ASSESSING THE IMPACT OF INTERNET AFFORDABILITY POLICIES ON BROADBAND ACCESS IN URBAN NEPAL: A COMPREHENSIVE POLICY REVIEW AND ANALYSIS

A study conducted as a part of the Daayitwa Nepal Public Policy Fellowship 2023, together with the Ministry of Communication and Information Technology (MoCIT)

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Yours Sincerely,

Pramod and Yash

Abstract

The research paper aims to explore the factors that influence customer satisfaction and loyalty in the context of Internet service providers (ISPs) in Nepal. The study employs a mixed-methods approach, conducting surveys, as well as thematic studies to formulate policies for quality internet services in the country. The research also assesses the economic consequences of internet breakdowns and occasionally lowered internet speeds for further policy planning. The findings contribute to the understanding of customer satisfaction, loyalty, and the factors that influence their choices in ISPs, ultimately providing valuable insights for ISPs and policymakers to improve the quality of internet services in Nepal. The study also reviews the problems prevalent in the internet sector, the variables to consider in the study, and the importance of competitiveness for affordable and high-quality internet service. The paper emphasizes the need for sound interconnection between ISPs for reliable internet connection and advocates for the government to invest more resources into internet infrastructure for economic advancement.

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GDP	Gross Domestic Product
GNI	Gross National Income
ISP	Internet Service Provider
KII	Key Informant Interview
NDCL	Nepal Doorsanchar Company Limited
NEB	Nepal Electricity Board
OECD	Organization for Economic Co-operation and Development
RONAST	Royal Nepal Academy for Science and Technology
SAARC	South Asian Association for Regional Cooperation
TKP	The Kathmandu Post
UN	United Nations
USA	United States of America
USD	United States Dollar

Chapter One: Introduction

1.1 Background

The internet is a vast network connecting computers all over the world: it is like a giant web of information that anyone can access at any time. Although the internet was a tool of communication during its inception in 1983, it has evolved rapidly to become the lifeline of the economy nowadays. Saadat and Soltanifar (2014) state that the Internet is one of the most significant innovations of the 20th century. Since its first prototype in the 1960s, the Internet has progressed remarkably and has become an inevitable part of everyday life for common people and organizational sectors of the modernized world. The Internet serves diverse purposes, and its popularity is growing at an immense rate. Common people use the Internet for social networking and information seeking, while organizations employ it for communication, business development, data exchange, and many other purposes. The smooth operation of the modernized world amidst overwhelming complexities without the Internet seems almost unimaginable.

The first instance of the use of Internet technology in Nepal was the e-mail services provided by Royal Nepal Academy for Science and Technology (RONAST). However, the credit for introducing the Internet to Nepalese people goes to the private sector. Mercantile Office Systems initiated commercial e-mail service in June 1994, and a year later, Mercantile Communications started Internet Services. At that time, Mercantile had established a connection to Singapore Telecom, Singapore via a 64 kbps leased line through Nepal Telecommunications Corporation (NTC), the only basic telecom service operator at that time. As of July 2021, 90.56% of the population in Nepal has access to the Internet, and the Internet penetration rate stands at 90.56% of the population. The cellular/mobile coverage is one of the main drivers of this internet connectivity and usage. Cyber cafes were important sources of Internet access for Nepalis around 2010-2015. However, projects like the Nepal Wireless Networking Project have already wirelessly connected seven remote mountain villages to the Internet, with plans to network twenty-one villages in allAn Internet service provider (ISP) is an institution managing all the activities regarding operation and distribution of Internet services to the public. A research of

Greenstein (2001) revealed the importance and meditating role of ISP in the development of modern society.

Internet Service Providers (ISPs) not only offer Internet services to consumers but also maintain and develop necessary applications for smooth operation, solve problems as they arise, and tailor general solutions to unique circumstances (Chiou, 2003). They also customize Internet services to meet the unique needs of consumers and organizations. In addition to providing subscribers with a data connection allowing access to the Internet through physical transport infrastructure, ISPs may also offer related services beyond Internet access, such as web hosting, web page design, and consulting services related to networking software and hardware (Saadat & Soltanifar, 2014).

ISPs are commercial institutions that generate income by charging their subscribers, which can include households, businesses, or governments, based on company policy or mutual contract (Perset, 2010). Many ISPs also offer bundle packages including telephone and television services. Typically, ISPs are large organizations with their own geographically dispersed networks, local points of presence, and numerous connections to other such networks (Tier 1 providers usually have large telecommunications companies) (Perset, 2010). On a broader sense, Internet Cafes or Kiosks providing Internet services can also be considered as small-scale ISPs, as they serve as platforms for accessing Internet services (Perset, 2010).

ISPs constantly seek and develop new technologies to optimize their services for customer acquisition and providing quality services to their existing customers (Czepiel, 1990). Service quality and customer satisfaction have a positive impact on customer loyalty and profitability (Storbacka et al., 1994). However, poor service quality can lead to customer dissatisfaction, loss of market share, and loss of profit (Mmutle & Shonhe, 2017).

In Nepal, the concept of ISPs was new before the 21st century. Initially, there was no provision for the regulation of ISPs. Later, when two other ISPs, World Link Communications and Computerland Communications System, proposed starting Internet services, the Ministry of Information and Communication decided to issue licenses to all three of them. In September 1997, the license to operate Internet Services was issued to the three ISPs by the Ministry. In

1998, Nepal Telecommunications Authority (NTA), a telecommunications regulatory body, was formed as per the Telecommunications Act, 1997. NTA holds the power to issue licenses to Internet Service Providers and has so far issued 62 broadband Internet service providers licenses. At present, the total Internet bandwidth exceeds 1 Gbps

Internet has tremendously changed the way we live, especially in areas of basic needs such as education, health, transportation, communication and even how the labour force do the tasks. In the field of education, the Internet began as a simple tool for research. Students and teachers used it to find information that was difficult to access otherwise. But as time went on, the Internet's role in education expanded. Today, entire courses and degree programs are offered online, allowing students from different corners of the world to learn without physically being in a traditional classroom. Homework, projects, and exams are often digital. Due to the internet, collaboration between students from different parts of the world is possible.

The internet has transformed many aspects of how medical services are delivered. In the early days, the internet was primarily used to access medical information. Now, we have telemedicine where doctors can diagnose and treat patients over the internet. People can schedule appointments, order medications, and even have virtual consultations from the comfort of their own homes. The internet has also enabled health professionals to share research and innovative practices with each other more easily.

Similarly, in the field of transportation, autonomous driving is becoming a reality with the rapid development of the internet and information technology. Also, the internet has drastically reshaped the way we work. Initially, the internet was used by companies for emails and to create an online presence whereas today we have a global marketplace for products and services. The internet has created new jobs and allowed people to work remotely from anywhere in the world. It has increased the productivity of the workers and helped in increasing the production of the firms ultimately adding to the GDP of the nation.

It is plausible to state that the availability of reliable and fast internet acts as a catalyst for the development of the nation. In today’s world, the internet penetration rate of the country has great effects on the level of development of the nation. According to (Datareportal, 2023), the internet

penetration rate of the USA is 91.8 percent whereas the rate of Nepal 51.6 percent and India is 48.7 percent. There seems to be a lot to be done in Nepal to be at par with the developed countries in internet penetration. Along with an increase in internet penetration, reliability of the internet service is also equally important for a quality service as the impact of broken internet connection could be huge in today's world.

Broadband internet and mobile data are the two major types of internet service used in Nepal. Due to the exponential increase in smartphone usage, mobile data internet has played an important role in increasing the internet penetration in Nepal. But with the higher cost of mobile data per volume, people prefer to use broadband internet connection as the main internet connection in their homes and offices and use mobile data as a secondary internet source; mostly while travelling. This study uses "internet" as the synonym for the primary internet source i.e., broadband internet connection from now on. The study only considers the urban region of Nepal with the assumption that the rural parts have different scenarios and different problems that require a separate independent study for making informed policies regarding the internet service in rural Nepal.

1.2 Current Status of Broadband Internet in Nepal

The number of internet users in Nepal has been increasing rapidly in recent years, with internet access being considered a basic service in people's lives. As of July 2021, 90.56% of the population has access to the internet, and the internet penetration stands at 90.56% of the population. According to a post in The Kathmandu Post, Nepal added 2.25 million internet users in 2018, and by 2019, 16.67 million Nepalese were connected to the internet, which is 63% of the total population. The internet penetration rate in Nepal is estimated to amount to 72.79% in 2023.

The Internet Service Providers Association of Nepal (ISPAN) was established in 1998 with a mission to develop and promote the internet for everyone. ISPAN has been working to make the internet affordable to local communities and penetrate rural areas. The competition between major telecom operators has encouraged them to provide cellular coverage to different parts of the country, which has been a major driver of internet connectivity and usage

The availability of cheap internet service provided by ISPs like Worldlink, Vianet Communications, Subisu, Websurfer, and Mercantile, as well as the recent availability of the CG Net, has contributed to the increment in internet users. Projects like the Nepal Wireless Networking Project have also been instrumental in bringing internet access to rural populations. In 2022, there were 11.51 million internet users in Nepal, and the internet penetration rate stood at 38.4% of the total population. The median mobile internet connection speed via cellular networks was 18.42 Mbps, and the median fixed internet connection speed was 28.32 Mbps. As per the (Nepal Telecommunication Authority, 2079), there are currently 63 internet service providers with active users. Broadband internet can be classified into wireless, cable and fiber internet. There are 14,153 wireless internet subscribers, 65,924 cable internet subscribers and 25,93,394 fiber internet subscribers in Nepal with a total of 26,73,471 broadband internet subscribers. About 97% of the broadband internet subscribers use fiber internet, about 2.5% use cable internet and about 0.5% use wireless internet service.

The six internet service providers in Nepal with the number of subscribers greater than 2,00,000 are as follow:

1. Worldlink Communications Ltd., Jawalakhel, Lalitpur
2. Nepal Doorsanchar Company Limited
3. Classic Tech Pvt. Ltd., Baneshwor, Kathmandu
4. Vianet Communications Pvt. Ltd., Jawalakhel, Lalitpur
5. Subisu Cablenet Ltd., Baluwatar, Kathmandu
6. Dish Media Network Pvt. Ltd., Pulchowk, Lalitpur

The market share (in percentage) of the ISPs in Nepal is shown Figure 1:

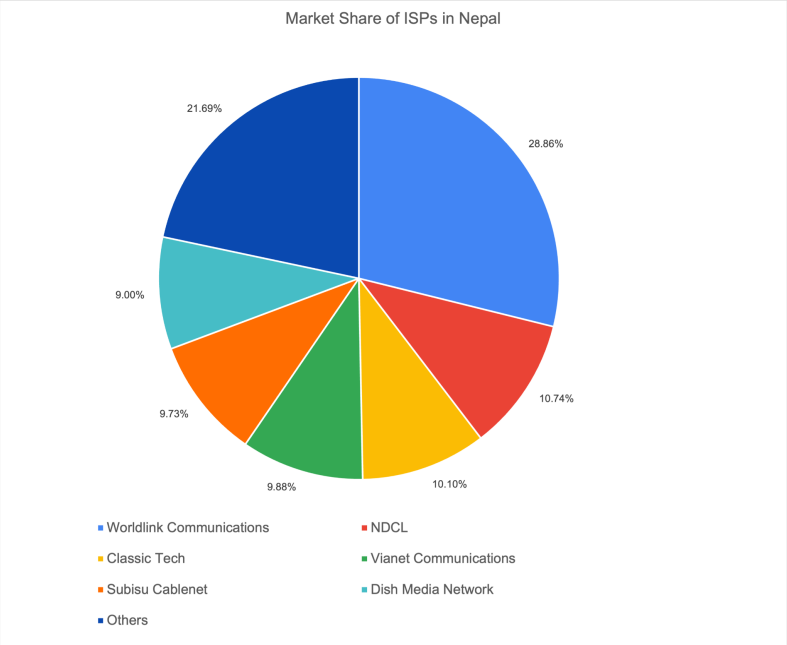

Figure 1: Market share of ISPs in Nepal.

Current world market is consumer centric in comparison to the producer centric market of 20th century (Sheth, Sisodia & Sharma, 2000). The success of an organization in a consumer centric market depends largely on its capability in meeting customer needs and interests. Thus, ISPs need to focus their activities in providing quality services to its users to be a successful organization by getting a depth insight of customer perception of their service quality. One effective method of achieving this goal is by doing qualitative and quantitative analysis of different factors influencing the customer perception of quality service (Liu, Zhou & Song, 2009).

1.3 Research Questions:

The primary aim of this study is to provide policy recommendations for affordable and quality internet service in Nepal. The guiding research questions are formulated in such a way that the findings could be used as evidence for formulation of proper policies regarding internet facilities in Nepal.

The research study is guided by two primary research questions as follows:

- What is the status of internet prices in Nepal relative to other SAARC countries? Are there any areas to explore such that the internet price becomes more competitive and affordable to the public that leads to greater internet penetration?
- How do the internet users perceive the quality of internet ISPs provide in urban Nepal? What is the public feeling regarding the pricing, speed, and the reliability of the internet connection they are offered?

The study explores the solutions to these guiding questions and provides relevant policy recommendations.

1.4 Limitations of the study

The major limitations of the study can be summarized as follows:

- **Sample Size:** This study is conducted as a part of Daayitwa Nepal Public Policy Fellowship 2023 that lasted for six months. The online survey form in the study has 61 responses which is the sample size for this study. The smaller sample size due to time constraint for the study is taken as one of the major limitations of the study.
- **Reliability of secondary data:** The mean pricing and mean download speed of the broadband internet connection in SAARC countries is taken from secondary data source (cable.co.uk, 2023). Reports from the Nepal Government are not available to validate the secondary data source.
- **Proper Communication with the top management of ISP:** Due to festive season around and busy work schedule the perception of Top level management on this topic couldn't be grabbed properly.

Chapter Two: Literature Review

2.1 Review of Related Studies

The research on service quality, customer satisfaction, and loyalty in the context of Internet service providers (ISPs) has been a subject of interest for several scholars. Parasuraman et al. (1985) defined service quality as a comparison between customer expectations and perceptions of the provided service and identified three main themes on service quality. They found that the evaluation of intangible service quality is more complex than tangible product quality, and service quality perceptions result from a comparison of consumer expectations with actual service performance. The dimensions of service quality are related to customer satisfaction and can determine the long-term performance of the firm.

Saruta Tangjai (2011) conducted a study on Internet service providers in Thailand, focusing on the determinants affecting customer loyalty. The research identified customer satisfaction as the most significant factor influencing customer loyalty in the Internet service industry of Thailand. The study used a questionnaire survey to gather the views of 300 Thai Internet users about their perception and opinions while choosing and staying with an Internet provider.

Wolfinbarger and Gilly (2002) conducted a study on service quality dimensions for online retailing and found four determining dimensions: website design, reliability/fulfillment, security/privacy, and customer service. These dimensions were strongly predictive of customer judgments of quality, satisfaction, loyalty, and attitudes toward the website.

Neger, Ahamed, and Mahmud (2013) studied the service quality of Internet service providing firms in Bangladesh and found that consumers have some level of knowledge about the different quality dimensions of Internet service and service quality of individual Internet service providing firms. The main quality dimensions on which the consumers were satisfied were assurance and tangibility.

Quach, Thaichon, and Jebarajakirthy (2016) explored the impact of service quality dimensions on customer loyalty in high-tech service settings. The study showed that service quality

dimensions can influence both attitudinal and behavioral loyalty, and the effects were diverse across different groups of ISP customers.

Ouparamai (2009) conducted a study on high-speed Internet service providers in Thailand and found that service providers must consider four key dimensions: customer satisfaction, corporate image, perceived value, and trust to maintain good business relationships with their existing customers. The research also showed that the expansion of high-speed Internet services to cover wider areas will be beneficial for the economic and social development of the nation.

In summary, the research on service quality, customer satisfaction, and loyalty in the context of Internet service providers has provided valuable insights into the factors that influence customer loyalty and the dimensions of service quality that are important for customer satisfaction and retention.

2.2 Impact of internet on economy and its role in economic advancement

As per (Qiang, Rossotto, & Kimura, 2009) , the economic growth is increased by 1.38 points per 10 percentage point increase in telecommunication penetration of broadband connection in low-and middle-income countries and by 1.21 percentage in high income economies. With respect to the internet speed, (Rohman & Bohlin, 2012) states that increasing the speed of broadband by 100 percent results in 0.3 % growth compared to the growth rate in the base year.

(Li, Zhang, & Yanwei, 2023) conducts a study in China using the data from 2003 to 2019 and concludes that the development in telecommunications infrastructure promotes entrepreneurship in developing countries. (Salahuddin & Gow, 2016) uses annual time series data for South Africa from 1991-2013 to understand the effects of the internet usage on the financial development and trade openness and economic growth. The authors conclude that there is long run relationship between internet usage and economic growth in South Africa and recommend the government to invest more resources into internet infrastructure for economic advancement.

2.2 Problems prevalent in internet sector

(Van Gorp & Middleton, 2010) mentions the importance of competitiveness for the affordable and high-quality internet service. The author mentions how policy has the important role in

introducing competitiveness in the market. The paper emphasizes how Canadian market is dominated by few providers and with lack of competition, the internet service is more expensive and often slower than the service available in OECD markets.

(Lindlacher, 2021), using a mixed logit discrete choice model, checks if high-speed internet and basic internet are substitutes and concludes that they are not. Instead, the author suggests that the users prefer basic speed internet to high-speed connection if their usage patterns do not require high speed connectivity.

(Chetty, Sundaresan, Muckaden, Feamster, & Callandro, 2013) states that broadband speed in South Africa is lower than the advertised speed and advocates for sound interconnection between ISPs for reliable internet connection. (Karn, Hongli, & Shafiq, 2017) conducted study on the broadband internet performance of Nepal through the customer's perspective and concludes that customers in Nepal are not achieving the speeds that are promised for their broadband internet.

2.3 Variables to consider in the study

(Thaichon, Antonio, Prentice, & Quach, 2014) uses (a) network quality, (b) customer service and technical support, (c) information quality and (d) security and privacy as the dimensions for the ISP's service quality. Further, the study concludes that all the dimensions have positive effects on subscriber's trust, but the network quality and customer service & technical support are directly related to the ISP's commitment.

Thus, this research is unique as it tries to get an insight of Internet users' perception of service quality and their satisfaction level along with afffordiability and will also look form the ISP perspective on what has been the major problems for ISP to cut price and look after the regulatory factors. It will help to explain the relationship between variables in a more authentic and strong manner to eliminate the existing gap in the study of service quality of ISPs. Furthermore, it will help to find the dimensions affecting the service quality and try to resolve the existing problems. The level of competitiveness between ISP companies can be measured with the help of this research. The study also highlights the service quality dimensions for Internet providers. Thus, the Internet providers can employ effective measures to improve their services and meet customers' expectations. This will ultimately help to retain existing customers

as well as attract new customers. As a result, the service provider can expand its market, get new subscribers and increase profit.

CHAPTER THREE: METHODOLOGY

The study uses mixed methods: a combination of qualitative and quantitative research methodologies.

3.1 Exploration of secondary data sources

For the first research question regarding the affordability of the internet in Nepal, the study is conducted as a case study. The mean download speed and the mean price of the broadband internet is taken from (cable.co.uk, 2023) from 2017-2023 of all SAARC countries as per the availability of the data. The trend from 2017-2023 of the pricing and the download speed is observed from the data and the status of the internet pricing and speed in Nepal is compared with other SAARC countries. Similalrly, the detail tax implied to ISP and the pole charges has been analyzed to see the impact of pre hand cost to both ISP and the end users

Further, the affordability of the internet service is assessed for SAARC countries. The United Nations Broadband Commission for Sustainable Development defines affordability as the availability of broadband access at a price that is less than two percent of the monthly GNI per capita. The GNI data is taken from (The World Bank, n.d.) and percentage of monthly GNI people have to spend for internet service is obtained using the mean internet price from (cable.co.uk, 2023). The affordability level of the internet service in all SAARC countries is observed and shown in bar diagram.

The second research question regarding the quality of service of the ISPs requires both qualitative and quantitative methods to analyze efficiently. Analyzing the complaints data from (Nepal Telecommunication Authority, 2079) regarding the internet service in Nepal, we can say that the major problems encountered by the consumers are (i) lower internet speed than the advertised speed and (ii) no internet connection from time to time.

3.2 Online survey

To quantify the perception of people towards the pricing and quality of internet services in Nepal, an online survey is conducted. A google form is prepared with several questions and distributed to hundreds of people selected in a random fashion such that the sample represents

various group of people such as students, businessowners, office employees, etc. The responses are recorded in spreadsheet document (Google Sheets) and used in further analysis.

The questionnaire in the survey is set considering primarily two variables:

1. Pricing (customer satisfaction of the internet pricing with respect to the speed they are offered, and
2. Quality of service: Quality of service includes:
    - Speed of the internet
    - Frequency of breakdown on the internet and time taken by the ISPs to address any issues.

The questions are prepared to assess the attitude and views of the respondents towards the predefined variables in the study. The responses are collected either in the form of 5-point Likert Scale or in words through several open-ended questions. 5-point Liker Scale can be used to measure degree of agreement, satisfaction, quality, frequency, performance, importance, focus as shown in Table 1.

Scale	Left-most	Left of center	Center	Right of center	Right-most
Rating	1	2	3	4	5
Agreement	Strongly Disagree	Disagree	Neither Agree/ Disagree	Agree	Strongly Agree
Satisfaction	Very Dissatisfied	Dissatisfied	Neither Satisfied/ Dissatisfied	Satisfied	Very Satisfied
Quality	Very Poor	Poor	Fair	Good	Very Good
Frequency	Never	Rarely	Occasionally	Frequently	Very Frequently
Performance	Awfully	Not Well	Work in Progress	Well	Superbly
Importance	Not at all Important	Slightly Important	Moderately Important	Very Important	Extremely Important

Focus	Much less Focus	Less Focus	Maintain	More Focus	Much more Focus

Table 1: Likert scale measurement (Source: www.cultureamp.com)

Apart from the questions to assess the views towards the variables of the study, demographic questions are included at the beginning of the survey and wrapping questions at the end of the survey. The response from these questions is used to analyze the responses by grouping the data in several demographic groups.

Chapter Four: Findings

4.1 Comparison of price and speed of the internet in Nepal with other SAARC countries

The secondary data for the pricing and the speed of the internet is taken from (cable.co.uk, 2023).

The mean pricing of the broadband internet connection in SAARC countries from 2017 to 2023 is shown in Figure Figure 2.

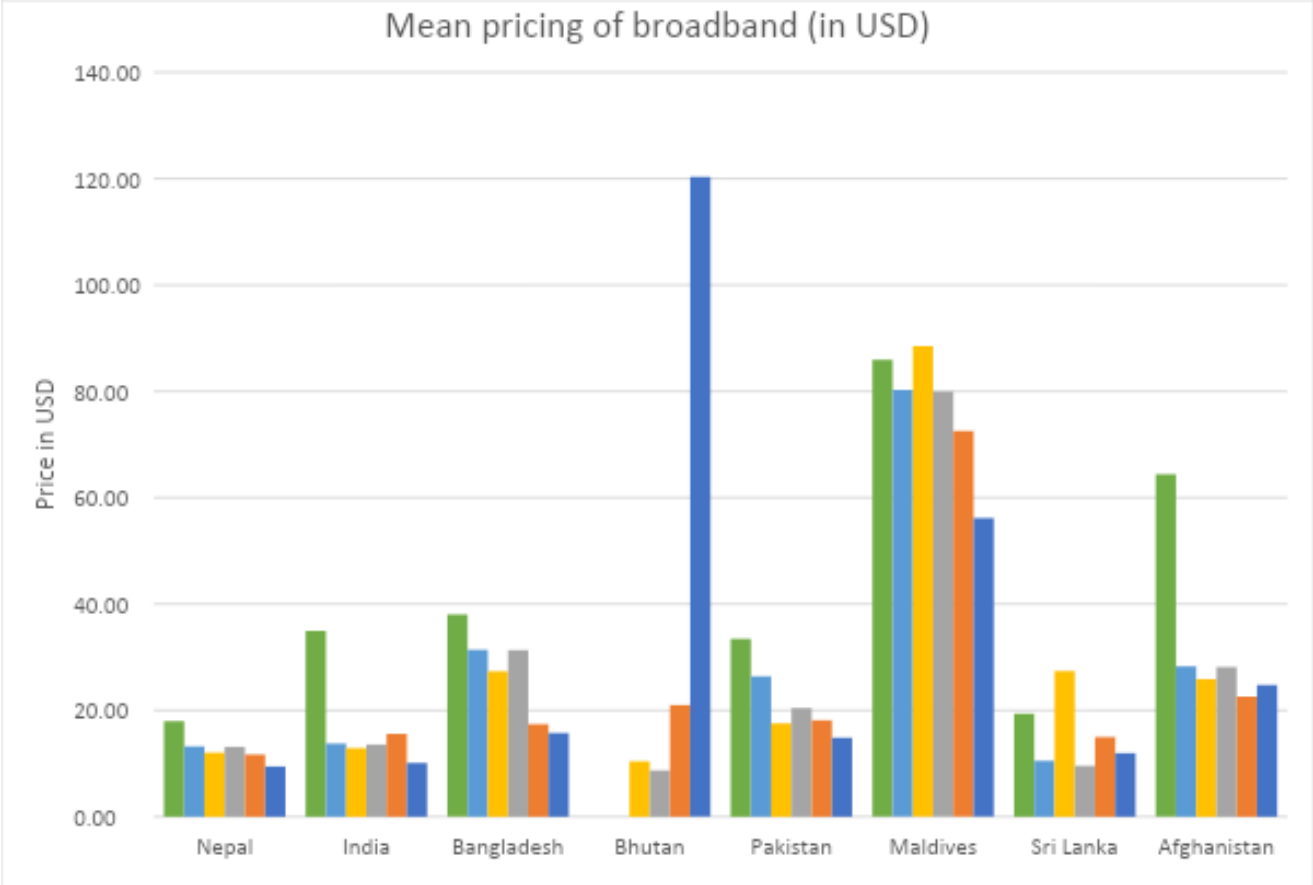

Figure 2: Mean pricing of broadband internet in SAARC countries.

It is seen that the price of the broadband internet in Nepal is consistently on the lower side compared to other SAARC countries. In 2023, with mean price of 9.46 USD, Nepal has the

cheapest internet price in SAARC countries while India has second to the cheapest rate with mean price of 10.11 USD.

The mean speed of the broadband internet connection in SAARC countries from 2017 to 2023 is shown in Figure 3.

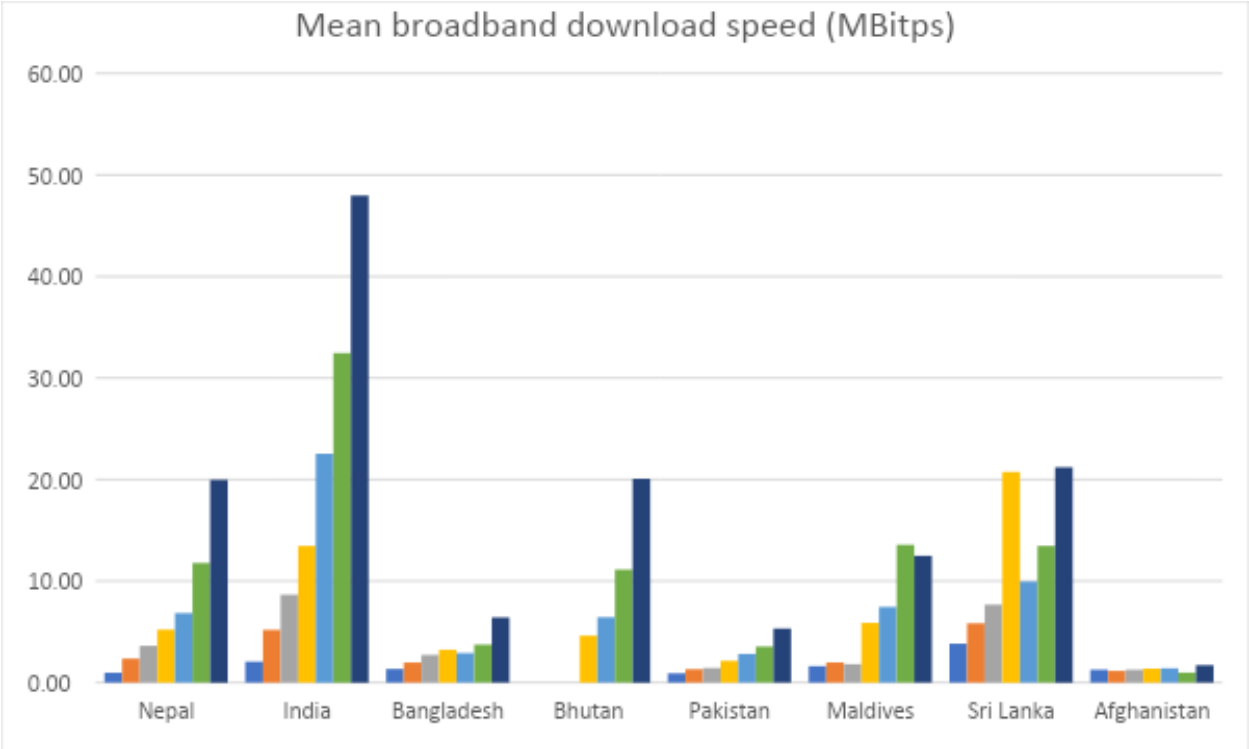

Figure 3: Mean Broadband Speed of SARRC Countries

It is observed that the mean broadband download speed is increasing at exponential trend over the last seven years. In 2017, the mean broadband download speed was 0.97 MBitps while it is now 19.99 MBitps in 2023. India has the greatest mean download speed at 47.99 MBitps while Sri Lanka has 21.23 MBitps, Bhutan has 20.08 MBitps and Nepal has 19.99 MBitps. Except for India, the mean download speed of broadband connection can be considered competitive with other SAARC countries.

4.2 Exploration of the public perception towards the internet connection in urban Nepal

An online survey was conducted with questionnaires as shown in Annex A. A google form was created and distributed randomly focusing on the residents of Kathmandu Valley. A total of 61 responses was recorded and analyzed in the study.

4.2.1 General Demographics of the Respondents

The survey is responded by a total of 61 respondents. About 74 percent of the respondents are between the age of 20-30 years while about 11.5 percent of them are less than 20 years. Almost 59 percent of the respondents live in Kathmandu Valley. Regarding the occupation of the respondents, about 40 percent of them are students while the rest are engaged in some type of income generating activities. About 51 percent of the respondents use Worldlink Communications as their ISP followed by NDCL with about 16 percent of the respondents. Regarding the contract duration, about 64 percent of the respondents is subscribed to ISP through Annual Contract while about 20 percent are subscribed through Monthly Contract.

From the responses, the average price paid by the users for internet service is NPR 14,401 per year which becomes monthly price of USD 9.23 (considering exchange rate of 1 USD = NPR 130.00) which almost align with the data taken from secondary source (cable.co.uk, 2023). It is recorded that 47.5 percent of respondents use internet more than 7 hours a day and 49.2 percent of respondents use internet for work related tasks as shown in Fig (cross reference). We can say that the importance of reliable internet connection is immense and has great impact in the economy as most people use internet for more than 7 hours for work related task.

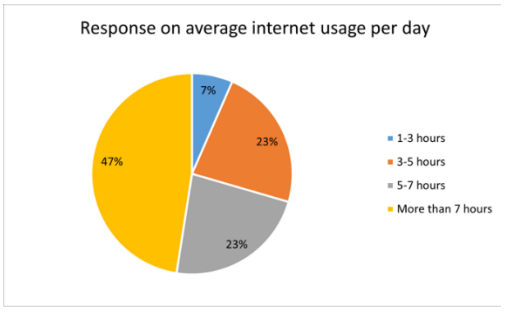

Figure 4: Responses on average internet usage per day in number of hours.

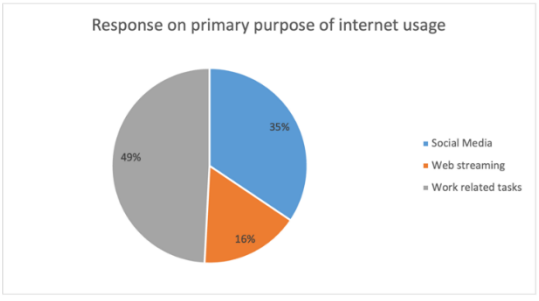

Figure 5: Responses on primary purpose of internet usage.

4.2.2 Public perception towards price, speed, and quality of service

Price

Figure 6: Public perception on internet price.

About 84 percent of the internet subscribers have not observed any unexpected charges which can be taken on positive note. Still, about 62 percent of the internet subscribers think that the price of the internet is expensive while about 34 percent of the users considers the price as reasonable.

Speed

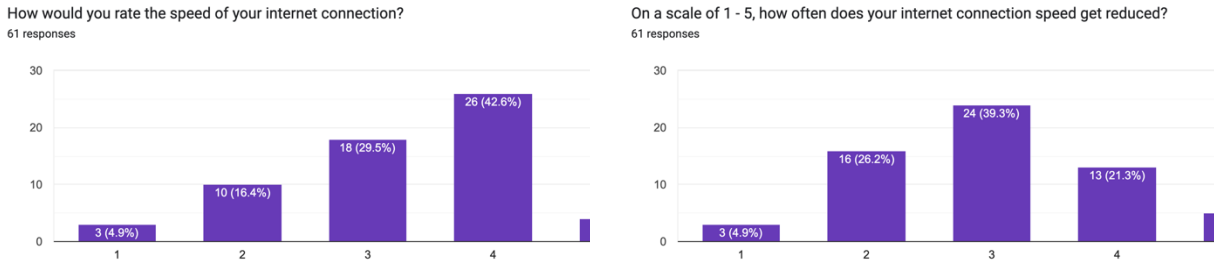

Figure 7: Public perception towards internet speed.

Although most of the users are satisfied with the speed of the internet connection they use, the speed is reduced occasionally.

Quality of service

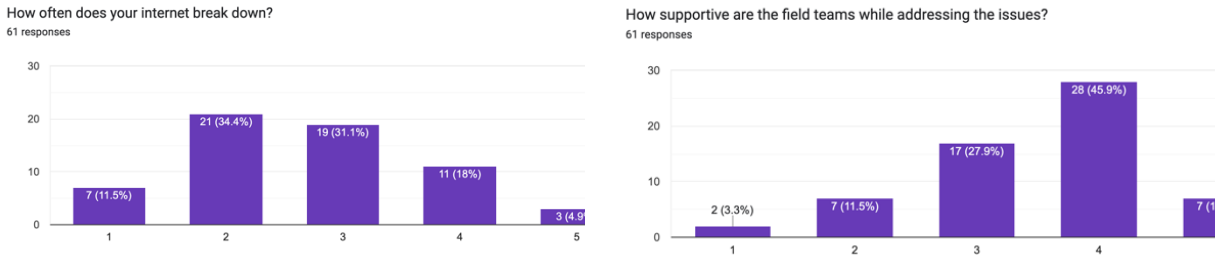

Figure 8: Public perception on customer service of internet.

Mostly, there is rarely or occasional internet breakdown in Nepal, but the ISPs are supportive in addressing the issues.

Apart from price, speed, and quality of service, survey contains questions related to the satisfaction of the internet service provider and whether the users recommend their service to others or not. In the responses, we find that about 46 percent are satisfied with the service while about 33 percent are neither satisfied nor dissatisfied. Regarding recommending the service to others, about 51 percent of internet users in urban Nepal recommend their ISPs to other users while about 31 percent of them are unsure about recommending the service to other.

4.3 Tax Breakdown of ISP

The ISP and the customers has to bear both tax and custom duty to get access to internet, The following rates has been collected as per the Income Tax Act 2058, Tax Amendment 2080/81 and Custom tariff 2023/24.

Custom Duty on telecommunications Equipment	
Material	Rate
Fiber Cable	15% of the total product cost

ONU (Optical Network Unit)	5% of the total product cost
Router and Switches	5% of the total product cost
Company Tax	
Particulars	Rate
TDS to International Provider	10% of the total income
Royalty	4% of the total income
Rural Telecommunication Development fund	2% of the total income
Telecommunication Service Charge	10% of the total income
Value Added Tax	13% of the income frome the subscription fee
Corporate Tax	30% of the EBITDA

Table 2: Tax charges on Internet equipment and usage

4.4 Pole and Rental Charge

NEA had issued new rental and pole charges on January, 2021. There has been a significant rise in the charges which results the main reason for high internet cost in Nepal.

Transmission Line	66 kv (for fiber cable)	33 kv (fiber optics)
Annual Charge on fiber per core	Rs. 32000 (excluding taxes)	Rs. 30000 (excluding taxes)

Table 3: Per Core Charge by NEB (Source: Nepalitelecom

Poles	Rural	Urban
Old	Rs. 50	Rs. 200
New	Rs. 200	Rs. 300

Table 4: Old and New pole charges by NEB

4.5 Affordability

The United Nations Broadband Commission for Sustainable Development defines affordability as the availability of broadband access at a price that is less than two percent of the monthly GNI per capita.

Figure (cross reference) shows the price of broadband connection in SAARC countries as a percentage of monthly GNI per capita in 2023. The price of broadband connection is taken from (cable.co.uk, 2023) and the GNI per capita is taken from (The World Bank, n.d.).

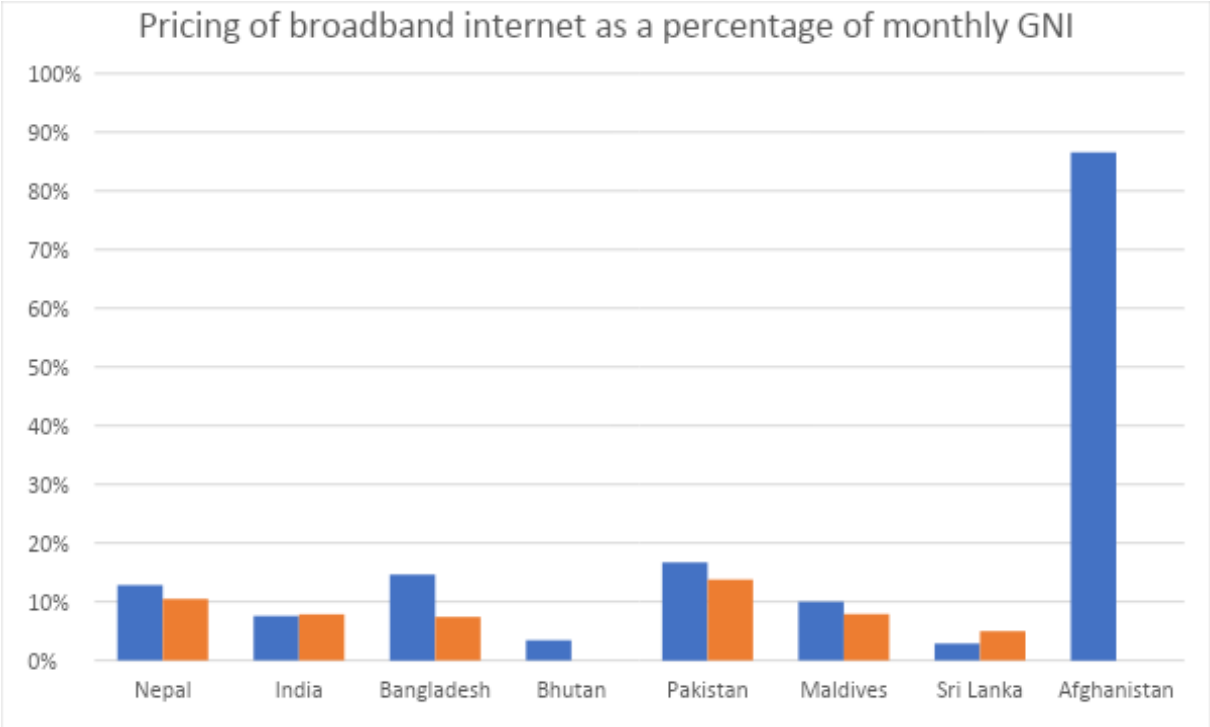

Figure 9: Pricing of broadband internet as a percentage of monthly GNI.

Although the mean pricing of broadband of Nepal is on the lower side, the case is not the same for the pricing of the broadband internet as a percentage of monthly GNI. In 2021, it is seen that

Sri Lanka and Bhutan has the most affordable internet service among SAARC countries and followed by India and Bhutan. Nepal lies on the fifth position among the eight South Asian countries. In 2022, Bangladesh overtook Nepal in terms of affordability by almost halving the pricing of the internet as a percentage of monthly GNI.

Although the pricing as a percentage of monthly GNI is decreased from 13 percent to 10 percent from 2021 to 2022, there is a long way between now and the affordable range of below 2 percent.

4.6 Price perception with respect to contract duration

The perception of price of the internet is seen grouping with contract duration and is plotted in Figure 10. It is seen that most of the people perceive the internet as expensive when the contract is monthly. When the contract duration increases, people gradually find the internet price a good deal and in annual contract, some people even feel the internet price cheap.

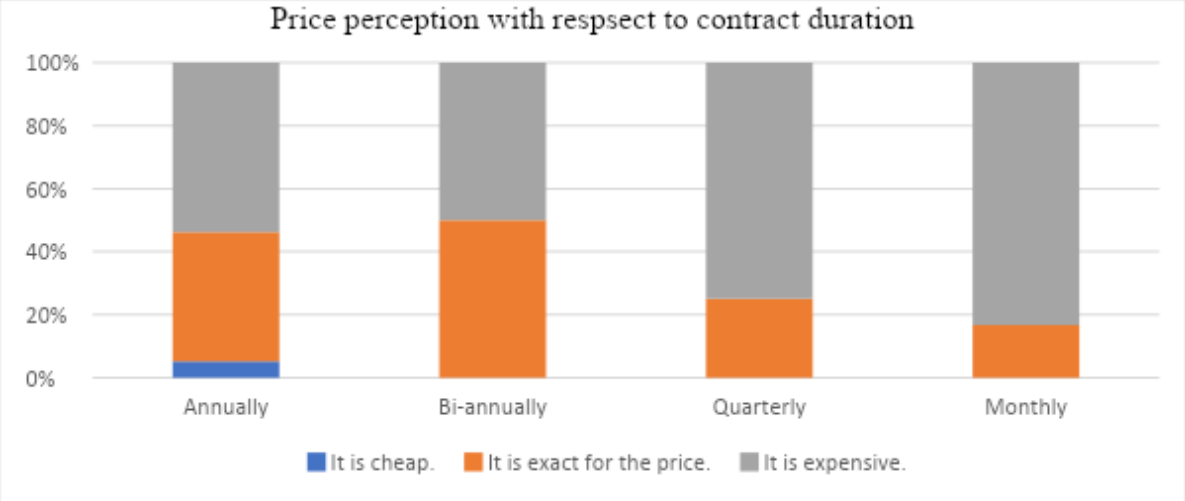

Figure 10: Price perception of internet with respect to contract duration.

4.7 Time and purpose of internet usage

The time of internet usage is categorized with the type of task engaged as in Figure 11. People who spend a smaller number of hours in internet mostly spend on social media while people who

spend a great number of hours in internet use it for work related productive task. The medium internet users mostly surf web streaming websites and work-related tasks.

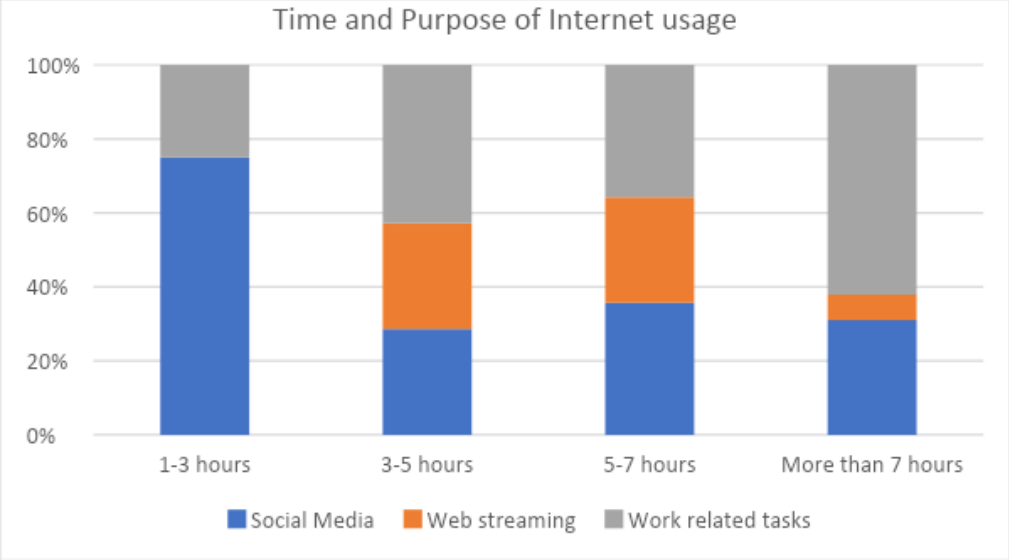

Figure 11: Time and purpose of internet usage.

4.8 Internet usage by age group

The respondents of different age groups are categorized with the internet usage time as in Figure 12. The sample population have lower number of people from age group 40-50 years and no response is recorded from population of age greater than 50 years. So, the result is generalized for the population with age up to 40 years. The most internet surfing population range is 20-30 years with about 50 percent of such population using internet for more than 7 hours while the least surfing population group is 30-40 years.

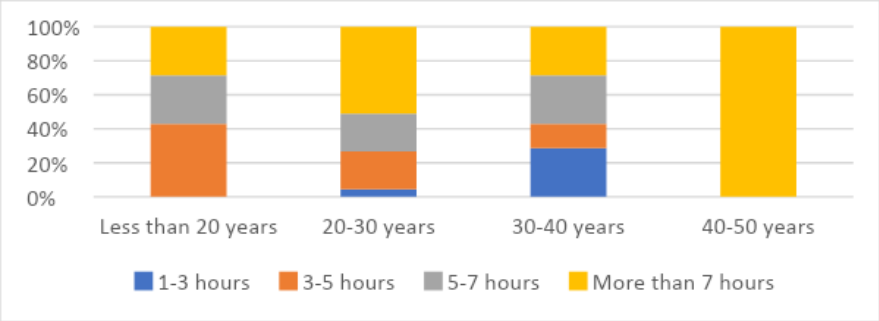

Figure 12: Internet usage by age group.

4.9 Internet usage by occupation

The respondents of different internet usage level are categorized with their occupation sector as in Figure 13. Observing the people with most internet usage, i.e., greater than 7 hours, most of them are student and working in private sector. On average, the government sector officials are using the internet for 3-5 hours daily. Most of the NGO officials use internet for 1-3 hours whereas the self-employed population use internet for greater than 5 hours daily.

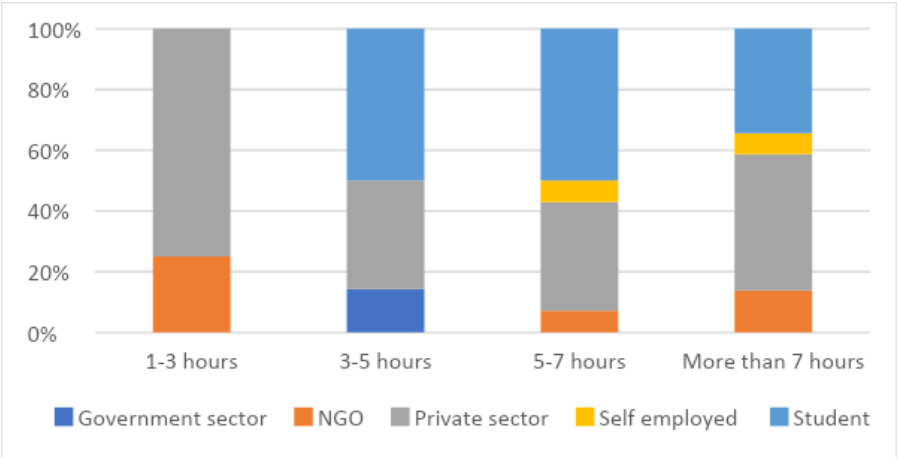

Figure 13: Internet usage by occupation

Chapter Five: Discussion

From the survey, it has been obvious that most number of customers are satisfied with the speed but are still unconvinced with the price tagged by ISP to them for the internet usage. People rely more than 1/3rd of their day on internet for performing their work. Many respondents have felt the price to be more than the value ISP have been providing to them. Though ISPs has been concerned about the breakdown and addressing the issue on time, but it is not the case for all the areas.

The most prominent reason for high price in Nepal is because of the high taxes and poles charges charged by government and NEA. On 2021 as per Awaz News, NEA claimed that rent charges on electricity pole are offered at lower rate but ISPs has used that as an excuse to hike the internet price. Various entity like Computer Association of Nepal (CAN) Federation and ISPAN had submitted recommendations to the government about keeping the internet cost at the lowest possible i.e, below 2 percent of monthly GNI per capita as defined by United Nations Broadband Commission for Sustainable Development but there has not been much cutoffs on the taxes and charges. The then President of ISPAN on 2021, Sudhir Parajuli said, "NEA has already published the notice thrice asking us to pay the charges as per the new rates, failing which it has threatened to cut and remove the internet wires from its utility poles". Meanwhile, NEA Executive Director, Kul Man Ghishing said that the utility charges were increased with the aim to maintain the infrastructural beauty. "NEA wants to promote the sharing of the IT infrastructure so that there would be fewer cables and bigger business. The tariffs have been higher since the beginning of last decade and there has not been much reformed to provided relief to both ISPs and customers. This has impacted the affordability of internet on the rural areas as well. On the process of this research, when talked with one of the top-level managements of the ISP, they have said that the infrastructure is very welt built for the urban cities and villages by them but the major challenge has been to the upper mountain areas. Though they have run the wires on every pole of and parts of Nepal, the cost of internet package and the adorable capacity by the people residing there has been a major challenge for ISPs not being able to reach every home. Thus, the survey and the tax rates clearly show what has been the major challenge for cutting of the prices and the affordability of the customers in the Nepal.

Chapter Six: Conclusion

In today's world, internet plays a significant role in any activities people perform. The world is evolving and the role of the internet in our life is increasing exponentially. Development and expansion of internet service should be a national priority for any nation. Although Nepal has the cheapest internet service among SAARC countries in terms of pricing, Nepal is only ahead of Pakistan and Afghanistan in terms of affordability with the value of 10 percent in 2022 which is way too far from the affordable internet of 2 percent. The government should work out for proper planning to achieve affordable internet in Nepal.

In urban Nepal, most people are satisfied with the internet speed and customer service they receive but consider price of the internet as expensive. Most people with monthly contract considers the internet price as expensive while the people with yearly contract are more satisfied with the price. ISPs in Nepal can consider this finding to further plan their pricing of the internet.

Most people use internet for work related tasks for greater than 7 hours: the impact of internet breakdown can be immense. The government should collaborate with ISPs to enhance smooth internet service.

CHAPTER SEVEN: POLICY RECOMMENDATION

In Nepal's urban areas, having access to affordable and dependable broadband is essential for advancement in terms of social inclusion, economic growth, and general development. The goal of this policy recommendation is to improve broadband access in Nepal by evaluating and strengthening the effects of internet affordability policies.

1. Assess Current Policies:

   To determine the policies' advantages, disadvantages, and gaps, a comprehensive assessment of Nepal's urban internet affordability policies should be carried out by working together with pertinent parties, such as members of the community, government organizations, and internet service providers (ISPs).

2. Infrastructure Development:

   Government should focus on Public-Private Partnerships by encourage private sector to investment in Fiber-optic cable infrastructure. As per NEA Executive Director Kul Man Ghishing on Awaz News, the main reason behind the increase of pole charges was with the aim to maintain the infrastructural beauty. As per him, "NEA wants to promote the sharing of the IT infrastructure so that there would be fewer cables and bigger business." He even advised ISP use 96 core cables instead of 24 core cables which help to facilitate higher bandwidth and can be used by multiple companies which can significantly help to reduce price. This will also help to solve the problem of ugly wires that has been hanging for long time in the pole. So, a proper policy must be developed for sharing infrastructure between telecommunications companies which can help to reduce cost. NEA has already created an underground optical fiber infrastructure to transmit internet signals with two additional under-ground channels to lay fibre optics, if necessary, in the future. So, the government, ISPs and NEA must work together on tri-party agreement to bring down the unused wires and make the cost cheaper. Also, existing infrastructure (e.g., electricity grid) must be utilized properly for broadband deployment.

3. Reducing Broadband Costs:

   The government should provide subsidies targeting low-income households and students especially for the upper mountain region so that very household can have the internet access. The government must review and amend tax policies for ISPs to incentivize affordable pricing and consider tax breaks for companies investing in infrastructure development.

4. Enhancing Competition:

   Government should bring regulatory reforms by introducing greater transparency in spectrum allocation and licensing processes. It will encourage competition by attracting new players into the market which will result to more quality service. The government

should also review existing regulations for outdated or restrictive policies hindering competition.

5. Government to Government Initiative

   G2G initiative can help a lot to reduce the price of internet in Nepal. Nepal's ISP are highly dependent on India and China to get internet access. Currently, ISP has to buy internet from Tata and Airtel where these companies take huge margin. The government of Nepal can tie up a treaty with India and China to have direct access to the submarine cable at Mumbai or Chennai landing point and connecting Hongkong data via China which will help to reduce the middle-man margin and lower the cost. Also, since the terai part of Nepal is directly linked with the Indian border having railway access, the government of Nepal can find ways to use the network of Indian railway connectivity which can offer quality service at lower price for the terai region.

CHAPTER EIGHT: FURTHER STUDY RECOMMENDATIONS

This study provides the perception of internet users in urban Nepal towards the speed, pricing, and customer service of ISPs in Nepal. Among the three stakeholders: internet user, ISP, and regulatory body, this study does not provide the key insights from ISP and the regulatory body. The further study can be done as an expansion to this study eliminating the prevalent limitations as follows:

1. Large sample size is required to get more precise insights regarding the topics explored in this study and further study can be conducted taking large sample size.
2. This study considers urban Nepal as its concentration and similar study can be conducted for rural Nepal to find the public perception towards the internet service.
3. As an expansion to the study, key informant interviews can be conducted with all the stakeholders and thematic study can be conducted to formulate the policy for quality internet service in Nepal.
4. The economic consequences of internet breakdown and occasionally lowered internet speed can be assessed for further policy planning.

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ANNEX A

Survey Questionnaire

General Demographic Questions:

- What is your age group?
- What is your occupation?
- Which ISP do you use?
- On average, how many hours per day do you use the internet?
- Primary purpose of using the internet?
- What is your internet speed in your package? (in Mbps)
- What is the duration of contract with the internet service provider?

Pricing

- How much do you pay for your internet service annually?
- How fair do you think is the price of your internet as per the service you obtain?
- Have you got any unexpected charges in your bill?

Quality of service

- What does the quality of service of the internet mean to you?

Speed

- How would you rate the speed of your internet connection?
- On a scale of 1 - 5, how often does your internet connection speed get reduced?
- [Internet Service Providers (ISP) use Fair Usage Policy (FUP) in unlimited internet service so as to limit the speed of the internet after a certain amount of data is used. This is done such that one user will not overuse the bandwidth and affect other users in the service provider's network.]

  Did you know about the Fair Usage Policy (FUP) before?

- Will you be ready to pay more for the internet if there was no FUP?

Frequency of the internet not working, and time taken to address any issues.

- How often does your internet break down?
- How easy is it for you to connect to your ISP's complaint hotline? How receptive are they towards your concerns?
- How much time does their field team take to arrive at your home if home visit is essential to solve issues?
- How supportive are the field teams while addressing the issues?

Wrapping up questions

- Overall, how satisfied are you with your internet service provider?
- Would you recommend your internet service provider to others?
- If you could change one thing about your internet, what would you change? Short answer question.