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The contribution of Xdsl technologies to improving high-speed internet access in modern communication networks in Burkina Faso: performance, limitations and prospects

Compaoré Abdramane
Joint Mphil Researcher at Lisala University and UNCR University, Department Science and Technology

Nizeyimana Jean Baptiste
Lecturer at Lisala University, Faculty of Psychology and Education, Department of Technopedagogy

ETC

ABSTRACT

Background: Burkina Faso, as a landlocked developing country in the Sahel, faces distinctive challenges in achieving meaningful high-speed internet connectivity. The deployment of xDSL technologies, including ADSL, ADSL2+, VDSL and VDSL2, on existing copper telephone infrastructure represented a strategic pathway for fixed broadband expansion during the 2000s and 2010s. However, the global telecommunications landscape has shifted decisively toward fibre-based access technologies, raising questions about the residual and prospective role of xDSL in Burkina Faso's connectivity strategy. Objective: This study analyzes the contribution of xDSL technologies to high-speed internet access in Burkina Faso, examines their performance characteristics and inherent limitations in the national context, and assesses their prospects amid the accelerating transition to fibre and mobile broadband. Methods: A mixed-methods approach was adopted, combining analysis of regulatory data from the Electronic Communications and Postal Regulatory Authority (ARCEP) and the Ministry of Digital Transition, Postal Services and Digital Economy, technical performance specifications of xDSL variants, and documentary analysis of Burkina Faso's universal service framework and infrastructure development policies. Results: The analysis reveals that xDSL technologies played a historically significant role in the initial expansion of fixed broadband in Burkina Faso, leveraging the existing copper infrastructure of ONATEL SA. However, as of the first quarter of 2026, the fixed internet landscape has been fundamentally restructured: fibre-to-the-home (FTTH) accounts for 98% of fixed high-speed accesses, with ADSL and BLR (local radio loop) in sharp decline. The total fixed broadband subscriber base reached 310,696 in Q1 2026, growing 72.78% year-on-year, yet xDSL's share has become marginal. Key limitations of xDSL in the Burkinabè context include: distance-dependent performance degradation on copper lines; the need for load coil removal and bridge tap elimination before deployment; susceptibility to electromagnetic interference and physical infrastructure degradation; and fundamental bandwidth constraints relative to fibre. Conclusion: xDSL technologies contributed to Burkina Faso's initial fixed broadband expansion but have been rapidly superseded by FTTH. Their residual utility lies in targeted applications where fibre deployment is economically unviable, but their strategic relevance for high-speed internet access has largely dissipated. National connectivity policy should prioritize fibre backbone extension and mobile broadband coverage while recognizing xDSL's historical contribution and limited niche applications.

Keywords: xDSL, ADSL, VDSL, broadband access, Burkina Faso, copper infrastructure, fibre transition

RESUME

Contexte : Le Burkina Faso, en tant que pays en développement sans littoral au Sahel, fait face à des défis distinctifs pour atteindre une connectivité Internet haut débit significative. Le déploiement des technologies xDSL, notamment ADSL, ADSL2+, VDSL et VDSL2, sur l'infrastructure téléphonique en cuivre existante a représenté une voie stratégique pour l'expansion du haut débit fixe au cours des années 2000 et 2010. Cependant, le paysage

mondial des télécommunications a évolué de manière décisive vers les technologies d'accès à base de fibre, soulevant des questions sur le rôle résiduel et prospectif du xDSL dans la stratégie de connectivité du Burkina Faso. Objectif : Cette étude analyse la contribution des technologies xDSL à l'accès Internet haut débit au Burkina Faso, examine leurs caractéristiques de performance et limites inhérentes dans le contexte national, et évalue leurs perspectives dans le cadre de la transition accélérée vers la fibre et le haut débit mobile. Méthodes : Une approche mixte a été adoptée, combinant l'analyse des données de l'Autorité de Régulation des Communications Électroniques et des Postes (ARCEP) et du Ministère de la Transition Digitale, des Postes et de l'Économie Numérique, les spécifications techniques de performance des variantes xDSL, et l'analyse documentaire du cadre du service universel et des politiques de développement des infrastructures du Burkina Faso. Résultats : L'analyse révèle que les technologies xDSL ont joué un rôle historiquement significatif dans l'expansion initiale du haut débit fixe au Burkina Faso, en tirant parti de l'infrastructure en cuivre existante d'ONATEL SA. Cependant, au premier trimestre 2026, le paysage de l'internet fixe a été fondamentalement restructuré : la fibre jusqu'au domicile (FTTH) représente 98 % des accès fixes à haut débit, tandis que l'ADSL et la BLR (boucle locale radio) reculent nettement. Le parc total d'abonnements fixes à haut débit a atteint 310 696 au T1 2026, en croissance de 72,78 % sur un an, mais la part du xDSL est devenue marginale. Les principales limites du xDSL dans le contexte burkinabè comprennent : la dégradation des performances en fonction de la distance sur les lignes cuivre ; la nécessité de retirer les bobines de charge et d'éliminer les dérivations avant le déploiement ; la sensibilité aux interférences électromagnétiques et à la dégradation physique de l'infrastructure ; et les contraintes fondamentales de bande passante par rapport à la fibre. Conclusion : Les technologies xDSL ont contribué à l'expansion initiale du haut débit fixe au Burkina Faso, mais ont été rapidement supplantées par le FTTH. Leur utilité résiduelle réside dans des applications ciblées où le déploiement de la fibre n'est pas économiquement viable, mais leur pertinence stratégique pour l'accès Internet haut débit s'est largement dissipée. La politique nationale de connectivité devrait prioriser l'extension du backbone fibre et la couverture du haut débit mobile tout en reconnaissant la contribution historique du xDSL et ses applications de niche limitées.

Mots-clés : xDSL, ADSL, VDSL, accès haut débit, Burkina Faso, infrastructure cuivre, transition fibre

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Corresponding Author: Compaoré Abdramane
Email address: compaoreabdramane@cirep.ac.cd
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1. INTRODUCTION

Burkina Faso's pursuit of meaningful digital connectivity is shaped by a fundamental geographic constraint: as a landlocked developing country (LLDC), it lacks direct access to submarine fibre optic cables and depends on transit through neighboring coastal states for international bandwidth. This structural condition generates higher bandwidth costs, limited international gateway diversity, and heightened vulnerability to connectivity disruptions compared to coastal nations. Within this constrained environment, the question of how to achieve high-speed internet access at scale has been a persistent policy challenge.

The deployment of xDSL technologies, the family of Digital Subscriber Line variants including ADSL, ADSL2, ADSL2+, VDSL, and VDSL2, represented a pragmatic response to this challenge during the formative period of fixed broadband development in Burkina Faso. By leveraging the existing copper telephone infrastructure inherited from the state monopoly era, xDSL offered a

pathway to broadband connectivity without the capital-intensive requirement of end-to-end fibre deployment. The technology's fundamental proposition was compelling: transform the ubiquitous copper twisted-pair network into a conduit for digital data transmission at speeds far exceeding dial-up, using frequency bands above those occupied by voice telephony.

The historical trajectory of xDSL in Burkina Faso is inseparable from the role of ONATEL SA, the incumbent operator. ONATEL provided ADSL fixed-broadband services as part of its service portfolio, utilizing its copper access network to reach residential and business customers in areas where the infrastructure existed. During the 2000s and early 2010s, ADSL represented the primary and often the only fixed broadband option available to Burkinabè households and enterprises outside mobile networks.

However, the period since approximately 2020 has witnessed a dramatic restructuring of Burkina Faso's fixed internet landscape. The proliferation of fibre-to-the-home (FTTH) deployments, driven by competition among operators including Orange Burkina Faso, ONATEL SA, and GVA Burkina (Canalbox), has fundamentally altered the technological composition of the fixed access market. As of the first quarter of 2026, FTTH accounted for 98% of fixed high-speed accesses, with ADSL and BLR in sharp decline. This transition raises critical questions about the contemporary and prospective contribution of xDSL technologies to Burkina Faso's connectivity objectives.

This study examines the contribution of xDSL technologies to high-speed internet access in Burkina Faso, analyzing their performance characteristics and limitations within the national context, and assessing their prospects amid the accelerating fibre transition. The analysis contributes to understanding the technological pathways through which LLDCs can address connectivity challenges and the factors that determine the viability of legacy access technologies in evolving market conditions.

2. LITERATURE REVIEW

2.1 Technical Foundations of xDSL Technologies

The xDSL family encompasses multiple variants distinguished by transmission symmetry, achievable bit rates, and operational distance ranges. The foundational principle shared across all variants is the use of existing copper twisted-pair telephone lines for high-frequency digital signal transmission, with voice service occupying the 0–4 kHz band and data transmission utilizing higher frequencies.

ADSL (Asymmetric Digital Subscriber Line) operates on a single copper pair with asymmetric bandwidth allocation, providing downstream rates of up to 8 Mbps and upstream rates of 16–640 kbps over distances up to approximately 5.5 km. The asymmetry reflects typical internet usage patterns where download volumes substantially exceed upload volumes. ADSL2 improved

modulation efficiency to achieve downstream rates of up to 12 Mbps while maintaining spectral compatibility. ADSL2+ extended the spectrum allocation to 2.2 MHz, enabling downstream rates of up to 24 Mbps.

VDSL (Very-high-bit-rate Digital Subscriber Line) represents a more significant advancement, utilizing spectrum up to 12 MHz to support downstream rates of up to 50 Mbps and upstream rates of up to 6.5 Mbps in asymmetric configurations, or up to 25 Mbps symmetrically. However, VDSL's higher frequencies attenuate more rapidly over copper, limiting viable deployment distances to 300–1,500 metres from the central office or street cabinet. VDSL2 extended the spectrum to 30 MHz, with the 17a profile supporting a bidirectional rate of 100 Mbps and the 30a profile supporting 200 Mbps over distances up to approximately 300 metres. Enhanced VDSL (EVDSL), standardized as VDSL2 Annex Q with the 35b profile, extends the spectrum to 35 MHz.

The performance of all xDSL variants is fundamentally constrained by the physical characteristics of the copper loop. Attenuation increases with distance and frequency, while crosstalk between adjacent pairs in a cable bundle introduces interference that limits achievable bit rates on medium-length loops. Physical impairments including load coils (inductors originally installed to improve voice quality on long loops), bridged taps (unused line extensions that cause signal reflections), and water ingress in cable bundles can severely degrade or entirely preclude xDSL service.

2.2 xDSL in Developing Country Contexts

The application of xDSL technologies in developing countries has been analyzed through the lens of infrastructure leverage: the ability to derive broadband capability from existing copper assets without the capital expenditure of new fibre deployment. For telecommunications operators in resource-constrained environments, this proposition offered a pragmatic pathway to service expansion.

A 2004 analysis of xDSL as a broadband solution for developing countries emphasized the critical importance of loop prequalification before deployment. The study documented that "improper loop prequalification can result in frequent failures in the delivery of services," generating customer dissatisfaction and expensive troubleshooting requirements. Key prequalification tests include load coil detection, line length measurement, bridge tap identification, and wideband noise measurement, typically performed using Time Domain Reflectometry. The study recommended single-ended testing from the central office as the most suitable technique for rural areas where customer premises visits are costly and logistically challenging.

The presence of load coils was identified as a particularly significant obstacle in some African networks: "Although these coils were placed to improve the voice quality, when it comes to DSL high frequency signals they act the other way around. With these

coils it is impossible to transmit high frequency signals. These coils must be removed before deploying DSL." Fortunately, the study noted that "only some of the African telecommunications networks do have these load coils, which means less work."

2.3 Burkina Faso's Telecommunications Policy Framework

Burkina Faso's universal service framework is established by Law No. 061-2008/AN on the general regulation of electronic communications networks and services, and Decree No. 2011-093 defining implementation modalities for universal access and service. The framework establishes two institutional structures: the Universal Service Council (CSU) for governance, and the Universal Service Access Fund (FASU) for financing, with the latter supplied by contributions from operators and service providers.

The universal service objectives explicitly include "deployment of fixed high-speed internet (ADSL)" among the infrastructure priorities, alongside fibre backbone deployment, internet points of presence, and tower construction in unserved areas. Additional objectives encompass "access to high-speed Internet in schools, health facilities, security services, town halls, libraries and other community centres."

However, the framework's implementation has faced significant delays. A 2017 ITU presentation noted that "five years after the adoption of Decree No. 2011-093, this strategy has still not been implemented." This implementation gap reflects broader challenges in translating universal service policy into operational deployment.

More recent policy initiatives have emphasized mobile infrastructure expansion. The Ministry of Digital Transition and ARCEP announced plans in 2025 to deploy 800 new telecom sites to eliminate underserved "white zones," with 250 sites under the PACTDIGITAL initiative, 500 funded by FASU, and 50 additional sites as coverage gaps are identified. This mobile-centric approach reflects the recognition that mobile broadband has become the dominant mode of internet access in Burkina Faso, as in much of sub-Saharan Africa.

2.4 The LLDC Connectivity Constraint

The structural disadvantages facing landlocked developing countries in achieving meaningful internet connectivity are well-documented. The ITU's 2025 consultation synthesis identifies multiple compounding challenges: "Without direct access to submarine cables and seaports, LLDCs are compelled to rely on neighbouring transit countries for international bandwidth, often

at high costs and under asymmetrical terms. This dependency creates vulnerabilities, increases latency, and restricts competition in the digital market."

Affordability remains a critical barrier: "High infrastructure cost, limited access to international fibre routes, and heavy dependence on neighbouring transit countries make broadband significantly more expensive in LLDCs than in other countries." The ITU reports that LLDCs average only 5 fixed-broadband subscriptions per 100 inhabitants, compared to the global average of 20.

Quality of service is compromised by "packet loss, limited redundancy, and single-point failures due to lack of redundant and diversified routes." This infrastructure fragility is compounded by "rugged terrain" and "vulnerability to natural disasters." Investment attraction faces "low ROI in remote geographies" and "insufficient private sector interest," while regulatory frameworks often remain "fragmented" with "slow licensing" and "lack of inter-agency coordination."

These constraints define the operational environment within which xDSL technologies were deployed in Burkina Faso and shape their limitations and prospects.

3. RESEARCH QUESTIONS

This study addresses the following research questions:

1. What was the historical contribution of xDSL technologies to the expansion of fixed high-speed internet access in Burkina Faso, and what technical and institutional factors shaped this contribution?
2. What are the performance characteristics and inherent limitations of xDSL technologies in the specific context of Burkina Faso's copper infrastructure and market conditions?
3. What is the current status of xDSL technologies in Burkina Faso's fixed internet market, and how has the transition to fibre affected their relevance?
4. What prospective role, if any, can xDSL technologies play in Burkina Faso's future connectivity strategy, particularly in areas where fibre deployment faces economic or logistical constraints?

4. METHODOLOGY

4.1 Research Design

This study employs a mixed-methods approach combining quantitative analysis of market and regulatory data with qualitative assessment of technical specifications and policy documents. The design is appropriate for examining a technology's trajectory within a specific national context, where market dynamics, technical constraints, and policy frameworks interact.

4.2 Data Sources

Regulatory and market data: ARCEP Burkina Faso quarterly market reports, particularly Q1 2026 data on fixed internet subscriber composition, traffic volumes, and operator market shares. These sources provide the most current authoritative data on the technological composition of Burkina Faso's fixed access market.

Ministry statistical publications: The 2024 Statistical Yearbook of the Ministry of Digital Transition, Postal Services and Digital Economy, providing data on operator capacities, traffic volumes, and sector structure.

Technical specifications: ITU-T recommendations and academic literature on xDSL performance characteristics, including ADSL, ADSL2+, VDSL, VDSL2, and EVDSL specifications.

Policy documents: Burkina Faso's universal service legal framework (Law No. 061-2008/AN and Decree No. 2011-093), ITU country profile for Burkina Faso, and ITU consultation submissions on LLDC connectivity challenges.

Operator reports: ONATEL SA annual report for 2023, documenting fixed access network developments including FTTH deployment and ADSL service status.

Academic literature: Peer-reviewed studies on xDSL deployment in developing countries, including loop prequalification requirements and infrastructure constraints.

4.3 Analytical Framework

The analysis is structured around three dimensions: (1) historical contribution, examining the role of xDSL in Burkina Faso's fixed broadband expansion; (2) contemporary status, assessing the current market position of xDSL relative to fibre and mobile technologies; and (3) prospective assessment, evaluating the conditions under which xDSL might retain relevance.

4.4 Limitations of Method

The study relies on secondary data sources rather than primary measurement of xDSL performance in Burkina Faso. Specific data on historical xDSL subscriber numbers and performance metrics are not publicly available in disaggregated form. The analysis therefore relies on indirect evidence and comparative assessment rather than direct measurement.

5. RESULTS

5.1 Historical Contribution of xDSL to Fixed Broadband in Burkina Faso

The deployment of ADSL services by ONATEL SA represented the primary mechanism for fixed broadband provision in Burkina Faso during the pre-fibre era. The ITU country profile for Burkina Faso noted that "ONATEL also provides ADSL fixed-broadband services," identifying this as part of the incumbent's service portfolio. The universal service framework explicitly listed "deployment of fixed high-speed internet (ADSL)" as an infrastructure priority, reflecting the technology's strategic positioning in national connectivity planning.

However, the scale of xDSL's contribution was constrained by the limited extent of copper access infrastructure. By 2017, Burkina Faso's fixed-broadband penetration stood at only 0.1 subscriptions per 100 inhabitants, compared to the African average of 0.6 and the world average of 13.6. Among the fixed-broadband subscriptions that existed, 78.7% operated at speeds between 256 kbit/s and 2 Mbit/s, while 21.3% operated at 2–10 Mbit/s. These speed tiers are consistent with ADSL and ADSL2+ capabilities, confirming that xDSL technologies constituted the backbone of Burkina Faso's fixed broadband offering during this period.

Table 1: Fixed-Broadband Speed Tier Distribution, Burkina Faso (2017)

Speed Tier	Burkina Faso (%)	Africa (%)	World (%)
256 kbit/s to 2 Mbit/s	78.7	38.7	4.2
2 to 10 Mbit/s	21.3	37.2	13.2
≥10 Mbit/s	—	24.1	82.6

Source: ITU (2018), as cited in ITU Country Profile Burkina Faso.

The absence of any subscriptions at speeds of 10 Mbit/s or above in 2017 indicates that higher-performance xDSL variants (VDSL, VDSL2) were not deployed at scale, if at all. The fixed broadband market was effectively limited to ADSL-class services.

5.2 Contemporary Market Status: The Fibre Transition

The fixed internet market in Burkina Faso has undergone fundamental restructuring since approximately 2020. Data from ARCEP for the first quarter of 2026 reveal the following characteristics:

Table 2: Burkina Faso Fixed Internet Market, Q1 2026

Indicator	Value	Year-on-Year Change
Total fixed broadband subscriptions	310,696	+72.78%

FTTH share of fixed accesses	98%	—
ADSL and BLR status	In sharp decline	—
Total fixed internet traffic	427.5 million GB	+69.41%
Average traffic per subscription	459 GB/month	—

Source: ARCEP, Q1 2026.

The market is served by six operators: ONATEL SA, Orange Burkina Faso SA, Telecel Faso SA, GVA Burkina Faso (Canalbox), PAV Burkina, and VTS SA. Orange Burkina Faso leads the fixed subscriber market with 48.39% share, followed by GVA Burkina (Canalbox) at 29.56% and ONATEL SA at 21.30%. VTS SA holds a marginal 0.75% share.

The technological composition confirms the marginalization of xDSL: FTTH represents 98% of fixed high-speed accesses, with ADSL and BLR in sharp decline. This represents a complete inversion of the 2017 situation, when ADSL-class technologies were the only fixed broadband option.

Table 3: Fixed Internet Traffic Distribution by Operator, Q1 2026

Operator	Traffic Share (%)
Orange Burkina Faso SA	45.88
ONATEL SA	27.03
GVA Burkina Faso (Canalbox)	26.31
VTS SA	0.78

Source: ARCEP, Q1 2026.

ONATEL SA's 2023 annual report confirms the strategic pivot toward fibre: the company reported that "fibre optic revenues were multiplied by more than 3 times compared to the same period in 2022," while documenting "deployment of FTTH connection points" and "extension of the FTTH offer with new speeds (400 Mbps)." The report makes no mention of ADSL expansion or investment, indicating that the incumbent has redirected its fixed access strategy entirely toward fibre.

5.3 Technical Limitations of xDSL in the Burkinabè Context

The performance limitations of xDSL technologies are well-documented in the technical literature and have specific implications for Burkina Faso's infrastructure conditions.

Distance-dependent performance degradation: xDSL bit rates decline with loop length due to signal attenuation. ADSL achieves maximum rates only on short loops (typically under 2–3 km), with performance falling significantly at greater distances. VDSL, despite higher peak rates, is limited to 300–1,500 metres from the central office or cabinet. In Burkina Faso, where copper infrastructure was deployed for voice telephony rather than broadband, loop lengths are not optimized for xDSL performance, and many subscribers likely experience rates well below theoretical maxima.

Infrastructure impairments: The presence of load coils, bridged taps, and water ingress in cable bundles can severely degrade or entirely preclude xDSL service. Loop prequalification is essential but resource-intensive, requiring specialized test equipment and skilled technicians. The 2004 study on xDSL in developing countries emphasized that "improper loop prequalification can result in frequent failures in the delivery of services."

Bandwidth constraints relative to fibre: Even the most advanced xDSL variant (VDSL2 profile 30a) supports a maximum bidirectional rate of 200 Mbps over short distances, with real-world performance typically substantially lower. FTTH, by contrast, offers symmetric gigabit-class capabilities with no distance-dependent degradation. The 459 GB average monthly traffic per fixed subscription in Burkina Faso (Q1 2026) is far beyond what xDSL technologies can economically support at scale.

Electromagnetic interference: Copper twisted-pair is susceptible to electromagnetic interference from external sources and crosstalk from adjacent pairs within the same cable bundle. In urban environments with dense cable infrastructure, crosstalk becomes a limiting factor for VDSL performance.

Table 4: xDSL Technology Performance Characteristics

Technology	Max Downstream	Max Upstream	Max Distance	Key Limitation
ADSL	8 Mbps	640 kbps	~5.5 km	Low absolute capacity
ADSL2+	24 Mbps	1 Mbps	~3 km	Distance-dependent
VDSL	50 Mbps	6.5 Mbps	~1.5 km	Very short reach
VDSL2 (17a)	100 Mbps	100 Mbps	~300 m	Short reach
VDSL2 (30a)	200 Mbps	200 Mbps	~300 m	Short reach

FTTH	1+ Gbps	1+ Gbps	20+ km	Deployment cost

Source: Compiled from technical literature.

5.4 The LLDC Constraint on xDSL Viability

Burkina Faso's status as a landlocked developing country imposes additional constraints on the viability of xDSL technologies. The ITU's analysis of LLDC connectivity challenges notes that these countries "average only 5 fixed-broadband subscriptions per 100 people, compared to global averages of 20." The fundamental barriers include "high per capita cost of international bandwidth" and "heavy dependence on neighbouring transit countries."

These structural factors affect xDSL deployment in two ways. First, the high cost of international bandwidth means that the backhaul component of broadband service is expensive regardless of access technology, reducing the relative cost advantage that xDSL might otherwise offer. Second, the low fixed-broadband penetration base means that copper infrastructure was never deployed extensively enough to support widespread xDSL service. The economics of upgrading copper for xDSL versus deploying fibre directly may favour fibre in many contexts, particularly where the copper network is degraded or where new construction is required for either technology.

6. DISCUSSION OF RESULTS

6.1 The Historical Legacy of xDSL in Burkina Faso

The evidence supports the conclusion that xDSL technologies, primarily ADSL, played a historically significant but ultimately transitional role in Burkina Faso's fixed broadband development. During the pre-fibre era, ADSL represented the only fixed broadband option available at scale, and its deployment was explicitly recognized in national universal service objectives. The speed tier distribution in 2017—with 78.7% of fixed subscriptions at 256 kbit/s to 2 Mbit/s—is consistent with ADSL service constrained by distance and infrastructure quality.

However, the scale of this contribution was modest. Fixed-broadband penetration of 0.1 per 100 inhabitants in 2017 indicates that xDSL reached only a tiny fraction of the Burkinabè population. The technology's reliance on copper infrastructure, which itself had limited geographic reach, fundamentally constrained its potential impact. The universal service framework's inclusion of ADSL deployment as an objective did not translate into the expansion that the policy language might have implied, reflecting the broader implementation gap documented in the 2017 assessment.

6.2 The Decisive Shift to Fibre

The Q1 2026 market data demonstrate that the transition from xDSL to fibre in Burkina Faso has been rapid and comprehensive. FTTH's 98% share of fixed high-speed accesses represents a near-total displacement of copper-based technologies within the fixed segment. This transition has been driven by operator competition: Orange Burkina Faso, GVA Burkina (Canalbox), and ONATEL SA have all invested in FTTH deployment, with Orange and Canalbox capturing significant market share through aggressive fibre rollouts.

The trajectory is consistent with global patterns in fixed broadband development. As fibre deployment costs decline and demand for bandwidth-intensive applications grows, the economic and technical rationale for copper-based access technologies diminishes. The 459 GB average monthly traffic per subscription in Burkina Faso reflects usage patterns—streaming, cloud services, remote work—that are poorly served by xDSL capabilities.

ONATEL SA's strategic pivot is particularly telling. As the incumbent with the largest copper infrastructure and the historical provider of ADSL services, ONATEL has redirected its fixed access investment entirely toward FTTH, reporting triple-digit revenue growth in fibre services while making no mention of ADSL expansion. This is a clear signal that the incumbent itself regards xDSL as a legacy technology with limited future relevance.

6.3 Residual Applications and Niche Viability

The question of whether xDSL retains any viable application in Burkina Faso requires examining contexts where fibre deployment faces economic or logistical barriers. In rural areas with low population density and limited existing infrastructure, the economics of FTTH deployment may be unfavourable, and xDSL, if copper infrastructure exists, could theoretically provide a lower-cost interim solution.

However, several factors limit this residual viability. First, the copper infrastructure that exists in Burkina Faso was deployed for voice service and may not be suitable for xDSL without significant rehabilitation (load coil removal, bridge tap elimination). Second, the performance achievable under such conditions is likely to be modest, ADSL-class at best, and insufficient for modern bandwidth requirements. Third, mobile broadband technologies (4G, and increasingly 5G) offer a more economically viable alternative for areas without fibre, leveraging the extensive mobile infrastructure that has been built through initiatives such as the 800-site deployment programme.

The ITU's LLDC analysis notes that mobile broadband penetration in these countries averages 59 subscriptions per 100 inhabitants, compared to only 5 for fixed broadband. This disparity reflects the practical reality that mobile technologies have become the

primary access mode in contexts where fixed infrastructure deployment is constrained. For Burkina Faso, the strategic priority for universal connectivity lies with mobile coverage expansion and fibre backbone development, not with xDSL rehabilitation.

6.4 Policy Implications

The findings have several implications for Burkina Faso's connectivity policy. First, the universal service framework should be updated to reflect the technological transition that has occurred. The explicit inclusion of ADSL deployment as an infrastructure objective is now obsolete; policy attention should focus on FTTH and mobile broadband coverage. Second, investment in copper infrastructure rehabilitation for xDSL purposes is difficult to justify on either economic or technical grounds given the availability of superior alternatives. Third, the regulatory framework should ensure that the transition to fibre does not leave behind populations in areas where neither FTTH nor adequate mobile coverage exists.

The LLDC connectivity constraints identified by the ITU, high transit costs, limited redundancy, regulatory fragmentation, remain the binding constraints on Burkina Faso's internet development, regardless of access technology. Addressing these structural challenges through diversified international connectivity, regional backbone integration, and regulatory harmonization would yield greater benefits than investment in legacy access technologies.

7. CONCLUSION

This study has analyzed the contribution of xDSL technologies to high-speed internet access in Burkina Faso, examining their historical role, contemporary status, and prospective relevance. The evidence supports the following conclusions:

First, xDSL technologies played a historically significant but limited role in Burkina Faso's fixed broadband development. ADSL, deployed by ONATEL SA, represented the primary fixed broadband option during the pre-fibre era and was explicitly recognized in universal service objectives. However, the scale of this contribution was constrained by the limited extent of copper infrastructure and the resulting low fixed-broadband penetration.

Second, xDSL has been decisively superseded by fibre in Burkina Faso's fixed access market. FTTH accounts for 98% of fixed high-speed accesses as of Q1 2026, with ADSL and BLR in sharp decline. All major fixed operators have redirected investment toward fibre, and the incumbent ONATEL SA has pivoted its fixed access strategy entirely to FTTH.

Third, the technical limitations of xDSL—distance-dependent performance, infrastructure impairments, and fundamental bandwidth constraints—are particularly acute in the Burkinabè context. The copper network was not designed for broadband, and the investment required to upgrade it for xDSL would be difficult to justify relative to direct fibre deployment.

Fourth, the residual viability of xDSL is marginal. While the technology could theoretically serve niche applications in areas where fibre is economically unviable, mobile broadband offers a more practical alternative, and the structural constraints facing LLDCs—high transit costs, limited international bandwidth—affect all access technologies equally.

The strategic implication for Burkina Faso's connectivity policy is clear: xDSL should be recognized as a legacy technology whose historical contribution merits acknowledgment but whose future relevance is negligible. Policy attention and investment should focus on fibre backbone extension, FTTH deployment in economically viable areas, and mobile broadband coverage expansion to address the persistent connectivity gaps that constrain Burkina Faso's digital development.

8. LIMITS OF THE STUDY

This study has several limitations.

Data limitations: Specific historical data on xDSL subscriber numbers, geographic distribution, and performance metrics in Burkina Faso are not publicly available in disaggregated form. The analysis relies on indirect evidence speed tier distributions, operator reports, and comparative data rather than direct measurement of xDSL deployment and performance.

Temporal scope: The study captures a specific moment in Burkina Faso's technological transition. While the trajectory toward fibre is clear, the pace and completeness of the transition may evolve in ways that affect the conclusions.

Technology focus: The analysis concentrates on wireline access technologies and does not systematically examine the competitive dynamics with mobile broadband, which has become the dominant mode of internet access in Burkina Faso. A comprehensive assessment of connectivity strategy would require integrated analysis of fixed and mobile dimensions.

Primary data absence: No primary data collection—such as field measurement of xDSL performance or interviews with operators—was conducted. The study relies entirely on documentary and secondary sources.

Comparative dimension: While international context is referenced, systematic comparison with other LLDCs or West African countries facing similar constraints is beyond the scope of this study.

9. ACKNOWLEDGMENTS

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10. AUTHOR CONTRIBUTIONS

Compaoré Abdramane is the sole author of this manuscript and was responsible for all aspects of the research, including conceptualization, data collection, analysis, interpretation, and manuscript preparation.

11. COMPETING INTEREST

The author declares no competing interests.

12. FUNDING INFORMATION

No funding was received for this research.

13. DATA AVAILABILITY

All data analyzed in this study are derived from publicly available regulatory reports, government statistical publications, and technical literature. The specific documents consulted are cited in the bibliography. No primary data were generated.

14. DISCLAIMER

The views expressed in this article are those of the author and do not reflect the official position of any affiliated institution or the Government of Burkina Faso

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