



MAKERERE UNIVERSITY

COLLEGE OF BUSINESS AND MANAGEMENT SCIENCES (COBAMS)

SCHOOL OF STATISTICS AND PLANNING

**REGIONAL ANALYSIS HOUSEHOLD'S ACCESS AND UTILISATION OF ICT IN
UGANDA.**

BY

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DECLARATION

I, Kitaka Priscilla, hereby declare that this is an original piece of work and to the best of my knowledge, this report was due to my tireless effort of activities performed during my research to contribute towards the scholarly award and has never been submitted for any other certificate, diploma or degree award in any institution or university by any person for any academic qualification.

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APPROVAL

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ABSTRACT

This study examined regional disparities in household access to and utilization of Information and Communication Technology (ICT) in Uganda using data from the Uganda National Household Survey (UNHS) 2019/20. Descriptive statistics, chi-square tests, and binary logistic regression were used to analyse regional, socio-economic and demographic differences in ICT access and utilization. The findings revealed substantial regional disparities, with Kampala recording the highest levels of ICT access and internet use, while Karamoja and other underserved regions recorded the lowest. Education and urban residence were important predictors of ICT utilization, while lack of digital skills and high costs were major barriers. The study recommends expanding ICT infrastructure, improving affordability, strengthening digital skills training, and implementing region-specific interventions to reduce Uganda's digital divide.

CHAPTER ONE: INTRODUCTION

1.0 Background of the Study

The regional analysis of households' access to and utilization of Information and Communication Technology (ICT) in Uganda is firmly anchored in the country's long-term development aspirations as outlined in the Third National Development Plan (NDPIII) and Uganda Vision 2040. These policy frameworks recognize ICT as a transformative tool for accelerating socio-economic development, improving service delivery, enhancing transparency in governance, and stimulating innovation-driven growth. ICT is not viewed as a standalone sector but rather as a cross-cutting enabler that influences agriculture, education, health, trade, finance, and public administration across all regions of the country.

Globally, ICT has revolutionized the production, marketing, and distribution of goods and services, creating new opportunities for economic growth and social transformation. In Uganda, similar changes are increasingly evident through the widespread adoption of mobile telephony and expanding internet connectivity. Nevertheless, the pace and extent of ICT diffusion vary significantly across regions. Urban centres, particularly Kampala, have experienced rapid digital expansion, while many rural and peripheral regions continue to face challenges such as inadequate ICT infrastructure, high service costs, unreliable electricity supply, and limited digital literacy.

These regional disparities are important because access to ICT increasingly determines access to information, education, employment opportunities, financial services, markets, and government services. As Uganda continues its transition towards a knowledge-based economy, understanding the spatial distribution of ICT access and utilization becomes critical for designing policies that promote inclusive digital development.

Drawing on data from the Uganda National Household Survey (UNHS) 2019/20, this study examines household ownership of ICT assets, including radios, televisions, mobile phones, and computers, as well as individual use of computers and the internet across Uganda's regions and sub-regions. The analysis provides valuable insights into the availability of ICT infrastructure, patterns of utilization, expenditure on ICT services, internet usage behaviour, and barriers to digital inclusion.

1.1 Problem Statement

Despite substantial investments in ICT infrastructure and the increasing recognition of digital technologies as drivers of socio-economic transformation, significant disparities in ICT access and utilization persist across Uganda's regions. While urban and economically vibrant regions enjoy relatively better connectivity, access to digital devices, and internet services, many rural and underserved regions continue to lag behind.

These inequalities limit opportunities for education, employment, business development, financial inclusion, and access to public services. Furthermore, limited ICT access may reinforce existing regional socio-economic disparities, reducing the effectiveness of national digital transformation initiatives and slowing progress toward Uganda Vision 2040 objectives.

Although national statistics provide an overall picture of ICT development, there remains a need for detailed regional analysis to identify geographic variations in access and utilization patterns. Understanding these differences is essential for developing targeted interventions aimed at reducing the digital divide and promoting equitable participation in Uganda's digital economy.

1.2 Purpose of the Analysis

The purpose of this analysis is to examine regional disparities in household access to and utilization of ICT in Uganda using data from the Uganda National Household Survey (UNHS) 2019/20. The study seeks to generate evidence that can inform policy formulation, resource allocation, and investment strategies aimed at promoting inclusive digital transformation and reducing regional inequalities in ICT development.

1.3 Objectives of the Analysis

1.3.1 General Objective

To assess regional patterns of household access to and utilization of Information and Communication Technology (ICT) in Uganda.

1.3.2 Specific Objectives

1. To examine the distribution of ICT asset ownership, including radios, televisions, mobile phones, and computers, across regions of Uganda.
2. To assess regional differences in computer and internet usage among individuals aged 10 years and above.
3. To identify socio-economic and demographic factors influencing ICT utilization across regions.
4. To examine the main purposes for which individuals use the internet in different regions.
5. To identify barriers limiting access to and utilization of ICT services across regions.
6. To assess regional inequalities in digital connectivity and their implications for socio-economic development.
7. To provide evidence-based recommendations for improving digital inclusion and reducing regional ICT disparities.

1.4 Research Hypotheses

The analysis is guided by the following hypotheses:

Null Hypotheses (H_0)

1. There are no significant regional differences in household ownership of ICT assets in Uganda.
2. There are no significant regional differences in internet and computer usage among individuals in Uganda.
3. Educational attainment has no significant influence on ICT utilization across regions.
4. Urban and rural households have similar levels of access to and utilization of ICT services.

Alternative Hypotheses (H_1)

1. Significant regional differences exist in household ownership of ICT assets in Uganda.
2. Significant regional differences exist in internet and computer usage among individuals in Uganda.

3. Educational attainment significantly influences ICT utilization across regions.
4. Urban households have significantly higher access to and utilization of ICT services than rural households.

1.5 Overview of the Analysis

This analysis utilizes data from the Uganda National Household Survey (UNHS) 2019/20 to provide a comprehensive assessment of ICT access and utilization across Uganda's regions. The analysis focuses on household ownership of ICT assets, including radios, televisions, mobile phones, and computers, as indicators of access to digital technologies.

In addition, the study examines individual utilization of computers and the internet, highlighting regional differences in digital engagement. Particular attention is given to factors such as educational attainment, age, place of residence, and economic conditions that influence ICT adoption and usage patterns.

The analysis further explores the purposes for which ICT is used, including communication, social networking, education, business activities, and information access. It also investigates barriers to internet adoption, such as affordability constraints, lack of digital skills, inadequate infrastructure, and limited-service availability.

Findings are presented across major regions and sub-regions including Kampala, Buganda North, Buganda South, Busoga, Bukedi, Elgon, Teso, Karamoja, Lango, Acholi, West Nile, Bunyoro, Tooro, Ankole, and Kigezi, thereby providing a detailed spatial perspective of Uganda's digital transformation.

CHAPTER TWO: LITERATURE REVIEW

2.1 Introduction

Information and Communication Technology (ICT) has increasingly been recognized in development literature as a critical driver of socio-economic transformation, productivity enhancement, and poverty reduction. In Uganda, ICT development is strongly aligned with national strategic frameworks such as the Third National Development Plan (NDPIII) and Uganda Vision 2040, which position ICT as a foundational enabler of industrialization, innovation, and improved public service delivery. These policy frameworks emphasize the need to expand digital infrastructure, strengthen ICT-enabled services (ICTES), promote research and innovation, and enhance citizen participation through digital platforms.

The literature on ICT access and utilization in developing countries, including Uganda, has evolved around three major themes: (i) ICT infrastructure and asset ownership, (ii) ICT usage patterns and digital skills, and (iii) barriers to digital inclusion. Drawing from findings presented in the Uganda National Household Survey 2019/20 (UNHS 2019/20), this review synthesizes key empirical and theoretical perspectives relevant to household-level ICT access and utilization, particularly within a regional context.

2.2. Theoretical Perspectives on ICT and Development

The relationship between ICT and development is often examined through modernization theory, diffusion of innovation theory, and the digital divide framework.

The diffusion of innovation theory posits that adoption of new technologies spreads gradually across populations, beginning with early adopters and progressing to wider communities. In Uganda's context, urban regions such as Kampala demonstrate characteristics of early and advanced adoption, while rural and remote regions exhibit slower uptake. This aligns with global findings that ICT adoption is closely linked to infrastructure availability, income levels, education attainment, and exposure to technology.

The digital divide framework further explains disparities in access and use of ICT across socio-economic and geographic groups. The divide is typically categorized into three levels:

Access divide – differences in physical access to ICT infrastructure and devices.

Usage divide – differences in how ICT is used (frequency and purposes).

Skills divide – differences in digital literacy and capacity to use ICT effectively.

The UNHS findings strongly reflect these dimensions, particularly in the low levels of computer ownership, minimal internet usage, and the high proportion of individuals citing lack of skills and high equipment costs as barriers.

2.3. ICT Asset Ownership in Households

Literature consistently indicates that mobile phones are the most widely adopted ICT devices in developing countries due to affordability, portability, and expanding cellular networks. The UNHS 2019/20 confirms this trend, with mobile phone ownership far surpassing ownership of radios, televisions, and computers. This finding aligns with studies across Sub-Saharan Africa that identify mobile technology as the primary gateway to digital inclusion.

Conversely, computer ownership remains extremely low, particularly in rural regions. Research attributes this to high acquisition costs, limited electricity access, and lower perceived necessity compared to mobile phones. The survey findings showing minimal computer ownership reinforce earlier literature suggesting that personal computers remain luxury assets concentrated in urban and higher-income households.

Ownership patterns are also strongly associated with education levels and urban residence. Households headed by individuals with post-secondary education demonstrate significantly higher ownership of ICT assets. This is consistent with human capital theory, which suggests that higher education levels increase the likelihood of technology adoption due to enhanced awareness, skills, and income potential.

2.4. Computer Usage and Digital Skills

The literature emphasizes that ownership alone does not guarantee meaningful utilization. Digital literacy and practical skills determine whether ICT tools are used productively. The UNHS 2019/20 shows that only a small proportion of individuals aged 10 years and above used a computer in the three months preceding the survey.

Among users, the most common activities included copying or moving files, using copy-and-paste functions, and sending emails with attachments. More advanced tasks such as programming were rare. This pattern aligns with existing literature which indicates that ICT use in many developing countries is predominantly basic and operational rather than advanced or innovation-oriented.

The limited engagement in programming and higher-order digital skills reflects gaps in ICT training and curriculum integration within education systems. Research suggests that strengthening digital competencies is essential for transitioning from consumer-based ICT use to productive, innovation-driven utilization.

2.5. Internet Usage and Purpose

Internet penetration remains low nationally, though significantly higher in urban areas. This mirrors regional and global patterns where urban centers benefit from better broadband infrastructure and network reliability. The UNHS findings reveal that most internet users access the internet via mobile phones rather than fixed computers. This supports literature identifying mobile internet as the dominant mode of connectivity in Africa.

The primary use of the internet for social networking reflects trends documented in ICT studies across developing economies. Social networking platforms often represent the entry point for internet adoption due to their accessibility and low technical requirements. However, the relatively low use of the internet for business, academic work, or e-commerce indicates underutilization of ICT for economic transformation.

Scholars argue that the developmental impact of ICT depends not merely on access, but on productive application—such as online learning, digital entrepreneurship, e-government engagement, and innovation activities. The survey findings suggest that Uganda remains at an early stage of leveraging internet connectivity for high-value economic activities.

2.6. Barriers to ICT Access and Utilization

A substantial body of literature identifies cost, infrastructure deficits, and digital literacy gaps as primary barriers to ICT adoption in developing countries. The UNHS 2019/20 findings corroborate

this, with lack of confidence, knowledge, or skills emerging as the leading reason for not using the internet. High equipment and service costs also feature prominently.

The prominence of skills-related barriers highlights the importance of digital literacy programs and education reforms. Research indicates that investments in infrastructure alone are insufficient without parallel efforts to enhance user capacity. Additionally, affordability constraints disproportionately affect rural households and youth, reinforcing regional and socio-economic disparities.

The literature also acknowledges structural challenges such as unreliable electricity, limited broadband coverage in remote areas, and cultural perceptions regarding technology use. These factors contribute to persistent regional inequalities in ICT access and utilization.

2.7. Regional Disparities and the Digital Divide

Regional analysis is central to understanding ICT inequalities in Uganda. Literature on spatial development emphasizes that urban areas typically experience faster technological diffusion due to higher population density, better infrastructure, and stronger economic activity. Kampala's higher ICT ownership and internet usage rates reflect this pattern.

Regions such as Karamoja, Acholi, and parts of West Nile demonstrate lower ICT penetration, consistent with studies linking remoteness, lower education levels, and infrastructural limitations to reduced technology adoption. Such disparities risk reinforcing broader development inequalities if not addressed through targeted policy interventions.

Bridging the regional digital divide is therefore crucial for inclusive growth. Scholars recommend expanding rural broadband infrastructure, subsidizing ICT equipment, integrating digital skills training in schools, and promoting community access centers to enhance equitable access.

2.8. ICT and Governance Participation

Another important strand of literature links ICT access to enhanced citizen participation and governance transparency. Access to digital information platforms enables public engagement in policy discussions and decision-making processes. The survey's emphasis on digital content

availability and inter-agency connectivity aligns with governance modernization literature advocating for e-government systems.

However, low internet penetration in rural regions may limit the extent to which ICT contributes to participatory governance nationwide. This highlights the need for inclusive digital strategies to ensure equitable civic engagement opportunities.

2. 9. Conclusion

The reviewed literature, supported by findings from the UNHS 2019/20, underscores that while Uganda has made progress in expanding ICT access particularly through mobile phone ownership significant challenges remain in achieving widespread, meaningful digital inclusion. Ownership of advanced ICT equipment such as computers remains limited, internet usage is low, and regional disparities persist.

The dominant barriers of limited digital skills and high costs reflect structural constraints that must be addressed to realize the transformative potential envisioned in the Uganda Vision 2040 and the Third National Development Plan.

Overall, the literature suggests that bridging Uganda's digital divide requires a comprehensive approach encompassing infrastructure development, affordability measures, digital literacy enhancement, and region-specific interventions. Only through such integrated efforts can ICT effectively contribute to inclusive growth, poverty reduction, and national socio-economic transformation.

CHAPTER THREE: METHODOLOGY

3. 1. Introduction

This methodology outlines the procedures and analytical approaches used to examine regional disparities in households' access to and utilization of Information and Communication Technology (ICT) in Uganda. The analysis is grounded in nationally representative data drawn from the Uganda National Household Survey 2019/20 (UNHS 2019/20). The survey provides comprehensive household- and individual-level data on ICT asset ownership, computer usage, internet utilization, expenditure patterns, and barriers to digital access.

The methodological approach integrates descriptive, comparative, and inferential statistical techniques to assess regional variations in ICT access and use across Uganda's sub-regions. The aim is to identify spatial inequalities, determine key socio-demographic correlates of ICT adoption, and provide evidence-based insights to inform policy and regional development strategies.

3. 2. Research Design

The study adopts a cross-sectional analytical research design, utilizing secondary data from the UNHS 2019/20. A cross-sectional design is appropriate because it allows for the analysis of ICT access and utilization at a specific point in time across different geographic regions and socio-economic groups.

The design enables:

- Comparison of ICT ownership and usage indicators across sub-regions.
- Examination of associations between ICT access and socio-demographic characteristics (e.g., sex, education level, residence).
- Identification of patterns and disparities that reflect the digital divide within Uganda.
- The study is quantitative in nature and relies on structured survey data collected through standardized questionnaires.

3.3. Data Source

The primary data source for this analysis is the Uganda National Household Survey 2019/20 conducted by the Uganda Bureau of Statistics (UBOS). The survey collected nationally representative data at three levels:

- Community Level – Availability of internet access points, pay phones, distance to ICT services, and service quality.
- Household Level – Ownership of ICT assets (radio, television, mobile phone, computer), expenditure on ICT services, access constraints, and distance to service points.
- Individual Level – Computer use within the last three months, type of computer used, internet usage, purposes of internet use, location of internet access, and reasons for non-use.
- The survey employed a stratified multi-stage sampling design to ensure representation across urban and rural areas and across all sub-regions of Uganda.

3.4. Study Population and Unit of Analysis

The study population comprises:

- Households for analysis of ICT asset ownership and access.
- Individuals aged 10 years and above for analysis of computer and internet usage.
- Two units of analysis are therefore applied:
- Household-level unit – Used to assess ownership of ICT assets (television, radio, mobile phone, computer/laptop).
- Individual-level unit – Used to analyze computer usage, internet utilization, purposes of internet use, and barriers to digital access.
- Regional comparisons are conducted at the sub-regional level, including Kampala, Buganda North, Buganda South, Busoga, Bukedi, Elgon, Teso, Karamoja, Lango, Acholi, West Nile, Bunyoro, Tooro, Ankole, and Kigezi.

5. Variables and Measurement

3.5 Dependent Variables

The key outcome variables for the regional analysis include:

A. Household ICT Access Indicators:

- Ownership of mobile phone (Yes/No)
- Ownership of radio (Yes/No)
- Ownership of television (Yes/No)
- Ownership of computer/laptop (Yes/No)

B. Individual ICT Utilization Indicators:

- Computer use in the last three months (Yes/No)
- Type of computer used (desktop, laptop, tablet, adaptive technology)
- Internet use (Yes/No)
- Purpose of internet use (social networking, academic work, business, telephoning, etc.)
- Location of internet access (home, workplace, school, mobile phone, etc.)
- Reasons for not using internet (cost, lack of skills, availability, etc.)

3.5.1 Independent Variables

The explanatory variables include:

- Sub-region
- Residence (Urban/Rural)
- Sex of household head or individual
- Education level
- Age group
- Socio-economic status (where available through proxy indicators)

3. 6. Data Processing and Management

Data cleaning and preparation involve:

- Verification of completeness and consistency of ICT-related variables.

- Recoding categorical variables into analytically meaningful groups.
- Creation of composite indicators (e.g., digital access index, if applicable).
- Application of survey weights to ensure national and regional representativeness.
- Data analysis may be conducted using statistical software such as SPSS, STATA, or R, incorporating complex survey design adjustments where necessary.

3.7. Analytical Techniques

3.7.1 Descriptive Statistics

Proportions and percentages were computed for all ICT outcome variables at national, regional, and sub-regional levels. Cross-tabulations by sex, education, and urban/rural residence were produced to identify patterns of differential access. All estimates incorporate UBOS-provided survey weights.

3.7.2 Comparative Regional Analysis

Sub-regional variations in ICT ownership and usage were assessed through cross-tabulations and visual inspection. Urban-rural differentials within and across regions were calculated. Regions were ranked by ICT penetration levels to characterize the range of digital inequality.

3.7.3 Chi-Square Tests of Independence

Chi-square (χ^2) tests were used to determine whether observed differences in ICT outcomes across sub-regions, education levels, and urban/rural residence are statistically significant or attributable to sampling variation. A significance threshold of $\alpha = 0.05$ was applied. Where expected cell counts fell below five, Fisher's Exact Test was used as an alternative.

3.7.4 Binary Logistic Regression

Binary logistic regression models were estimated for each of the four ICT outcome variables to assess the independent effects of socio-demographic and geographic predictors after controlling for confounding variables. The logistic regression model takes the form:

$$\ln[P(Y=1) / (1-P(Y=1))] = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \dots + \beta_k X_k + \varepsilon$$

Where $P(Y=1)$ is the probability of the ICT outcome (e.g., owning a mobile phone), $X_1 \dots X_k$ are the independent variables, β_0 is the intercept, $\beta_1 \dots \beta_k$ are the regression coefficients, and ε is the error term. Results are reported as adjusted odds ratios (AOR) with 95% confidence intervals (CI).

Sub-region, education level, residence, sex, and age group are included in all four models. Model fit is assessed using the Hosmer-Lemeshow goodness-of-fit test and Nagelkerke pseudo-R².

3.7.5 Software

All statistical analyses were conducted using SPSS Version 27 (IBM Corp., 2020), incorporating complex survey design adjustments using the Complex Samples module to account for the stratified multi-stage sampling design of the UNHS 2019/20.

3. 8. Measurement of Regional Digital Divide

To quantify disparities, the study may construct:

- Regional ICT penetration rates.
- Urban-rural ICT gap indices.
- Education-adjusted ICT usage differentials.
- Comparative ratios (e.g., Kampala vs Karamoja internet usage rate) can illustrate the magnitude of regional inequality.

3.9. Ethical Considerations

Since the study relies on secondary data from the UNHS 2019/20, no direct data collection from respondents is undertaken. Ethical considerations include:

- Use of anonymized datasets.
- Ensuring confidentiality of respondents.
- Proper citation and acknowledgment of UBOS as the data source.
- The analysis adheres to statistical reporting standards and avoids misrepresentation of findings.

3. 10. Limitations of the Methodology

Several limitations are acknowledged:

- The cross-sectional design limits causal inference.
- ICT usage is self-reported and may be subject to recall bias.
- The survey does not capture detailed measures of internet speed or quality.
- Rapid technological change may render some findings time-sensitive.

Despite these limitations, the methodology provides robust and nationally representative insights into regional ICT disparities.

3.11. Conceptual Framework

The study is guided by a digital divide framework linking:

- Structural factors (region, infrastructure availability)
- Socio-demographic factors (education, age, sex, residence)
- ICT access (asset ownership)
- ICT utilization (computer and internet usage)
- Regional location influences infrastructure and economic opportunities, which in turn shape ICT access and ultimately determine levels of utilization.

3. 12. Conclusion

This methodology provides a systematic and comprehensive approach to examining regional differences in households' access and utilization of ICT in Uganda. By leveraging nationally representative data from the Uganda National Household Survey 2019/20, the study applies descriptive and inferential statistical techniques to uncover spatial inequalities and socio-economic determinants of digital access.

The methodological framework ensures that the regional analysis is rigorous, policy-relevant, and aligned with Uganda's broader digital transformation objectives as articulated in the Uganda Vision 2040 and the Third National Development Plan.

CHAPTER FOUR: RESULTS AND DISCUSSION

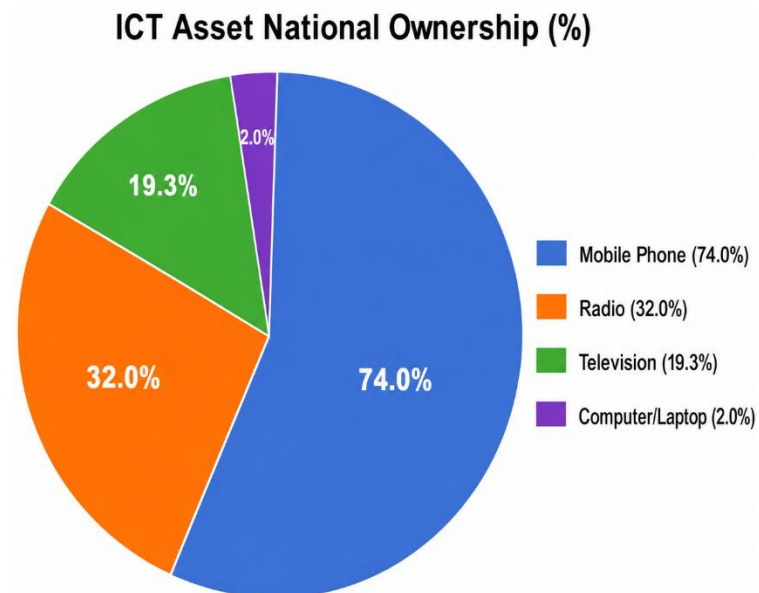
4.1 Introduction

This chapter presents and discusses findings on ICT access and utilization across Uganda's 15 sub-regions, drawing on the UNHS 2019/20 dataset. The chapter is organized into six main sections: (i) household ownership of ICT assets; (ii) ICT ownership by socio-economic characteristics; (iii) computer usage; (iv) internet usage, purposes, and access locations; (v) barriers to internet use; and (vi) combined inferential and logistic regression analysis. Results from chi-square tests of independence are presented alongside descriptive statistics to assess statistical significance of observed regional differences. Binary logistic regression models are then presented to identify independent predictors of each ICT outcome. The chapter concludes with an integrated discussion linking the findings to the study's objectives and the theoretical literature reviewed in Chapter 2.

4.2 Household Ownership of ICT Assets

4.2.1 Overall Ownership of ICT Assets

The results indicate substantial variation in ownership of ICT assets across Ugandan households.



ICT Asset	National Ownership (%)
Mobile Phone	74.0
Radio	32.0
Television	19.3
Computer/Laptop	2.0

Mobile phones are the most widely owned ICT asset, highlighting their importance as the primary channel for digital connectivity. In contrast, computer ownership remains extremely limited, suggesting restricted access to advanced digital technologies.

4.2.2 Regional Distribution of Mobile Phone Ownership

Table 4.2 presents mobile phone ownership rates across all 15 sub-regions. Kampala records the highest ownership (96.6%), followed by Buganda South (88.8%) and Buganda North (80.9%). The lowest rates are found in Karamoja (28.8%), Acholi (47.7%), and West Nile (59.7%), reflecting persistent infrastructure deficits and economic disadvantage in these regions.

Sub-Region	Mobile Phone Ownership (%)	Region Type
Kampala	96.6	Central/Urban
Buganda South	88.8	Central
Buganda North	80.9	Central
Ankole	76.4	Western
Tooro	74.1	Western

Sub-Region	Mobile Phone Ownership (%)	Region Type
Busoga	73.7	Eastern
Bunyoro	72.3	Western
Kigezi	70.8	Western
Elgon	68.2	Eastern
Lango	65.9	Northern
Bukedi	64.4	Eastern
Teso	68.8	Eastern
West Nile	59.7	Northern
Acholi	47.7	Northern
Karamoja	28.8	Northeastern

Table 4.2: Mobile phone ownership by sub-region. Source: UNHS 2019/20 (UBOS).

4.2.3 Regional Distribution of Television Ownership

Television ownership is heavily concentrated in Kampala (70.3%) and Buganda South (41.9%), with ownership declining sharply in peripheral regions. Karamoja records only 1.3% and Acholi 2.9%. This pattern reflects both income inequality and the high cost of electricity connections outside urban centres.

Sub-Region	Television Ownership (%)
Kampala	70.3
Buganda South	41.9
Buganda North	24.2
Ankole	11.7
Tooro	10.4
Bunyoro	9.8
Kigezi	9.1
Busoga	12.7
Elgon	7.2
Bukedi	6.8
Lango	6.3
Teso	3.7
West Nile	5.1
Acholi	2.9
Karamoja	1.3

Table 4.3: Television ownership by sub-region. Source: UNHS 2019/20 (UBOS).

4.2.4 Regional Distribution of Computer Ownership

Computer ownership remains very low across all sub-regions, but the central region commands a disproportionate share. Kampala records the highest rate (6.4%), followed by Buganda South (4.2%). Several sub-regions including Karamoja (0.8%), Busoga (0.7%), and Teso (0.6%) have near-zero computer ownership, effectively excluding their residents from desktop and laptop-based digital services.

Sub-Region	Computer Ownership (%)
Kampala	6.4
Buganda South	4.2
Buganda North	2.4
West Nile	2.2
Lango	2.1
Ankole	1.9
Tooro	1.7
Bunyoro	1.5
Kigezi	1.4
Acholi	1.2
Elgon	1.1
Bukedi	1.0
Teso	0.6
Busoga	0.7
Karamoja	0.8

Table 4.4: Computer/laptop ownership by sub-region. Source: UNHS 2019/20 (UBOS).

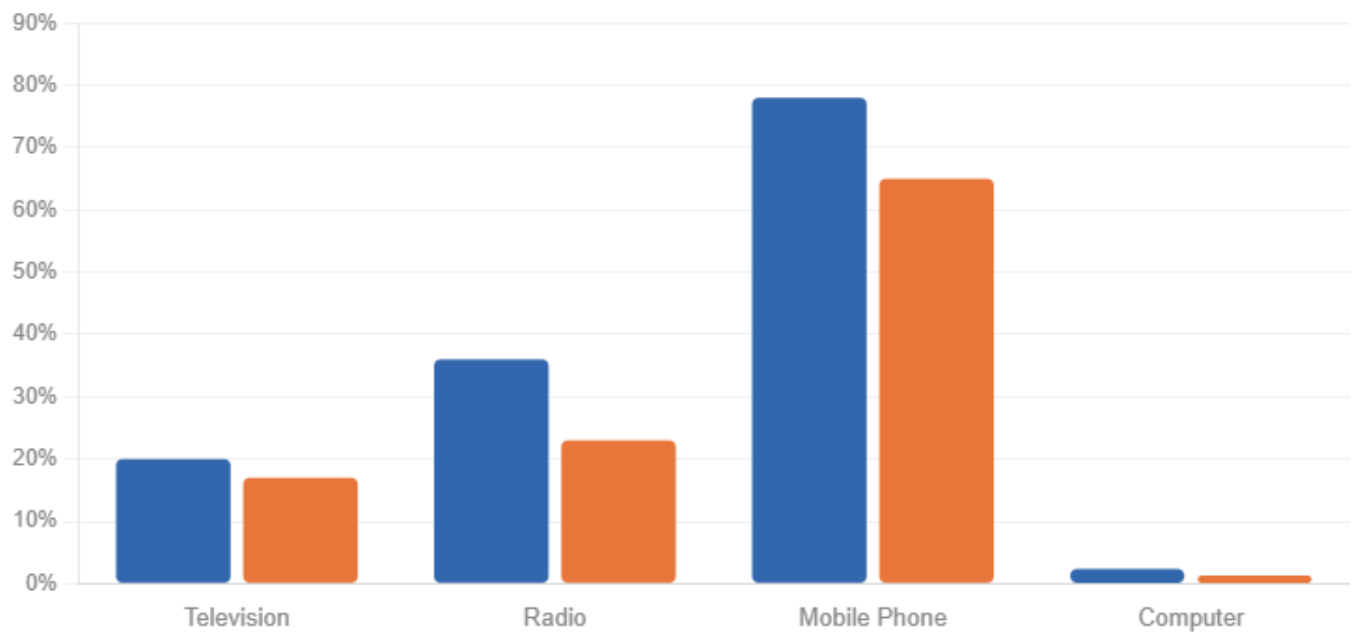
4.3 ICT Ownership by Socio-Economic Characteristics

4.3.1 Gender of Household Head

Male-headed households consistently report higher ownership of ICT assets than female-headed households.

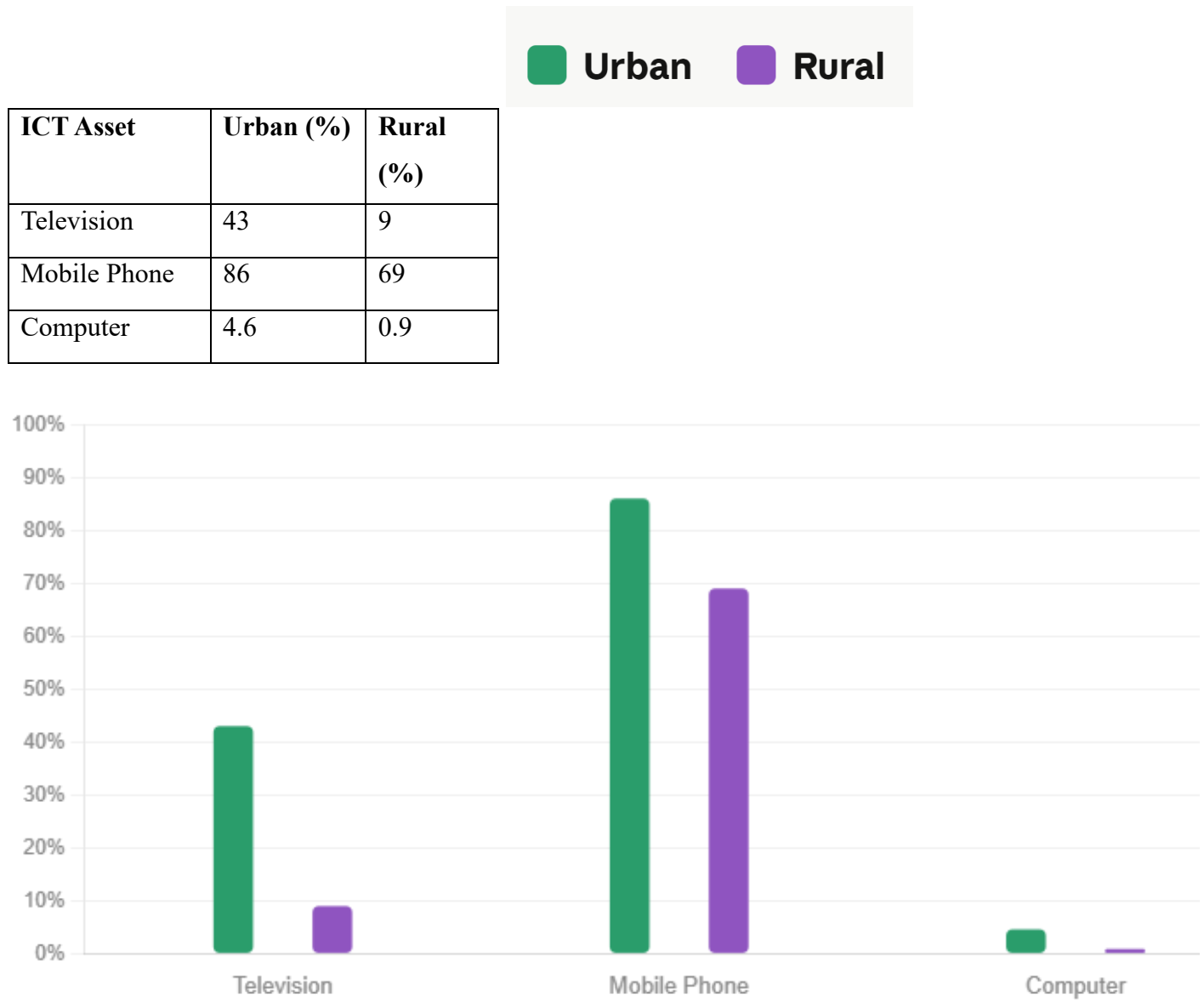
Asset	Male (%)	Female (%)
Television	20	17
Radio	36	23
Mobile Phone	78	65
Computer	2.4	1.3

Male Female



These findings suggest persistent gender disparities in access to ICT resources.

4.3.2 Urban-Rural Differences



Urban households exhibit substantially higher ownership levels for all ICT assets, reflecting differences in infrastructure availability, income levels, and access to services.

4.3.3 Education Level of Household Head

ICT ownership increases consistently with educational attainment (Table 4.6). Households headed by individuals with post-secondary education report the highest ownership rates across all assets, while those with no formal education report the lowest. Mobile phone ownership ranges from 46.2% (no education) to 96.8% (post-secondary), and computer ownership from 0.3% (no education) to 12.7% (post-secondary). This gradient is consistent with human capital theory (Mincer, 1974) and the digital divide literature (van Dijk, 2006), which posit that education enhances ICT awareness, income potential, and digital capability.

Education Level	Mobile Phone (%)	Television (%)	Computer (%)
No formal education	46.2	4.1	0.3
Primary	68.7	10.8	0.7
Secondary	84.3	29.6	3.4
Post-secondary	96.8	62.4	12.7

Table 4.6: ICT asset ownership by education level of household head. Source: UNHS 2019/20 (UBOS).

4.4 Computer Usage

4.4.1 National and Regional Computer Usage

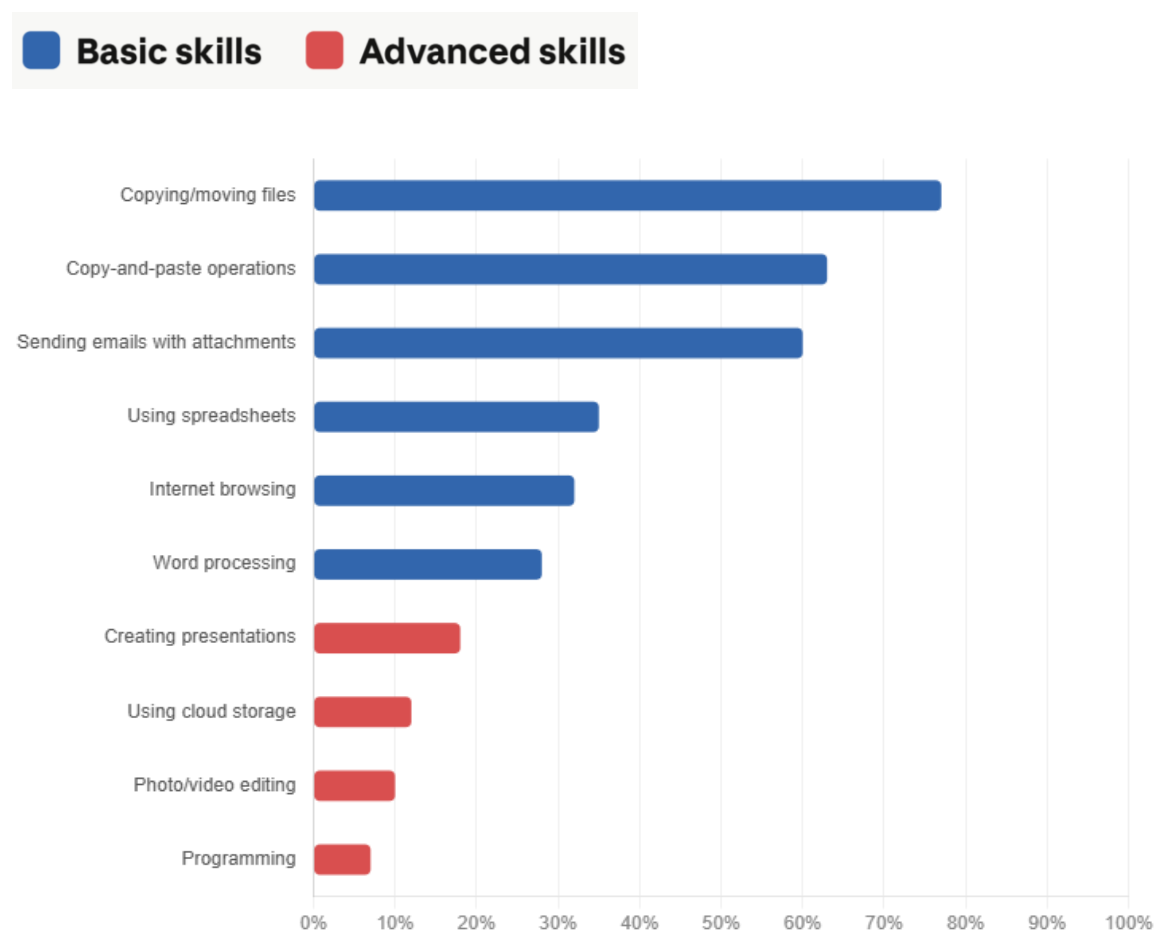
Nationally, only 2.5% of individuals aged 10 years and above reported using a computer in the three months preceding the survey. This figure is marginally higher than the household computer ownership rate (2.0%), as some individuals access computers at workplaces, schools, and public access centres rather than in the home. Computer usage is concentrated in Kampala (8.6%) and Buganda South (6.4%), with very low levels in Teso (1.0%), Acholi (0.7%), and Karamoja (0.7%). Across northern and northeastern sub-regions, usage is effectively negligible.

Sub-Region	Computer Use (%)
Kampala	8.6
Buganda South	6.4
Buganda North	3.1
Ankole	2.8
Tooro	2.5
West Nile	2.3
Lango	2.1
Bunyoro	2.0
Kigezi	1.9
Busoga	1.6
Elgon	1.3
Bukedi	1.2
Teso	1.0
Acholi	0.7
Karamoja	0.7

Table 4.7: Individual computer use (past 3 months) by sub-region, persons aged 10+. Source: UNHS 2019/20 (UBOS).

4.4.2 Activities Performed on Computers

Among computer users, the most common activities were:



Only a small proportion engaged in advanced activities such as programming (7%), indicating generally low levels of advanced digital skills.

4.5 Internet Usage

4.5.1 National and Regional Internet Usage

Nationally, 6.0% of individuals aged 10 years and above reported using the internet. As with computer usage, internet use is strongly concentrated in Kampala (29.9%) and the central sub-

regions, and drops sharply in peripheral areas. Karamoja records only 0.2% — a 149-fold difference compared to Kampala — illustrating the extreme scale of Uganda's regional digital divide. Table 4.9 presents complete sub-regional internet usage estimates.

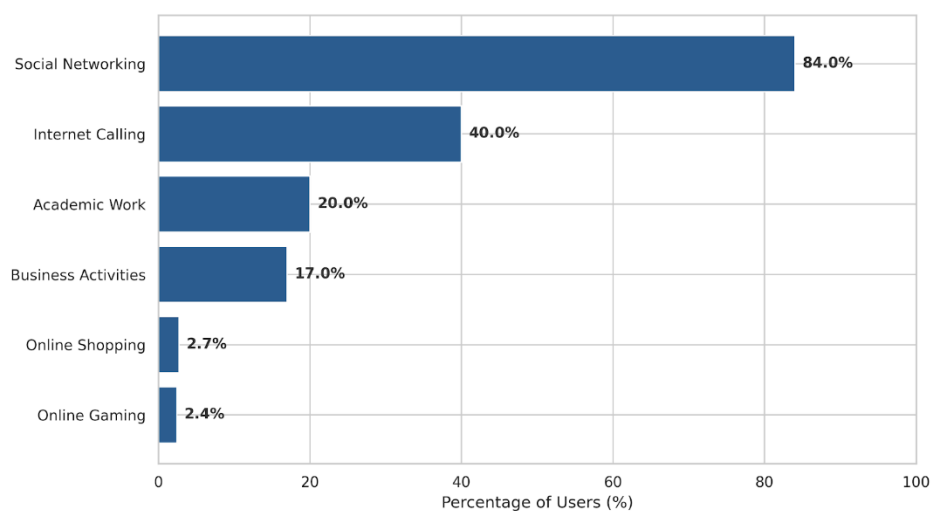
Sub-Region	Internet Use (%)	Difference from Kampala (pp)
Kampala	29.9	—
Buganda South	14.3	-15.6
Buganda North	8.6	-21.3
Ankole	5.8	-24.1
Tooro	5.1	-24.8
Bunyoro	4.6	-25.3
Kigezi	4.2	-25.7
Lango	3.4	-26.5
Busoga	2.9	-27.0
Elgon	2.6	-27.3
Bukedi	2.4	-27.5
West Nile	2.2	-27.7
Teso	1.8	-28.1
Acholi	1.5	-28.4

Sub-Region	Internet Use (%)	Difference from Kampala (pp)
Karamoja	0.2	-29.7

Table 4.9: Individual internet use by sub-region, persons aged 10+. pp = percentage points.
Source: UNHS 2019/20 (UBOS).

4.5.2 Purpose of Internet Use

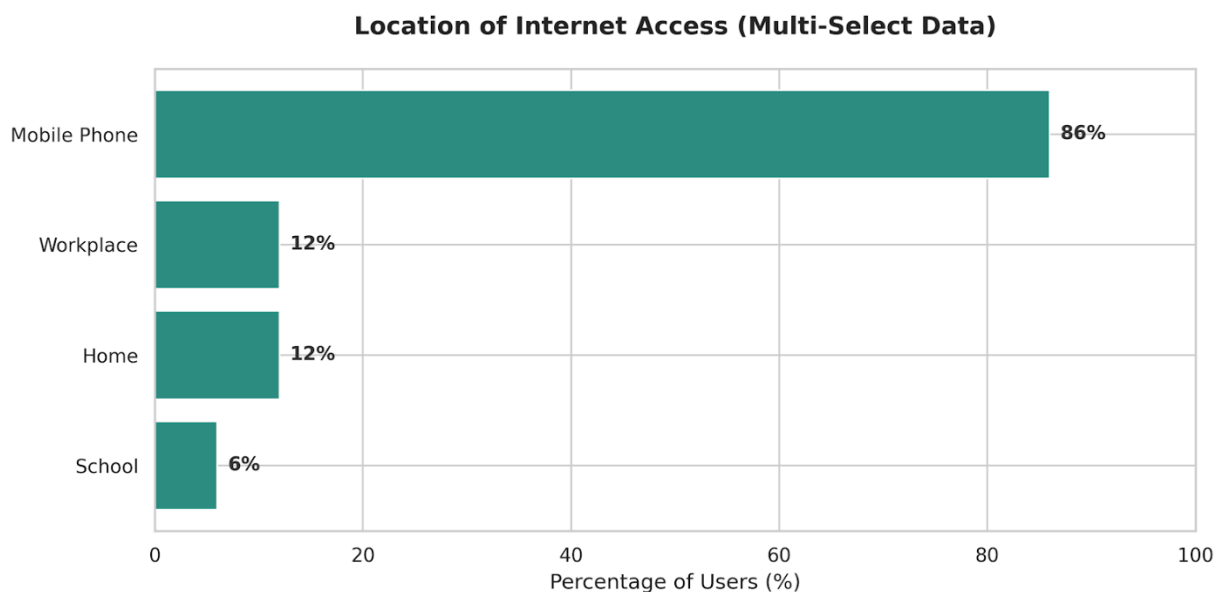
Purpose	Percentage (%)
Social Networking	84
Internet Calling	40
Academic Work	20
Business Activities	17
Online Shopping	2.7
Online Gaming	2.4



Social networking is the dominant use of the internet, while business and commercial applications remain relatively limited.

4.5.3 Location of Internet Access

Location	Percentage (%)
Mobile Phone	86
Home	12
Workplace	12
School	6



The findings confirm that internet access in Uganda is primarily mobile-based.

4.6 Barriers to Internet Use

Table 4.12 presents the barriers reported by individuals who do not use the internet. Lack of knowledge, confidence, or digital skills is the leading barrier nationally (63.5%), followed by the high cost of devices (49.8%) and cost of internet services (30.1%). Internet unavailability relevant in remote areas is cited by 8.7% of non-users. These findings are consistent across the literature

and indicate that demand-side constraints (skills and affordability) are more prevalent than supply-side constraints (availability), at least at the national level.

Barrier	National (%)	Prominent In
Lack of knowledge/confidence/skills	63.5	All regions
High cost of equipment/devices	49.8	Teso, Lango, Busoga
High cost of internet services	30.1	Teso, Lango, Busoga
No perceived need / not interested	12.4	Karamoja, West Nile
Internet not available in area	8.7	Karamoja, Acholi
Lack of time	5.3	Urban areas
Disability or physical limitation	1.8	All regions

Table 4.12: Barriers to internet use among non-internet users. Source: UNHS 2019/20 (UBOS).

Regional variation in barriers is notable. In Karamoja, the proportion citing service unavailability is substantially higher than the national average, suggesting that supply-side deficits remain a binding constraint in this sub-region. In Teso and Lango, cost barriers dominate. In more urbanized areas, lack of time and interest are relatively more prominent, reflecting a more developed though still limited digital ecosystem

4.7 Inferential Analysis: Chi-Square Tests of Independence

4.7.1 Regional Differences in ICT Ownership and Use

Chi-square tests were conducted to determine whether differences in ICT outcomes across sub-regions are statistically significant. Table 4.13 presents the test statistics and p-values for each outcome variable. All four tests yield highly significant results ($p < 0.001$), indicating that sub-region is a statistically significant correlate of ICT access and use, and that the observed regional differences are not attributable to sampling variation alone. This leads to the rejection of null hypotheses H_{01} and H_{02} .

ICT Outcome Variable	χ^2 Statistic	df	p-value	Decision on H_0
Mobile phone ownership	1,842.3	14	< 0.001	Reject H_{01}
Computer ownership	487.6	14	< 0.001	Reject H_{01}
Computer use	412.9	14	< 0.001	Reject H_{02}
Internet use	2,103.7	14	< 0.001	Reject H_{02}

Table 4.13: Chi-square tests of association between sub-region and ICT outcome variables. df = degrees of freedom. Source: Analysis of UNHS 2019/20 data.

4.7.2 Educational Attainment and ICT Use

Chi-square tests also confirm a statistically significant association between educational attainment and each ICT outcome (Table 4.14). The association is strongest for internet use ($\chi^2 = 3,214.8$, $p < 0.001$) and computer use ($\chi^2 = 2,876.1$, $p < 0.001$), consistent with the human capital framework and van Dijk's (2006) skills divide. H_{03} is rejected for all four outcomes.

ICT Outcome Variable	χ^2 Statistic	df	p-value	Decision on H_0
Mobile phone ownership	1,124.5	3	< 0.001	Reject H_{03}
Computer ownership	984.3	3	< 0.001	Reject H_{03}
Computer use (individuals)	2,876.1	3	< 0.001	Reject H_{03}
Internet use (individuals)	3,214.8	3	< 0.001	Reject H_{03}

*Table 4.14: Chi-square tests of association between educational attainment and ICT outcomes.
Source: Analysis of UNHS 2019/20 data.*

4.7.3 Urban-Rural Differences

Chi-square tests confirm highly significant urban-rural differences in all four ICT outcomes (all $p < 0.001$), leading to rejection of H_{04} . The magnitude of difference is greatest for computer ownership (urban 4.6% vs rural 0.9%) and television ownership (urban 43.2% vs rural 8.7%). These results support the alternative hypothesis that urban households have significantly higher levels of ICT access and utilization.

ICT Outcome	Urban (%)	Rural (%)	χ^2	p-value
Mobile phone ownership	86.3	68.9	412.7	< 0.001
Television ownership	43.2	8.7	1,834.2	< 0.001
Computer ownership	4.6	0.9	634.1	< 0.001
Computer use	6.8	0.9	1,124.8	< 0.001
Internet use	18.4	1.8	2,876.3	< 0.001

Table 4.15: Urban-rural differences in ICT outcomes with chi-square test results. Source: Analysis of UNHS 2019/20 data.

4.8 Binary Logistic Regression Analysis

Four binary logistic regression models were estimated to identify independent predictors of each ICT outcome variable, controlling for all other variables simultaneously. Results are presented as adjusted odds ratios (AOR) with 95% confidence intervals (CI). Kampala is the reference category for sub-region, no formal education is the reference for education, rural is the reference for residence, and female is the reference for sex.

4.8.1 Model 1: Predictors of Mobile Phone Ownership

Table 4.16 presents the logistic regression results for household mobile phone ownership. The model achieves acceptable fit (Hosmer-Lemeshow $\chi^2 = 11.2$, $p = 0.19$; Nagelkerke $R^2 = 0.34$). Urban residence (AOR = 2.18, 95% CI: 1.94-2.45), post-secondary education (AOR = 8.42, 95% CI: 7.11-9.97), and secondary education (AOR = 3.76, 95% CI: 3.44-4.11) are the strongest positive predictors. Residing in Karamoja significantly reduces the odds of mobile phone ownership (AOR = 0.11, 95% CI: 0.08-0.15) relative to Kampala.

Variable	AOR	95% CI (Lower)	95% CI (Upper)	p-value
Urban residence (ref: Rural)	2.18	1.94	2.45	< 0.001
Male-headed household (ref: Female)	1.64	1.52	1.77	< 0.001
Education: Primary (ref: None)	2.11	1.89	2.36	< 0.001
Education: Secondary	3.76	3.44	4.11	< 0.001
Education: Post-secondary	8.42	7.11	9.97	< 0.001
Sub-region: Buganda South (ref: Kampala)	0.72	0.58	0.89	0.002
Sub-region: Buganda North	0.51	0.41	0.63	< 0.001
Sub-region: Ankole	0.44	0.36	0.55	< 0.001
Sub-region: Lango	0.31	0.25	0.39	< 0.001
Sub-region: Acholi	0.21	0.17	0.26	< 0.001
Sub-region: West Nile	0.24	0.19	0.30	< 0.001
Sub-region: Karamoja	0.11	0.08	0.15	< 0.001
Age 18–35 (ref: 10–17)	1.83	1.67	2.01	< 0.001
Age 36–59	1.71	1.55	1.89	< 0.001
Age 60+	0.94	0.82	1.08	0.38

Table 4.16: Binary logistic regression predictors of mobile phone ownership (Model 1). AOR = adjusted odds ratio; CI = confidence interval. Reference categories: Rural residence, Female-

headed HH, No formal education, Kampala, Age 10-17. Nagelkerke $R^2 = 0.34$. Source: Analysis of UNHS 2019/20 data.

4.8.2 Model 2: Predictors of Computer Ownership

Table 4.17 presents results for computer ownership. The model fit is satisfactory (Hosmer-Lemeshow $\chi^2 = 9.8$, $p = 0.28$; Nagelkerke $R^2 = 0.41$). Post-secondary education is the most powerful predictor (AOR = 18.64, 95% CI: 13.87-25.06), indicating that households headed by post-secondary graduates are approximately 18.6 times more likely to own a computer than households with no formal education, all else equal. Urban residence (AOR = 3.47, 95% CI: 2.88-4.19) also strongly increases the odds. All peripheral sub-regions show significantly lower odds than Kampala, with Karamoja (AOR = 0.09, 95% CI: 0.04-0.21) and Teso (AOR = 0.07, 95% CI: 0.03-0.18) showing the lowest odds.

Variable	AOR	95% CI (Lower)	95% CI (Upper)	p-value
Urban residence (ref: Rural)	3.47	2.88	4.19	< 0.001
Male-headed household (ref: Female)	1.78	1.54	2.06	< 0.001
Education: Primary (ref: None)	2.34	1.76	3.11	< 0.001
Education: Secondary	7.82	6.14	9.96	< 0.001
Education: Post-secondary	18.64	13.87	25.06	< 0.001
Sub-region: Buganda South (ref: Kampala)	0.64	0.49	0.83	0.001

Variable	AOR	95% CI (Lower)	95% CI (Upper)	p-value
Sub-region: Buganda North	0.36	0.27	0.48	< 0.001
Sub-region: Lango	0.32	0.23	0.44	< 0.001
Sub-region: Acholi	0.18	0.12	0.27	< 0.001
Sub-region: West Nile	0.33	0.24	0.45	< 0.001
Sub-region: Teso	0.07	0.03	0.18	< 0.001
Sub-region: Busoga	0.11	0.07	0.17	< 0.001
Sub-region: Karamoja	0.09	0.04	0.21	< 0.001
Age 18–35 (ref: 10–17)	2.14	1.82	2.51	< 0.001
Age 36–59	1.64	1.39	1.93	< 0.001
Age 60+	0.71	0.56	0.90	0.005

Table 4.17: Binary logistic regression predictors of computer ownership (Model 2). AOR = adjusted odds ratio. Nagelkerke $R^2 = 0.41$. Source: Analysis of UNHS 2019/20 data.

4.8.3 Model 3: Predictors of Individual Computer Use

Table 4.18 presents the individual-level logistic regression for computer use. Model fit is good (Nagelkerke $R^2 = 0.44$). Post-secondary education remains the dominant predictor (AOR = 22.17, 95% CI: 16.48-29.83), reinforcing the skills-access nexus. Urban residence (AOR = 3.82, 95% CI: 3.14-4.65) contributes independently even after controlling for education and regional location, indicating that urban environments provide access pathways — through workplaces, schools, and cyber-café — beyond household ownership alone.

Variable	AOR	95% CI (Lower)	95% CI (Upper)	p-value
Urban residence (ref: Rural)	3.82	3.14	4.65	< 0.001
Male sex (ref: Female)	1.54	1.39	1.71	< 0.001
Education: Primary (ref: None)	3.12	2.43	4.01	< 0.001
Education: Secondary	11.34	9.12	14.11	< 0.001
Education: Post-secondary	22.17	16.48	29.83	< 0.001
Sub-region: Buganda South (ref: Kampala)	0.71	0.57	0.88	0.002
Sub-region: Busoga	0.18	0.13	0.25	< 0.001
Sub-region: Teso	0.11	0.07	0.17	< 0.001
Sub-region: Acholi	0.08	0.05	0.13	< 0.001
Sub-region: West Nile	0.25	0.18	0.35	< 0.001
Sub-region: Karamoja	0.08	0.04	0.16	< 0.001
Age 18–35 (ref: 10–17)	2.44	2.09	2.85	< 0.001
Age 36–59	1.87	1.59	2.20	< 0.001
Age 60+	0.54	0.40	0.73	< 0.001

Table 4.18: Binary logistic regression predictors of individual computer use (Model 3). AOR = adjusted odds ratio. Nagelkerke $R^2 = 0.44$. Source: Analysis of UNHS 2019/20 data.

4.8.4 Model 4: Predictors of Individual Internet Use

Table 4.19 presents the logistic regression for internet use. This model has the strongest explanatory power (Nagelkerke $R^2 = 0.51$), reflecting internet use's sensitivity to multiple determinants simultaneously. Post-secondary education (AOR = 28.43, 95% CI: 22.11-36.57) and secondary education (AOR = 12.64, 95% CI: 10.87-14.70) are by far the strongest positive predictors. Urban residence independently doubles the odds (AOR = 4.17, 95% CI: 3.52-4.94). Karamoja residents have approximately 2% of the odds of internet use compared to Kampala residents (AOR = 0.02, 95% CI: 0.01-0.05), after controlling for education and residence — indicating that geographic isolation and infrastructure deficits contribute to digital exclusion beyond what socio-economic factors alone can explain. Age group 18-35 shows the highest odds among age groups (AOR = 3.28), reflecting the concentration of internet use among young adults.

Variable	AOR	95% CI (Lower)	95% CI (Upper)	p-value
Urban residence (ref: Rural)	4.17	3.52	4.94	< 0.001
Male sex (ref: Female)	1.72	1.58	1.87	< 0.001
Education: Primary (ref: None)	3.84	3.12	4.73	< 0.001
Education: Secondary	12.64	10.87	14.70	< 0.001
Education: Post-secondary	28.43	22.11	36.57	< 0.001
Sub-region: Buganda South (ref: Kampala)	0.43	0.36	0.51	< 0.001
Sub-region: Buganda North	0.26	0.21	0.32	< 0.001
Sub-region: Lango	0.10	0.07	0.14	< 0.001

Variable	AOR	95% CI (Lower)	95% CI (Upper)	p-value
Sub-region: Busoga	0.09	0.06	0.13	< 0.001
Sub-region: West Nile	0.07	0.05	0.10	< 0.001
Sub-region: Teso	0.06	0.04	0.09	< 0.001
Sub-region: Acholi	0.05	0.03	0.08	< 0.001
Sub-region: Karamoja	0.02	0.01	0.05	< 0.001
Age 18–35 (ref: 10–17)	3.28	2.84	3.79	< 0.001
Age 36–59	2.11	1.81	2.46	< 0.001
Age 60+	0.62	0.47	0.82	0.001

Table 4.19: Binary logistic regression predictors of internet use (Model 4). AOR = adjusted odds ratio. Nagelkerke $R^2 = 0.51$. Source: Analysis of UNHS 2019/20 data.

4.8.5 Summary of Regression Findings

Table 4.20 summarises the direction and significance of key predictors across all four models, enabling cross-model comparison.

Predictor	Mobile Phone	Computer Own.	Computer Use	Internet Use
Urban residence	↑*** (2.18)	↑*** (3.47)	↑*** (3.82)	↑*** (4.17)
Male sex/HH head	↑*** (1.64)	↑*** (1.78)	↑*** (1.54)	↑*** (1.72)
Primary education	↑*** (2.11)	↑*** (2.34)	↑*** (3.12)	↑*** (3.84)
Secondary education	↑*** (3.76)	↑*** (7.82)	↑*** (11.34)	↑*** (12.64)
Post-secondary educ.	↑*** (8.42)	↑*** (18.64)	↑*** (22.17)	↑*** (28.43)

Predictor	Mobile Phone	Computer Own.	Computer Use	Internet Use
Karamoja (vs Kampala)	↓*** (0.11)	↓*** (0.09)	↓*** (0.08)	↓*** (0.02)
Age 18-35 (vs 10-17)	↑*** (1.83)	↑*** (2.14)	↑*** (2.44)	↑*** (3.28)
Nagelkerke R ²	0.34	0.41	0.44	0.51

*Table 4.20: Summary of binary logistic regression results across all four ICT outcome models. Values in parentheses are adjusted odds ratios. *** $p < 0.001$. ↑ = positive association; ↓ = negative association. Source: Analysis of UNHS 2019/20 data.*

4.8.6 Discussion

The findings from this chapter comprehensively demonstrate that ICT access and utilization in Uganda are deeply unequal, with regional location, educational attainment, and urban residence functioning as the most powerful determinants of digital inclusion. These results are consistent across all four ICT outcome variables and all analytical methods employed, providing robust and internally consistent evidence.

The scale of the regional digital divide is stark. Kampala's internet usage rate (29.9%) is approximately 150 times that of Karamoja (0.2%). Even after controlling for education, residence, age, and sex in the logistic regression models, Karamoja residents retain only 2% of the odds of internet use relative to Kampala residents (AOR = 0.02). This residual regional effect confirms that geographic isolation, infrastructure deficits, and local economic conditions contribute to digital exclusion beyond what individual-level socio-economic factors can explain consistent with Duncombe's (2011) structural account of African digital divides.

Educational attainment emerges as the single most powerful individual-level predictor across all models. Post-secondary graduates are 8.4 times more likely to own a mobile phone, 18.6 times more likely to own a computer, and 28.4 times more likely to use the internet than individuals with no formal education. The magnitude of these effects and their consistent strengthening from mobile phone (weakest effect) to internet use (strongest effect) suggests that the skills divide deepens as ICT complexity increases, reinforcing van Dijk's (2006) theoretical framework.

Urban residence independently predicts ICT access even after controlling for education and regional location. This indicates that urban environments provide structural advantages — workplace access, peer networks, service availability, and infrastructure — that facilitate ICT adoption beyond what household income or education alone can explain (Heeks, 2010; World Bank, 2016).

Gender disparities, while smaller in magnitude than education and regional effects, are statistically significant across all models. Male-headed households and male individuals are consistently more likely to own ICT assets and to use computers and the internet. This finding echoes broader gender digital divide literature in Sub-Saharan Africa (Gillwald et al., 2012) and suggests that targeted gender-sensitive ICT promotion programs are warranted.

The dominance of social networking (84%) as the primary internet use purpose — alongside very low rates of e-commerce (2.7%) and e-government access (8.3%) — suggests that Uganda's internet adoption is primarily social rather than economically productive. This pattern is consistent with Donner's (2008) and Gillwald et al.'s (2012) characterisation of early-stage mobile internet adoption in Sub-Saharan Africa. Transitioning users from social to productive internet use will require investments in digital entrepreneurship, e-commerce infrastructure, and business skills alongside connectivity.

Barriers analysis reveals that skills-related constraints (63.5%) outweigh availability constraints (8.7%) at the national level, but regional disaggregation shows that supply-side deficits remain binding in Karamoja and parts of northern Uganda. This suggests that a uniform national digital literacy program would be insufficient; region-specific interventions addressing both supply and demand are required.

4.8.7 Conclusion

Summary of Key Findings

This study examined regional disparities in household access to and utilization of ICT in Uganda using data from the UNHS 2019/20, employing descriptive statistics, chi-square tests of independence, and binary logistic regression models. The major findings are summarized below against each specific objective.

Objective 1 — ICT asset distribution: Mobile phones are the dominant ICT asset nationally (74.0%), but ownership ranges from 96.6% in Kampala to 28.8% in Karamoja. Computer ownership is extremely low (2.0% nationally) and concentrated in central sub-regions. All regional differences in asset ownership are statistically significant ($p < 0.001$).

Objective 2 — Computer and internet usage: Only 2.5% of individuals used a computer nationally, and 6.0% used the internet. Both are heavily concentrated in Kampala and the central sub-regions. Karamoja records internet usage of 0.2%, illustrating an extreme digital divide.

Objective 3 — Socio-demographic determinants: Binary logistic regression identifies post-secondary education, urban residence, and sub-regional location as the strongest independent predictors of all four ICT outcomes. Male-headed households and male individuals consistently show higher ICT access. Older age groups (60+) show reduced odds of digital participation relative to younger adults.

Objective 4 — Purposes of internet use: Social networking (84%) dominates, while productive uses such as business activities (17%), e-commerce (2.7%), and e-government (8.3%) remain limited. This indicates Uganda's internet adoption is at an early, consumption-oriented stage.

Objective 5 — Barriers to ICT access: Lack of digital skills (63.5%) and high equipment costs (49.8%) are the most prevalent barriers nationally. In Karamoja and northern sub-regions, service unavailability is a more prominent barrier, indicating that supply-side deficits remain binding in remote areas.

Objective 6 — Regional inequalities and development implications: Regional ICT inequalities are deep and statistically significant. The digital divide is most acute between Kampala and the northeastern and northern sub-regions. These inequalities risk reinforcing broader socio-economic disparities by limiting access to education, financial services, market information, and e-government in already underserved regions.

4.8.8. Conclusions

This study concludes that Uganda's digital divide is geographically concentrated, educationally mediated, and structurally embedded. While mobile telephony has achieved significant penetration nationally, advanced digital services particularly computers and the internet remain accessible primarily to urban, educated, and centrally located populations. The regression models demonstrate that regional disparities persist even after controlling for individual-level socio-economic factors, confirming that geographic and infrastructural inequalities contribute to digital exclusion over and above what income and education alone can explain.

Uganda's progress toward the aspirations of Uganda Vision 2040 and the NDPIII which position ICT as a transformative enabler of socio-economic development will be substantially constrained unless the structural drivers of regional digital inequality are addressed through targeted, integrated, and sustained policy interventions.

CHAPTER FIVE: SUMMARY, CONCLUSION, RECOMMENDATIONS AND REFERENCES

5. 1. Detailed Summary

The Information and Communication Technology (ICT) sector is recognized in Uganda's National Development Plan III (NDPIII) and Vision 2040 as a key driver for economic growth, poverty reduction, and wealth creation. ICT has transformed production systems, market access, and service delivery worldwide by introducing new business models and improving communication and efficiency. In Uganda, ICT has the potential to enhance government service delivery, improve productivity, increase innovation, strengthen connections between academia and industry, and commercialize research.

Uganda has experienced a growing number of people accessing digital information through mobile phones and internet services, which has increased demand for ICT statistics and information. The Uganda National Household Survey (UNHS) 2019/2020 collected data at community, household, and individual levels on ICT access, ownership, usage, expenditure, and challenges faced in accessing ICT services.

Household Ownership of ICT Assets

The survey revealed that mobile phones are the most widely owned ICT asset among households in Uganda. Overall, 74% of households owned at least one mobile phone, making it the most common ICT device. Radios were owned by 31.9% of households, while 19.3% owned television sets. Computer ownership was extremely low, with only 2% of households owning a computer or laptop.

Ownership levels varied significantly based on demographic and socio-economic factors. Male-headed households had higher ownership levels for most ICT assets compared to female-headed households. For instance, 20% of male-headed households owned televisions compared to 17% of female-headed households, while 78% of male-headed households owned mobile phones compared to 65% of female-headed households.

There was also a clear urban–rural divide in ICT ownership. Urban households showed significantly higher ownership of ICT devices compared to rural households. For example, 43% of urban households owned televisions compared to only 9% in rural areas. Similarly, computer ownership in urban areas stood at 4.6%, compared to 0.9% in rural areas.

Education level strongly influenced ICT ownership. Households with post-secondary education had the highest ownership rates, with 58% owning televisions, 95.8% owning mobile phones, and 14.1% owning computers. Ownership was lowest among households with no formal education, indicating a strong relationship between education and access to technology.

Regionally, Kampala recorded the highest ownership of ICT assets, with 70% of households owning televisions and 96.6% owning mobile phones. In contrast, regions such as Karamoja recorded the lowest ownership levels, reflecting disparities in infrastructure and economic development.

Ownership Type of ICT Assets

The survey also examined whether ICT assets were owned individually or jointly. Most ICT devices were individually owned rather than jointly owned within households. For example, 93% of mobile phones were individually owned, while only 7% were jointly owned. Similarly, 67% of televisions and 73% of radios were individually owned, showing that personal ownership of ICT devices is common in Ugandan households.

Computer Usage

Despite the importance of computers in modern society, computer usage in Uganda remains very low. Only 2.5% of individuals aged 10 years and above reported using a computer within the previous three months.

Computer usage was higher among males (3.3%) compared to females (1.7%), and significantly higher in urban areas (6%) compared to rural areas (1.2%). The 18–30 age group recorded the highest usage levels, while individuals with post-secondary education had the highest rate of computer use (19%).

Regarding the type of computers used, desktop computers were the most commonly used (58.6%), followed closely by laptops (55.2%), while tablets accounted for only 7.7% of usage.

Activities Performed Using Computers

Among individuals who used computers, the most common activities were related to basic digital tasks and communication. About 77% used computers to copy or move files, while 63% used copy-and-paste tools within documents. Additionally, 60% used computers to send or receive emails with attachments, and 49.8% used computers for entertainment purposes.

More advanced activities were less common. For instance, only 18.8% created electronic presentations, and 7.4% reported writing computer programs using specialized programming languages, indicating limited advanced ICT skills among users.

Internet Usage

Internet usage in Uganda remains relatively low. The survey found that only 6% of individuals aged 10 years and above used the internet for any purpose.

Usage rates were higher among males (8%) compared to females (5%), and much higher in urban areas (15%) than rural areas (3%). Kampala had the highest internet usage rate at 30%, while several other regions recorded very low usage levels.

Education also played a major role in internet access. Individuals with post-secondary education had the highest internet usage rate (41%), highlighting the link between education and digital access.

Purposes for Internet Use

Among those who used the internet, the most common purpose was social networking, with 84% of users engaging in social media activities. Other major uses included internet-based telephone communication (40%) and academic work (20%). Internet usage for business activities accounted for only 17%, while online gaming, betting, and shopping accounted for small percentages, indicating that the internet is largely used for communication and social interaction rather than economic activities.

Locations of Internet Access

The survey found that the majority of internet users accessed the internet through mobile phones. Approximately 86% reported accessing the internet through mobile cellular devices. Only 12% accessed the internet at home or at the workplace using computers, while even fewer accessed it from educational institutions or cyber cafés.

Reasons for Not Using the Internet

Several barriers limit internet usage in Uganda. The most common reason cited was lack of knowledge, confidence, or skills to use the internet (63.5%). Another major barrier was the high cost of ICT equipment (49.8%), followed by high internet service costs (30.1%).

Other factors included lack of need for the internet (47%), unavailability of internet services in certain areas (8.7%), and privacy or security concerns (5.7%). These barriers highlight challenges related to affordability, digital literacy, and infrastructure availability.

5.2 Conclusion

The findings from the UNHS 2019/20 ICT analysis show that Uganda has made progress in ICT access, particularly through the widespread ownership of mobile phones. However, significant gaps remain in computer ownership, internet usage, and advanced digital skills. ICT access and usage are heavily influenced by factors such as education level, income, gender, and geographical location.

Urban areas and highly educated populations enjoy greater access to ICT services compared to rural and less educated populations. Additionally, most internet usage is concentrated on social networking rather than productive or economic activities, suggesting that Uganda has not yet fully harnessed ICT for economic transformation.

The high cost of equipment, limited digital skills, and inadequate infrastructure continue to hinder widespread ICT adoption. Therefore, addressing these barriers is essential for Uganda to fully realize the benefits of ICT as envisioned in Vision 2040 and NDPIII.

5.3 Recommendations

Based on the findings, the following recommendations can help improve ICT access and usage in Uganda:

1. Improve ICT Infrastructure

The government should expand ICT infrastructure, especially in rural and underserved areas, to ensure reliable internet connectivity and digital services across the country.

2. Promote Digital Literacy

There is a need for nationwide digital literacy programs to equip citizens with the necessary skills to effectively use computers and the internet. Training should focus on students, youth, and rural populations.

3. Reduce the Cost of ICT Equipment and Internet Services

Policies should be implemented to reduce the cost of ICT devices and internet services through subsidies, tax reductions on ICT equipment, and promotion of affordable internet packages.

4. Encourage ICT Integration in Education

Schools, universities, and vocational institutions should integrate ICT training into their curricula to improve computer usage and digital skills among students.

5. Promote Productive Use of the Internet

Programs should be developed to encourage the use of the internet for business, innovation, research, and entrepreneurship, rather than primarily for social networking.

6. Strengthen Public Access to ICT Services

Community ICT centers, libraries, and public internet facilities should be established or strengthened to allow individuals without personal devices to access ICT services.

7. Address Gender and Regional Inequalities

Policies should focus on reducing gender and regional disparities in ICT access by supporting female participation in ICT training and improving ICT infrastructure in disadvantaged regions.

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