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Reported Barriers to Digital Device Access among Unemployed Maasai Women in Monduli District, Tanzania

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Abstract
Digital inclusion requires affordable devices, practical skills and conditions that support independent use. This study examined reported device categories and access barriers among unemployed Maasai women in Monduli District, Tanzania. A descriptive study involved 120 women aged 18–60 and used questionnaires and interviews. Frequencies and percentages summarised the reported categories. Smartphones accounted for 75 device records (62.5%), laptops for 40 (33.3%) and tablets for five (4.2%). Gender norms and cultural perceptions each accounted for 30 responses (25.0%); household income, education and literacy, and network coverage each accounted for 20 (16.7%). Device and internet costs were the most frequently recorded challenge followed by male-dominated household decision-making and inadequate electricity and charging facilities. Interpreted through Kabeer's resources, agency and achievements framework, the findings suggest considering economic, household and infrastructural conditions together. Device reports do not establish personal ownership, independent control or a women–men access gap. Locally assessed affordability support, practical training, dependable charging and dialogue supporting women's choices warrant consideration. The findings provide a descriptive basis for intervention design, subject to verification of the incomplete challenge distribution.

1.0 Introduction

Digital technologies can facilitate communication, learning, financial transactions and access to information. However, participation in these activities depends on more than having a device. The GSMA (2025) identifies affordability, literacy and digital skills, safety and connectivity as barriers to women's mobile internet adoption and use in low- and middle-income countries. Its subsequent report continues to distinguish mobile ownership, smartphone ownership and mobile internet

adoption (GSMA, 2026). These distinctions matter when interpreting community-level evidence: a reported device need not mean a woman owns it, controls its use, or benefits from it.

Research on digital inequality also distinguishes physical connectivity from the material resources needed to sustain access. Van Deursen and van Dijk (2019) examine how differences in devices and associated resources matter beyond internet access. Although their study concerns a different national setting, the distinction helps explain why equipment, recurring costs, and supporting infrastructure should be examined separately. Hilbert (2011) further demonstrates the importance of employment, education and income when interpreting women's digital participation in developing countries. These findings caution against explaining access constraints through presumed cultural preferences alone.

In Tanzania, the National Information and Communications Technology Policy provides a framework for ICT-supported development and identifies infrastructure, skills and security challenges (United Republic of Tanzania, 2016). The World Bank (2020) also emphasises the role of the digital economy in Tanzania's development and the importance of affordable services for poorer users. These national perspectives establish the policy relevance of digital inclusion, but they do not describe the household conditions under which unemployed women in particular communities obtain and use devices.

1.2 Study problem and contribution

This study focuses on unemployed Maasai women in Monduli District, Arusha Region. The empirical problem is whether women's reported access constraints concern economic resources, household expectations, skills or the infrastructure needed to use devices. A local account can inform intervention design by identifying which categories women report and by distinguishing household decision-making from practical conditions such as charging and connectivity. The study does not assume that all Maasai households share identical practices or that women's unemployment necessarily means that they have no income from other activities.

The contribution is a descriptive account of device categories and reported access barriers among 120 women in the selected study communities. It brings resource constraints and household decision-making into a common analytical discussion while retaining their conceptual differences. Its contribution is contextual and exploratory: it does not estimate a gender gap, test causal relationships or establish the effects of devices on employment and empowerment. Claims of novelty therefore concern the focus and interpretation of the local evidence rather than the discovery of affordability or skills barriers in general.

The general objective was to examine reported digital device access and its barriers among unemployed Maasai women in Monduli District. Specifically, the study sought to identify reported device categories, describe economic, social and infrastructural factors relating to access, and examine challenges in accessing and using devices. The study investigated smartphones, laptops, and tablets. The title avoids classifying these devices as "high cost" because the study does not provide a verified price threshold or expenditure measure.

1.3 Analytical perspective

Kabeer's (1999) resources, agency and achievements framework guides interpretation. Resources include material and social means that support choices; agency concerns the capacity to define goals and act; achievements concern outcomes. In this study, income, devices, connectivity and charging relate to resources, while reported household decision-making raises questions of agency. Skills concern the practical ability to use available resources. The framework supports interpretation rather than serving as a retrospectively claimed basis for instrument development. Because we did not measure device use as an achievement, ownership or reported availability cannot be equated with empowerment.

Ownership is understood as possession, access as an opportunity to use a device, control as authority over acquisition and use, affordability as the ability to meet purchase and recurring costs, and effective use as the practical application of technology. These distinctions organise the discussion; the supplied tables do not measure them independently. Reported social categories are treated as participants' descriptions rather than objective measurements of culture or proof of a universal gender norm.

2 Methodology

The study was conducted in Maasai communities in Monduli District, Arusha Region, Northern Tanzania. The district was purposively selected to investigate digital access among unemployed women in a pastoralist setting. The study used a descriptive design to document device categories and reported access constraints. The individual woman was the unit of observation. The analysis characterises the study sample and does not estimate causal effects.

The sample comprised 120 unemployed Maasai women aged 18–60. This sample did not include community leaders, elders, government officials, or development practitioners as separate participant groups. The population figure reported for the study was 1,200. The sample therefore constituted 10% of that figure, but the sampling fraction alone does not demonstrate representativeness or provide a statistical sample-size justification.

Data were collected through questionnaires and interviews. Questionnaires were administered to women able and willing to respond in writing. Interviews accommodated women who preferred oral communication or could not read and write. The reported outputs cover device categories, factors relating to access and challenges in accessing or using devices. Written and oral administration may affect comprehension or willingness to disclose household restrictions, which is considered in the interpretation.

The analysis reports category frequencies and percentages. Percentages were calculated as the category frequency divided by 120 and multiplied by 100, with results rounded to one decimal place. Tables 1 and 2 each contain 120 recorded category responses. Table 3 contains 110 responses across its listed categories. For consistency, Table 3 retains percentages of the full sample and reports a subtotal of 110 (91.7%); the unexplained difference has not been assigned to a substantive category or treated as nonresponse. No inferential test or causal model is reported.

The tables are interpreted as distributions of recorded categories rather than verified prevalence estimates for personal ownership or particular experiences. Because the response format requires

confirmation, the analysis does not infer that barriers are mutually exclusive or add overlapping social categories together. The available article does not present coded interview material, so it does not claim quotations, themes, or qualitative findings. If separate qualitative interviews were conducted, report their analysis and integration with these distributions using the original transcripts.

3 Results and Discussion

3.1 Reported device categories

Smartphones were the most frequently recorded device category, accounting for 75 records (62.5%), followed by laptops with 40 (33.3%) and tablets with five (4.2%) (Table 1). The distribution shows the relative frequency of the reported categories among the 120 women. It does not establish whether the devices were personally owned, shared, borrowed or available elsewhere in the community.

Table 1. Reported device categories

Device category	Frequency	Percentage
Smartphones	75	62.5
Laptops	40	33.3
Tablets	5	4.2
Total	120	100.0

3.2 Reported factors relating to access

Gender norms and cultural perceptions each accounted for 30 responses (25.0%). Household income, education and literacy, and network coverage each accounted for 20 responses (16.7%) (Table 2). These counts identify reported categories rather than the magnitude or statistical significance of their effects on access. Gender norms and cultural perceptions are presented separately because the source records distinguish them; their conceptual overlap limits interpretation as independent factors.

Table 2. Reported factors relating to access

Reported factor	Frequency	Percentage
Household income	20	16.7
Gender norms	30	25.0
Education and literacy	20	16.7
Network coverage	20	16.7
Cultural perceptions	30	25.0
Total	120	100.0

3.3 Reported access challenges

Device and internet costs were the most frequently recorded challenge (46; 38%). Male-dominated household decision-making accounted for 25 responses (21%), inadequate electricity and charging facilities for 21 (18%), and limited digital literacy and social judgment and online safety concerns for 16 each (13%) (Table 3).

Table 3 Reported access challenges

Reported challenge	Frequency	Percentage
Device and internet costs	46	38
Male-dominated household decision-making	25	21
Limited digital literacy	12	10
Inadequate electricity and charging facilities	21	18
Social judgment and online safety concerns	16	13
Listed-category subtotal	120	100

4 Discussion

4.1 Device reports and material access

The prominence of smartphones in the device distribution indicates that mobile technology deserves attention in locally designed access support. It does not explain why this category predominated. Purchase prices, device quality and actual usage were not measured, and the lower counts for laptops and tablets cannot be attributed to cost alone. The distinction between a recorded device category and usable access is consistent with the material-access perspective of van Deursen and van Dijk (2019). A device can offer limited practical access where data, maintenance or dependable charging are unavailable.

This interpretation is relevant to the Monduli setting because charging and connectivity appear in the women's recorded response categories. Their inclusion warrants examining local service conditions rather than presuming that the district's pastoralist character itself causes exclusion. Community-level interventions should establish where women can use devices, how reliably they can do so and whether they control that use. These questions extend the descriptive findings without converting unmeasured circumstances into empirical results.

4.2 Affordability and household agency

The recorded cost category had the highest frequency among the listed challenges. Its prominence directs attention to both device acquisition and recurring internet expenses, although the combined item cannot distinguish the two. GSMA (2025) identifies handset and data affordability among obstacles to mobile internet use, while the World Bank (2020) stresses affordable digital services in Tanzania. The agreement concerns categories of concern, not comparable prevalence: the samples, question formats and technologies investigated differ.

Household decision-making, recorded by 25 women in Table 3, introduces a distinct question about authority over acquisition and use. In Kabeer's (1999) terms, material resources and agency need to be considered separately. Household purchasing capacity does not necessarily establish who decides that a device will be acquired or how it will be used. The item supports examination of reported household restrictions, but it does not specify permission practices, income ownership, shared-phone arrangements or the experiences of every respondent.

The findings therefore suggest that affordability support should be designed alongside attention to women's choices. Subsidies or shared facilities could address material constraints while leaving household restrictions or privacy concerns unresolved. This is an implication for programme

design, not evidence that a specific intervention has succeeded. Women's participation in decisions about support is particularly relevant where household authority was itself reported as a challenge.

4.3 Skills infrastructure and social expectations

Education and literacy, network coverage, electricity and charging all appear in the recorded distributions. These categories concern the practical conditions under which women can use devices. The smaller count for literacy in Table 3 should not be taken as evidence that literacy is unimportant: Tables 2 and 3 may use different questions or selection rules, and respondents may face several constraints at once. Hilbert's (2011) findings reinforce the need to consider economic and educational circumstances when interpreting women's digital participation.

Gender norms and cultural perceptions each appear in 30 responses, but the data do not establish that these represent distinct, non-overlapping mechanisms. The social judgment and safety item likewise combines two potentially different concerns. Gender-sensitive interpretation should identify the specific expectations or experiences these labels represent, rather than treating Maasai identity as an explanation. Genuine interview material could clarify these meanings if available. In its absence, the discussion remains limited to the reported categories.

4.4 Study limitations

The descriptive design cannot establish causality, compare women with men or determine changes over time. The available results do not distinguish ownership, shared access, control or sustained use, and no device price or income-to-price measure was analysed. The sampling and measurement documentation remains incomplete, which prevents a defensible claim of population representativeness. Written and oral administration may also affect response comparability. Overlapping or combined categories constrain interpretation, and the unresolved Table 3 difference limits confidence in that distribution. These limitations restrict the findings to a descriptive account of the recorded responses.

5 Conclusion and Recommendations

Among 120 unemployed Maasai women in Monduli District, smartphones were the most frequently recorded device category. Reported constraints included affordability, household decision-making, literacy, connectivity, charging, and social concerns. The study adds a local descriptive account that distinguishes material conditions from questions of household agency. It does not establish personal ownership rates, causal determinants or a quantified gender gap. Interpreting the challenge distribution remains conditional on reconciling its incomplete total.

Local government and development partners should first assess women's device and recurring data expenses before selecting an affordability intervention. Training should address practical tasks and online safety in languages and at times identified as appropriate by women themselves. Charging support should be planned around actual electricity conditions, management arrangements and maintenance costs. Household and community dialogue should support women's independent choices while ensuring that women shape programme priorities. Any pilot should measure affordability, access, control and actual use separately, rather than counting devices alone as evidence of empowerment.

Further research should document participant characteristics, clarify category definitions and examine relationships using individual-level data where available. Separate qualitative interviews could explain household decision-making and the meanings attached to social expectations. These extensions should follow the actual evidence and research design; they should not be reconstructed from aggregate frequencies.

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