TELECOMMUNICATION OWNERSHIP AND USER PREFERENCES IN KUMAUN REGION OF UTTARAKHAND - IMPLICATIONS FOR UNIVERSAL SERVICE

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ABSTRACT

This paper uses survey conducted upon 2026 individuals in four districts of Uttarakhand, India to study the ownership patterns and user preferences in telecommunication technology. Results reveal that non-ownership (ownership of neither personal mobile nor landline telephone) is more prevalent amongst females, lower income segments, rural areas, uneducated and higher age groups. Even at the same income levels, the probability that a respondent has neither a landline nor a mobile is much higher in rural areas than in urban areas. Users who subscribe to only one form of communication show a strong preference for the mobile phone. Mobile phone only is the most popular form of ownership, and is much more prevalent in the rural and lower income segments. The results suggest the necessity to review the current approach to universal service which predominantly employs the rural-urban divide as the sole segmentation criteria. Further, even though mobile telephony has thrown open access to areas previously un-served by landline telephony, the present Universal policy provides for direct subsidy only on landlines. In the name of increasing penetration, the policy may be subsidizing usage of a technology (landline) which is no more in demand.

Keywords : Universal Service Obligation, Telecommunication, Subsidies, Landline, Mobile

INTRODUCTION

"Universal Service Obligation" (USO) refers to the cost of providing service to all citizens of a country in a non-discriminatory manner. Within a particular service area, it may be more profitable to serve certain customers due to usage characteristics or location. USO may be defined as the cost of serving those locations or customers who may be non-profitable.The meaning of the term USO may be used in the context of any of the two modes - an 'economizing' mode and a 'socializing' mode (Verhoest, 2000). The economizing mode refers to the efficiency and distribution of economic welfare whereas the socializing mode refers to the notion of social welfare and citizens' rights to access communication facilities.

Although they are often used interchangeably, there is a fine distinction between the two terms universal service and universal access (International Telecommunication Union, 2003). Universal access refers to a shared level of service, where access is made available to the citizens at community centres, public booths etc. Universal service refers to access at the individual or household level.

REVIEW OF LITERATURE

A literature review ofuniversal service directives issued by various telecom regulators

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was taken up. The International Telecommunications Union's (ITU) second colloquium in 1993 agreed "that there is no fixed and uniform definition of 'Universal Service" (International Telecommunication Union, 1993). The theme of Universal Service is expressed in Article 1 (d) of the Constitution of International Telecommunication Union (ITU) which states that the purposes of the Union are "to promote the extension of the benefits of the new telecommunication technologies to all the world's inhabitants"(International Telecommunication Union, 2011).

A wide variation is seen in the definition of Universal Service adopted in various countries.The Universal Services Directive of the European Commission defines the scope of universal service as the "minimum set of services of specified quality to which all end-users have access, at an affordable price in the light of specific national conditions, without distorting competition" (European Commission, 2002). Along with changes in technology and consequent expectation of the users, Universal Service may mean different things in different countries and contexts. "Universal Service Obligation" in Indian Telegraph (Amendment) Rules has been defined as the obligation to provide access to basic telegraph services to people in the rural and remote areas at affordable and reasonable prices.

Keeping in view the evolving nature of Universal Service, regulators in some countries choose to define Universal Service on a functional basis, rather than on the basis of certain services. For example, the regulator in USA, Federal Communications Commission (FCC), lays down that universal service should include services (Section 254(c)(1) of Communications Act of 1934 in USA) which -

"a. are essential to education, public health, or public safety;

b. have, through the operation of market choices by customers, been subscribed to by a substantial majority of residential customers;

c. are being deployed in public telecommunications networks by telecommunications carriers; and,

d. are consistent with the public interest, convenience and necessity".

Literature review also took up a study of surveys undertaken in various parts of the world to study the needs and preferencesof telecommunication users. In a study conducted in Phillippines, Alampay (2006) analyzed the socio-demographic differences in the access and use of ICTs. In a similar study undertaken in the rural communities in India (Gujarat), Mozambique and Tanzania, Souter et al. (2005) studied the economic impact of telecommunications on rural livelihoods and poverty reduction. Another exhaustive survey (TNS Opinion and Social, 2010) covering 27 member states of European Union measured, interalia, the various types of telephone and internet access available within homes and the uptake of various communication packages. Scott et al. (2004) analyzed gender differences in patterns of use and attitudes on the basis of field evidence from Botswana, Ghana and Uganda. Hauge et al. (2009) used survey data to study low-income households' telecommunications choices in the United States and to consider the degree to which such households' preferences are addressed by existing universal service programs. Such and other studies provided useful reference points for designing the questionnaire.

OBJECTIVES

Thispaper studies the ownership patterns and user preferences in telecommunication technology in the Kumaun region of Uttarakhand. The objective is to identify the determinants of non-ownership and analyze how various demographic variables affect the ownership pattern, so as to suggest strategies for more efficient allocation of USOF subsidies.

RESEARCH METHODOLOGY

This cross-sectional study is based on primary data which was generated through field work using schedules seeking information from 2026 individuals above 15 years of age in diverse localities about their preferences, ownership and usage of telecommunication devices.

The three components of the study design may be listed as (a) development and validation of a standardized schedule to probe the respondents' preferences, ownership and usage of telecommunication devices, (b) data collection

through a uniform method, and (d) data analysis.

For the purpose of pre-testing, the schedule was administered to 24 respondents from Nainital city and adjoining rural area of Sukhatal. Valuable feedback received helped design the final instrument after making minor modifications to the test-questionnaire.

The study adopted a multi-stage sampling design. Samples were collected from each of the blocks in all the districts under study. Each of the development blocks in a district was allotted a quota for the number of rural and urban samples to be collected. The villages representing the rural sampling points were drawn randomly from amongst all villages in the development block. For urban samples, the locations of survey were decided randomly from amongst areas defined by boundaries of municipal wards. Thus, a two-stage cluster sampling was applied - selection of a rural (village) or urban locality (municipal ward) in the first stage and selection of a cluster of houses in the second stage. While sacrificing for some accuracy (due to sampling error at each stage), this method provided for efficiency of data collection.

In order to study the influence of various social groupings on preferences and usage behavior, non-parametric statistical tests were undertaken as part of the statistical analysis. The Chi-Square test / Cramer's V statistic were employed to analyse the statistical differences between groups.

Four out of the six districts of Kumaon region in Uttarakhand state were selected for data collection, namely (a) Almora (b) Bageshwar (c) Nainital, and (d) Pithoragarh. The desirability of obtaining a sample of sufficient size with considerable diversity in respect of (a) Type of locality (Rural/ Urban), (b) Terrain (Hilly/ Plain area) (c) Level of telephone service coverage (single/multiple service providers and technologies) and (d) Accessibility of the locality (motorable/ non-motorable etc.)was the principal reason for focusing research on these four districts.

RESULTS AND DISCUSSION

The study analysed the level of ownership of mobile and landlines in order to understand user preferences. The respondents were divided into four categories of ownership namely (a) Owners of Landline phones only, (b) Owners of mobile phones only, (c) Owners of both landline and mobile phones, and (d) Neither landline nor mobile ownership.

Table 1 indicates the status of ownership of communication devices in the four districts of Uttarakhand under study. It is seen that majority of the respondents have personal mobile phones. A very minuscule proportion of the respondents reported having only a landline phone. This indicates the changing trends in usage of communication devices in Uttarakhand region.

Table 1 :Status of ownership of mobile and landline in districts under study

	Almora (n=503)	**Bageshwar** (n=490)	**Nainital** (n=483)	**Pithoragarh** (n=550)	**Total no. of samples** (n=2026)	**Percent of Total Sample** (n=2026)
You have a landline in the household, but do not have a personal mobile phone.	7	2	2	6	17	0.84%
You have a personal mobile phone, but do not have a landline in the household.	347	372	148	474	1341	66.19%

You have both a landline in the household and a personal mobile phone.	109	33	323	34	499	24.63%
You have neither a landline in the household nor a personal mobile phone.	40	83	10	36	169	8.34%

Ownership of communication devices - Association with various demographic variables

In order to test the level of association of ownership of communication devices with Income level, the Chi square test is applied in order to test whether significant association exists between ownership and the various demographic variables. Results reveal that ownership is significantly associated with income level, type of locality (Rural/Urban), education level, gender and occupation at 95% level of confidence. The Cramer's V statistic reflects the strongest association of ownership with income, followed by type of locality, education, occupation and then gender (in that order).

Owners of Landline phones only

A very small proportion (.84%) of the respondents reported having only landline phone as communicating device. The results (Table 2) indicate that they are quite satisfied with their present status and are not interested in buying a new mobile phone in next six months. It is also found that one member of the household having a mobile phone is seen as sufficient to serve the needs of other family members. The results also indicate that cost related aspects (e.g. call charges, handset cost) of mobile phones are not perceived as a deterrent to ownership of a mobile phone.

Table 2 :Reasons given for not owning a personal mobile phone

	Almora	Bageshwar	Nainital	Pithoragarh	Total
One or more household members has\ have a mobile phone that serves the needs of the household	1	0	2	4	7
The mobile handset costs are too high	1	0	0	2	3
The rental charges/ cost of calls are too high	0	0	0	0	0
Mobile phone coverage is not available where you live	1	0	0	2	3
You or other members of your household do not need a mobile phone	4	0	1	1	6
Don't Know	1	0	0	0	1
Others	1	0	1	0	2

Owners of Mobile phones only

66.19 % of the respondents indicated that they have a personal mobile phone but not a landline in the household. Table 3 presents the reasons cited for not having a landline phone in the household.

Table 3 :Reasons given for not having a landline phone in the household

	Almora	Bageshwar	Nainital	Pithoragarh	Total	Percent of total respondents (n=1341)
Your household plans to get a landline phone within the next six months.	7	2	4	2	15	1.12%
One or more household members has\ have a mobile phone that serves the needs of the household	317	365	94	435	1211	90.31%
The initial installation\ connection costs are too high	38	0	6	19	63	4.70%
The rental charges/ cost of calls are too high	8	1	27	26	62	4.62%
Landline is not available where you live	20	9	7	42	78	5.82%
You or other members of your household do not need a landline phone.	152	39	76	205	472	35.20%
Don't Know	4	0	2	2	8	0.60%
Others	5	0	1	0	6	.45%

The following results are brought out based on Table 3 which point out the barriers to use in case of a landline phone -

i. The reason cited for non-ownership of landline by almost 90% of the respondents was that one or more members had a mobile phone which served the needs of household. In other words, respondents feel that a member having a mobile phone is sufficient to meet the needs of the household and there is no reason to have a fixed line as well. This indicates that an understanding of the social factors - how such technologies are shared amongst individuals in a household- is important to comprehend how individuals access telecommunication services.

ii. 35.2 % of the respondents also indicated that the need for a landline phone was not felt in the household.
iii. 9.3 % of the total respondents have given cost as an inhibiting factor for ownership of the landline phone.
iv. Only about 6 % of the respondents cited non-coverage as a reason for not having a landline in the household.
v. Very few of the responses expressed a willingness to buy a landline within the next six months.

Based on the above, it can be inferred that the main reason for non-use of the landline phone is that its overall utility as compared to the mobile phone is perceived to be poor. It appears that at least in the area of study, the mobile phone is a shared utility amongst members of the household to the extent that it obviates the need for a landline phone.

In order to understand whether cost of a landline is a barrier to its ownership, the reasons furnished for non-ownership of a landline phone are cross-tabulated with various income categories and presented in Table 4.

Table 4 : Reasons furnished for non-ownership of a landline phone

	Percentage of respondents				
	Less than Rs 5,000 (n=343)	Rs 5,000 - Rs. 9,999 (n=311)	Rs 10,000 - Rs. 19,999 (n=381)	Rs. 20,000 or above (n=306)	Total respondents (n=1341)
Your household plans to get a landline phone within the next six months.	1.46	1.61	0.26	1.31	1.12
One or more household members has\ have a mobile phone that serves the needs of the household	88.92	90.68	91.60	89.87	90.31
The initial installation\ connection costs are too high	9.62	5.47	1.57	2.29	4.70
The rental charges/ cost of calls are too high	4.96	3.22	5.51	4.58	4.62
Landline is not available where you live	7.00	6.11	4.99	5.23	5.82
You or other members of your household do not need a landline phone.	32.07	24.76	33.60	51.63	35.27

Overall, 9.3% of the respondents cited a cost reason (high installation or high call charges) for non-ownership of landline. However, this figure was higher for the lower income segments. A significant 14.6% of the respondents earning less than Rs. 5000 a month cited cost reasons. Almost 10% of the respondents in this income category stated that high installation cost was one of the reasons for not owning a landline. Another 5% believed that high fixed line call charges were a barrier.

However, even within the low income categories, the utility of the landline was perceived as poor. For example, as many as 89% of

respondents earning less than Rs. 5000 a month and having a mobile only said that a mobile phone with a member of family serves the needs of entire household, and as such did not feel that landline was required.

By indicating that the non-use of landline is a function of landline's perceived poor utility compared to the mobile phone, the above findings have important implications for the universal service policy. Most of the respondents having only a mobile phone answered that they did not have a landline phone in the household because a mobile phone with a single member of the family could be shared. Some of the landline only respondents answered that they did not feel a need for the mobile phone. These responses indicate that the landline and mobile phones are being seen as substitutes. Also, it appears that the overall cost associated with a landline phone (installation cost, rental and call charges) is also perceived as high, at least by the lower income groups.

These findings reiterate the view that barriers to universal service are not necessarily related to only the costs incurred by the consumers, but also a function of the demand side characteristics e.g., consumer preferences, perceived utility etc.

Owners of both Landline and Mobile phones

24.63% of the respondents reported that they have both landlinein the household as well as a personal mobile phone. In the study these respondents were asked about their primary usage medium. The primary usage medium was explained to the respondents as the medium from which more number of calls are made. The frequency distribution with respect to the indicated primary usage medium is shown below in Table 5. The results show that majority of the respondents are using mobile phones as compared to landline phones.

Table 5: Primary usage medium for communication

	Almora	Bageshwar	Nainital	Pithoragarh
Landline	15	1	7	3
Mobile	85	23	315	28
Can't say	10	3	0	1

Neither Landline nor mobile ownership

8.34% of the respondents did not have any kind of phone (neither landline nor mobile phone). This constitutes an important target population for the present study since the preferences and usages of such uncovered segments of population hold out great significance for Universal access policies. These respondents were asked to respond to specific questions designed to study their perceptions about the requirement of communication devices.

When asked which facility they would prefer to have if they decide to buy one (considering their present conditions), almost all expressed their desire to buy a mobile telephone rather than a landline (Table 6). The results clearly indicate that most of the prospective buyers of communication devices will prefer to buy a mobile phone rather than a land line phone.

Table 6 :Preference to buy communication devices

	Almora	Bageshwar	Nainital	Pithoragarh	Total	Percentage of total
Landline	1	0	1	3	5	3.01 %
Mobile phone	16	73	9	4	102	61.45 %
Can't say	24	7	0	28	59	35.54 %

The respondents were further asked to indicatethereason for their choice of the mobile or landline telephone. The results are shown in Table 7.

Table 7 :Reason for choice of a Mobile/ Landline

	Almora	Bageshwar	Nainital	Pithoragarh	Total	Percentage of respondents (%)
More relevant to my needs	6	26	6	0	38	37.25
Less Costly	12	37	9	3	61	59.80
Better Coverage	2	16	1	4	23	22.55
Others	21	1	0	2	24	23.53

Interpreted alongside the results presented in Table 6, it may be inferred that -

i. An overwhelming proportion of the respondents with no communication device indicated that they would prefer to buy a mobile phone rather than a landline phone. The most common reason stated for preferring a mobile to a landline was that it was less costly than a landline phone (given by almost 60% of respondents).

ii. A significant number of respondents (37.25 %) also perceived the mobile to be more relevant to their needs than the landline. In the area of study, some respondents (22.55 %) also felt that mobile telephony has better coverage.

Table 8shows how non-ownership (neither landline nor mobile) varies with the various demographic variables.

Table 8 :Variation of non-ownership (neither landline nor mobile) with demographic variables

Variable	Percentage non-ownership of landline and mobile (%)
Gender	
Male	7.46
Female	11.25
Monthly Income	
Less than Rs. 5000	23.83
Rs. 5000 to Rs. 9999	7.82
Rs. 10000 to Rs. 19999	2.03
Above Rs. 20000	0.82

Variable	Percentage non-ownership of landline and mobile (%)
Location	
Rural	14.23
Urban	1.95
Education	
Uneducated	60.00
Did not complete Class V	37.78
Completed Cl. V but not Class X	19.69
Completed Cl. X but not a Graduate	4.78
Graduate and above	0.82
Age Group	
Less than 25 years	4.62
25 to 35 years	5.43
35 to 45 years	7.77
above 45 years	14.21

From Table 8, it may be inferred that non-ownership (neither mobile nor landline) is found to be more amongst females, lesser income segments, rural areas, uneducated and higher age groups.

Table 9 :Forms of ownership of communication devices - Percentage distribution of respondents

Ownership of landline/ mobile - The rural-urban divide

Income level of a respondent has been shown earlier to have a significant association with ownership of a communication device. Accordingly, the level of ownership in rural and urban areas was sought to be evaluated after taking away the effect of income.

Income Category	Percentage of respondents (Rural =1054; Urban =972)							
	Landline only		Mobile only		Landline + Mobile		Neither	
	Rural	Urban	Rural	Urban	Rural	Urban	Rural	Urban
Less than Rs 5000	1.53	0.00	65.90	70.59	3.31	23.53	29.26	5.88
Rs 5000 - Rs 9999	0.44	1.66	82.02	68.51	5.70	27.07	11.84	2.76
Rs 10000 - Rs 19999	0.40	1.22	83.40	71.43	14.57	24.90	1.62	2.45
Rs 20000 or above	0.00	0.70	69.35	41.45	28.49	57.61	2.15	0.23

This study finds that 67% of the individuals with income less than Rs. 5,000 per month are dependent solely on the mobile, as against 50% of the mobile-only individuals with monthly income above Rs. 20,000 per month. Table 9provides the ownership levels in rural and urban areas across various income categories. The figures therein reflect the percentage of the total rural or urban respondents, as the case may be.It is observed that -

i. At the same income, the percentage of respondents having neither a landline nor a mobile is much higher in rural areas than in urban areas. For example, in the income category of less than Rs. 5,000 per month, 29.26% of the rural respondents reported having neither a landline at home nor a personal mobile phone, as against only 5.88% of urban respondents. This difference is seen in three income categories out of four. Further, the difference is much higher amongst the lower income segments, suggesting the poor access/ ownership levels of the economically weak segments in rural areas.
ii. As many as 74.1% of the rural respondents reported owning only a mobile as against 57.6% of urban respondents who reported ownership of only mobile phone. Hence, the mobile only form of ownership is much more prevalent in the rural areas than in the urban areas. Only the lowest income segment (which shows a very high non-ownership in the rural areas) presents an exception to this.
iii. The percentage of respondents with both the devices is much higher in urban areas than in rural areas. This pattern is seen consistently across all income categories.

CONCLUSIONS AND RECOMMENDATIONS

The analysis of ownership and preference of telecommunication technology within various segments of population was one of the key themes of this paper.

Ownership of mobile/ landline

The results relating to status of ownership of communication devices in the four districts of Uttarakhand indicate that ownership is significantly associated with income, location of the respondent (i.e. Rural or Urban), education level, gender and occupation.

i. It is seen that non-ownership (ownership of neither mobile nor landline telephone) is more amongst females, lower income segments, rural areas, uneducated and higher age groups.
ii. Even when the effect of income is taken away, the percentage of respondents having neither a landline nor a mobile is much higher in rural areas than in urban areas. This difference is seen in three income categories out of four. Further, the difference is much higher amongst the lower income segments, which indicates lower ownership levels of the economically weak segments in rural areas.
iii. Manifold reasons are found for non-ownership of a landline. A significant 14.6% of the respondents earning less than Rs. 5000 a month cited high cost as a barrier to ownership of a landline. Almost 10% of the respondents in this income category stated that high installation cost was one of the reasons for not owning a landline. Another 5% believed that high fixed line call charges were a barrier. However, even within the low income categories, the utility of the landline was perceived as poor.
iv. The finding that even at same income levels, the likelihood that an urban household has access to a communication facility is much higher in urban than rural areas of Uttarakhand is very important from the perspective of Universal service. It may be concluded from the research findings that even though the Universal Service Fund program is subsidizing access to the telecommunication services in the rural areas, the program is failing to provide people in rural areas with comparable access to

telecommunications services.

v. The adoption of type of locality (rural/urban) as a sole segmentation criterion for implementation of USOF schemes needs to be reviewed. For specific USOF schemes, different criteria need to be identified so as to address non-ownership amongst lower income segments, rural areas, uneducated and higher age groups.

vi. The overall cost associated with a landline phone (installation cost, rental and call charges) is perceived as high in the lower income groups, which is one of the causes of non-ownership of a landline. The direct subsidy on landline phones should be accompanied by flexible tariff packages, so that the barriers to entry are reduced. If preferences in communication technology (discussed in next section) are taken into account, a strong case in made out for reviewing the policy of direct subsidy on landlines.

Preferences in communication technology

The results of the study indicate that majority of the respondents have personal mobile phones, with only a very minuscule proportion of the respondents having only a landline phone. This result indicates the changing trends in usage of communication devices in Uttarakhand region.

i. Users who subscribe to only one form of communication show a strong preference for the mobile phone.

ii. Mobile phone only is the most widely owned means of telecommunications in urban as well as rural areas. Interestingly, this ownership pattern is much more prevalent in the rural areas than in the urban areas. This implies that more people in rural areas are relying exclusively on the mobile than urban areas.

iii. Sole dependence on the mobile for telecommunication needs is an ownership pattern more pronounced in the lower income segments as against the higher income segments.

iv. The most common reason stated by non-owners (neither landline nor mobile) for preferring a mobile to a landline was that it was less costly than a landline phone (given by almost 60% of respondents). 37.25 % also perceived the mobile to be more relevant to their needs than the landline. Some respondents (22.55 %) also felt that mobile telephony has better coverage.

v. As many as 89% of respondents from the lower income group (earning less than Rs. 5000 a month) and having a mobile only said that a mobile phone with a member of family serves the needs of entire household, and as such did not feel that landline was required. Overall, respondents attached lower value to ownership of landline telephones as compared to mobile phones.

It is, hence, clearly established that mobile telephones are the preferred mode of voice communication, especially in the low income and rural segments.

vi. The above findings have important implications for the universal service policy. Even though mobile telephony has thrown open access to areas previously un-served by landline telephony, the present policy provides for direct subsidy only on landlines. Thus, there is a lack of alignment between the preferences of target population and the subsidy schemes of USOF. In the name of increasing penetration, the USOF policy is attempting to incentivize usage of a technology (landlines) which is no more preferred by the target population. The exclusion of mobile telephony from direct subsidy suggests that the current approach to universal service is rooted in the past regulatory era when the landline telephony was the dominant telecommunications technology and mobile telephony was considered the preserve of rich. The overwhelming preference for the mobile telephony over the wireline telephony calls for a thorough review of the universal service policy. The universal service programs need to address this mismatch by providing for a direct subsidy program for mobile telephony.

Further, making a distinction between the fixed-line and mobile telephony for providing direct subsidy also violates the technology neutrality of the universal service programs.

vii. The barriers to universal service are not necessarily related to the costs incurred by the consumers, but also to the demand side factors like consumer preferences, perceived utility etc. Thus, the USOF policy needs to take into account the social aspects for promotion of technology usage and assimilation rather than relying only on monetary incentives.

Note: This paper has been written for academic purposes and the views and opinions expressed herein are personal. The views and opinions expressed herein should not be ascribed in any form whatsoever to the Govt. of India.

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