

Impact of Mobile Telecommunication Access on Porters' Living Standard: A Study based on Street Porters in Kathmandu City

Sabin Shrestha^{1*}, and Ravi Kumar Prajapati²

Abstract

This paper examines how telecommunication access has affected the living standard of street porters and what are their mobile telecom service usage. The study used income, expenditure, saving, and factors affecting these variables to assess the change in living standard of street porters. The study used descriptive and explorative research design with a before-after approach. Primary data obtained from 440 street porters using purposive random sampling method was used. Both telephone questionnaire and interview schedule consisting comprehensive 54 items were administered. The tools of analysis used were descriptive statistics and inferential parametric (t- test, paired t- test) and non-parametric statistics (McNemar test). The study found that street porters use voice service mainly to talk to family and to take load orders. More than half of the sample (56%) were found to use less than 5 minutes call per day on average with 5 to 10 call counts for load per day. The study also found that mobile communication access has increased the income per day, expenditure per day and monthly saving of street porters. Further, the study also found mobile communication has enhanced the income generating factors like efficiency of street porters, bargaining power, market exploration and reduction in travel and search cost. Based on the analysis of income and expenditure, the study concluded that mobile communication access has improved the living standard of street porters.

Keywords: telecommunication, access, living standard, street porters, paired t test

Article Information

Received: 2023-05-08 Reviewed: 2023-05-21 Revised: 2023-06-26 Accepted: 2023-06-29

*Corresponding author, Email: sabinshrestha3@gmail.com

Orcid: <https://orcid.org/0000-0002-7356-8954>

Cite this article as:

Shrestha, S., & Prajapati, R.K. (2023). Impact of mobile telecommunication access on porters' living standard: A study based on street porters in Kathmandu City. *Janabhawana Research Journal*, 2(1), 73-87.

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¹ Officer at Ncell Axiata Limited

² Research officer at Confederation of Nepalese Industries (CNI)

Introduction

Telecommunication has affected every sphere of daily life. The use of telecommunication services has aided almost every person in daily activity whether that be just chatting on the phone or making call for order placing or be the business call for business dealing. Every sector and section of society is almost equipped with mobile handsets and the telecommunication service has become a necessity for all. This is partly due to the emergence of private telecom operators, easy accessibility of telecom service and easy affordability of mobile handsets. Availability of handset for different ranges of price from highly premium price to low- price have increased tele density in developing countries including Nepal.

The last decade has seen tremendous growth in mobile phones and mobile phone use in developing countries. Mobile cellular technologies have enabled even the poorest countries to extend telecommunication network coverage to the mass of their populations including the rural poor (Martin, 2010). Several recent reviews of practice have revealed widespread application of mobile phones in support of livelihoods in rural and less- developed regions of developing countries. Reviews from South Asia (De Silva, 2008) identify mobile phones as a key innovative technology in support of livelihoods, with evidence of growing integration into agricultural extension, information provision and marketing systems. Mobile phones in support of livelihoods are not restricted to agriculture but include new forms of micro- financial service provision and micro- enterprise support, and data gathering and dissemination for projects concerned with social development covering education, health, the environment, and humanitarian relief in response to disasters and emergencies.

Nepalis not exception to witness the growth of increased mobile telecommunication access. With the emergence of private sector involvement in mobile telecom service, access to telecommunication services is growing rapidly as evident from the tele density of more than 140 % in Nepal (Nepal Telecommunication Authority, 2022). Mobile handsets and mobile telecommunication have become necessity to Nepalese people. People from low-income groups to high income groups in every part of the economy, especially in urban areas, have access to mobile telecom services.

In the broader perspective, the progress of commercial companies along with whole economy expressed by the growth of labor productivity is presumed to be caused by the progress in the field of telecom and information technology. There is a strong impact of telecommunication upon the economic development of a country. But at the micro level also, access to telecommunication has increased the living standard and earning capacity of individual people. Telecommunication has not only helped to increase the income and earning of trader, business-people and the professionals, it has also aided farmers, and people with elementary occupation including porters, doorkeepers, street vendor, messenger to mention few (Sife, Kiondo, & Lyimo-Macha, 2010).

Very little study related to agriculture, livelihood and telecommunication have been carried out. However, there is no study carried out, at least in Nepal, to show the relationship between telecommunication and income of elementary occupation specifically street porters. Street porters are the elementary occupation holders who carry goods and luggage of end customers and general shop including wholesaler, retailer and distributor of consumer goods and services.

The present study has been directed towards identifying the relationship between mobile telecommunication access and street porters' living standard. The study tried to explain how telecommunication access has changed the earning of the street porters. The study assessed different uses of telecommunication in their daily life. The objective of the study is to examine the different usage of mobile telecom services and mobile phone by street porters, to examine the income of street porters' before and after mobile telecommunication access; and to examine the consumption expenditure of street porters before and after mobile telecommunication access.

Hypotheses

The following hypotheses have been formulated to evaluate the impact of mobile telecommunication access on street porters' living standard.

H₁: There is significant change in income of street porter's before and after access to mobile telecommunication.

H₂: There is significant change in consumption expenditure of street porter's before and after access to mobile telecommunication.

Literature Review

Beuermann (2010) conducted research in rural Peru to examine the effects of providing public payphones to highly isolated villages. The study found that access to telecommunications technologies led to increased agricultural productivity and reduced child labor. After the installation of payphones, farmers' earnings from agricultural production increased by 16% and agricultural costs decreased by 23.7%, resulting in a 19.5% overall increase in agricultural productivity. The availability of phones also led to a decrease in child labor, with a reduction of 31.9% in child market work and 26.3% in child agricultural work. The study concluded that improved telecommunications access positively impacted agricultural productivity and reduced the reliance on child labor. De Silva et al., (2008) conducted a study across five Asian countries to assess the economic benefits of telecom access for individuals at the bottom of the pyramid (BOP). The study found that telecom access at the BOP provided a sense of security during emergencies, helped maintain social relationships, and had financial benefits such as increased income-earning ability and cost savings. It also improved daily efficiency and facilitated contact with others, leading to relationship maintenance and a feeling of connectedness. Additionally, telecom access at the BOP was perceived as a source of security in times of conflict, illness, or accidents.

Duncombe (2014) conducted a study on the impact of mobile phones on the livelihoods of developing countries. The research showed that mobile phones facilitate the substitution of assets, such as using mobile phone airtime instead of transportation costs. The study demonstrated that better communication through mobile networks reduces travel frequency, time, and expenses, and enables quicker responses to emergencies. Mobile phones also contribute to asset enhancement by improving efficiency in resource utilization, conducting social and productive activities, information search, and coordinating local agricultural value chains. Lola et al. (2012) studied the impact of mobile telecom on household income generation and business expansion in southwest Nigeria. The findings revealed that mobile telecom

reduced transportation and information costs, improved market access, and boosted income generation and business expansion. It also facilitated easier business transactions, resulting in higher productivity and improved living standards.

Martin (2010) conducted research on impact of mobile uses on small to medium size farm holders in Kamuli district of Uganda. The study was of qualitative nature and sample respondents consisted of 110 farmers (56 men and 54 women). For the sampling, purposive and snowball sampling was used. A semi-structured in-depth interview was conducted to uncover the research questions. The study showed more than half of the farmers were using mobile phones to coordinate access to agricultural inputs, obtain market information, and to monitor agriculture emergency situations and financial transactions and slightly less than half were consulting with experts via mobiles ultimately leading to enhancement of livelihood. Mittal and Mehar (2012) conducted a study on the impact of mobile phone access on small farmers. The study found that mobile phones met the agricultural information needs of farmers, improved market connectivity, increased farm income, and reduced production costs. The study revealed that mobile phone access enabled better market connectivity and allowed farmers to adjust their supply based on market demand predictions, resulting in higher revenues. Mobile phones also reduced the time and cost associated with information search and transportation, increasing the efficiency of farmers, and allowing them to engage in other productive activities.

Mramba, Sutinen, Haule and Msami (2014) conducted an exploratory study on mobile phone usage among street vendors in Dar Es Salaam, Tanzania. The study found that mobile phones were commonly used by street vendors for basic services such as voice calls and SMS. Voice calls were preferred for their ease of use and quick responses, while SMS was convenient and widely used due to its affordability. Street vendors sent and received an average of 35-40 SMS per day. The study revealed that most mobile phone usage among street vendors was for social purposes rather than business affairs. However, vendors utilized their phones to gather information from suppliers, communicate with customers and fellow traders, and stay informed about market trends, stock availability, and appointments. Mobile phones proved beneficial in reducing the need for physical travel and enhancing business efficiency for street vendors.

Conceptual Framework

Telecommunication access can have an impact on the following component that is directly or indirectly related to the living standard of porters.

- **Increased Efficiency and Work Opportunity**
De Silva et al., (2008) found in India, Pakistan and Philippines that more than 60 percent engaged in agriculture felt that access to telecom improves both the efficiency of their daily activities as well as improving their ability to earn or save more. Telecommunication access can increase the efficiency of porters. The use of a phone by a porter to keep informed about hires is an example. They can have better and increased work opportunities. For example, they might have been carrying 'X' luggage in the past and now with access to telecommunication they are able to increase that volume to some 'X++'

numbers. So, in the given time (day), their efficiency could be increased with telecommunication access by decreasing the idling time. This means they are increasing their income.

- **Reduction in Travel Cost and Time saving.**
Mobile phones were used to cut down the need to travel or simplify travelling and transport arrangements, thereby saving time and money (Sife et al., 2005). With access of telecommunication, it is expected to reduce travel or transportation cost of porters. They can avoid unnecessary trips or at least those trips to relatives and customers which can be done with one call. For example, they don't need to visit families to say hello or to ask about their wellbeing. Similarly, they don't need to visit their customers every time to ask for job opportunities. They can just call and have business opportunities if they have good relationships with their customers.
- **Bargaining Power**
A study by De Silva (2008) on a project at Sri Lanka's largest wholesale agricultural market, where product prices were available through an automated voice system accessible through mobile phones found that most farmers believed that they were able to get accurate prices through the system over the phone empowering them to bargain for higher prices. Telecommunication access can increase the bargaining power of porters and reduce transaction costs. They can negotiate the price for carrying luggage over the telephone which helps them to decide immediately to transfer or not. This has provided leverage to porters on increasing volume of carrying luggage as they can engage themselves to the area where there is more benefit and income. This also indirectly affects the income-generating capacity of the porters.
- **Reduced Search cost and Improved Market Information**
Aker (2008) in his research found that mobile phone reduced search cost in the grain market of Niger. Telecommunication can reduce the search cost for the porters. Search Cost for porters can be effort-expend to search job opportunity and cost incurred doing so. They can simply use the phone to assess the work opportunity unlike wandering here and there for searching job prior to taking phone. Telecom can also help them to be aware of market updates. They can know about new markets, shops and new opportunity areas, for example, through friends and customers.

Figure 1

Access of Telecommunication effect transmission

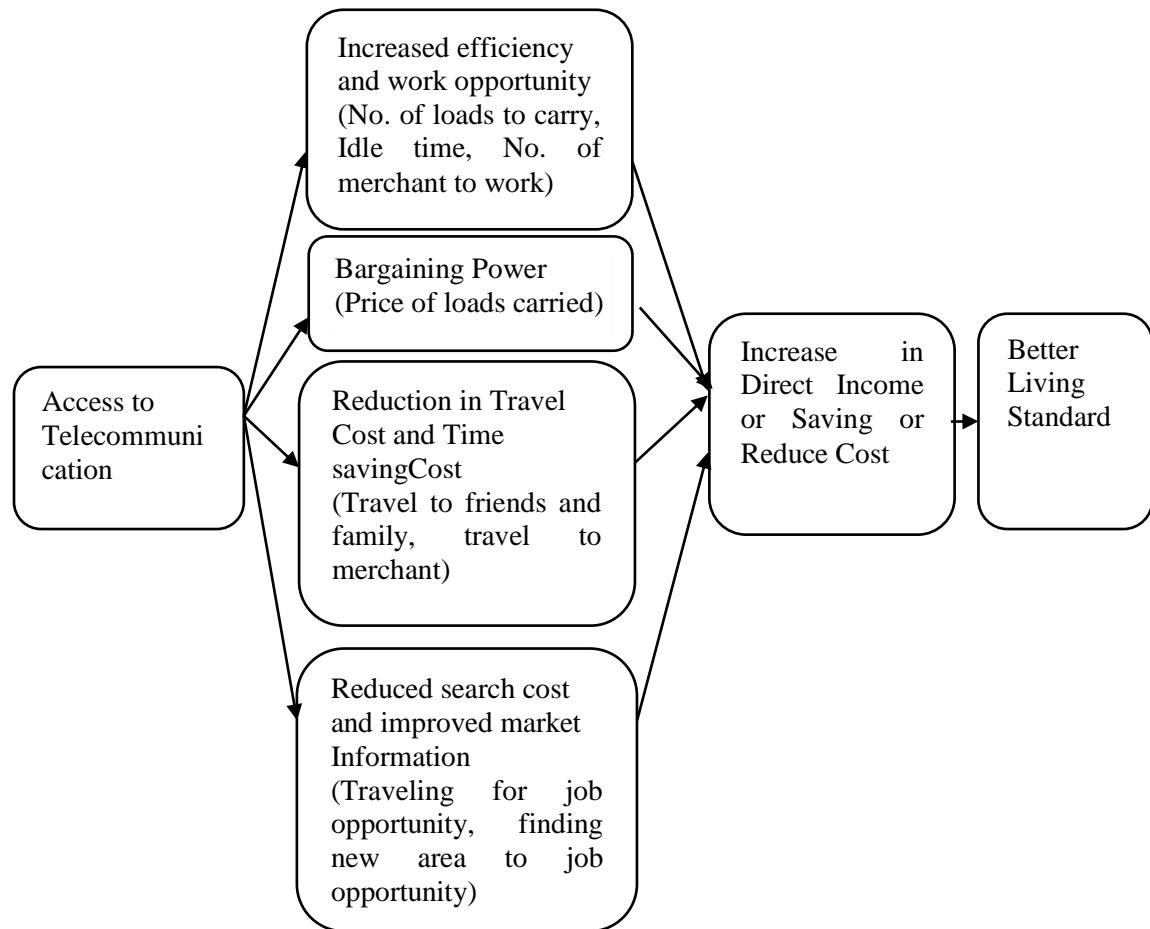
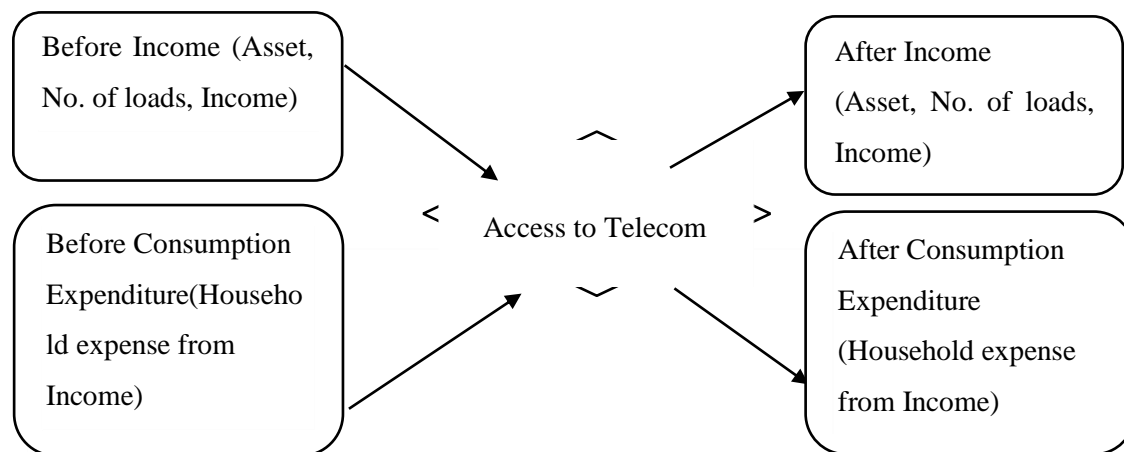


Figure 2*Telecommunication access and change in Income and Consumption*

All the above dimensions lead to an increase in income. Porters can increase the number of jobs in a day, bargain over wages, increase the number of merchants in contact, avoid unnecessary travel. These all factors directly or indirectly increase the income of the porters. With access to mobile communication porters can capitalize on the opportunity and increase their income.

Telecommunication access can lead to an increase in the living standard which can also be reflected on the expenditure side. When an individual starts using mobile, s/he must spend on using telecommunication services. This is the direct expenditure incurred from telecommunication access. The more individuals use or become habitual to the device; the more expenditure will increase.

Telecommunication access can also indirectly increase the expenditure of the individual. If we consider the case of porters, telecommunication will help increase the job volume of the porters and since their job nature involves physical exercise and effort, this will call for more diet and carbo foods. Thus, increasing the daily diet expenses of porters.

It also could be possible that telecommunication access increases the consumption, increase their telecom expenses (which include increase talking with family member, friends), cloth expenses, entertainment expenses and other ad hoc expense provided their income increases.

Research Design

The present research used the combination of descriptive and explorative research in design with before-after approach. Under this, different factors measuring income and expenditure or factors contributing to income generation and component of expenditure have been compared before carrying

mobile and after carrying mobile. Similarly descriptive analysis of various telecom services and contribution of telecommunication access on daily working of street porters have been done.

Description of the Sample

The total sample consisted of 440 street porters from various areas within ring road of Kathmandu city. We assumed all the street porters to be homogenous in characteristics like nature of work, wage earning and habits on consumption. Hence, sample size was determined by using the sample proportion formula of sample size determination taking confidence interval of 95% and error as 0.05 as under:

$$n = 1.5 \times \left(\frac{Z}{E}\right)^2 \times pq \cong 432$$

Where; $p = 0.25$; $q = 1 - p = 1 - 0.25 = 0.75$, $Z_{0.05} = 1.96$ and $E = 0.05$

Purposive random sampling has been used for selecting respondents. Various clusters (area or the spot where street porters reside for job) within ring road area were collected and listed. These clusters were selected using simple random sampling where 49 clusters were chosen. And respondents were selected using homogenous sampling method (purposive sampling method). Homogeneous sampling is a purposive sampling technique that aims to achieve a homogeneous sample; that is, a sample whose units (e.g., people, cases, etc.) share the same (or very similar) characteristics or traits (e.g., a group of people that are similar in terms of age, gender, background, occupation, etc.). It took almost 2.5 to 3 days on average to complete a survey in a cluster.

Instrumentation

The major tool used as instrument for primary data collection is a questionnaire set using the conceptual framework for the present research. The pre-test of the questionnaire was also carried out to increase the validity of the study.

The questionnaire was made as simple as possible to avoid confusion to respondent and interviewer while taking interview and to consume less time at the same time. The questionnaire consists of multiple-choice single responses, multiple response questions, and dichotomous questions etc. focusing objective of the study.

Data Collection Procedure

The present research is primarily research based upon the primary data collected through telephone interview and direct interview consisting comprehensive 54 items structured interview schedule.

Techniques of Data Analysis

The data analysis has been done considering before – after study approach. Various statistical tools were used to answer the research question. For presentation of data, several graphical tools like tables, charts, diagram and graphs and other descriptive statistics were used. For analyzing before and after

changing inferential parametric statistics (two sample t-test and paired t-test) and non-parametric statistics (McNemar test) have been used.

Operational Definition of Major Concepts/Variables

- i. Street Porters: A Porter is a person employed to carry luggage and other loads, especially in a railway station, airport, hotel, or market. In the current study, the definition of street porters has been operationalized as the people who carry goods and luggage of end consumer and general shops including distributor, wholesaler, and retailer of consumer goods for the price paid. Their nature of job falls under elementary occupation where considerable physical effort is required to perform the jobs. These people work on a wage-based system wherein as soon as the job is done, the price is paid. Hence, the higher the number of jobs done, the higher their income will be.
- ii. Standard of Living: Standard of living refers to the level of wealth, comfort, material goods and necessities available to a certain socioeconomic class in a certain geographic area. The standard of living includes factors such as income, quality and availability of employment, class disparity, poverty rate, quality and affordability of housing, people, hours of work required to purchase necessities, gross domestic product, inflation rate, number of holiday days per year, affordable (or free) access to quality healthcare, quality and availability of education, life expectancy, incidence of disease, cost of goods and services, infrastructure, national economic growth, economic and political stability, political and religious freedom, environmental quality, climate and safety.

Results and Discussion

The study explored the usage of telecom and its impact on income and expenditure of the street porter by comparing before and after access to mobile telecommunication.

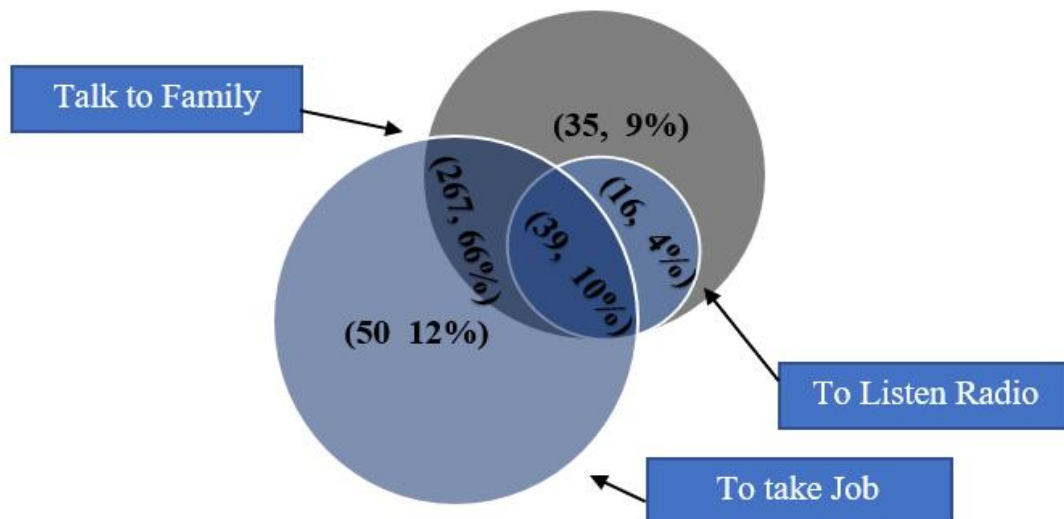
The respondent predominantly uses less than 5 minutes outgoing voice per day. Hence, the average outgoing voice usage is 6.5 minutes per day with standard deviation of 5.8.

Table 1

Outgoing Voice Usage

Outgoing Minute	Frequency	Percent
0 -5	226	56%
5 -10	108	27%
10 – 15	26	6%
15 -20	19	5%
More than 20	28	7%

The respondents were predominantly found to use phone mainly to call to family and to take job.

Figure 3*Respondent by Use of Phone*

Similarly, the respondent predominantly receives 5 to 10 calls for job orders. The average call count received is 8.2 calls with a standard deviation of 3.99. The following table and figure show the distribution call count for job to porters.

Table 2*Call Count for Job Distribution*

Call Count	Frequency	Percent
Less than 5 Calls	70	17%
5 – 10 Calls	225	55%
10 – 15 Calls	101	25%
More than 20 Calls	11	3%
Total	407	100%

The Income of Street Porters' Before and After Mobile Telecommunication Access

In this study, Income refers to accumulated wage earned in a day. Porters were supposed to be able to increase income with mobile communication access. It was hypothesized that income of porters increases after carrying mobile. The Pair t- test was carried out to see if there is any significant difference in income per day of porters.

Table 3*Paired Samples Statistics for Income Per Day*

Income	Mean	N	Std. Deviation	Paired t	Sig
Current Income	1,063.90	401	444.86	25.9	0.00
Before Income	634.66	401	224.88		

The paired sample test box shows that $t_{\text{calculated}}$ is 25.95(>1.96) and P value 0.00 confirms there is significant difference between income per day before and after carrying mobile. The income per day have increased after carrying mobile.

Bargaining Power

Mobile telecommunication access has helped to increase bargaining power of porters. They can negotiate the price for carrying luggage over mobile and decide instantly whether to carry out job or not.

Table 4*Independent sample t Statistics for Bargaining Power*

Bargaining	Mean	N	Std. Dev	t-test	Sig
- Yes	209.43	106	87.93	4.5716	0.00
- No	162.03	106	52.90		

There is a significant difference between average wage for bargaining group and non-bargaining group. Since p-value and critical value approach provided the same conclusion under both assumption of equal and unequal variance. Thus, mobile communication access to the porters bargaining power have increased as evident from the fact that the average wage of bargainer is higher than that of non-bargainer.

Asset Accumulation

Asset have been defined, in present study, as all the durable goods household could have in their home. Durable goods like rice cooker, pressure cooker, Television and all the items as listed in the questionnaire have been analyzed to see if mobile communication have changed asset position of porters. Respondents were asked to mark on the listed item to see if it was there before carrying mobile, after carrying mobile or in both periods (before as well as after carrying mobile i.e. no change). So, we have dichotomous response of "Yes" and "No" only. To test the impact of mobile communication access, asset position before carrying mobile and after carrying mobile of all the asset were put into two group as before and after and McNemar's test was carried out.

Table 5*McNemar test for Asset Accumulation*

Assets	Asset position Yes	Assent Position No	N	Chi-square	Sig
Now	1276	2387	3663	157.92	0.00
Before	911	2752			

The Test statistics box shows that p value (0.00) $< \alpha$ (0.05). Hence, we can conclude that there is significant difference between before and after asset proportions. Further we can say asset proportion has increased after carrying mobile by respondent.

Reduction in Travel Cost and Time Saving

As stated in conceptual framework it was found that the majority of respondent agreed on the statement that mobile have saved time significantly. However, there is differing view on the agreement and disagreement on saved time being used for business. 97% of the respondents agreed that mobile has saved time and only 3% didn't agree that mobile has contributed to saving time. Further, 56% of respondents who said yes stated that the saved time has been used for business and it contributed a lot. Similarly, 32% of respondents who said yes stated that the saved time contributed to some extent only to increase job order and 12% stated that it has not contributed at all.

Increase Efficiency

Telecommunication access can increase the efficiency of porters. The efficiency dimensions considered in the current study are Number of Load carried in a day, number of loads passed on by friends, working hour, waiting time between two consecutive job orders and Number of merchants worked. Table 6 shows there is a significant difference in efficiency dimension before and after. The efficiency has increased after access to the mobile

Table 6*Paired t test for Increase Efficiency*

	Paired Difference			Paired t	Sig
	Mean	Std. Dev	Std. Error Mean		
Working Hour Now vs Before	239.01	1.04	0.05	3.681	0.00*
Number of Load Now vs Before	2.95	4.25	.21	13.97	0.00*
Waiting Time Now vs Before	-25.39	36.97	1.83	13.85	0.00*
Number of Merchant Now vs Before	2.59	2.47	0.12	21.09	0.00*
Number of Load sharing from Friend Now vs Before	1.67	1.39	0.07	24.23	0.00*

Consumption Expenditure

The impact of mobile communication access on the living standard of porters has also been assessed from expenditure side as well. To measure expenditure, various dimensions of household expenses have been considered. They are expenses out of income, way of purchasing rice (whether in bulk or in kg), eating habit (frequency of eating non vegetarian items), watching cinema, clothing, and schooling of kids.

Table 7

Paired t test for Consumption Expenditure

	Paired Difference			Paired t	Sig
	Mean	Std. Dev	Std. Error Mean		
Expenses Per Day Now vs Before	239.01	246.59	12.31	19.41	0.00*
Frequency of cooking/eating non-Veg food Now vs Before	0.05	0.59	0.03	1.84	0.07
Frequency of Watching Cinema Now Vs Before	0.02	0.28	0.01	1.72	0.09
Frequency of buying New Cloth Now vs Before	0.02	0.24	0.01	1.88	0.06
Monthly Saving Now vs Before	588.94	2369.5	117.46	5.01	0.00*

Table 7 shows there is a significant difference between Expenses per and the monthly saving before and after access to mobile communication. However, there is no change in other dimensions of consumption expenditure.

Discussion

The findings from the present study are like previous study regarding contributory role of mobile telecom access. The finding of the study is like the study of Beuermann (2010) and De Silva et al., (2008) with respect to enhancement of productivity and efficiency. Telecom access has increased the efficiency and productivity of street porters. The present study talked about the increase in load order per day and waiting time of street porters which is the metric to efficiency, whereas the study of Beuermann (2010) talked about growth of farmers productivity and De Silva et al., (2008) concentrated on bottom of pyramid of the social setting.

Similarly, the finding of the present study also aligned with study by Duncombe (2014), Lola, Martin (2010), Mittal and Mehar (2012) and Mramba et al.,(2014) with respect to role of telecommunication access in saving transportation cost, reducing market search cost and enhancing market access. However, these studies were focused to agriculture and farming (study by Duncombe (2014), Martin (2010), Mittal and Mehar (2012)) and Street vendor and small business (study by Lola et a., (2012) and Mramba et al., (2014))

Conclusion

The present study assesses the impact of mobile communication on the living standard of street porters and their telecom usage. The current study found that street porters use voice service mainly to talk to family and to take load offer. Mobile communication access has increased the income per day, expenditure per day and monthly saving of the street porters. Mobile communication has also enhanced the income generating factors, which ultimately increase the income of the street porters. The present study used income and expenditure as an approximation to the living standard of the street porters. Hence, we can conclude that mobile communication access has improved the living standard of the street porters.

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