

## 4 Building an Impact Investing Market for Community-centered Connectivity

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### 4.1 Introduction

Access to meaningful internet connectivity is increasingly recognized as a foundation for economic inclusion, education, healthcare, and civic participation. Yet billions remain unconnected, particularly in rural, low-income, and marginalized communities. Connect Humanity, a philanthropic investment organization, addresses this gap through a community-centric financing approach, which channels catalytic capital to community networks and locally rooted Internet Service Providers (ISPs) that are building connectivity solutions where market-driven actors fail to reach. Rather than relying on top-down infrastructure projects, Connect Humanity supports bottom-up digital infrastructure, where communities design, deploy, and govern the networks that serve them. Over the past two years, Connect Humanity has developed and deployed a tailored investment framework to evaluate and fund these networks—partnering with ISPs across Latin America, Africa, and Asia to surface what it takes to responsibly invest in the global digital equity frontier.

This paper presents the first cross-sectional analysis of community-centered internet providers across the Global South through the lens of investability. While much of the discourse around digital inclusion emphasizes infrastructure gaps or regulatory hurdles, little attention has been given to how these networks perform as financially viable, socially impactful investment opportunities. The rationale behind this study is to reframe community networks as emerging infrastructure enterprises with scalable potential, not as grant-dependent experiments. By systematically underwriting nine diverse networks across various regions, we highlight the pathways through which these community ISPs can attract capital and contribute meaningfully to the global mission of digital equity and sustainable development.

## 4.2 Methodology

Our research methodology is grounded in Connect Humanity's practical due diligence and underwriting of nine community-centered ISPs across the world. Each ISP was evaluated using a structured Investment Risk Framework that assessed five key dimensions: Network Technical Risk, Community Engagement, Business Model Strength, Legal & Compliance, and Portfolio Fit. This due diligence methodology has been tested in a North America context, with no credit defaults to date.

Each dimension is evaluated through specific subfactors and assigned a numerical score where lower scores indicate lower risk, including:

- **Network Technical:** principals, network design (uplink, distribution, access), believability of network rollout), support and operations.
- **Community Engagement:** need/digital equity gap, approach to community engagement.
- **Business Model:** sources and uses of capital, revenue model, cost structure, financial performance.
- **CH Portfolio:** size of investment, type of investment, impact on broader portfolio economics, source of capital, duration/repayment.
- **Legal and Compliance:** age and sophistication of company, financial review and understanding, internal control environment, contingent liabilities and legal status, executive management review.

These scores are aggregated to produce a total risk rating, categorized as A (Low Risk: 15-26), B (Some Risk: 27-39), C (Material Risk: 40-54), or D (Not Aligned: 55-66). Lower scores mean lower risk. The framework is designed for a diverse range of ISPs, including community-centric vs non-community centric ISPs and early- vs late-stage ISPs operating in underserved markets. The framework is intended to remove biases in traditional underwriting that often overlooks contextual complexity and social value of community-oriented broadband.

The methodology combines quantitative scoring with qualitative context, capturing the unique social value, technical feasibility, and financing challenges of each network. Connect Humanity conducted in-depth interviews with leadership teams, reviewed technical diagrams, financial statements, community engagement plans, and deployment maps. The nine selected networks span different geographies (e.g., Latin/South America, Sub-Saharan Africa, Southeast Asia), governance

models (e.g., co-ops, nonprofits, family-owned ISPs) and stages of maturity. This comparative analysis provides not only a snapshot of individual investability but also a synthesis of the systemic enablers and barriers shaping the global community network ecosystem.

The nine community network initiatives selected included:

- **El Oasis; Colnodo (Colombia):** A veteran digital rights NGO supporting locally governed WiFi networks in rural Colombia, with a focus on gender equity, civic participation, and community digital autonomy.
- **Zenzeleni (South Africa):** A solar-powered, wireless community-owned network in South Africa's Eastern Cape, recognized for its strong governance, open-source ethos, and ability to deliver sustainable rural broadband.
- **Common Room (Indonesia):** A multidisciplinary Indonesian initiative combining community centers, IoT deployment, and WiFi networks across island villages, with deep roots in capacity building and digital literacy.
- **MyKCat (Philippines):** A profitable, 100% Filipino-owned fiber ISP operating in Negros Occidental, delivering high-speed broadband to underserved towns with strong subscriber growth and operational discipline.
- **TandaNet (Kenya):** A licensed community-based ISP rooted in Nairobi's informal settlements, blending digital skilling and internet service through a CBO model, with ambitions to scale via partnerships with global tech firms.
- **MAJI (Nigeria):** A grassroots digital justice organization in the Niger Delta using voucher-based WiFi networks to expand access, originally rooted in environmental monitoring and now evolving into a social enterprise.
- **AheriNet (Kenya):** A licensed community ISP serving informal settlements and schools in Kisumu County, with a hybrid wireless-fiber network and a mission to close the digital divide through affordable access.
- **IFS Sertao (Brazil):** A university-led initiative to build a fiber-backed community network in a remote quilombola region, supported by national operators and regulators through public-private infrastructure agreements.

- **TIC (Mexico):** A nonprofit telecom carrier enabling indigenous communities to build and operate their own mobile and internet networks, pioneering decentralized models through legal spectrum access and local governance.

These initiatives were selected by APC and Connect Humanity on the basis of representing a wide variety of network models within the typology of community-centred connectivity initiatives presented in the first chapter, spread around different regions and countries. All initiatives selected had in common that all had implemented mechanisms to sustain the connectivity over time.

### 4.3 Results

Of the nine networks analyzed, the majority were rated B (some risk) using Connect Humanity's Investment Risk Framework. Two achieved an A (low risk) rating, based on operational profitability, clean financials, and scalable governance structures. The rest fell into the C category, reflecting material risks related to unclear ownership structures, undefined long-term sustainability, or capacity gaps.

**Table 4.1**

Category	ISP 1	ISP 2	ISP 3	ISP 4	ISP 5
Network Technical	8/14	6/14	6/14	5/14	7 / 14
Community Engm't	1/5	2/5	1/5	2/5	1 / 5
Business Model	8/13	8/13	11/13	4/13	9 / 13
CH Portfolio Impact	7/17	13/17	12/17	8/17	12 / 17
Legal & Compliance	9/17	10/17	12/17	9/17	9 / 17
<b>Total Risk Score</b>	<b>33</b>	<b>39</b>	<b>42</b>	<b>28</b>	<b>38</b>

**Table 4.2**

Category	ISP 6	ISP 7	ISP 8	ISP 9	CH Port.
Network Technical	9/14	7/14	11/14	7/14	3.2/14
Community Engm't	2/5	2/5	3/5	1/5	0.6/14
Business Model	11/13	11/13	12/13	9/13	5/14
CH Portfolio Impact	11/17	9/17	9/17	12/17	9.8/14
Legal & Compliance	11/17	9/17	14/17	9/17	9.2/14
<b>Total Risk Score</b>	<b>44</b>	<b>38</b>	<b>49</b>	<b>38</b>	<b>27.8</b>

The analysis of nine community networks reveals a consistent pattern of strong social alignment, moderate technical reliability, and widely variable financial readiness. Across the five dimensions of Connect Humanity's Investment Risk Framework, the average total risk score was 38.8 (max 66) with a standard deviation of 6.1, placing most networks nearly between the "B - Some Risk" and "C - Material Risk" categories. While these networks are not yet fully investment-grade by conventional standards, their risk profiles show they are fundamentally viable with appropriate financial structuring and technical assistance.

The strongest performance came in Community Engagement, with an average score of 1.7 and a standard deviation of 0.7, indicating low risk. This reflects the embeddedness of these networks in their local contexts, their participatory governance models, and their track record of digital inclusion work with marginalized groups. Conversely, the Business Model category showed the highest average risk at 9.2 with the largest standard deviation of 2.1, indicating significant variation between networks. Some ISPs maintain positive cash flows and clear subscriber economics, while others remain heavily donor-funded or lack disciplined financial forecasting and projections.

Technical risk, averaging 7.3 with a standard deviation of 1.8, fell in the mid-range. Most networks use hybrid models of fiber, WiFi, LTE, and solar-powered mesh; technically credible designs, but in operating environments prone to infrastructure challenges such as power outages or storm damage. The analysis revealed strong technical credibility across networks (e.g., modular fiber-WiFi architectures), consistent local legitimacy, but limited capital readiness.

Legal and compliance risks, averaging 10.2 with a standard deviation of 1.7, typically stem from either incomplete registration structures or limited ability to access capital due to licensing complexity or organizational form (e.g., co-ops, NGOs).

When compared to Connect Humanity's existing portfolio of active investments, the nine community networks show both distinct strengths and predictable weaknesses. Notably, these community networks score similarly in Community Engagement, validating their core value proposition: trusted, locally governed infrastructure deeply aligned with digital equity outcomes.

However, the comparison also highlights meaningful gaps in investment readiness. The average Network Technical Risk score among the community networks is 4.1 points higher, almost two deviations, indicating less redundancy, limited network automation, and greater vulnerability to environmental disruptions. This suggests a need for investment not just in last-mile connectivity, but in resilience and monitoring capacity at the network core.

The most significant divergence lies in the Business Model dimension, where the community networks almost two deviations higher in risk compared to the broader portfolio. This is attributable to reliance on grants, the absence of audited financials, and limited experience with debt servicing or reserve planning. Other common challenges included regulatory bottlenecks and limited access to patient, flexible capital. However, most networks had real and growing user bases, with take-rates between 30–50% and demonstrated ability to monetize service via prepaid or subscription models. Addressing this gap will require pairing capital with technical assistance to build budgeting, pricing, and revenue management capabilities.

Together, these insights disaggregate prior held perceptions that community networks are not investable. Rather, community networks present a spectrum of organizations, some immediately investable while others requiring more scaffolding than traditional ISPs. The commonality is that they require investments structured differently and more aligned with their specific challenges. Their high social impact, strong demand, and small capital needs make them ideally suited for tailored, milestone-linked financing, especially when paired with patient, blended capital.

#### **4.4 Analysis and Implications**

The underwriting process surfaced several cross-cutting insights. First, demand for connectivity is not the problem: nearly every network reaches breakeven if allowed to deploy. Second, the greatest barriers are capital access, permitting friction, and execution capacity, not market viability. Most community networks are structurally excluded from capital markets: they lack collateral, operate at small ticket sizes (\$50K–\$300K), and are invisible to national broadband funds.

Consequently, 60-90% of deployments have been grant-funded, making them vulnerable to donor cycles and program timelines.

Third, success is closely tied to strong local leadership and embedded governance models. ISPs with proximity to the communities they serve have built trust and resilience even in resource-constrained environments. However, financial discipline, technical assistance, and institutional strengthening are necessary to scale these efforts. The implication is clear: for community networks to flourish, we need investment structures that are local, flexible, and catalytic, such as recoverable grants, revenue-based financing, and blended capital pools. Technical assistance must be paired with capital to close the maturity gap that prevents many networks from absorbing investment at scale.

Key themes of due diligence amongst the community networks that we saw include:

#### Demand Is Real, But Growth Is Constrained

- **Market gaps are undeniable:** Every network serves rural, low-income, indigenous, quilombola or peri-urban regions that are structurally ignored by commercial ISPs. In many areas, the only alternative is a 2G/3G handset or no service at all.
- **Latent demand is high:** Once deployed, networks commonly see significant take rates (>30-50%). Community buy-in is strong, particularly when pricing is fair and services are reliable.
- **Growth is not limited by demand, but by regulation and capacity:** Scale is often blocked by slow permitting, limited managerial bandwidth/capacity, and lack of access to working capital.

#### CapEx is the Bottleneck, Not OpEx

- **The biggest cash pinch is upfront:** Across nearly all networks, capital for towers, fiber drops, CPE, and OLTs is the main barrier. Post-deployment burn rates are relatively modest and typically manageable vis-a-vis operating revenue.
- **Capital needs are smaller than expected:** Most buildouts require \$50K-\$300K, impact transaction costs. While modest, especially when compared to typical infrastructure investments, this capital goes a long way.

### Capital Access is Severely Limited

- **Bank financing is largely inaccessible:** Local lenders require land collateral or cash flow history that small networks don't have. National broadband funds often exclude small players through eligibility or administrative complexity.
- **Grants have filled the gap:** ~60–90% of buildouts have been grant-funded (APC, ISOC, EU, local NGOs), but this model is not sustainable or scalable.
- **Revenue-based or other structured credit** is likely the most viable path forward for most investable networks.

### Execution and Governance Are Uneven

- **Technical infrastructure is rarely the problem:** Nearly all networks have deployed credible designs using hybrid fiber, wireless, or LTE. Examples include MyKCat's redundant IXP-connected fiber ring and Zenzeleni's solar mesh network.
- **Financial management and forecasting are often weak:** While mature community networks analysed have clean books and clear projections, many others remain project-based with a "non-profit, grant-dependent mentality", with limited forecasting capabilities.
- **Leadership matters:** Networks with strong, embedded, mission-aligned founders consistently outperform peers with diffuse or rotating governance.

### Structure and Ownership Models Vary Widely

- **Decentralized governance is common:** Many networks are co-ops, associations, or nonprofits with distributed decision-making and community boards. While this builds trust, it often slows execution and business capacity building.
- **Equity is frequently off the table:** Legal or political restrictions (e.g., foreign ownership rule) make equity infeasible, increasing the need for tailored credit.

### Talent Pipelines Are Emerging but Need Support

- **Several networks are investing in local capacity:** Programs in TIC, IFS Sertão, and Zenzeleni are training youth, volunteers, and/or professionals in technical operations. However, scaling these efforts requires funding and formalization.

### Transaction Cost Is a Hidden Barrier

- **Low ticket sizes and high diligence friction** are the primary reasons commercial investors avoid this segment. With capital needs often below \$250K, minimizing transaction cost and maximizing speed and flexibility are essential for any funder entering this space.

Despite operating in highly resource-constrained settings, nearly all networks have deployed technically sound infrastructure, often using modular, hybrid designs that combine fiber, wireless, and LTE/MVNO access. The technical layer is rarely the primary weakness. However, financial sophistication and capitalization vary widely. Only a few are profitable or investment-ready at scale.

The financing opportunity to close the global digital divide is real, but unlocking it requires patient capital, risk-aligned instruments, and stronger operational readiness across the board. A programmatic approach that pairs small-scale, milestone-based financing with TA and flexible repayment structures appears best positioned to meet the sector where it is and move it toward scalable, investable maturity.

## 4.5 Implications for “Fit for Purpose” Financing

Across nearly all cases, traditional debt would not be appropriate unless deeply customized. Instead, risk-sharing, longer tenors (5–7 years), and milestone-based disbursements would be critical to aligning incentives and reducing risk.

**Table 4.3**

Illustrative Instruments	Best For
Revenue-Based Financing (RBF)	Networks with recurring revenue and moderate financial systems in place: <ul style="list-style-type: none"> <li>• ISPs with at least 12–24 months of operating history, active subscriber billing, and strong operational foundation.</li> <li>• Operators that can track and report monthly revenue, even if financial controls are informal but reliable.</li> <li>• Networks seeking growth capital for expansion into adjacent markets with clear breakeven paths.</li> </ul>
Recoverable Grants	Mission-aligned networks with social mandates but early-stage business maturity: <ul style="list-style-type: none"> <li>• Community networks operating as nonprofits or cooperatives, where capital recovery depends on donor/funder flexibility.</li> <li>• Ideal for pilot-stage deployments or high-impact digital equity programs without reliable cash flow.</li> <li>• Organizations with strong local legitimacy but no collateral, formal loan capacity, or prior borrowing history.</li> </ul>

Illustrative Instruments	Best For
Blended Capital Pools	Decentralized networks or portfolios of small deployments that need scale and risk layering: <ul style="list-style-type: none"> <li>• Federated or multi-community models where shared back-end support and TA reduces individual project risk.</li> <li>• Networks where grant funding can de-risk early-stage operations while repayable capital supports scale-up.</li> <li>• Appropriate when working through intermediaries, umbrella NGOs, or consortia coordinating multiple CNs.</li> </ul>
Bridge-to-Permitting Debt	Networks with proven deployment models but slow regulatory approvals: <ul style="list-style-type: none"> <li>• ISPs that face multi-month delays between permitting and buildout.</li> <li>• Operators with clear pipeline and track record of securing permits, but limited capital to pre-fund infrastructure or community outreach.</li> <li>• Can be structured as tranches linked to permitting milestones, mitigating idle capital risk.</li> </ul>
TA-Linked Capital	Networks with strong community traction but lacking operational maturity: <ul style="list-style-type: none"> <li>• Early-stage CNs with promising demand but gaps in financial modeling, governance, or network planning.</li> <li>• Organizations that can execute with support, especially in transition from donor-funded pilot to revenue model.</li> <li>• Useful for networks where organizational strengthening is as critical as the capital itself.</li> </ul>

## 4.6 Recommendations to Catalyze Impact Investors

- 1. Aggregate Demand via a Facility or Fund.** Individual community networks are often too small for most investors. A global or regional fund that bundles 10–30 networks under a single investment thesis could create scale, standardization, and portfolio diversification.
- 2. Blend Capital to Absorb First-Loss Risk.** Philanthropic or catalytic investors can provide grants or junior capital to de-risk senior debt. This structure would allow more commercial capital to participate, particularly DFIs or impact lenders.
- 3. Build Standardized Diligence and Reporting Tools.** Many networks lack audited financials or formal governance documents. A toolkit for shared due diligence, financial forecasting, and impact measurement would streamline underwriting and reduce transaction costs.
- 4. Leverage Public Subsidy or Anchor Buyers.** Governments and anchor institutions (e.g., schools, health clinics) can co-finance networks through service contracts. This demand-side revenue underwriting can improve the network’s bankability.

- 5. Tell a Better Story.** These networks are more than last-mile ISPs, they are platforms for education, entrepreneurship, and civic engagement. Packaging community networks as “social infrastructure” could tap into climate, sustainability, gender, and digital rights capital flows.
- 6.** Most critically, we need one or several patient funders willing to provide capital to test and build what works. There will be nuances and differences in financing community networks across regions, countries, and even provinces. We need the space to iterate the underwriting and structuring while developing a larger body of loan performance data. Once loan performance data hits critical mass, we would expect more impact investors, institutional credit, DFIs, and even local banks to get more involved in financing community networks.

## **4.7 Conclusion**

Community networks represent a powerful, locally rooted response to global digital inequality. They are technically viable, socially embedded, and often the only source of meaningful connectivity in remote or underserved areas. Yet they remain excluded from traditional financing systems; starved of capital not because they are unviable, but because our financing tools have not evolved to meet their realities.

Our analysis indicates that, with the right investment structures and support systems, community ISPs can scale sustainably, improve livelihoods, and advance the goals of universal digital inclusion. What they need now is a shift in perception: from unsustainable micro-non-profit to high-impact, undercapitalized asset class.

With the right mix of donors, development finance institutions, and mission-aligned investors, we have the opportunity to recognize community networks not as fringe actors, but as essential infrastructure builders, and to join in creating the investment vehicles that can unlock their full potential for inequality reduction and sustainable development.