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Mobile-First, Fixed-Last: Trends and Structural Breaks in Broadband Adoption in Somalia, 2012–2024

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Abstract

Somalia's telecommunications sector grew for two decades with little state regulation, and it is often described as mobile-led. Few studies have measured how far broadband adoption in Somalia has diverged between mobile and fixed networks, or whether the published indicators can support such claims. This study describes the trajectories of mobile and fixed broadband adoption in Somalia between 2011 and 2024, tests them for trends and structural breaks, and examines coverage and affordability as explanations for the gap. We built an annual country-level panel from the OIC Statistics (OICStat) database, which republishes International Telecommunication Union (ITU) and United Nations indicators, and from World Bank population estimates. Mobile broadband subscriptions were converted to a per-100-inhabitant rate so that they could be compared with fixed broadband. We used compound annual growth rates, Mann–Kendall tests with Sen's slope, the Pettitt change-point test, segmented (hinge) regression for fixed broadband, and an interrupted time-series model for mobile broadband. Both series rose significantly (Mann–Kendall $\tau = 0.82$, $p < 0.001$ for each), but at very different speeds. Mobile broadband rose from 0.86 to 40.1 subscriptions per 100 inhabitants between 2013 and 2024. Fixed broadband rose from 0.32 to 0.72 per 100 between 2012 and 2023. Fixed broadband growth slowed after 2015, from 0.091 to 0.012 subscriptions per 100 per year. At that pace, adding one more subscription per 100 people would take more than 80 years. The ratio of mobile to fixed subscriptions rose from 1.8 in 2013 to 18.7 in 2023, and mobile accounted for 95% of all broadband subscriptions by 2023. Fixed broadband cost between 39% and 80% of monthly GNI per capita in 2021–2025. That is 19 to 40 times the Broadband Commission's 2% affordability target. The mobile series shows a sharp level shift in 2022 (a factor of 3.6, $p = 0.012$), which follows three years of identical carried-forward values. We argue this shift reflects both real 4G expansion and a revision in how subscriptions were reported. This is, to our knowledge, the first time-series analysis of the mobile–fixed broadband divide in Somalia. It shows that the country's broadband market has settled into a mobile-only path, with fixed broadband stalled by cost and missing infrastructure. It also shows that official indicators for fragile states need to be checked for carried-forward values and revisions before they are used to judge policy.

Keywords: mobile broadband; fixed broadband; digital divide; leapfrogging; affordability; structural break; fragile states; Somalia

1. Introduction

Broadband is currently considered basic infrastructure for public services, banking, health, and education. Most people in low-income countries connect to the internet via a mobile network rather than a fixed connection. In 2023, Africa had 48 active mobile broadband subscriptions per 100 population, compared to 87 worldwide [1]. Where fixed broadband is available, it is usually much more expensive. According to the ITU, a fixed broadband subscription in a low-income country cost almost one-third of the average person's income. [2]. An example of this pattern is Somalia. After the central government's collapse in 1991, private operators constructed mobile networks in the absence of a national regulator, a public fixed-line incumbent, or a domestic fiber backbone [3], [4]. The country's first international fibre connection, the EASSy cable, landed in Mogadishu only in early 2014 [4]. A Communications Act was passed in 2017 and the National Communications Authority (NCA) was formed in 2018 [5]. Mobile money now carries about two-thirds of financial transactions, and telecom companies have taken on quasi-state roles [6]. Yet the country still ranked 192nd of 193 on the UN E-Government Development Index in 2022 [5].

The phrase “mobile-first” is used often about Africa, and about Somalia in particular. It is rarely measured. Existing studies of broadband diffusion focus on OECD countries or on large cross-country panels, where Somalia is either missing or appears as a single noisy observation [7], [8]. Somalia specific research is largely qualitative and focuses on the political economy of telecoms. [3], [6] or with sector strategy [4]. We found no study that follows mobile and fixed broadband in Somalia over time, compares their trajectories, or determines whether the available datasets are credible enough to justify policy conclusions.

This paper fills that gap. It analyzes how mobile and fixed broadband usage developed in Somalia between 2011 and 2024, evaluates each series for trends and structural breaks, and investigates how far network coverage, pricing, and the way the metrics are reported explain the discrepancy. The paper provides three contributions. First, it provides the first harmonized, per-capita time series of mobile and fixed broadband in Somalia, quantifying the divide using trend and change-point tests. Second, it identifies two actual causes that contribute to the divergence: the spread of 3G and 4G coverage, as well as the extremely high cost of fixed broadband in comparison to income. Third, it discusses carried-forward values and a possible adjustment to the official mobile broadband series. This is significant beyond Somalia, because the same international indicators are used to assess and fund fragile states.

The rest of the paper is organised as follows. Section 2 reviews the literature and sets out the framework. Section 3 describes the data and methods. Section 4 presents the results. Section 5 discusses them and draws out policy implications. Section 6 sets out limitations and concludes.

2. Literature review and theoretical framework

Diffusion of innovations theory describes adoption as an S-shaped curve: slow uptake among early adopters, rapid growth once a technology becomes cheaper and more visible, and saturation as the remaining population is reached [9]. The shape and pace of that curve in telecommunications are determined by network coverage, pricing, supplementary commodities such as devices and electricity, and regulatory factors. Lee et al. [7] found that fixed and mobile broadband diffusion follow distinct S-curves due to varying factors. According to Gulati and Yates [8], what drives broadband diffusion varies depending on development level. In emerging nations, competition and telecom investment are more important, and the presence of a national regulator is not in itself associated with faster diffusion.

Leapfrogging refers to countries that directly adopt a newer technology rather than an older one. James [10] defines it as the ratio of mobile to fixed telephone lines, weighted by each country's percentage of mobile customers. The concept transfers across naturally to broadband. Where fixed infrastructure was never created, mobile networks can quickly connect vast numbers of people. Aker and Mbiti [11] describe how mobile phones reduced search and transaction costs throughout Africa. Gruber and Koutroumpis [12] predict significant growth implications from mobile telecommunications. Czernich et al. [13] found growth effects of broadband expansion in OECD nations. Hjort and Poulsen [14] demonstrate that the entrance of underwater cables and high-speed internet increased employment in Africa, particularly in skilled jobs.

A mobile-first path is not the same as a complete one. Napoli and Obar [15] argue that mobile-only users form an “internet underclass”. They face data caps, small screens and weaker support for content creation and productive work. Prieger [16] shows that mobile broadband can close rural usage gaps where fixed coverage is missing, but it does so as a substitute for, not a replacement of, fixed capacity. Fixed and fibre networks also carry backhaul for mobile towers, connect hospitals, universities and government offices, and support the data centres that digital public services depend on. A broadband market with almost no fixed layer may therefore hit a ceiling in institutional connectivity, even if individual mobile use keeps growing. Somalia's telecom sector is widely regarded as a unique example of private provision in a stateless environment [3], [17]. Operators including Hormuud, Golis, Telesom, and Somtel established mobile networks using microwave links and satellite capacity. According to the World Bank [4], just 27-34% of the population lived in areas having addressable internet connectivity in 2015, while the majority of municipalities lacked a fiber access network. International fiber arrived via EASSy in 2014, followed by DARE1, which arrived in Mogadishu and Bosaso in February 2020 [18], and then by PEACE, G2A, and 2Africa [5]. Domestically, however, Somalia has just approximately 1,874 km of

operational fiber in 2023 and no carrier-neutral data center [5]. According to Chonka et al. [6], mobile money flows are controlled by the same operators, strengthening the link between digital services and mobile platforms.

2.1 Framework and hypotheses

We integrate these threads to form a simple framework (Figure 1). Mobile broadband adoption is determined by network coverage (3G and 4G), mobile data pricing, and device ownership. Fixed broadband adoption is determined by a home fixed or fiber access network, the cost of fixed service relative to income, and household amenities such as computers and reliable electricity. After international fiber came in Somalia, mobile-side conditions improved significantly, while fixed-side conditions remained stable. This generates three theories.

International fibre reached Somalia through mobile networks, not fixed lines

Conceptual framework and hypotheses (H1–H3)

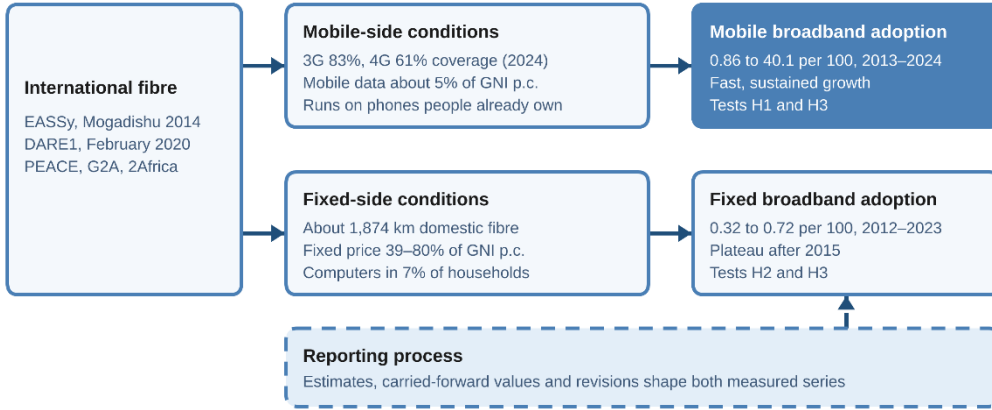


Figure 1. Conceptual framework: the mobile and fixed adoption paths and the reporting layer between adoption and measurement.

- **H1.** Mobile and fixed broadband in Somalia both show positive monotonic trends, but mobile broadband grows substantially faster, so the mobile-to-fixed ratio rises over time.
- **H2.** Fixed broadband growth slows to a plateau, which appears as a structural break in its trend.
- **H3.** The divergence is associated with expanding 3G/4G coverage and with fixed broadband prices far above international affordability thresholds.

We add a methodological expectation. Because Somalia’s indicators are often estimated or imputed by international agencies, apparent breaks in the series may reflect reporting changes as well as real adoption. We therefore test for breaks and check whether any detected break coincides with signs of revision.

3. Data and methods

3.1 Data sources

The main source is the OIC Statistics database (OICStat) [19], which is managed by the Statistical, Economic, and Social Research and Training Center for Islamic Countries (SESRI). OICStat republishes telecommunication indicators from the ITU World Telecommunication/ICT Indicators Database, as well as ITU SDG indicators. It republishes the UN E-Government Survey to provide e-government metrics. We downloaded all 62 Somalia indicators in OICStat’s ICT, communication, and associated categories, which span 1989–2026. Of these, 30 had no values at all, and another 8 had only one or two observations. Total population (SP.POP.TOTL) from 2008 to 2024 was obtained from the World Bank World Development Indicators API [20] (last updated 13 July 2026).

3.2 Variables

Table 1 outlines the variables that were used. The study period for mobile broadband is 2011–2024 (the first non-zero value is in 2011), and for fixed broadband, it is 2012–2023. Variables with less than four observations are used only descriptively.

Table 1. Variables, units and coverage

Variable	Definition	Unit	Years with data	Use
Mobile broadband (MBB)	Active mobile-broadband subscriptions	Count; converted to per 100 inhabitants	2008–2024 (n = 15; 2012, 2017 missing)	Main outcome
Fixed broadband (FBB)	Fixed broadband subscriptions, all speeds	Per 100 inhabitants; count	2012–2023 (n = 11; 2018 missing)	Main outcome
Mobile cellular	Mobile-cellular telephone subscriptions	Per 100 inhabitants	1989–2023	Context
Internet users	Individuals using the internet	% of population	1990–2024 (n = 28)	Context
3G coverage	Population covered by at least a 3G network	%	2010–2024 (n = 13)	Driver
4G coverage	Population covered by at least a 4G network	%	2012–2024 (n = 10)	Driver
Fixed broadband basket	Price of entry-level fixed broadband	% of monthly GNI per capita	2021–2025 (n = 5)	Driver (descriptive)
Household computers	Households with a computer	%	2016, 2020	Descriptive
Home internet	Households with internet access at home	%	2020	Descriptive
Population	Total population	Persons	2008–2024	Denominator

3.3 Harmonisation

Mobile broadband is reported as a count, while fixed broadband is reported per 100 inhabitants. We therefore computed mobile broadband per 100 inhabitants as

$$MBB_t^{100} = \frac{MBB_t}{POP_t} \times 100$$

Recomputing fixed broadband per 100 from the reported counts and the same population series reproduced the OICStat values exactly for every year, which confirms that both rates rest on the same denominator. We then defined the mobile-to-fixed ratio $R(t) = \text{MBB per 100} / \text{FBB per 100}$ (adapted from [10]) and the mobile share of broadband subscriptions $S(t) = \text{MBB} / (\text{MBB} + \text{FBB})$. Missing years were left missing. We did not interpolate, because several series contain repeated values that appear to be carried forward rather than measured (Section 4.5).

3.4 Statistical analysis

Growth rates: Compound annual growth rates (CAGR) were computed for sub-periods as

$$CAGR_{a,b} = \left(\frac{Y_b}{Y_a} \right)^{1/(b-a)} - 1$$

Monotonic trend: The Mann–Kendall test [21], [22] was applied to each series. It is non-parametric, makes no assumption about the distribution, and is robust to outliers and short series. The magnitude of the trend was estimated with Sen’s slope [23], the median of all pairwise slopes, computed on actual years so that gaps are handled correctly:

$$\beta = \text{median} \left(\frac{Y_j - Y_i}{t_j - t_i} \right), \quad i < j$$

Change points: The Pettitt [24] test was used to locate the single most likely change point in each series without assuming its date in advance.

Segmented regression for fixed broadband: To test H2, we fitted a continuous hinge model in which the slope may change at break year τ :

$$FBB_t = \beta_0 + \beta_1(t - 2012) + \beta_2 \max(0, t - \tau) + \varepsilon_t$$

The break year τ was selected by grid search over 2014–2020, minimising the residual sum of squares [25]. The hinge model was compared with a single linear trend by an F-test. Because τ was chosen from the data, the nominal p-value is optimistic, and we report it as indicative.

Interrupted time series for mobile broadband: The mobile series jumps between 2021 and 2022. We modelled the natural logarithm of MBB per 100 with a segmented regression [26]:

$$\ln \text{MBB}_t^{100} = \beta_0 + \beta_1(t - 2013) + \beta_2 D_t + \beta_3 D_t(t - 2022) + \varepsilon_t$$

Here $D(t) = 1$ from 2022 onward. β_1 is the pre-2022 growth rate, β_2 the immediate level change, and β_3 the change in slope. A simpler level-shift model ($\beta_3 = 0$) was compared with a linear trend by F-test. We also projected the 2013–2021 log-linear trend to 2024 as a counterfactual.

Associations: Spearman rank correlations were computed between broadband rates and 3G/4G coverage and internet use. All of these series trend upward, so the correlations describe co-movement and are not evidence of causation.

Software: Analyses were run in Python 3 with pandas, SciPy, statsmodels and pymannkendall [27]. The significance level was 0.05. The cleaned panel and analysis code are provided as supplementary material.

4. Results

4.1 Diverging trajectories

Mobile and fixed broadband began at similar, extremely low levels and eventually separated (Figure 2). In 2013, Somalia had 0.86 mobile and 0.47 fixed broadband subscriptions per 100 people. By 2023, the numbers were 13.45 and 0.72. In 2024, mobile broadband penetration reached 40.1 per 100, or around 7.6 million subscriptions. Fixed broadband never exceeded 0.72 per 100, or roughly 133,000 subscriptions.

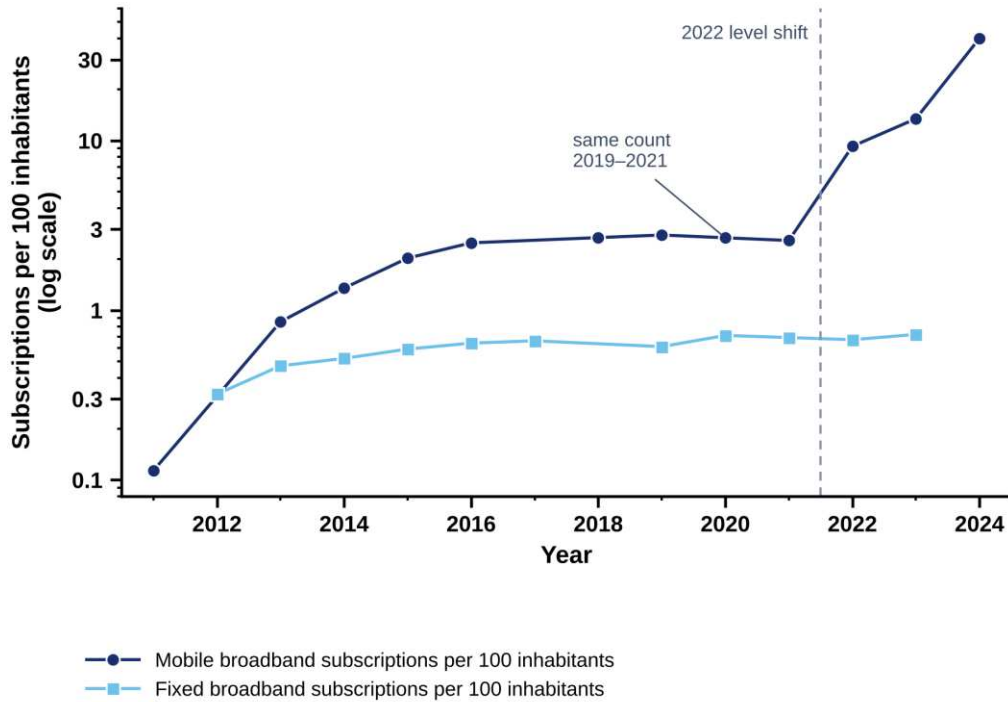


Figure 2. Mobile and fixed broadband subscriptions per 100 inhabitants. Source: OICStat (ITU series); mobile rate computed with World Bank population.

The mobile-to-fixed ratio increased from 1.8 in 2013 to 3.9 in 2016 and 4.6 in 2019. It dropped to 3.7 in 2020–2021, when the mobile series remained flat, before rising to 13.8 in 2022 and 18.7 in 2023. During the same period, mobile broadband subscriptions increased from 64.7% (2013) to 81.9% (2019) and 94.9% (2023). Table 2 displays growth rates for sub-periods. Between 2013 and 2019, mobile broadband grew at a rate of roughly 22% per year and 71% per year from 2019 until 2024. Fixed broadband growth slowed from roughly 10% to 4% per year.

Table 2. Compound annual growth rates of broadband subscriptions per 100 inhabitants

Series	Early period	CAGR, early	Late period	CAGR, late	Whole period	CAGR, whole
Mobile broadband	2013–2019	21.7%	2019–2024	70.6%	2013–2024	41.9%
Fixed broadband	2012–2019	9.7%	2019–2023	4.2%	2012–2023	7.7%

In absolute terms, mobile broadband added about 7.5 million subscriptions between 2013 and 2024. Fixed broadband added about 93,000 between 2012 and 2023.

4.2 Trend tests

All core series show significant positive monotonic trends (Table 3). For mobile and fixed broadband, the Mann–Kendall statistics are identical ($\tau = 0.818$, $p < 0.001$), because each series rises in almost every year. Their magnitudes are very different. Sen’s slope is 0.68 subscriptions per 100 per year for mobile broadband and 0.024 for fixed broadband, a 28-fold difference. The mobile-to-fixed ratio itself has a significant upward trend ($\tau = 0.722$, $p = 0.009$). This supports H1.

Table 3. Mann–Kendall trend tests and Sen’s slope

Series	Period	n	Kendall’s τ	Z	p-value	Sen’s slope (per year)
Mobile broadband (per 100)	2013–2024	11	0.818	3.43	<0.001	0.679
Fixed broadband (per 100)	2012–2023	11	0.818	3.43	<0.001	0.024
Mobile-to-fixed ratio	2013–2023	9	0.722	2.61	0.009	0.735
Mobile cellular (per 100)	2010–2023	14	0.890	4.38	<0.001	2.033
Internet users (%)	2011–2024	12	0.970	4.32	<0.001	2.240
3G coverage (%)	2010–2024	13	0.910	4.35	<0.001	5.496
4G coverage (%)	2015–2024	9	0.917	3.41	<0.001	5.929

4.3 Structural breaks

Fixed broadband: The grid search placed the break in the fixed broadband trend at 2015 (Table 4, Model A). Before 2015, fixed broadband grew by 0.091 subscriptions per 100 per year. After 2015 the slope fell by 0.079, to 0.012 per year. The hinge model explained far more variance than a single linear trend (R^2 0.945 against 0.734; $F(1, 8) = 30.8$, nominal $p < 0.001$). The Pettitt test pointed to the same period, with the change falling after 2015 ($K = 28$, $p = 0.078$). At the post-2015 rate, adding one subscription per 100 inhabitants would take more than 80 years. This supports H2: fixed broadband did not take off after international fibre arrived in 2014, but flattened.

Mobile broadband: Before 2022, mobile broadband per 100 grew at about 12.7% a year in log-linear terms ($\beta_1 = 0.119$, $p = 0.010$). The interrupted time-series model shows a significant level increase in 2022 ($\beta_2 = 0.796$, $p = 0.038$) and a steeper slope afterwards ($\beta_3 = 0.614$, $p = 0.015$), with $R^2 = 0.960$ (Model B). A simpler level-shift model estimated a jump of 1.29 log points, a 3.6-fold rise ($p = 0.012$), and fitted significantly better than a single trend ($F(1, 8) = 10.5$, $p = 0.012$). Projecting the 2013–2021 trend forward gives a counterfactual of 4.7 subscriptions per 100 in 2024, against an observed 40.1. The Pettitt test, which looks for one shift in median rather than a change in growth, located the mobile change after 2016 ($p = 0.078$). It also found significant changes after 2015 for internet users ($p = 0.015$) and mobile cellular subscriptions ($p = 0.007$).

Table 4. Segmented regression estimates (OLS; standard errors in parentheses)

Term	Model A: fixed broadband per 100, hinge at 2015	Model B: ln mobile broadband per 100, ITS at 2022	Model C: ln mobile broadband per 100, level shift only
Intercept	0.343 (0.026)***	0.235 (0.167)	0.156 (0.242)
Trend (per year)	0.091 (0.012)***	0.119 (0.034)*	0.139 (0.050)*
Slope change after break	−0.079 (0.014)***	0.614 (0.191)*	—
Level change at break	—	0.796 (0.312)*	1.291 (0.399)*
n	11	11	11
R^2	0.945	0.960	0.900
Durbin–Watson	2.97	1.37	—

Note: * $p < 0.05$; *** $p < 0.001$. Model A’s break year was selected by grid search, so its p-values are optimistic. Model B has only three post-break observations, so its slope-change estimate is fragile.

4.4 Coverage, use and affordability

Mobile network coverage expanded quickly (Figure 3). 3G coverage went from zero in 2010 to 39% of the population in 2015, 70% in 2019 and 83% in 2024. 4G coverage rose from 9% in 2016 to 30% in 2020–2022,

then to 50% in 2023 and 61% in 2024. The 2023–2024 rise in 4G coverage coincides with the steepest part of the mobile broadband series. Internet use rose from 2.7% of the population in 2019 to 15.0% in 2020 and about 28% in 2022–2024.

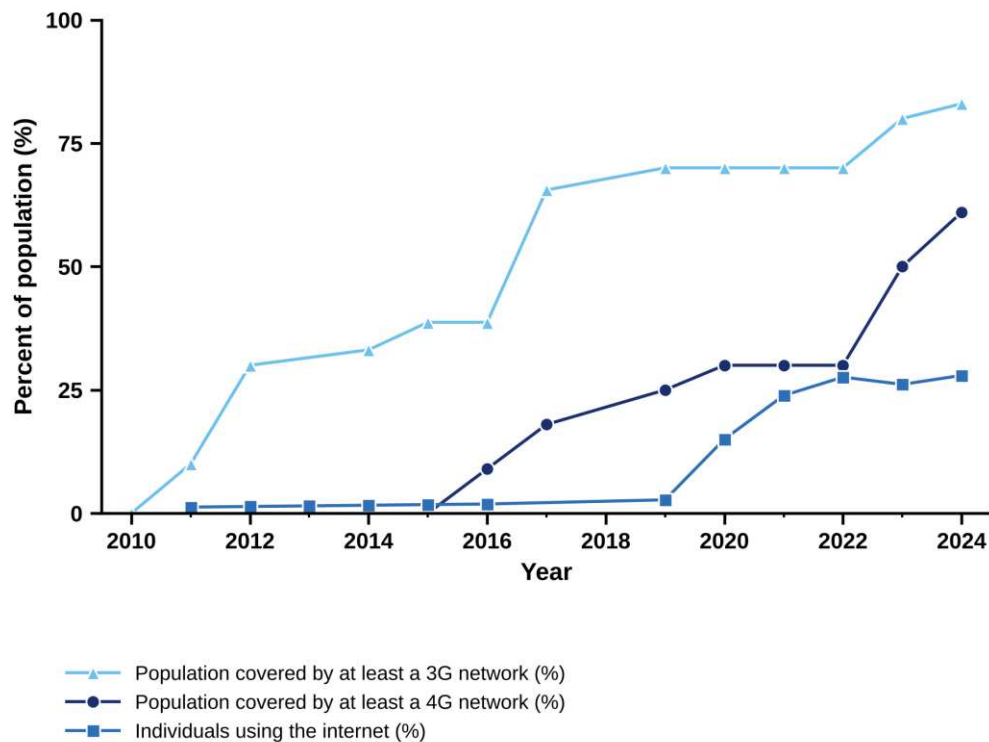


Figure 3. Population covered by 3G and 4G networks and individuals using the internet. Source: OICStat (ITU series). The 2012 4G value (22%) is omitted as inconsistent with 0% in 2015.

Mobile broadband per 100 was strongly correlated with 3G coverage (Spearman $\rho = 0.95$, $n = 9$, $p < 0.001$), 4G coverage ($\rho = 0.88$, $n = 8$, $p = 0.004$) and internet use ($\rho = 0.94$, $n = 10$, $p < 0.001$). Fixed broadband was also correlated with 3G coverage ($\rho = 0.89$) and internet use ($\rho = 0.90$). That is a reminder that, with this many upward-trending series, rank correlations mostly reflect a shared time trend. They are consistent with H3 but do not identify a cause.

Affordability gives a sharper explanation for the fixed side. An entry-level fixed broadband subscription cost 38.7% of monthly GNI per capita in 2021, 80.0% in 2022, 76.6% in 2023, 59.0% in 2024 and 50.0% in 2025 (Figure 4). That is between 19 and 40 times the Broadband Commission’s target that entry-level broadband should cost less than 2% of monthly GNI per capita by 2025 [28]. It is also 15 to 32 times the 2024 global median of 2.5% for fixed broadband [2]. By comparison, the mobile data-only basket in Somalia was reported at 5.3% of GNI per capita [5]. That is still above the target, but roughly one-seventh to one-fifteenth of the fixed price. Household complements are also thin: only 2.6% of households had a computer in 2016 and 6.9% in 2020, and 11.9% had internet access at home in 2020.

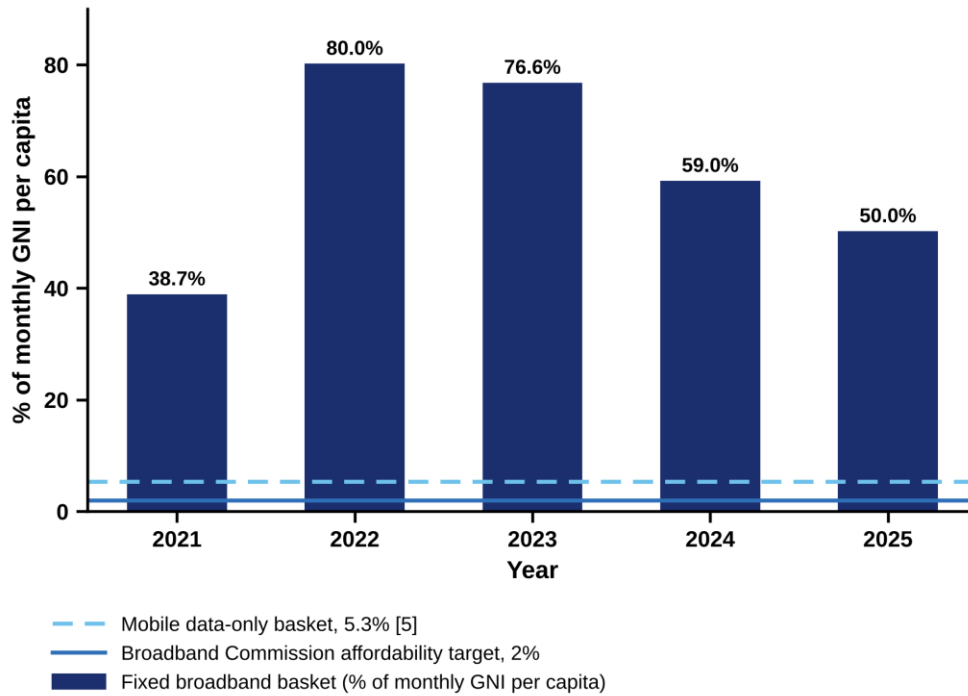


Figure 4. Fixed broadband basket price against the Broadband Commission 2% target. Source: OICStat (ITU series); mobile basket from MoCT [5].

4.5 Data quality and reporting effects

Several features of the series suggest that part of the observed pattern reflects how the data were produced. The mobile broadband count is exactly 445,000 in 2019, 2020 and 2021, then rises to 1.65 million in 2022, 2.47 million in 2023 and 7.62 million in 2024. Three identical values in a row are very unlikely for a real subscription count, and they point to carried-forward estimates. Fixed broadband repeats too: 98,000 in 2017 and 2019, and 119,000 in 2020–2022. 2G coverage is fixed at 80% for 2012–2022. 4G coverage is reported as 22% in 2012 but 0% in 2015, which cannot both be correct for the same definition. International bandwidth jumps from 370 Mbit/s in 2017 to 80,000 Mbit/s in 2022, which is more consistent with a change of unit or method than with a 216-fold increase. Finally, the Ministry of Communications and Technology’s 2023 situational analysis still cited mobile broadband subscriptions of about 3% [5]. That matches the pre-2022 series rather than the revised 9–13 per 100 now shown for 2022–2023.

Taken together, these signs suggest that the 2022 level shift in Table 4 combines two things: real growth driven by 4G expansion and cheaper international capacity, and a reporting revision that replaced stale estimates. The data do not allow the two to be separated. The fixed broadband plateau, on the other hand, is visible both before and after the period of repeated values, and is consistent with the price data. We therefore treat the fixed broadband stagnation as robust and the exact size of the mobile surge as uncertain.

5. Discussion

The results support all three hypotheses. Somalia’s broadband market is not just mobile-first. It is effectively mobile-only: 95 out of every 100 broadband subscriptions in 2023 were mobile. Fixed broadband grew for a few years after 2012, then flattened at well under 1 per 100. This fits the leapfrogging account [10] in a particular form. Somalia did not skip fixed broadband after building it. It never built the domestic fixed layer in the first place. Mobile operators were the only actors with networks, capital and customers when international fibre arrived, so the new capacity flowed into mobile data.

The fixed broadband break around 2015 is notable because it comes just after the EASSy landing in 2014. Cheaper international bandwidth did not translate into fixed access at home. The likely reason is the domestic “middle mile” and “last mile”. There was no national fibre backbone, access networks relied on microwave and satellite, and only parts of Mogadishu and Somaliland had fibre [4]. Even by 2023, operational domestic fibre

totalled about 1,874 km [5]. Lee et al. [7] and Gulati and Yates [8] both stress that fixed broadband diffusion depends on infrastructure investment and competition. Somalia had very little of either on the fixed side.

Infrastructure explains why fixed broadband was scarce, but price explains why so few people take it up where it exists, and the affordability figures are the clearest explanation for the fixed plateau. At 39–80% of monthly GNI per capita, fixed broadband is out of reach for nearly all households. This is far worse than the low-income country benchmark ITU describes (about a third of average income) and 15–32 times the global median [2]. Mobile data, at about 5% of GNI per capita, is also expensive, but it can be bought in small amounts on a phone people already own. Device ownership points the same way. Only 6.9% of households had a computer in 2020, while estimates of individual mobile phone ownership range from 48% (ITU estimate for 2024, via OICStat [19]) to 85% of people aged 15 and over [5]. In Rogers' [9] terms, fixed broadband in Somalia lacks the relative advantage and compatibility that drive adoption, while mobile broadband rides on an existing, near-universal device.

Given this, it might be argued that a mobile-only market is good enough. We think the evidence calls for caution. Mobile-only users face data caps, small screens and limited capacity for productive and creative use [15]. Prieger [16] finds that mobile broadband narrows usage gaps, but alongside fixed capacity rather than instead of it. Many of the services that Somalia's development plans depend on run on fixed infrastructure: hospital information systems, national health and blood bank records, university networks, government data centres, and the fibre backhaul that 4G and 5G towers themselves need. The economic gains documented for Africa came with the arrival of fast, fibre-based internet [14], and the growth effects of broadband in OECD countries were measured on fixed penetration [13]. Somalia's very low E-Government Index (0.13 in 2022, rank 192 of 193) is consistent with this. Mobile reach has grown much faster than the institutional digital layer.

The data-quality findings also matter beyond Somalia. A run of identical values followed by a large jump looks, in a regression, like a structural break. Without checking the raw series, an analyst could credit the 2022 surge entirely to a policy or a new cable. In Somalia, part of it is very likely a revision. International datasets such as ITU's fill gaps for countries with weak national statistics, and those estimates are then republished in secondary databases like OICStat without flags. Rankings, aid allocation and SDG reporting all draw on these numbers. We therefore recommend that studies of fragile states check for carried-forward values, test for breaks, and, where possible, triangulate against operator reports and household surveys.

These findings point to four policy priorities. The first is to build the domestic fibre backbone and open access to it. International capacity is no longer the main bottleneck; the gap lies in national and metro fibre, and open-access wholesale arrangements, as proposed by the World Bank [4], would let several retail providers use the same network and lower prices. The second is to set and monitor an affordability target for fixed broadband. The NCA could adopt the 2% of GNI benchmark and publish annual price data for both fixed and mobile baskets.

The third priority is to connect institutions first. Hospitals, universities, schools and government offices are the natural anchor users for fixed and fibre broadband, and connecting them would create demand that makes last-mile extensions viable. The fourth is to improve the statistics. The NCA and the Somalia National Bureau of Statistics should collect operator-reported subscription data each year, publish them with revision notes, and add ICT questions to household surveys. This would allow ITU and secondary databases to replace modelled estimates with measured values.

6. Limitations and conclusion

6.1 Limitation

The study has five main limitations. First, the series is short (9 to 14 annual observations), which reduces statistical power and makes regression estimates, particularly the post-2022 slope, sensitive to single values. Second, many values for Somalia are estimates or carried-forward figures produced by international agencies, rather than actual counts. We have flagged these, but we can not fix them. Third, the affordability series only covers the years 2021–2025, and the mobile data basket is only available as a single reported value, making it impossible to model price over time. Fourth, the analysis is national. It does not distinguish between regions, Somaliland, Puntland, and south-central Somalia, urban, rural, and nomadic households, or between men and

women. The 2023 Ministry analysis shows significant gaps on each of these lines [5]. Fifth, the correlations between adoption and coverage show a consistent pattern and should not be interpreted as causal effects.

Three extensions to this work would address these limitations and improve the evidence. A comparative panel of IGAD and East African countries (Kenya, Ethiopia, Djibouti, and Uganda) would reveal whether Somalia's mobile-to-fixed ratio is unusual given its income level. The NCA's operator-level or regional data would allow us to distinguish between actual adoption and reporting revisions. Household survey data would allow for individual-level models of who uses mobile and fixed broadband and why.

6.2 Conclusion

Between 2011 and 2024, Somalia went from almost no broadband to approximately 40 mobile broadband subscriptions per 100 people, while fixed broadband remained below 1 per 100. Mobile now accounts for roughly 95% of broadband subscriptions. Fixed broadband growth slowed sharply after 2015, despite the arrival of international fiber, and the service now costs between 39% and 80% of monthly income per person. The mobile surge after 2022 is real in direction but uncertain in size, as the official series includes carried-forward values and an apparent revision. For policymakers, the message is that mobile networks have addressed the reach issue but not the capacity issue. If Somalia's digital services are to be based on more than just mobile data, it will require a domestic fiber backbone, an enforced affordability target, and better statistics.

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