018

Table 16: Benefits from Infrastructure

Indicators	Total Respondent	Respondent Frequency	Percent
Increased income	76	51	67.1
Increased employment opportunities	76	39	51.3
Improved market access	76	47	61.8
Reduce a seasonal migration	76	15	19.7
Improved health and sanitation	76	48	63.2

Source: Field Survey, 2018

CONCLUSION

WFP and DDC unit RCIW carried out and assisted infrastructure development programs. The program had a very positive and appropriate impact because the involvement of local people in the empowerment process was increased. They used local labor to pay for infrastructure development at the appropriate labor rate. The involvement of locals increased income-generating activities. The livelihood lifestyle was altered following the implementation of a small rural infrastructure program. Infrastructure such as mule/foot trails, irrigation channels, toilet construction, and school building construction was built, allowing people in the surrounding area to change their livelihood strategies. They were moving in the direction of industrial agriculture, commerce, and employment. Infrastructure improved access to health care, education, and market access, allowing people to meet their basic needs while increasing land productivity. This situation has the potential to broaden the scope of commercial farming, leading to more job opportunities and a reduction in the need to migrate for seasonal work. People were more aware of their rights and gender discrimination, particularly among women and Dalits.

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