



# BRIDGING THE DIGITAL DIVIDE IN THE LARGEST SLUM IN KENYA:

The Tanda Community Network



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**Marie Lisa M. Dacanay**

***Project Director and President***

Institute for Social Entrepreneurship in Asia (ISEA)

# List of Abbreviations

<b>APC</b>	Association for Progressive Communications
<b>BETA</b>	Bottom-Up Economic Transformation Agenda
<b>CA</b>	Communications Authority
<b>CAK</b>	Communications Authority of Kenya
<b>CBO</b>	Community-Based Organization
<b>CCCI</b>	Community-Centered Connectivity Initiatives
<b>CHP</b>	Community Health Promoters
<b>CIPESA</b>	Collaboration on International ICT Policy for East and Southern Africa
<b>CN</b>	Community Network
<b>COP</b>	Community of Practice
<b>COVID</b>	Coronavirus disease
<b>DI</b>	Development Indexing
<b>ECHIS</b>	Electronic Community Health Information System
<b>GBV</b>	Gender-Based Violence
<b>GHRD</b>	Grassroot Human Rights Defenders
<b>ICT</b>	Information and Communications Technology
<b>ICTP</b>	International Centre of Theoretical Physics
<b>ISEA</b>	Institute for Social Entrepreneurship in Asia
<b>ISOC</b>	Internet Society
<b>ISP</b>	Internet Service Provider
<b>KHIS</b>	Kenya Health Information System
<b>KENET</b>	Kenya Education Network Trust
<b>KES</b>	Kenyan shilling currency
<b>KRA</b>	Key Result Area

# List of Abbreviations

<b>MBPS</b>	Megabyte per second
<b>MIT</b>	Massachusetts Institute of Technology
<b>MTP IV</b>	Fourth Medium Term Plan
<b>NBS</b>	National Broadband Strategy
<b>NGO</b>	Non-government Organizations
<b>NREN</b>	National Research and Education Network
<b>PI</b>	Performance Indicators
<b>PPP</b>	Public- Private Partnerships
<b>PV</b>	Present Value
<b>SROI</b>	Social Return on Investment
<b>SVI</b>	Social Value International
<b>TandaNet</b>	Tanda Community Network
<b>USD</b>	United States Dollar
<b>USF</b>	Universal Service Fund
<b>WEEP</b>	Women's Economic Empowerment Program

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# INTRODUCTION

This case study is one of four research outputs on the social impact of community-centered connectivity initiatives (CCCI) that the Institute for Social Entrepreneurship in Asia (ISEA) generated in partnership with the Association for Progressive Communications (APC). These case studies use social entrepreneurship concepts and tools to explore the multifaceted impact of initiatives that have achieved relative success in bringing meaningful connectivity to marginalized populations and communities in Indonesia, India, South Africa, and Kenya.

These CCCIs may be considered as social enterprises in the digital industry. They enable marginalized people and communities not only to access but to control, manage, and use digital resources and connectivity in ways that improve their quality of life and enhance their capacity to be actors in their own development.

As social enterprises, they provide three types of services: transactional, social inclusion, and transformational services. Transactional services are connectivity services that can be accessed via a payment of money or other form of agreed transaction in exchange for the service. Social inclusion services are oriented towards addressing digital exclusion and meaningful connectivity, or other factors behind the “usage” gap. Examples include the provision of affordable or free internet; developing and sharing local digital knowledge resources relevant to meeting community needs; provision of hubs or community-based facilitators to broaden access; and provision of training on digital skills. Transformational services are oriented at enabling the poor and excluded to overcome their capability deprivation and become actors in their own development. These are services that build their capability to own, govern, and manage digital resources in a way that would positively impact their lives and the lives of their families, communities, and the marginalized sectors they are a part of. Transformational services enable the poor and excluded to be co-owners, supervisors, managers, and decision-makers or to become leaders and stakeholders of the social enterprises that provide digital-related services and ensure meaningful connectivity. Transactional and social inclusion services are usually directed at the potential users or customers of digital-related services. Transformational services are usually directed towards those who are capacitated to provide, manage, and operate the provision of digital-related services to communities.

These three types of services result in or facilitate various social impacts. Depending on which type of service played the most significant role in bringing about the social impact, they are then referred to as transactional services-facilitated impacts, social inclusion services-facilitated impacts, and transformational services-facilitated impacts. Profit-oriented internet service provider companies mainly bring about transactional services-facilitated impacts. The cases studied would substantiate that beyond these transactional services-facilitated impacts, many of the social impacts brought about by CCCIs are facilitated by their social inclusion and transformational services.

The analytical tools used to study the social impact of these 4 CCCIs are Development Indexing (DI) and Social Return on Investment (SROI).

Development indexing (DI) is a methodology that assists in the quantification of social impacts where simple proxy measures are deemed inadequate. As shown by the 4 cases studied, CCCIs have many social inclusion and transformational services-facilitated impacts including the improvement in the economic position and conditions of community stakeholders and increased levels and capacities for inclusive human development. Faced with time and resource constraints and as the first case studies to explore the use of DI to quantify these complex social impacts of CCCIs, the cases were able to define main elements or key result areas, sub-elements of such and potential performance indicators where significant social impacts were noted. The case research did not reach the stage of developing and using a scorecard, usually from one to one hundred (1-100), assigning scores based on relative weights to quantify the performance indicators under each key result area, the last stage when using DI as a methodology. In lieu of quantification based on assigned scores, the case studies identified what may be considered significant social impacts based on the available data approximating relative scale and depth of impact characterized as high, medium, and low. The social impact characterized by the performance indicator is considered significant when both scale and depth were approximated as high, at least one was deemed high, or both scale and depth were deemed as medium.

Social Return on Investment (SROI) is a methodology that articulates the financial and social costs and benefits of social enterprises, in the process showing whether the benefits derived from such investment outweigh the costs. With the total value of the net financial return of the CCCI together with the monetized value of social outcomes using established conventions as numerator and investments as denominator, the ratio needs to be greater than one to show cost-effectiveness. SROI follows certain conventions in quantifying and defining proxy measures for monetizing both tangible and intangible social impacts. The SROI methodology used in the 4 cases follows the procedures, requirements, and conventions developed by Social Value International (SVI) that are accessible through their website (<https://www.socialvalueint.org/guide-to-sroi>). The SVI-prescribed SROI Value Map that was generated as a result of the case study is made available as an appendix to each case study.

Tangible social impacts that can be easily monetized include economic benefits such as increased incomes or cost savings derived from the use of the Internet. Intangible social impacts such as increased capacities for inclusive human development and community empowerment are much harder to quantify and monetize. Following the principles and conventions of SROI as a methodology, the cases approximated the quantification of significant social impacts and used monetary proxies that were deemed meaningful and acceptable to the stakeholders benefiting from the CCCI's services, as represented by the key informants for the cases. Given resource and time constraints, the case studies were only able to explore the quantification and monetization of a limited set of performance indicators deemed significant and as such, the SROI values derived are undervalued.

DI and SROI are complementary measures of effectiveness: DI is a measure of effectiveness in terms of qualitative impact on relevant stakeholder groups while SROI is a measure of cost-effectiveness. With the aid of DI and SROI as methodologies, the case that follows provides indications of the most significant social impacts that the CCCI in Kibera has made among the poor in the largest slum in Nairobi, as well as the cost effectiveness of the intervention in bridging the digital divide in Africa.



# **BRIDGING THE DIGITAL DIVIDE IN THE LARGEST SLUM IN KENYA:**

The Tanda Community Network

# THE STATE OF DIGITAL CONNECTIVITY IN KENYA

Kenya is often dubbed the “Silicon Savannah” because it has been at the forefront of technological innovations in East Africa. With digital transformation at the center of its development strategy, it has one of the ten fastest-growing digital economies in the world.<sup>[1]</sup> There are currently nine major internet service providers in Kenya, namely: Faiba, Safaricom, Zuku, Airtel, Poa!, Liquid Home, Surfnets Solutions, CheetahNet Solutions, and Telkom.<sup>[2]</sup>

Despite significant investment in digital infrastructure by the government and in several commercial internet service providers,<sup>[3]</sup> only 32.18 percent or 17.86 million of the total population of 54.56 million are internet users as of January 2023.<sup>[4]</sup> The following factors hinder widespread internet usage in Kenya: uneven connectivity (relatively good fixed services in major urban areas but limited in rural areas), unaffordable mobile broadband services, expensive devices and equipment needed to connect to the internet, low digital literacy rates, the gender digital divide, concerns with privacy and cybersecurity, limited relevant local online applications and e-government services, as well as unreliable electricity.<sup>[5],[6]</sup>

Alongside the connectivity issues in rural communities, urban poor communities in informal settlements also remain largely unconnected, at most using only basic digital services. The affordability issue prevents many from accessing digital tools such as smartphones, the internet, and computers. They have also not been incentivized to develop their basic digital literacy skills. During the COVID-19 pandemic, the urban-rural digital divide became more evident. It revealed how efforts to encourage better connectivity at the national level did not have the expected spillover effect on rural and urban poor communities.<sup>[7]</sup>

## Policy and Regulatory Environment

The Kenyan government, in partnership with the private sector and international organizations, has adopted several policies and programs to build a digital ecosystem. The Kenya Information and Communications Act of 1998 (The Act), later revised in 2013, provides the framework for regulating the communications sector in Kenya. The Communications Authority of Kenya (CAK) is responsible for the development and implementation of policies and strategies concerning telecommunications services in Kenya.

The National Broadband Strategy (NBS) 2018 – 2023 (to be updated) was developed to transform the country into a knowledge-based economy through the provision of fast, reliable, secure, and affordable internet services to all Kenyans.<sup>[8]</sup> The NBS includes availing of sufficient spectrum for Wireless Broadband Networks, forging government-sponsored Public-Private Partnerships (PPP) to fund infrastructure development, using the Universal

[1] <https://ecdpm.org/work/achilles-heel-kenyas-growing-digital-economy>

[2] <https://www.tdk.co.ke/updated-list-of-t10-best-internet-service-providers-in-kenya/>

[3] <https://kippra.or.ke/building-a-robust-digital-economy-in-kenya/>

[4] <https://datareportal.com/reports/digital-2023-kenya>

[5] <https://www.kictanet.or.ke/state-of-internet-penetration-in-kenya/>

[6] <https://kippra.or.ke/building-a-robust-digital-economy-in-kenya/>

[7] <https://ecdpm.org/work/achilles-heel-kenyas-growing-digital-economy>

[8] <https://www.trade.gov/country-commercial-guides/kenya-information-communications-and-technology-ict>

Service Fund (USF) to extend broadband network penetration and enhancing regulatory oversight to improve the quality of service.

The provision of internet connectivity across the country and the region has been a significant factor in the attainment of Kenya's Vision 2030.<sup>[9]</sup> Through its Digital Masterplan 2022 – 2032, Kenya seeks to align with global technological advancements and enhance the rise of its digital economy through four key pillars: digital infrastructure, digital management and data management, digital skills, and digital innovation for entrepreneurship. Improving the affordability and availability of internet services is also one of its goals.<sup>[10]</sup> Further, the Fourth Medium Term Plan (MTP IV) 2023-2027 implements the Bottom-Up Economic Transformation Agenda (BETA), which identifies the Digital Superhighway as a priority to accelerate the growth of the country's digital economy. It plans to significantly increase the national fiber optic network across the country to provide internet access to all schools, government and private offices, business establishments, healthcare facilities, homes, public spaces, and areas outside of major cities.<sup>[11]</sup>

In 2021, the CAK formulated a Licensing and Shared Spectrum Framework for Community Networks (CN), with contributions from the Association for Progressive Communications (APC), its local member KictaNet, the University of Strathclyde, Scotland, and supported by the United Kingdom's Digital Access Programme. The license, part of the Unified Licensing Framework, is exclusively for community-based organizations or other forms of non-profit collectives. It allows a licensee to deploy communication infrastructure within a specific region/subcounty. The license application fee is KES 1,000 (USD 8), with an annual renewal fee of KES 5,000 (USD 38) and a validity period of 10 years. This license category is more affordable compared to the Network Facilities Provider license, where the lowest initial license fee is KES 200,000 (USD 1,549).

## **Evolution of Community-Centered Connectivity Initiatives in Kenya**

Recently, the number of CNs (or CCCIs as referred to in this report) in Kenya has been growing to address the digital divide that many communities face. CCCIs are largely filling the connectivity gaps that commercial Internet Service Providers (ISPs) cannot address because these areas are economically unviable. Aside from addressing market gaps, CCCIs also aim to address the lack of community engagement by commercial service providers and the limited integration of connectivity with other socially important aspects of life, such as cultural norms.<sup>[12]</sup> They also focus on market segments often overlooked by other ISPs such as schools, vocational training centers, and social groups.<sup>[13]</sup>

CCCIs, however, face several challenges including funding gaps, an insufficiently skilled and experienced workforce, high cost of backhaul connectivity, limited knowledge of network monitoring, financial management, and network congestion mitigation.<sup>[14]</sup>

[9] <https://www.kictanet.or.ke/state-of-internet-penetration-in-kenya/>

[10] <https://www.trade.gov/country-commercial-guides/kenya-information-communications-and-technology-ict>

[11] <https://kippra.or.ke/building-a-robust-digital-economy-in-kenya/>

[12] Community Networks in Kenya - Inception Interview Report (document provided by TandaNet).

[13] Ibid.

[14] Ibid.

# THE TANDA COMMUNITY NETWORK

## Program Background

The Tanda Community Network (TandaNet) operates in Kibera, one of the largest urban slums in Africa, located in Kenya's capital city of Nairobi.<sup>[15]</sup> TandaNet's journey began in 2015 under the name TunapandaNET, as it was initially developed and hosted by the Tunapanda Institute. At the time, Kenya did not have a licensing framework for community networks, so the initiative operated as a project within the organization. It was only in 2021 that a Community Networks Service Provider License was issued. To comply with the new regulations, the network transitioned from being hosted by Tunapanda to becoming an independent, registered entity called Tanda Community-based Organization. (CBO). The newly registered organization has its own administrative and governance structure and leadership and holds a Community Network Service License from the Communications Authority (CA).<sup>[16]</sup>

TandaNet's vision is to bridge the digital futures by closing opportunity gaps. Tanda envisions fostering grassroots-driven development by expanding access to connectivity and digital opportunities. It aims to catalyze digital transformation through the provision of affordable connectivity, digital skilling, production of locally-relevant content, and supporting movement building for inclusive and sustainable communities.

TandaNet embraces a community-owned and community-led approach, believing that solutions to community problems need to be anchored and driven by the community, for the community, and with the community, for it to be successful and sustainable. This approach seeks to build a sense of ownership among project beneficiaries so they can be the frontrunners in the design and implementation of strategies that address their community concerns.<sup>[17]</sup> TandaNet prioritizes the needs and perspectives of the community to ensure that its work is relevant, effective, impactful, and sustainable. For example, its program on strengthening the CCCI movement in Kenya is based on the results of a participatory action research initiative. An advisory committee composed of experts and fellows from 11 CCCIs identified the training needs.<sup>[18]</sup>

As a result, TandaNet's administrative and governance structures have been built to reflect the values, needs, and aspirations of the community it serves. TandaNet is hosted by the community and led by community members who actively participate in decision-making processes, ensuring that its initiatives are rooted in local knowledge and needs. This grassroots approach aligns with the Communications Authority's definition of a CN.<sup>[19]</sup>

In more detail, the following core values guide TandaNet in conceptualizing and implementing projects:

- **Inclusivity:** fostering a welcoming and inclusive environment for everyone, regardless of their background, identity, or beliefs.

[15] Please see Annex A for additional information about Kibera.

[16] Interview with TandaNet Director David Ochiel and TandaNet Strategy and Partnership Lead Risper Ambrose

[17] Interview with TandaNet Director David Ochiel and TandaNet Strategy and Partnership Lead Risper Ambrose

[18] Ibid.

[19] <https://kippra.or.ke/building-a-robust-digital-economy-in-kenya/>

- **Togetherness:** believing in the power of working together and supporting one other to achieve common goals and overcome challenges.
- **Diversity:** recognizing and valuing the unique perspectives and experiences of each individual in the team and believing that their differences make them stronger.
- **Integrity:** meaning what they say and saying what they mean, practicing transparency and honesty to inspire the trust and confidence of their internal and external stakeholders.
- **Excellence:** embracing excellence in work, to the community and with their stakeholders.<sup>[20]</sup>

TandaNet's initiatives from 2015 to 2023 have been guided by its strategic plan and primarily funded by the Association for Progressive Communication (APC) and the Internet Society (ISOC). In 2017, through a partnership with the ISOC, the International Centre of Theoretical Physics (ICTP, Italy) and Rhinotivity (Denmark), four wireless access points were deployed in two schools with over 1,500 students and a youth center serving 300 local youths. In 2018, through the BeyondNET funding program of ISOC, TandaNet and the local ISOC Kenya Chapter collaborated to scale the CCCI by providing connectivity to seven schools, two youth centers, and one women's center. The project has so far reached four of the 13 villages in Kibera<sup>[21]</sup>, providing connectivity covering a 15 to 20-kilometer range.<sup>[22]</sup> For TandaNet's upstream internet connection, it used a link to the Kenya Education Network Trust (KENET), a non-profit membership operator which runs the National Research and Education Network (NREN).<sup>[23]</sup>

TandaNet leverages existing infrastructure, employs wireless technologies, or partners with local ISPs to achieve its mandate. Since 2023, TandaNet has been using equipment from Taara for its backhaul internet link. Taara provides wireless, optical technology for high-speed line-of-sight links. As of April 2024, a steady growth of the network to 103 points of presence has made it possible to connect 56 centers and 47 residential dwellings located in all of the 13 villages of Kibera. These direct beneficiaries include schools, community hubs, community businesses, community dispensaries and health centers, local government offices, non-governmental organizations, and CBOs. An additional 49,902 individuals, composed of 55% learners, 35% youth, and 10% elderly, also indirectly benefit from the project, gaining access to the internet via WiFi subscriptions using access points at the centers.<sup>[24]</sup> Overall, a total of 50,000 entities (centers and individuals) benefit from TandaNet's network.

TandaNet also worked with the Government of Kenya by providing input to the public consultation organized by the CAK towards the adoption of CCCI-friendly policies and processes governing CCCIs in the country. This consultation resulted in the creation of a community networks category as part of CAK's Unified Licensing Framework<sup>[25]</sup>. Even before the CAK process, there was increased collaboration amongst development partners upon seeing the tangible impact of TandaNet's work, which leveraged synergies and amplified collective impact. For example, APC worked closely with the ISOC to upscale the impact of CCCIs in the communities where TandaNet worked.<sup>[26]</sup>

[20] <https://datareportal.com/reports/digital-2023-kenya>

[21] More about Kibera can be read in Annex A.

[22] Ibid.

[23] Interview with TandaNet Director David Ochiel and TandaNet Strategy and Partnership Lead Risper Ambrose

[24] Ibid.

[25] <https://www.ca.go.ke/sites/default/files/articles/Telecoms%20Forms/Application%20Form%20For%20Community%20Network%20and%20Service%20Provider%20Licence1-TL-8-0.pdf>

[26] Interview with TandaNet Director David Ochiel and TandaNet Strategy and Partnership Lead Risper Ambrose

TandaNet's accomplishments inspired its Executive Council to refine the organization's long-term vision, incorporating lessons learned and identifying new opportunities. Meanwhile, the TandaNet staff benefited from increased knowledge and skills and professional growth.

## Key Players in the Tanda Community Network

TandaNet has two types of community stakeholders. The first are CBOs that benefit from TandaNet's services. The second are the CCCIs that have been provided with training and support by TandaNet to operate their networks.

To serve their community stakeholders, TandaNet identified four main stakeholders in its CCCI model, as shown in *Table 1* below.

Table 1. TandaNet's stakeholders		
Stakeholder	Role of Stakeholder	Stakeholder's Expectation of TandaNet
<b>Government of Kenya</b>	<ul style="list-style-type: none"> <li>Provide the legal framework for conducting the TandaNet programs (e.g., licensing)</li> <li>Provide security and infrastructure</li> <li>Encourage and support activities</li> <li>Provide enabling environment for development</li> </ul>	<ul style="list-style-type: none"> <li>Compliance with the laws of the land</li> <li>Accountability with regard to donor funds</li> <li>Development and sustainability of interventions</li> </ul>
<b>Development partners</b>	<ul style="list-style-type: none"> <li>Provide funding and other resources</li> <li>Share and disseminate information</li> <li>Provide technical support</li> <li>Provide capacity building initiatives</li> </ul>	<ul style="list-style-type: none"> <li>Successful implementation of projects</li> <li>Project impacts</li> <li>Proper utilization of resources</li> <li>Compliance with set norms, guidelines, and requirements</li> <li>Transparency and accountability (e.g., progress report, audit reports) to target audiences, etc.</li> <li>Information and experience sharing and partnering with other like-minded partners and individuals</li> <li>Scaling-up and replication of best practices</li> <li>Contribute towards achieving their visions and missions</li> </ul>
<b>TandaNet Executive Council</b>	<ul style="list-style-type: none"> <li>Formulate policies</li> <li>Provide technical support and backstopping</li> <li>Provide advisory and oversight governance</li> <li>Conduct resource mobilization</li> </ul>	<ul style="list-style-type: none"> <li>Maintain TandaNet's vision and mission</li> <li>Members operate within and accountable to the constitution guidelines</li> <li>Enhance networking between and among members</li> <li>Effective vertical and horizontal communication</li> <li>Embrace policy of volunteerism</li> <li>Adherence to statutory requirements</li> </ul>
<b>TandaNet Staff</b>	<ul style="list-style-type: none"> <li>Execute and implement the strategic plans and projects</li> <li>Develop annual plans for approval by the Executive Council</li> <li>Conduct regular monitoring and evaluation of TandaNet's activities</li> <li>Foster enhanced collaboration, learning, and networking</li> <li>Build capacity of the communities</li> <li>Conduct resource mobilization and fundraising for the network</li> <li>Coordinate network activities</li> <li>Facilitate information, innovation, and best practices sharing</li> <li>Manage information</li> <li>Implement the Executive Council's decisions</li> <li>Develop progress reports to relevant stakeholders - Executive Council and partners</li> <li>Mobilize members for action</li> </ul>	<ul style="list-style-type: none"> <li>Integrity and responsibility</li> <li>Remuneration of legally-engaged personnel</li> <li>Provision of an enabling work environment</li> <li>Motivation of personnel and network</li> <li>Capacity building and career development</li> <li>Increased communication and feedback from members</li> <li>Implement action plans agreed during networking forums - workshops and meetings</li> <li>Gender sensitivity in its operations</li> </ul>
<b>TandaNet community</b>	<ul style="list-style-type: none"> <li>Access to the internet, digital services, knowledge products and local digital solutions.</li> <li>Promote local development, inclusion of marginalized communities</li> <li>Participate in the co-creating digital solution, and uptake training, and digital products.</li> </ul>	<ul style="list-style-type: none"> <li>Provision of affordable and reliable internet access.</li> <li>Co creation of digital solution that responds to community needs and concern</li> <li>Co-create training solution that address the digital needs of the community.</li> </ul>

## TandaNet as a Social Enterprise

### Theory of Change

As a social enterprise in Kenya's digital industry, TandaNet is driven by its commitment to bridging digital futures by closing opportunity gaps. It aims to bridge the digital divide and uplift the community through three thematic programs: (1) provision of affordable and reliable internet access, (2) digital skilling and sustainable livelihoods promotion, (3) movement building for sustainable CCCIs. These are supported by a fourth program that looks into organizational sustainability.

The three thematic programs are expected to produce the following outcomes:

- increased meaningful internet access in underserved and unconnected communities,
- enhanced digital literacy and skills among community members,
- increased production and consumption of locally relevant digital content,
- stronger and more empowered CCCIs advocating for their rights and needs,
- increased participation of marginalized groups in the digital economy and society, and
- sustainable and inclusive development of communities through the use of digital technologies.<sup>[27]</sup>

### **Thematic Program 1: Technology and Innovation**

1. *Affordable Internet Access Provision:* TandaNet explores cost-effective solutions, such as leveraging existing infrastructure, employing wireless technologies, or partnering with local ISPs, to make internet connectivity accessible and affordable for individuals and businesses in underserved areas.
2. *Network Training Services:* TandaNet recognizes the importance of empowering community members with the necessary skills to build, operate, and maintain networks. TandaNet aims to enable community members to actively participate in the development and sustainability of the network infrastructure by offering network training programs designed to educate individuals on networking concepts, network management, troubleshooting, and security practices.
3. *Storage and Host Services:* TandaNet provides data storage and hosting services to individuals, businesses, and organizations within the community as part of its technology and innovation focus. This includes offering cloud storage solutions, website hosting, and other digital content hosting services. TandaNet promotes digital entrepreneurship within the community by providing a reliable and secure storage and hosting option.
4. *Local Content and Responsive Applications and Platforms:* TandaNet works with diverse partners in hosting local platforms and engages the community in creating content on the platforms. For example, TandaNet collaborated with DW Academie in deploying the open and free Colmena audio file management application together with media partners from the Global South. This has enabled local and community media to produce and publish content including recording interviews and editing audio materials together, streaming live broadcasts, team meetings, secure data exchange, online team meetings, publishing radio stories, and podcasts, among others, even in times of crisis.<sup>[28]</sup>

[27] Interview with TandaNet Director David Ochiel and TandaNet Strategy and Partnership Lead Risper Ambrose

[28] Ibid.

## **Thematic Program 2: Digital Skilling and Sustainable Livelihoods**

1. *Women Engineers Program*: The program aims to empower young women in the community through network management skills training. The training equips them with the essential technical knowledge to bridge the gender gap in the technology field and promote inclusivity. The program enables women to establish their own CCCIs or support existing CCCIs in network management.
2. *Creatives Accelerator Program*: The program recognizes the vibrant creativity that is present in Kibera. It offers a venue for young creatives to collaborate, leverage digital resources and amplify their work. The program aims to provide youth with the necessary tools, skills, and support to thrive in the digital landscape. It also seeks to nurture the creative economy within the community and create sustainable livelihood opportunities.

*Grassroot Human Rights Defenders (GHRDs) Program*: The program empowers

3. grassroots human rights defenders by mainstreaming human rights and feminist internet principles in enhancing digital literacy skills. Effective advocacy requires the ability to leverage digital platforms and tools to amplify voices and advocate for causes. TandaNet provides training and support to activists in utilizing digital tools and platforms to effectively promote their causes, raise awareness, and mobilize support as well as confront evolving challenges such as cyberbullying, proliferation of hate speech, and increasing data privacy issues.<sup>[29]</sup>

## **Thematic Program 3: Movement Building**

1. *Kenya National School of CCCIs*: The school provides a venue for dialogues, information exchange, and knowledge sharing between people engaged with CCCIs across Kenya. It offers a space to co-create the future of the CCCI movement in Kenya.
2. *Training, Mentorship and Peer Exchange*: TandaNet provides training, mentorship, and peer exchange opportunities for emerging CCCIs at the national level through the Community of Practice (COP) program. This provides a standardized and high-quality training curriculum that equips grassroots communities with the necessary skills and knowledge to effectively operate CCCIs. Through the mentorship program, established CCCIs and experienced practitioners can impart guidance, advice, and practical insights to emerging CCCIs.
3. *Techno-Feasibility Study and Institutional Support*: Techno-feasibility studies and institutional support provision are valuable in ensuring the success of emerging CCCIs. These studies assess the technical viability and potential challenges of establishing a CCCI in a specific area, which can guide emerging CCCIs to make informed decisions regarding network design, infrastructure requirements, and connectivity options. Additionally, TandaNet offers institutional support to help networks navigate regulatory frameworks, establish governance structures, and access funding opportunities.
4. *Sub-Granting Emerging CCCIs*: TandaNet established a sub-granting process to accelerate the growth and sustainability of emerging CCCIs to realize their vision of connecting underserved communities. Financial support amounting to KES 472,500

[29] Ibid.



(USD 3,650) was provided to promising initiatives that demonstrated the potential for impact and scalability. The sub-grants assisted emerging CCCIs with their initial infrastructure costs, capacity-building activities, and community engagement efforts.

5. *Policy Advocacy*: TandaNet lobbies for legislative and policy changes to promote an enabling environment for CCCIs in Kenya.<sup>[30]</sup>

### Monitoring and Evaluation

TandaNet monitors and evaluates its progress toward its goals through a combination of quantitative and qualitative data collection methods such as regular review meetings, activity reporting, field trips and surveys. They track the number of people connected to the network, the number of participants in training programs, the reach and engagement of online content, and the impact of advocacy efforts.<sup>[31]</sup>

### Operational and financial sustainability

Table 2 presents TandaNet's income statement from 2021 to 2023.<sup>[32]</sup> Over the three-year period, TandaNet was able to generate USD 293,842 from external sources for its community initiatives. These grants came from the APC, the ISOC, the Collaboration on International ICT Policy for East and Southern Africa (CIPESA), Deutsche Welle, the Center for Youth Development, and the Massachusetts Institute of Technology (MIT). The expenses covered the provision of affordable and reliable internet services and TandaNet's programs that were mentioned earlier.

**Table 2. TandaNet's Income Statement (2021 – 2023), in USD**

	2021	2022	2023	Total
<b>Revenue</b>				
Grants	131,314	128,324	34,204	293,842
Subscription Fees		743	908	1,651
<b>Total Revenue</b>	<b>131,314</b>	<b>129,067</b>	<b>35,112</b>	<b>295,493</b>

[30] Ibid.

[31] Ibid.

[32] Financial statement provided by TandaNet

Table 2. TandaNet's Income Statement (2021 – 2023), in USD [cont.]				
	2021	2022	2023	Total
<b>Expenses</b>				
Personnel	42,389	39,087	9,079	90,555
Consultants	6,000	22,431	11,430	39,861
Administration and Operations	1,001	2,729	4,456	8,186
Backhaul Fees	6,246	1,910	-	8,156
Meetings and Events	10,807	7,692	4,577	23,076
Media and Publications	1,405	1,753	2,101	5,259
Furniture and Equipment	13,545	1,231	2,557	17,334
Maintenance and Repair	-	21	163	184
Total Expenses	81,393	76,854	34,363	192,611
<b>NET INCOME</b>	<b>49,921</b>	<b>52,213</b>	<b>749</b>	<b>102,882</b>

As is evident from the table above, cost recovery revenue has so far been insignificant, at only USD 1,651. TandaNet wants to focus more on a sustainability agenda through the establishment of stronger alliances and partnerships. In addition, it plans to provide technical assistance on youth digital skilling and livelihood development to CCCI organizations in Kenya and the Eastern Africa region. TandaNet is also looking to increase its visibility by showcasing its past and current innovative interventions and best practices in CCCI programming to attract more supporters, partners, and resources as well as those requiring its technical expertise in designing and implementing digital skilling programs and interventions. Working with and implementing innovative interventions that target youth, schools, and those with special needs are seen as critical to the achievement of its objectives.<sup>[33]</sup>

In 2022, TandaNet started to charge subscription fees to some of its anchor clients to test its subscription model as part of its sustainability transition. There were two major subscription plans: one for public access in hotspots and one for fixed wireless connections to the user premises. The first plan was offered under the following rates: (1) USD0.08 per hour, (2) USD0.39 per day, (3) USD1.93 per week, and (4) USD3.87 per month. The second plan allows for a combination of data rates and data caps at different prices: (1) Bronze (10Mbps / 500 GB) at USD11.61, (2) Silver (15Mbps / 500 GB) at USD27.08, (3) Gold (20Mbps / 1 TB) at USD38.68, and (4) Diamond (25Mbps / 1 TB) at USD58.03.<sup>[34]</sup>

[33] Interview with TandaNet Director David Ochiel and TandaNet Strategy and Partnership Lead Risper Ambrose

[34] Ibid.

In 2023, TandaNet entered into a revenue-sharing agreement with Taara, a backhaul service provider. The profit-sharing arrangement changed the nature of the internet fees previously charged by its backhaul service provider.<sup>[35]</sup> Before this arrangement, TandaNet paid USD 6,246 in backhaul fees to the Kenya Educational Network (KENET) in 2021 and USD 1,910 to Liquid Telecom and KENET in 2022.

As of 2024, TandaNet had 56 centers and 47 residential subscribers. *Table 3* shows details of its subscribers.<sup>[36]</sup>

Table 3. Subscribers of TandaNet	
Centers	NUMBER
Health	7
Education	10
Youth	6
Human rights defender	3
Micro-enterprise	10
Women-based organization	4
Other community-based organizations	14
Local government offices	2
<b>Sub-Total</b>	<b>56</b>
Homes (fixed connections at an individual client's house)	47
<b>TOTAL</b>	<b>103</b>

TandaNet acknowledges the need to grow its subscriber base. Each node of TandaNet is capable of providing access to 200 clients at any particular time. With the 6 relay sites or points of presence (POPs) currently used to service 103 subscribers, TandaNet's system could in theory accommodate 20,600 concurrent users.<sup>[37]</sup>

[35] Ibid.

[36] Information provided by TandaNet.

[37] Interview with TandaNet Director David Ochiel and TandaNet Strategy and Partnership Lead Risper Ambrose

# RESULTS AND IMPACT

Overall, TandaNet's initiatives resulted in increased access to affordable and reliable internet in underserved and unconnected communities. The digital literacy and skills of the community members were also enhanced. There was an increased production and consumption of locally relevant digital content. In addition, through TandaNet's support, CCCIs became stronger and more empowered in advocating for their rights and needs.

## TandaNet Report

According to TandaNet, the following are some indications of the social impact of its programs:

- Increased internet service penetration, reaching all of the 13 villages of Kibera and over 50,000 individuals who directly and indirectly benefited from internet connectivity.
- Provision of affordable and reliable access to the underserved residents and organizations in the urban informal community of Kibera such as community schools, community hospitals, CBOs, activists, and microenterprises. Due to TandaNet's initiatives, 56 centers were connected to the internet, giving access to about 50,000 direct and indirect beneficiaries.
- Five hundred representatives of the connected centers were trained on various digital literacy topics such as basic network and infrastructure management, digital literacy, digital storytelling, online privacy and security, online gender-based violence, online censorship, movement building, communication, and advocacy. The trainees included women who were human rights defenders, female legal practitioners, and micro-organizations or organizations operating under limited financial resources. These training programs had an 80 percent completion rate.
- Production of local content, such as comic strips and videos, and platforms was encouraged by equipping the community members to become creators of digital content instead of merely being content consumers.
- Support to 13 emerging and existing CCCIs in Kenya through training and mentorship on the key success factors in the design, implementation, and sustainability of CCCIs. Six CCCIs had since obtained their licenses while five CCCIs already had offer letters through the guidance from TandaNet on license application.
- Training and mentorship on the development of digital skills and creation of locally relevant digital skills and services to 13 micro-organizations from digitally unserved areas and six community representatives intending to start CCCIs in Kenya.
- TandaNet itself posted 511 tweets and uploaded 17 YouTube videos on CCCI Movement public awareness and creation (the postings of users of the network were not assessed due to the limited time and resources).<sup>[40]</sup>

TandaNet believes that increased access would likely have been slower and less widespread without its interventions. This is why it invested in building community-owned networks, partnered for affordable access plans, and provided training to overcome infrastructure and knowledge barriers. Similarly, enhanced digital literacy would not have happened at the same scale without TandaNet's targeted training programs and locally relevant content creation.<sup>[39]</sup>

[38] Ibid.

[39] Ibid.

## Results of Community Stakeholders' Interviews

Five key informants, representing four centers and one CCCI, shared their experiences with TandaNet:

- Ms. Roda Maviala is the overall in-charge of the Women's Economic Empowerment Program (WEEP). Established in 2015, it has empowered 32 women/beneficiaries who were living with HIV by providing training and workshops to improve their business acumen in running their own enterprises. WEEP also provides women with access to loans to run their microenterprises, either as individuals or as a group member. WEEP joined the TandaNet network in 2021.
- Ms. Norah Muguna is a nurse at Raila Beyond Zero Clinic, a government-funded program established in 2015 whose vision is zero preventable deaths of mothers and children in Kenya. It also has a program that aims to eliminate maternal and child mortality and HIV and AIDS. Norah manages one of the 10 container clinics in Kibera which serves as a healthcare dispensary and provides curative and preventive services such as immunization to children aged 5 years and below. In 2023, the clinic administered 5,000 preventive and curative health services. The clinic also promotes health education in partnership with the communities - managing five units composed of 50 community health promoters, with each promoter attending to 100 households. The clinic obtained an internet connection in 2023 through TandaNet.
- Mr. Stephen Ngazi is the Head Teacher of the St. Christine Community School whose mission is to provide affordable learning to the needy students in Kibera. The school was established in 2007 and offers primary up to junior secondary (Grade 9) formal education to 108 students. The school started to use TandaNet's internet service in 2021.
- Ms. Lorine Ooko is a Program Associate at Nivishe Foundation, an organization that promotes youth mental wellness in vulnerable and marginalized communities in Kenya through community-based mental health interventions, mental health media and advocacy, and strategic partnerships, aiming to achieve a healthy mental state for the youth in marginalized and vulnerable communities in Kenya. At the time of the interview, it had 200 fellows or beneficiaries, and each fellow was expected to reach out to 200 more fellows. The foundation joined TandaNet in 2022.
- Dominic Losinyono is the Information and Communication Technology (ICT) and Information Officer at Ng'ikekoko. Ng'ikekoko was established in 2018 with a mission to bridge the digital divide through improving digital literacy to support equal opportunities in the marginalized sector. Ng'ikekoko means guardians or shepherds of the community. As members of a nomadic tribe that lives in deserts spread along four countries, they share the same customs, traditions, and languages. Ng'ikekoko uses the backhaul service of Safaricom and has 15 members or subscribers. Ng'ikekoko did not use TandaNet's network but benefited from its capacity building training initiatives.

The key informants highlighted the important role that the TandaNet played in accomplishing their respective organizational missions, as outlined below:

### Cost savings and operational efficiency

WEEP used to pay KES 5,000 (USD 37.79) for the monthly subscription fee with Safaricom but this was reduced to KES 1,500 (USD 11.34) monthly when they transferred to TandaNet in 2021. Before having an internet connection at the school campus, the faculty members of St. Christine Community School used commercial cyber cafes to access their e-mails and to research teaching materials, each spending KES 2,000 (USD 15.12) monthly or a total of KES 16,000 KES (USD 120.94). The school now only spends KES 1,500 (USD 11.34) for its monthly

internet subscription from TandaNet. Similarly, the Nivishe Foundation previously used mobile internet, costing KES 44,000 (USD 332.59) a month. Shifting to TandaNet in 2022 reduced their internet expense to KES 1,500 (USD 11.34) monthly. Overall, the average reduction in monthly internet fees of the three centers when they shifted to TandaNet was 93%.

Besides reduction in monthly Internet fees, faculty members of St. Christine Community School also saved travel time and expense, as they no longer needed to go to cyber cafes to access the internet. The school also used to buy physical books amounting to KES 30,000 (USD 226.77) yearly. With TandaNet, the school instead bought 10 tablets costing KES 1,500 (USD 11.34) to store electronic books and short videos, which the teachers were able to access for free. The internet also made it easier for teachers to look for materials or information to prepare their lesson plans. Mr. Ngazi estimated that each teacher was able to save five days monthly by just browsing the internet instead of using physical books. The average daily salary of the teachers was KES 233.33 (USD 1.76) and with seven teachers plus the Head Teacher, the school saved KES 9,333.20 (USD 70.55) monthly.

The Nivishe Foundation saved two days because of TandaNet's reliability in terms of good customer service and efficient processes. The foundation's online presence significantly increased compared before when their mobile internet allocation was limited. Their fellows were also able to access different online platforms when they visited the foundation's office and were also able to attend virtual training programs. Access to TandaNet's network increased the foundation's number of fellows by 70 to 80 percent.

The children of the WEEP beneficiaries used to spend KES 200 (USD 1.51) weekly in internet cafés to do their assignments. Since WEEP made its internet-connected computers accessible to the children, they no longer had to go to internet cafes. On average, five students accessed WEEP's computers weekly. Since the majority of the Kibera residents earned less than KES 270 (USD 2) daily, the families were able to save 11% of their weekly income due to the free internet access at the center.

## **Business development and employment generation**

WEEP trained its 32 beneficiaries to harness the internet to gain additional customers and in using their smartphones to gain an online presence. The beneficiaries used to earn KES 5,000 (USD 37.79) per month prior to the training but this increased to KES 20,000 (USD 151.18) monthly when they started using the internet.

Ng'ikeyokok extended digital literacy training to 200 girls to help them gain employment. Of the 200 girls trained, six were hired as research assistants by an international non-governmental organization (NGO). They were employed for 30 days, earning KES 8,300 (USD 62.74) daily or a total of KES 249,000 (USD 1,882.16). Meanwhile, 36 girls were hired as data entry staff. They were engaged for 15-27 days, gaining an average salary of KES 4,875 (USD 36.85). Another seven girls were hired as digital animation employees, earning between KES 6,000 (USD 45.35) to KES 8,300 (USD 62.74).

## **Internet in daily business operations and access to online financial services**

Ms. Roda Maviala who used to spend two days physically sending reports now only spends a few minutes doing so through e-mail. WEEP was able to shift all of its banking transactions

online. Before, it spent KES20 (USD0.15) for transportation per transaction for its average of 12 transactions per month. Half of St. Christine Community School's 108 students are now able to pay their fees online, which means that students do not have to be physically on campus when doing financial transactions.

## **Education and learning opportunities**

Access to the internet made it possible for the teachers of St. Christine Community School to expand their knowledge and additional teaching materials.

Attendance to Ng'ike yokok's financial literacy training allowed 37 girls to qualify for digital animation training provided by a university, of which thirteen girls were awarded digital literacy scholarships. The course ran for six to eight months, and the value of the scholarship was KES 10,000 (USD 75.59) per student.

TandaNet also provided free training to Ng'ike yokok on Sustainability of Running a CCCI and on Content Creation. As a result, Ng'ike yokok applied for a CCCI registration, influenced the creation of another CCCI<sup>[40]</sup>, and learned how to engage the local community. Ng'ike yokok valued each training program at KES 20,000 (USD 151.18). Additionally, Ng'ike yokok established a platform, which included four online channels, to launch its digital content for the youth such as career talks and tips on how to pick courses during university application. This was important since the areas where the CCCI's beneficiaries were located did not have radio stations and the only way to reach them was through Facebook.

TandaNet extended free training to Nivishe Foundation on Microsoft Office, Online Safety and Security, and Online Advocacy. The foundation benefited from the training because its staff learned to perform basic computer troubleshooting. Staff efficiency also increased because some processes became automated.

## **Cultural preservation**

St. Christine Community School used to have difficulty accessing relevant and current information about cultural programs and activities. With their access to the internet through TandaNet, the teachers and students are now able to watch cultural programs and events in Nairobi online.

## **Health and COVID management**

Having access to more affordable internet connectivity made it possible for the beneficiaries of WEEP to surf the internet without limitations. This enabled them to have increased access to information on HIV and AIDS management and treatment and to COVID symptoms and prevention during the pandemic. Because of this, none of WEEP's 32 beneficiaries got infected, which was a relief for the program as a COVID hospitalization cost more than KES 50,000 (USD 377.94).

The Raila Beyond Zero Clinic was first connected to the internet by TandaNet in 2023. Since then, it has used the internet to communicate with patients, ensure timely communication

[40] Ateker Community Network

with the government and community health promoters, and conduct online research. Nurse Norah Muguna mentioned that using the Messenger App helped in communicating to the community health promoters to remind the mothers of their children's immunization schedule. Before this, half of the 500 non-immunized children who visited their clinic annually were hospitalized. Each hospitalization cost an average of KES 100,000 (USD 755.89). The clinic also used WhatsApp when it needed an ambulance, which resulted in the timely transport of emergency cases. It was also useful in searching for the best route to take in transporting a patient from Kibera to the hospital. WhatsApp also facilitated the timely delivery of health products to the clinic. Moreover, Norah was able to send her reports via e-mail and was able to communicate with her seniors on the day-to-day clinic operations.

During the COVID pandemic, Ng'ike yokok established digital hubs that were used by students and employees whose only option was to go to cyber cafes to be able to attend their classes or perform their jobs. These individuals previously paid the cyber cafes KES 1,000 a month (USD 7.56). 45 students and 25 office workers benefited from using the digital hubs in 2020 while 41 students used the hubs in 2021.

### **Psycho-emotional well-being and family relationships**

St. Christine Community School recognized the role of connectivity in encouraging family interactions through shared viewing of online stories and videos. The school also understood mental health issues better and the steps needed to address them.

The Nivishe Foundation came up with online advocacies on mental health and cyber bullying. Ms. Lorine Ooko said that these campaigns enhanced the organization's visibility on social media which helped them extend their reach and increase their work impact.

### **Environmental protection**

St. Christine Community School showed YouTube videos to inspire the students to preserve the environment. Ng'ike yokok posted environmental protection videos that it produced on their channels. Videos produced included waste and recycling, climate change, and schedules of their clean-up activities, among others.

### **Gender and women empowerment**

The Nivishe Foundation created online campaigns against domestic violence in the community where women were abused and killed by their partners. Due to this online advocacy, more women went to their office to consult. The community champions also started to refer cases of domestic violence to the foundation.

### **Negative Consequences**

On the other hand, increased access to the internet also had negative consequences. For instance, professionals started using a considerable amount of their time watching YouTube, accessing social media, watching movies, and listening to songs instead of working. Children also suffered from cyber bullying and were able to access inappropriate content. Digital fraud/scams also rose because of increased connectivity.

## Initiating the Use of Development Indexing to Measure Social Impact<sup>[41]</sup>

Considering the multifaceted social impacts of the TandaNet, simple proxy measures are inadequate to characterize them. As a tool that aids in characterizing complex social enterprise impacts, Development Indexing (DI) was then used to define the most significant outcomes of TandaNet's intervention on its most important community stakeholders.

Due to time and resource constraints, the study focused on defining key result areas, sub-elements, and performance indicators rather than fully implementing a weighted scorecard. For TandaNet, the determination of significance was based on an informed judgement of the TandaNet team through online workshops facilitated by the ISEA team. Several iterations on the DI and social value map were made based on inputs from workshops with TandaNet in the last quarter of 2024 and the first quarter of 2025. The enhancement workshops resulted in 6 key result areas (KRAs) and 22 performance indicators (PIs). Seven (7) of the PIs were not quantified due to inadequate data given the time constraints of the study.

Based on data gathered, the main elements of a Development Index that characterize the multi-faceted social impacts of the CCCI may be synthesized into the following six KRAs and their respective performance indicators (PIs):

Table 4. KRAs and PIs of TandaNet	
KRAs	PIs
<b>KRA #1:</b> Improvement in the economic position and conditions of community stakeholders	<ul style="list-style-type: none"> <li>PI 1: Number of community stakeholders employed in e-jobs and have become entrepreneurs in the digital economy</li> <li>PI 2: Increased income from employment and sales resulting from use of online platforms</li> </ul>
<b>KRA #2:</b> Improved levels and capacities for inclusive and holistic human development	<ul style="list-style-type: none"> <li>PI 1: Faster, more affordable, and more effective access and utilization of updated teaching materials through online research</li> <li>PI 2: Improved access and use of digital educational resources by community schools and students (cheaper cost of education materials)</li> <li>PI 3: Safer learning environment during the COVID-19 pandemic through online classes</li> <li>PI 4: Improved capacity to deliver appropriate mental health information, education, and services online</li> <li>PI 5: Increased number of children effectively immunized based on health standards and required protocols (Better monitoring of immunization schedule)</li> <li>PI 6: Faster and more affordable way of reports and orders submission from the centers' branches to the head office through the online facility</li> </ul>
<b>KRA #3:</b> Increase in awareness and action on environmental issues and concerns	<ul style="list-style-type: none"> <li>PI 1: Increase in social media engagement of community members on environmental issues and concerns</li> <li>PI 2: Increase in enrollment or engagement in online environmental courses and actions</li> </ul>
<b>KRA #4:</b> Empowerment of community to own, govern, and manage internet and digital resources	<ul style="list-style-type: none"> <li>PI 1: Number of community-based organizations and individuals that are engaged in the governance, management, and operation of TandaNet in Kibera</li> <li>PI 2: Share / increase in share in the digital market of CCCIs</li> <li>PI 3: Percentage / increase in percentage of community representatives occupying management and governance positions in the CCCI</li> <li>PI 4: Number of community members serving as staff / technicians of CCCIs</li> <li>PI 5: Number of CCCIs established and developed serving new unconnected and underserved communities beyond Kibera</li> </ul>
<b>KRA #5:</b> Inclusion and empowerment of women as stakeholders in digital transformation	<ul style="list-style-type: none"> <li>PI 1: Increase in the number of women beneficiaries and organisations inquiring and reporting cases of online gender-based violence</li> <li>PI 2: Number and percentage of women occupying governance, management, and technical positions in CCCIs</li> <li>PI 3: Increase in awareness and action on gender issues and practice of women's rights in the digital space</li> </ul>
<b>KRA #6:</b> Improved enabling environment for CCCIs	<ul style="list-style-type: none"> <li>PI 1: Increase in the number and capacity of CCCIs serving unconnected and underserved communities</li> <li>PI 2: Improved or increased capacity of new CCCIs to sustain their operations</li> <li>PI 3: Number of new CCCIs and community stakeholders reached as a result of policies and programs of the government</li> <li>PI 4: Resources effectively deployed to support existing and new CCCIs resulting to increase in the number and quality of outreach among unconnected communities</li> </ul>

[41] The elements of the development index and social value map for the TandaNet Case Report were developed from data generated in late 2024 through key informant interviews with the following stakeholders: Ms. Roda Maviala, Ms. Norah Muguna, Mr. Stephen Ngazi and Ms. Lorine Ooko from community-based organizations, and Mr. Dominic Losinyono from the CCCI. These were further enriched through workshops undertaken in January to April 2025 with Director David Ochiel and his TandaNet Team.

Table 5 below presents the initial elements of an evolving DI to measure the social impact of TandaNet:

Table 5. Initial Elements of an Evolving Development Index to Measure the Social Impact of TandaNet				
Key Result Area (KRA): Elements & sub elements	Stakeholders	Description of Performance Indicators / Performance Indicators	Approximate Rating for TandaNet	
			Significance (Combined reach & depth of impact)	Quantification & monetization
KRA #1: Improvement in the economic position and conditions of community stakeholders				
PI 1: Number of community stakeholders employed in e-jobs and have become entrepreneurs in the digital economy	Community stakeholders employed in e-jobs and digital entrepreneurs	Employment and income gained through CCCI	Significant	Not quantified
PI 2: Increased income from employment and sales resulting from use of online platforms	Out of school (teen mothers) employed in clerical and data annotation	Income & salary gain from clerical and data annotation jobs	Significant	Salary/ income obtained
	Usafi Boyz members engaged in online employment and e-commerce	Income & salary gain from e-jobs & digital economy	Significant	Salary/ income obtained
KRA #2: Improved levels and capacities for inclusive and holistic human development				
PI 1: Faster, more affordable, and more effective access and utilization of updated teaching materials through online research	Community organization: Nivishe Foundation was able to derive savings due to internet access	Cost savings without and with connectivity thru the community network	Significant	From 200 Kenyan shillings a day to 50 KS a day
PI 2: Improved access and use of digital educational resources by community schools and students (cheaper cost of education materials)	The centers are able to source cheaper educational materials	Centers save in cost of procuring hard copy of books	Significant	Savings from not purchasing physical books
PI 3: Safer learning environment during the COVID-19 pandemic through online classes	Students and youth attending classes	Medical cost savings due to reduction in morbidity	Significant	Not quantified
PI 4: Improved capacity to deliver appropriate mental health information, education, and services online	Mental health patients, number of health professionals using online resources	Cost savings without and with connectivity thru community network	Significant	13.75/hour
	Youth & mental health professionals attending and participating in the mental health fellowship	Cost savings without and with connectivity thru community network	Significant	200-50= 150 Kenyan Shilling a day
PI 5: Increased number of children effectively immunized based on health standards and required protocols (Better monitoring of immunization schedule)	Better monitoring of schedules by community health promoters (CHPs) using Electronic Community Health Information System (ECHIS) and KHIS	Cost savings without and with connectivity thru community network	Significant	Before: 40 Shillings to access the bulletin board; After: 20 Shillings to access ECHIS
	Health professionals monitoring the health programs	Cost savings without and with connectivity thru community network	Significant	From: 20 shillings/hour to 6.25/hour (unlimited)
PI 6: Faster and more affordable way of reports and orders submission from the centers' branches to the head office through the online facility	Individuals in charge of facilities (health care providers linked to the facility)	Cost of individual access without minus with connection	Significant	Savings in the cost of access

**Table 5. Initial Elements of an Evolving Development Index to Measure the Social Impact of TandaNet [cont.]**

Key Result Area (KRA): Elements & sub elements	Stakeholders	Description of Performance Indicators / Performance Indicators	Approximate Rating for TandaNet	
			Significance (Combined reach & depth of impact)	Quantification & monetization
KRA #3: Increase in awareness and action on environmental issues and concerns				
PI 1: Increase in social media engagement of community members on environmental issues and concerns	Center beneficiaries	Cost savings without and with connectivity thru community network	Significant	Cost savings
PI 2: Increase in enrollment or engagement in online environmental courses and actions	Center beneficiaries (students, organizations, etc.)	Number of enrollees or engagements in online environmental courses or actions	Significant	Not quantified
KRA #4: Empowerment of community to own, govern, and manage internet and digital resources				
PI 1: Number of community-based organizations and individuals that are engaged in the governance, management, and operation of the TandaNet in Kibera	Community members from Kibera that are now engaged in governance, management and operation of TandaNet	Engagement has resulted in employment and income gain	Significant	Income gain
PI 2: Share / increase in share in the digital market of CCCIs	CCCI subscribers	Record of share in the digital market overtime	Significant	Not quantified
PI 3: Percentage / increase in percentage of community representatives occupying management and governance positions in the CCCI	Community representatives occupying governance & management positions in the CCCI	Income gained	Significant	Income
PI 4: Number of community members serving as staff / technicians of CCCIs	No. of relays with 2 full time tech and 1 part time staff	Income gained per relay	Significant	Income
PI 5: Number of CCCIs established and developed serving new unconnected and underserved communities beyond Kibera	CCCIs with capacity to run the network	Savings in expenses for network consultants	Significant	Cost savings
KRA #5: Inclusion and empowerment of women as stakeholders in digital transformation				
PI 1: Increase in the number of women beneficiaries and organizations inquiring and reporting cases of online gender-based violence	More of the centers' beneficiaries inquired about and/or addressed gender and empowerment issues	Gender-based violence in Kenya: Savings in the cost of providing services on GBV due to the CCCI	Significant	Savings on the cost of reporting and attending to domestic abuse cases
PI 2: Number and percentage of women occupying governance, management, and technical positions in CCCIs	Women sitting in executive boards	KES 5,000 honoraria per board member x 4 board meetings a year = KES 20,000 or USD \$163.60 a year	Significant	Income from allowances
PI 3: Increase in awareness and action on gender issues and practice of women's rights in the digital space (Women are given information and an avenue to assert their rights)	No. of women attended the trainings; Technological gender-based violence	Savings from not being scammed; KES 300 to 1500 shillings per potential victim of illegal job placement	Significant	Cost savings due to ability to do: -fact checking + tools - technologically facilitated gender-based violence
KRA #6: Improved enabling environment for CCCIs				
PI 1:Increase in the number and capacity of CCCIs serving unconnected and underserved communities	Community representatives who took part in training	Savings in consultancy services Before: 2 consultants a year 2021-2024	Significant	Cost savings due to enhanced capability
PI 2: Improved or increased capacity of new CCCIs to sustain their operations	CCCIs and its members	Financial surplus for expansion	Significant	Not quantified
PI 3: Number of new CCCIs and community stakeholders reached as a result of policies and programs of the government	CCCI subscribers and communities; Government agencies	Resources invested to CCCIs and unconnected communities	Significant	Not quantified
PI 4: Resources effectively deployed to support existing and new CCCIs resulting to increase in the number and quality of outreach among unconnected communities	New CCCIs and unconnected communities	Resources generated and deployed to new CCCIs (Payroll savings, writing of grant proposals, selling their services is subject to research - TandaNet)	Significant	Not quantified

## **Improvement in the Economic Position and Conditions of Community Stakeholders**

TandaNet has significantly contributed to improving the economic position of community stakeholders by enabling access to e-jobs and fostering entrepreneurship within the digital economy. Through its digital skilling programs and affordable connectivity services, individuals in Kibera have been empowered to participate actively in online marketplaces, creating new income streams and enhancing their sales. These initiatives have not only increased individual incomes but have also strengthened the overall economic resilience of the community.

## **Improved Levels and Capacities for Inclusive and Holistic Human Development**

TandaNet has modernized access to education, health, and operational efficiency within the community. Teachers now have faster, more affordable access to updated materials, while students benefit from cost-effective digital resources and safer learning environments during crises like the COVID-19 pandemic. In health, the initiative has supported better immunization monitoring and delivery of mental health education through online platforms. Furthermore, institutions leverage digital tools for quicker, cheaper report submissions, contributing to overall development and empowerment.

## **Increase in Awareness and Action on Environmental Issues and Concerns**

By fostering environmental awareness, TandaNet has mobilized community engagement on sustainability issues. Social media campaigns and online educational programs have encouraged community members to actively participate in environmental protection initiatives. Through increased enrollment in online courses and actions focused on environmental advocacy, the community has become better equipped to address pressing ecological challenges and promote sustainable practices.

## **Empowerment of the Community to Own, Govern, and Manage Internet and Digital Resources**

TandaNet has empowered community members to take ownership of digital resources by engaging them in governance, management, and technical operations of the community network. The active involvement of local stakeholders ensures that the network remains responsive to their needs. Additionally, TandaNet has facilitated the establishment of new CCCIs in underserved areas, creating an inclusive digital ecosystem while enhancing the share of CCCIs in the digital market.

## **Inclusion and Empowerment of Women as Stakeholders in Digital Transformation**

TandaNet actively champions gender inclusion by empowering women through digital literacy programs and leadership roles in community networks. Women are increasingly occupying governance, management, and technical positions while utilizing digital platforms to report and address online gender-based violence. These efforts are fostering greater awareness of gender issues and equipping women with the skills and resources needed to exercise their rights and thrive in the digital space.

## Improved Enabling Environment for CCCIs

TandaNet has contributed to building a supportive ecosystem for the growth and sustainability of CCCIs. By advocating for favorable policies, providing capacity-building initiatives, and deploying resources effectively, the initiative has supported the establishment and scaling of new CCCIs. These efforts have extended internet access to underserved communities, increasing the quality and outreach of digital services while ensuring long-term sustainability of the networks.

## Toward Measuring Cost Effectiveness Using Social Return on Investment

To evaluate the cost-effectiveness of TandaNet as a CCCI, the Social Return on Investment (SROI) methodology was employed. Following the conventions of Social Value International (SVI), the process involved quantifying the monetary value of the social benefits experienced by TandaNet's key stakeholders. Based on available data, stakeholders participated in estimating and monetizing the benefits they considered significant and feasible for quantification. An SROI Value Map was then generated, detailing the relevant estimations of social benefits and costs. The TandaNet SROI Value Map accessible through <https://tinyurl.com/TandaNet-SROIValueMap>, provides valuable insights into its social impact, with key findings highlighted in this section.

Table 6 outlines the social impacts or benefits experienced by the relevant stakeholders and details the methods used to quantify and monetize these impacts. Additionally, it indicates the corresponding key result area (KRA) associated with each monetized social impact.

**Table 6. Social Impact Estimates of Stakeholders and Valuation of Outcomes**

Table 6. Social Impact Estimates of Stakeholders and Valuation of Outcomes													
Key Result Area (KRA): Elements & sub elements	Stakeholders	No. of Stakeholders						Outcomes/Benefits (in USD)					
		2021	%	2022	%	2023	%	2021	%	2022	%	2023	%
KRA #1: Improvement in the economic position and conditions of community stakeholders		25	1%	25	0.40%	40	1%	82,822.50	65%	82,822.50	60%	115,951.50	66.86%
PI 1: Number of community stakeholders employed in e-jobs and have become entrepreneurs in the digital economy	Employed community members in e-jobs & entrepreneurs in the digital economy	-		-		-		-		-		-	
PI 2: Increased income from employment and sales resulting from use of online platforms	Out of school (teen mothers) employed in clerical and data annotation	10		10		25		22,086		22,086		55,215	
	Usafi Boyz members engaged in online employment and e-commerce	15		15		15		60,737		60,737		60,737	
KRA #2: Improved levels and capacities for inclusive and holistic human development		113	3%	113	2.00%	143	2%	10,244	8%	10,244	7%	13,565	7.82%
PI 1: Faster, more affordable, and more effective access and utilization of updated teaching materials through online research	Community organization: Nivishe Foundation was able to derive savings due to internet access	1		1		1		448		448		448	
PI 2: Improved access and use of digital educational resources by community schools and students (cheaper cost of education materials)	The centers are able to source cheaper educational materials	10		10		10		2270		2270		2270	

**Table 6. Social Impact Estimates of Stakeholders and Valuation of Outcomes [cont.]**

Key Result Area (KRA): Elements & sub elements	Stakeholders	No. of Stakeholders						Outcomes/Benefits (in USD)					
		2021	%	2022	%	2023	%	2021	%	2022	%	2023	%
PI 3: Safer learning environment during the COVID-19 pandemic through online classes	Students and youth attending classes	-		-		-		-		-		-	
PI 4: Improved capacity to deliver appropriate mental health information, education, and services online	Mental health patients, number of health professionals using online resources	4		4		4		88		88		88	
	Youth & mental health professionals attending and participating in the mental health fellowship	50		50		80		5,535		5,535		8,856	
PI 5: Increased number of children effectively immunized based on health standards and required protocols (Better monitoring of immunization schedule)	Better monitoring of schedules by community health promoters (CHPs) using Electronic Community Health Information System (ECHIS) and KHIS	40		40		40		1,701		1,701		1,701	
	Health professionals monitoring the health programs	4		4		4		117		117		117	
PI 6: Faster and more affordable way of reports and orders submission from the centers' branches to the head office through the online facility	In charge of facilities (health care providers linked to the facility)	4		4		4		85		85		85	
<b>KRA #3: Increase in awareness and action on environmental issues and concerns</b>		<b>3,234</b>	<b>95%</b>	<b>3,234</b>	<b>57.00%</b>	<b>3,234</b>	<b>57%</b>	<b>6,468</b>	<b>5%</b>	<b>6,468</b>	<b>5%</b>	<b>6,468</b>	<b>3.73%</b>
PI 1: Increase in social media engagement of community members on environmental issues and concerns	Center beneficiaries	3,234		3,234		3,234		6,468		6,468		6,468	
PI 2: Increase in enrollment or engagement in online environmental courses and actions	Center beneficiaries (students, organizations, etc.)	-		-		-							
<b>KRA #4: Empowerment of community to own, govern, and manage internet and digital resources</b>		<b>27</b>	<b>1%</b>	<b>27</b>	<b>0.50%</b>	<b>27</b>	<b>0.50%</b>	<b>25,495</b>	<b>20%</b>	<b>25,495</b>	<b>19%</b>	<b>25,495</b>	<b>14.70%</b>
PI 1: Number of community-based organizations and individuals that are engaged in the governance, management, and operation of the TandaNet in Kibera	CBOs from Kibera that are now engaged in governance, management and operation of TandaNet	10		10		10		1,472		1,472		1,472	
PI 2: Share / increase in share in the digital market of CCCI	CCCI subscribers	-		-		-							
PI 3: Percentage / increase in percentage of community representatives occupying management and governance positions in the CCCI	Community representatives occupying governance & management positions in the CCCI	2		2		2		8,834		8,834		8,834	
PI 4: Number of community members serving as staff / technicians of CCCIs	No. of relays with 2 full time tech and 1 part time staff	4		4		4		14,135		14,135		14,135	

**Table 6. Social Impact Estimates of Stakeholders and Valuation of Outcomes [cont.]**

Key Result Area (KRA): Elements & sub elements	Stakeholders	No. of Stakeholders						Outcomes/Benefits (in USD)					
		2021	%	2022	%	2023	%	2021	%	2022	%	2023	%
PI 5: Number of CCCIs established and developed serving new unconnected and underserved communities beyond Kibera	CCCIs with capacity to run the network	11		11		11		1,053		1,053		1,053	
<b>KRA #5: Inclusion and empowerment of women as stakeholders in digital transformation</b>		<b>6</b>	<b>0.20%</b>	<b>2,275</b>	<b>40.10%</b>	<b>2,275</b>	<b>40%</b>	<b>982</b>	<b>1%</b>	<b>11,302</b>	<b>8%</b>	<b>11,302</b>	<b>6.52%</b>
PI 1: Increase in the number of women beneficiaries and organisations inquiring and reporting cases of online gender-based violence	More of the centers' beneficiaries inquired about and/or addressed gender and empowerment issues	0		2,200		2,200		-		6,765		6,765	
PI 2: Number and percentage of women occupying governance, management, and technical positions in CCCIs	Women sitting in executive boards	6		6		6		982		982		982	
PI 3: Increase in awareness and action on gender issues and practice of women's rights in the digital space (Women are given information and an avenue to assert their rights)	No of women attended the trainings; Technological gender-based violence	0		69		69		-		3,556		3,556	
<b>KRA #6: Improved enabling environment for CCCIs</b>		<b>4</b>	<b>0.10%</b>	<b>4</b>	<b>0.10%</b>	<b>4</b>	<b>0.07%</b>	<b>654</b>	<b>1%</b>	<b>654</b>	<b>0.50%</b>	<b>654</b>	<b>0.38%</b>
PI 1: Increase in the number and capacity of CCCIs serving unconnected and underserved communities	Community representatives who took part in training	4		4		4		654		654		654	
PI 2: Improved or increased capacity of new CCCIs to sustain their operations	CCCIs and its members	-		-		-							
PI 3: Number of new CCCIs and community stakeholders reached as a result of policies and programs of the government	CCCI subscribers and communities; Government agencies	-		-		-							
PI 4: Resources effectively deployed to support existing and new CCCIs resulting to increase in the number and quality of outreach among unconnected communities	New CCCIs and unconnected communities	-		-		-							
		<b>3,409</b>	<b>100%</b>	<b>5,678</b>	<b>100%</b>	<b>5,723</b>	<b>100%</b>	<b>126,665</b>	<b>100%</b>	<b>136,985</b>	<b>100%</b>	<b>173,435</b>	<b>100%</b>

## The Stakeholders Benefiting the Most

Table 7 below shows the social impact estimates of beneficiaries and valuation. The beneficiaries who experienced the most significant impact from TandaNet's interventions include center beneficiaries engaged in environmental awareness efforts, out-of-school teen mothers employed in clerical and data annotation roles, and women who sought support for gender empowerment initiatives.

Environmental awareness programs had the highest reach, with 3,234 center beneficiaries actively engaging in social media campaigns on sustainability issues. This demonstrates the expansive influence of digital advocacy in mobilizing communities toward environmental action, underscoring the effectiveness of TandaNet's awareness campaigns.

Another group that benefited substantially from TandaNet's efforts was out-of-school teen mothers who secured employment in clerical and data annotation roles through digital platforms. This economic empowerment initiative not only provided stable income sources but also contributed to broader financial independence and inclusion in the digital workforce. Similarly, Usafi Boyz members, numbering 15 per year, capitalized on e-commerce and online employment opportunities, highlighting how TandaNet fosters accessibility to digital-driven livelihoods.

In terms of gender inclusion, TandaNet saw a dramatic surge in women beneficiaries seeking information and reporting online gender-based violence, jumping from zero in 2021 to 2,200 in 2022. This increase underscores the growing awareness and proactive stance of women in addressing digital safety and gender empowerment concerns. Additionally, the presence of women in governance and management positions within community networks remained stable, signifying consistent inclusion efforts.

Overall, these key beneficiary groups reflect the transformative role of digital connectivity in enhancing economic opportunities, social advocacy, and gender empowerment.

### KRAs and PIs exhibiting the most significant monetized benefits among stakeholders

Among the KRAs, KRA #1: "Improvement in the economic position and conditions of community stakeholders" registered 65 percent of the monetized benefits in 2021, 60% in 2022, and 67% in 2023. It is followed by KRA #4: "Empowerment of community to own, govern, and manage internet and digital resources", with 20% of the benefits in 2021, 19% in 2022 and 15% in 2023. Among the PIs, the greatest number of stakeholder-beneficiaries were under PI 1 of KRA 3: "Increase in social media engagement of community members on environmental issues and concerns", with 95% of total stakeholders in 2021 and 57% of the total in both 2022 and 2023.

The PI with the highest share of monetized benefits is PI 2 of KRA #1: "Increased income from employment and sales resulting from use of online platforms". In 2021, PI 2 had 65% of the total monetized benefits for that year. This proportion is largely maintained in the succeeding years, with 60% in 2022 and 67% in 2023. This is due to the high monetary value of "Usafi Boyz realizing income gain from online employment and e-commerce" at USD 60,737 for years 2021, 2022 and 2023, and the income gain of "Out of school (teen mothers) employed in clerical and data annotation" at USD 22,086 for 2021 and 2022 and USD 55,215 in 2023.

**Table 7. Social Impact Estimates of Stakeholders and Valuation of Outcomes**

Key Result Area (KRA): Elements & sub elements	Stakeholders	No. of Stakeholders						Outcomes/Benefits (in USD)					
		2021	%	2022	%	2023	%	2021	%	2022	%	2023	%
KRA #1: Improvement in the economic position and conditions of community stakeholders		25	1%	25	0.40%	40	1%	82,822.50	65%	82,822.50	60%	115,951.50	66.86%
PI 1: Number of community stakeholders employed in e-jobs and have become entrepreneurs in the digital economy	Employed community members in e-jobs & entrepreneurs in the digital economy	-		-		-		-		-		-	
PI 2: Increased income from employment and sales resulting from use of online platforms	Out of school (teen mothers) employed in clerical and data annotation	10		10		25		22,086		22,086		55,215	
	Usafi Boyz members engaged in online employment and e-commerce	15		15		15		60,737		60,737		60,737	
KRA #2: Improved levels and capacities for inclusive and holistic human development		113	3%	113	2.00%	143	2%	10,244	8%	10,244	7%	13,565	7.82%
PI 1: Faster, more affordable, and more effective access and utilization of updated teaching materials through online research	Community organization: Nivishe Foundation was able to derive savings due to internet access	1		1		1		448		448		448	
PI 2: Improved access and use of digital educational resources by community schools and students (cheaper cost of education materials)	The centers are able to source cheaper educational materials	10		10		10		2270		2270		2270	
PI 3: Safer learning environment during the COVID-19 pandemic through online classes	Students and youth attending classes	-		-		-		-		-		-	
PI 4: Improved capacity to deliver appropriate mental health information, education, and services online	Mental health patients, number of health professionals using online resources	4		4		4		88		88		88	
	Youth & mental health professionals attending and participating in the mental health fellowship	50		50		80		5,535		5,535		8,856	
PI 5: Increased number of children effectively immunized based on health standards and required protocols (Better monitoring of immunization schedule)	Better monitoring of schedules by community health promoters (CHPs) using Electronic Community Health Information System (ECHIS) and KHIS	40		40		40		1,701		1,701		1,701	
	Health professionals monitoring the health programs	4		4		4		117		117		117	
PI 6: Faster and more affordable way of reports and orders submission from the centers' branches to the head office through the online facility	In charge of facilities (health care providers linked to the facility)	4		4		4		85		85		85	

Table 7. Social Impact Estimates of Stakeholders and Valuation of Outcomes

Table 7. Social Impact Estimates of Stakeholders and Valuation of Outcomes													
Key Result Area (KRA): Elements & sub elements	Stakeholders	No. of Stakeholders						Outcomes/Benefits (in USD)					
		2021	%	2022	%	2023	%	2021	%	2022	%	2023	%
KRA #3: Increase in awareness and action on environmental issues and concerns		3,234	95%	3,234	57.00%	3,234	57%	6,468	5%	6,468	5%	6,468	3.73%
PI 1: Increase in social media engagement of community members on environmental issues and concerns	Center beneficiaries	3,234		3,234		3,234		6,468		6,468		6,468	
PI 2: Increase in enrollment or engagement in online environmental courses and actions	Center beneficiaries (students, organizations, etc.)	-		-		-							
KRA #4: Empowerment of community to own, govern, and manage internet and digital resources		27	1%	27	0.50%	27	0.50%	25,495	20%	25,495	19%	25,495	14.70%
PI 1: Number of community-based organizations and individuals that are engaged in the governance, management, and operation of the TandaNet in Kibera	CBOs from Kibera that are now engaged in governance, management and operation of TandaNet	10		10		10		1,472		1,472		1,472	
PI 2: Share / increase in share in the digital market of CCCI	CCCI subscribers	-		-		-							
PI 3: Percentage / increase in percentage of community representatives occupying management and governance positions in the CCCI	Community representatives occupying governance & management positions in the CCCI	2		2		2		8,834		8,834		8,834	
PI 4: Number of community members serving as staff / technicians of CCCIs	No. of relays with 2 full time tech and 1 part time staff	4		4		4		14,135		14,135		14,135	
PI 5: Number of CCCIs established and developed serving new unconnected and underserved communities beyond Kibera	CCCIs with capacity to run the network	11		11		11		1,053		1,053		1,053	
KRA #5: Inclusion and empowerment of women as stakeholders in digital transformation		6	0.20%	2,275	40.10%	2,275	40%	982	1%	11,302	8%	11,302	6.52%
PI 1: Increase in the number of women beneficiaries and organisations inquiring and reporting cases of online gender-based violence	More of the centers' beneficiaries inquired about and/or addressed gender and empowerment issues	0		2,200		2,200		-		6,765		6,765	
PI 2: Number and percentage of women occupying governance, management, and technical positions in CCCIs	Women sitting in executive boards	6		6		6		982		982		982	
PI 3: Increase in awareness and action on gender issues and practice of women's rights in the digital space (for confirmation from TandaNet) (Women are given information and an avenue to assert their rights)	No of women attended the trainings; Technological gender-based violence	0		69		69		-		3,556		3,556	
KRA #6: Improved enabling environment for CCCIs		4	0.10%	4	0.10%	4	0.07%	654	1%	654	0.50%	654	0.38%
PI 1: Increase in the number and capacity of CCCIs serving unconnected and underserved communities	Community representatives who took part in training	4		4		4		654		654		654	
PI 2: Improved or increased capacity of new CCCIs to sustain their operations	CCCIs and its members	-		-		-							
PI 3: Number of new CCCIs and community stakeholders reached as a result of policies and programs of the government	CCCI subscribers and communities; Government agencies	-		-		-							
PI 4: Resources effectively deployed to support existing and new CCCIs resulting to increase in the number and quality of outreach among unconnected communities	New CCCIs and unconnected communities	-		-		-							
		3,409	100%	5,678	100%	5,723	100%	126,665	100%	136,985	100%	173,435	100%

## Social Return on Investment (SROI) of Tanda Community Network

Table 8 below presents the SROI Summary. The resulting year-on-year SROI values exhibit an increasing trend. Starting from a ratio of 1:1.50 in 2021-22, the ratio increased to 1.72 in 2022-23, and peaking at 4.88 in 2023-24. The longitudinal, year-on-year increase in the SROI ratio shows that TandaNet's impact on the community has increased over time.

Table 8. SROI Summary for TandaNet			
Outcome: KRAs/Performance Indicators	2021-22	2022-23	2023-24
<b>KRA #1: Improvement in the economic position and conditions of community stakeholders</b>			
PI 1: Number of community stakeholders employed in e-jobs and have become entrepreneurs in the digital economy	-	-	-
PI 2: Increased income from employment and sales resulting from use of online platforms	82,822.50	82,822.50	115,951.50
<b>KRA #2: Improved levels and capacities for inclusive and holistic human development</b>			
PI 1: Faster, more affordable, and more effective access and utilization of updated teaching materials through online research	447.85	447.85	447.85
PI 2: Improved access and use of digital educational resources by community schools and students (cheaper cost of education materials)	2,270.00	2,270.00	2,270.00
PI 3: Safer learning environment during the COVID-19 pandemic through online classes	-	-	-
PI 4: Improved capacity to deliver appropriate mental health information, education, and services online	5,622.72	176.84	8,943.72
PI 5: Increased number of children effectively immunized based on health standards and required protocols (Better monitoring of immunization schedule)	1,818.16	1,818.16	1,818.16
PI 6: Faster and more affordable way of reports and orders submission from the centers' branches to the head office through the online facility	85.08	85.08	85.08
<b>KRA #3: Increase in awareness and action on environmental issues and concerns</b>			
PI 1: Increase in social media engagement of community members on environmental issues and concerns	6,468.00	6,468.00	6,468.00
PI 2: Increase in enrollment or engagement in online environmental courses and actions	-	-	-
<b>KRA #4: Empowerment of community to own, govern, and manage internet and digital resources</b>			
PI 1: Number of community-based organizations and individuals that are engaged in the governance, management, and operation of the TandaNet in Kibera	1,472.40	1,472.40	1,472.40
PI 2: Share / increase in share in the digital market of CCCIs	-	-	-
PI 3: Percentage / increase in percentage of community representatives occupying management and governance positions in the CCCI	8,834.40	8,834.40	8,834.40
PI 4: Number of community members serving as staff / technicians of CCCIs	14,135.04	14,135.04	14,135.04
PI 5: Number of CCCIs established and developed serving new unconnected and underserved communities beyond Kibera	1,052.70	1,052.70	1,052.70

**Table 8. SROI Summary for TandaNet [cont.]**

Outcome: KRAs/Performance Indicators	2021-22	2022-23	2023-24
<b>KRA #5: Inclusion and empowerment of women as stakeholders in digital transformation</b>			
PI 1: Increase in the number of women beneficiaries and organisations inquiring and reporting cases of online gender-based violence	-	6,765.00	6,765.00
PI 2: Number and percentage of women occupying governance, management, and technical positions in CCCIs	981.6	981.6	981.6
PI 3: Increase in awareness and action on gender issues and practice of women's rights in the digital space	-	3,555.57	3,555.57
<b>KRA #6: Improved enabling environment for CCCIs</b>			
PI 1: Increase in the number and capacity of CCCIs serving unconnected and underserved communities	654.4	654.4	654.4
PI 2: Improved or increased capacity of new CCCIs to sustain their operations	-	-	-
PI 3: Number of new CCCIs and community stakeholders reached as a result of policies and programs of the government	-	-	-
PI 4: Resources effectively deployed to support existing and new CCCIs resulting to increase in the number and quality of outreach among unconnected communities	-	-	-
<b>Monetized Outcomes (Net income gain, cost savings)</b>	<b>126,664.85</b>	<b>136,985.43</b>	<b>173,435.42</b>
<b>Present value of each year</b>	<b>122,381.50</b>	<b>132,353.07</b>	<b>167,570.45</b>
<b>Total Present Value (PV)</b>	<b>122,381.50</b>	<b>132,353.07</b>	<b>167,570.45</b>
<b>Investment Cost</b>	<b>81,393.40</b>	<b>76,854.40</b>	<b>34,363.40</b>
<b>TandaNet Operating Expenses</b>			
<b>APC &amp; others (the Internet Society, the Collaboration on International ICT Policy for East and Southern Africa (CIPESA), Deutsche Welle, the Center for Youth Development, and the Massachusetts Institute of Technology (integrated in investment cost))</b>			
<b>TOTAL COST</b>	<b>81,393.40</b>	<b>76,854.40</b>	<b>34,363.40</b>
<b>Net Present Value (PV minus the investment)</b>	<b>40,988.10</b>	<b>55,498.67</b>	<b>133,207.05</b>
<b>Social Return (Value per amount invested)</b>	<b>1.5</b>	<b>1.72</b>	<b>4.88</b>

## A Closer Look at the Qualitative Social Impact and Cost Effectiveness of TandaNet

Comparing *Table 9* below with *Tables 6, 7 and 8*, it may be observed that the monetized impact indicators that went into the SROI computation were mostly transactional service related (but are nevertheless vital and double up as social inclusion, leading to the entry of transformational services). Given the nature of the exchange involved in transactional services (i.e., money savings), the impact they created was relatively easier to monetize than those of social inclusion and transformational services. Thus, the Development Index complements the SROI Value Map by capturing the other equally significant outcomes, but whose monetary values were difficult to establish or even to estimate. In this particular case, the significant impact indicators that are community-based in scope and need further monetization are the following:

- Number of community stakeholders employed in e-jobs and have become entrepreneurs in the digital economy
- Safer learning environment during the COVID-19 pandemic through online classes
- Increase in enrollment or engagement in online environmental courses and actions
- Share/increase in share in the digital market of CCCI
- Improved or increased capacity of new CCCIs to sustain their operations
- Number of new CCCIs and community stakeholders reached as a result of policies and programs of the government
- Resources effectively deployed to support existing and new CCCIs resulting to increase in the number and quality of outreach among unconnected communities

**Table 9. Various Types of Services Provided by TandaNet**

Transactional Services	Social Inclusion Services	Transformational Services
<p>Provision of internet connectivity (subscription fees)</p> <p>Provision of cloud storage solutions, website hosting, digital content hosting services to individuals and organizations within the community</p>	<p>Conduct of Women Engineers Program, equipping women with technical skills in technologies and CCCI network management</p> <p>Conduct of Creatives Accelerator Program, equipping the youth with tools and skills useful in the digital economy</p> <p>Provision of training about digital literacy topics such as digital storytelling, online privacy and security, online gender-based violence, online censorship, etc.</p>	<p>Deployment of open and free Colmena, an audio file management application, which enabled the community to produce and publish their content such as recorded interviews, live broadcasts, online team meetings, podcasts, etc.</p> <p>Provision of training to empower the community to use digital platforms for their own cause and advocacy campaigns (e.g., conduct of Grassroot Human Rights Defenders Program)</p> <p>Facilitated the production of comic strips and videos using the content gathered from the community</p> <p>Provision of venue for dialogues, information exchange, and knowledge sharing between people engaged with CCCIs across Kenya through the Kenya National School of CCCIs</p> <p>Provision of training, mentorship, and peer exchange opportunities for emerging CCCIs at the national level through the Community of Practice (COP) program. This program also equips grassroots communities to effectively operate CCCIs</p>













Table 10 shows the PIs that have been monetized or not and their type of impact. Most of the PIs that straddle transformational services and social inclusion-related impacts are not quantified and monetized in the current analysis.

Table 10. Significant social impacts and their classification						
Key Result Area (KRA) sub elements	Stakeholders	Description of Performance Indicator / Performance Indicator	Indication if monetized or not in the SROI Analysis	Indication of Type of Impact		
				Transactional services-related impact	Social Inclusion- related impact	Transformational services-related impact
KRA #1: Improvement in the economic position and conditions of community stakeholders						
PI 1: Number of community stakeholders employed in e-jobs and have become entrepreneurs in the digital economy	Community stakeholders employed in e-jobs and digital entrepreneurs	Employment and income gained through CCCI	Not monetized	x	x	x
PI 2: Increased income from employment and sales resulting from use of online platforms	Out of school (teen mothers) employed in clerical and data annotation	Income & salary gain from clerical and data annotation jobs	Monetized	x		
	Usafi Boyz members engaged in online employment and e-commerce	Income & salary gain from e-jobs & digital economy	Monetized	x		
KRA #2: Improved levels and capacities for inclusive and holistic human development						
PI 1: Faster, more affordable, and more effective access and utilization of updated teaching materials through online research	Community organization: Nivishe Foundation was able to derive savings due to internet access	Cost savings without and with	Monetized	x		
PI 2: Improved access and use of digital educational resources by community schools and students (cheaper cost of education materials)	The centers are able to source cheaper educational materials	Centers save in cost of procuring hard copy of books	Monetized	x		
PI 3: Safer learning environment during the COVID-19 pandemic through online classes	Students and youth attending classes	Medical cost savings due to reduction in morbidity	Not Monetized	x	x	
PI 4: Improved capacity to deliver appropriate mental health information, education, and services online	Mental health patients, number of health professionals using online resources	Cost savings without and with connectivity thru community network	Monetized	x		
	Youth & mental health professionals attending and participating in the mental health fellowship	Cost savings without and with connectivity thru community network	Monetized	x	x	
PI 5: Increased number of children effectively immunized based on health standards and required protocols (Better monitoring of immunization schedule)	Better monitoring of schedules by community health promoters (CHPs) using Electronic Community Health Information System (ECHIS) and KHIS	Cost savings without and with connectivity thru community network	Monetized	x		
PI 6: Faster and more affordable way of reports and orders submission from the centers' branches to the head office through the online facility	In charge of facilities (health care providers linked to the facility)	Cost of individual access without minus with connection	Monetized	x		

**Table 10. Significant social impacts and their classification [cont.]**

Key Result Area (KRA) sub elements	Stakeholders	Description of Performance Indicator / Performance Indicator	Indication if monetized or not in the SROI Analysis	Indication of Type of Impact		
				Transactional services-related impact	Social Inclusion- related impact	Transformational services-related impact
KRA #3: Increase in awareness and action on environmental issues and concerns						
PI 1: Increase in social media engagement of community members on environmental issues and concerns	Center beneficiaries	Cost savings without and with connectivity thru community network	Monetized	✓		
PI 2: Increase in enrollment or engagement in online environmental courses and actions	Center beneficiaries (students, organizations, etc.)	Number of enrollees or engagements in online environmental courses or actions	Not Monetized	✓	✓	
KRA #4: Empowerment of community to own, govern, and manage internet and digital resources						
PI 1: Number of community-based organizations and individuals that are engaged in the governance, management, and operation of the TandaNet in Kibera	Community members from Kibera that are now engaged in governance, management and operation of TandaNet	Engagement has resulted in employment and income gain	Monetized	✓	✓	✓
PI 2: Share / increase in share in the digital market of CCCI	CCCI subscribers	Record of share in the digital market overtime	Not Monetized	✓	✓	✓
PI 3: Percentage / increase in percentage of community representatives occupying management and governance positions in the CCCI	Community representatives occupying governance & management positions in the CCCI	Income gained	Monetized	✓	✓	✓
PI 4 :Number of community members serving as staff / technicians of CCCIs	No. of relays with 2 full time tech and 1 part time staff	Income gained per relay	Monetized	✓	✓	
PI 5: Number of CCCIs established and developed serving new unconnected and underserved communities beyond Kibera	CCCIs with capacity to run the network	Savings in expenses for network consultants	Monetized	✓	✓	✓
KRA #5: Inclusion and empowerment of women as stakeholders in digital transformation						
PI 1: Increase in the number of women beneficiaries and organisations inquiring and reporting cases of online gender-based violence	More of the centers' beneficiaries inquired about and/or addressed gender and empowerment issues	Gender-based violence in Kenya: Savings in the cost of providing services on GBV due to the CCCI	Monetized	✓	✓	
PI 2: Number and percentage of women occupying governance, management, and technical positions in CCCIs	Women sitting in executive boards	KES 5,000 honararia per board member x 4 board meetings a year = KES 20,000 or USD \$163.60 a year	Monetized	✓	✓	✓
PI 3: Increase in awareness and action on gender issues and practice of women's rights in the digital space (Women are given information and an avenue to assert their rights)	No of women attended the trainings; Technological gender-based violence	Savings from not being scammed; KES 300 to 1500 shillings per potential victim of illegal job placement	Monetized	✓	✓	

Table 10. Significant social impacts and their classification [cont.]

Key Result Area (KRA) sub elements	Stakeholders	Description of Performance Indicator / Performance Indicator	Indication if monetized or not in the SROI Analysis	Indication of Type of Impact		
				Transactional services-related impact	Social Inclusion- related impact	Transformational services-related impact
KRA #6: Improved enabling environment for Community Networks						
PI 1: Increase in the number and capacity of CCCIs serving unconnected and underserved communities	Community representatives who took part in training	Savings in consultancy services Before: 2 consultants a year 2021-2024	Monetized			
PI 2: Improved or increased capacity of new CCCIs to sustain their operations	CCCIs and its members	Financial surplus for expansion	Not Monetized			
PI 3: Number of new CCCIs and community stakeholders reached as a result of policies and programs of the government	CCCI subscribers and communities; Government agencies	Resources invested to CCCI and unconnected communities	Not Monetized			
PI 4: Resources effectively deployed to support existing and new CCCIs resulting to increase in the number and quality of outreach among unconnected communities	New CCCIs and unconnected communities	Resources generated and deployed to new CCCIs ( Payroll savings, writing of grant proposals, selling their services is subject to research - TandaNet)	Not Monetized			



The integration of DI and Social Value Mapping within the TandaNet Case Report has provided a structured approach to assessing the social impacts of the CCCI. The evaluation that was conducted in two major phases enabled the enhancement of the DI and SROI analysis. Given the broad scope and multidimensional nature of TandaNet's interventions, as well as time and resource constraints, a weighted scorecard was not feasible to complete and utilize. What was developed after analyzing the data generated was a refined set of six KRAs and 22 performance indicators, with 15 of these indicators quantified and monetized.

By employing SROI as methodology, the evaluation came up with approximations of the monetary value of the social benefits generated by TandaNet relative to its overall investment costs. Through stakeholder engagement, significant social impact areas were identified, quantified, and monetized to compute the SROI ratio. The results illustrate an increasing SROI trend, indicating that the initiative's value creation has grown substantially over time.

The following highlights the most significant areas of impact derived from the SROI analysis, showcasing economic empowerment, stakeholder engagement, governance improvements, and sustained growth in social value over time:

### **1. Economic Empowerment is the Leading Monetized Impact**

- KRA #1: "Improvement in the economic position and conditions of community stakeholders" accounted for 65% of the monetized benefits in 2021, 60% in 2022 and 67% in 2023, primarily driven by employment in e-jobs and entrepreneurship via digital platforms.
- The largest share of monetized benefits was attributed to PI 2 under KRA #1, specifically income gains from Usafi Boyz e-commerce participation (a total of USD 60,737 for 2021, 2022 and 2023) and out-of-school teen mothers employed in clerical and data annotation roles (a total of USD 22,086 for the 3 years).

### **2. High Stakeholder Participation in Environmental and Gender-Based Initiatives**

- Social media engagement in environmental awareness efforts (PI 1 under KRA #3) saw the highest stakeholder reach, representing 95% of total beneficiaries in 2021, and tapering down to 57% for both 2022 and 2023.
- Gender empowerment efforts (PI 1 under KRA #5) demonstrated notable growth, with women seeking support and reporting online gender-based violence increasing from zero beneficiaries in 2021 to 2,200 in 2022 and 2023, showcasing heightened awareness and proactive measures.



### **3. Strengthened Community Governance and Digital Resource Management**

- KRA #4: "Empowerment of the community to own, govern, and manage internet and digital resources" accounted for 20% in 2021, 19% in 2022, and 15% in 2023 of the monetized benefits, with strong participation in management positions, technician roles, and direct operation of community networks.
- Community members actively engaged in governance reported income gains of USD 8,834 for each year, while technicians contributed an estimated USD 14,135 annually to monetized benefits for the 3 years.

### **4. SROI Shows Consistent Growth in Social Impact Over Time**

- The SROI ratio increased from 1:1.50 in 2021-22 to 1:1.72 in 2022-23 and 1:4.88 in 2023-24. This demonstrates that for every dollar invested, the social returns have multiplied significantly, indicating improved cost-effectiveness and broader community impact.

The evaluation highlights the pivotal role of TandaNet in driving social and economic progress through digital inclusion. With a continuously increasing SROI, the initiative proves to be a cost-effective intervention with far-reaching benefits. Strengthening strategies in economic empowerment, environmental advocacy, gender inclusion, and network sustainability will maximize its transformative potential in underserved communities.

While the SROI analysis in this study indicates a significant upward trend in both social and financial value, with a return worth 9.87 times over in 2023, these research findings may still understate the true extent of TandaNet's contributions. To fully capture the social impact of TandaNet, the DI and SROI analysis should continue towards enabling the quantification and monetization of all significant social inclusion and transformational services-related impacts surfaced by this study.



## SUMMARY AND CONCLUSION

TandaNet's initiatives have led to substantial financial savings for connected institutions and their beneficiaries. Monthly internet fees for institutions decreased by 93% after switching from a commercial internet service provider, while beneficiary families saved 11% of their weekly income due to free internet access provided by community centers. This is particularly significant given that the majority of Kibera residents live below the poverty line, earning less than KES 270 (USD 2) per day.

Beyond direct internet users, the initiative also benefited non-users, with tangible effects seen in children receiving timely immunizations and experiencing healthier family relationships. The case highlights TandaNet's key role in fostering inclusive and holistic human development, enhancing women's participation in governance and digital resource management, and creating a more enabling environment for CCCIs, allowing their expansion beyond Kibera.

Many of the positive outcomes resulted from TandaNet's comprehensive programs and services, its community-owned and community-led approach, and its commitment to sustainable solutions. By fostering deep partnerships with community-based organizations, TandaNet has helped address pressing issues in Kibera, including education quality, poverty, unemployment, HIV/AIDS, and domestic violence.

However, despite these benefits, stakeholders have observed challenges related to worker productivity, children's heightened exposure to cyber bullying and inappropriate content, as well as increased vulnerability to digital fraud and scams. These concerns underscore the need for balanced digital integration, ensuring safeguards against potential risks.

This study has clearly shown the value added of TandaNet as a CCCI and how facilitating meaningful digital inclusion results in transforming lives, livelihoods and communities in many arenas.

**The study shows how digital inclusion drives economic and social transformation:** The findings affirm that internet accessibility directly enhances employability and entrepreneurial opportunities, particularly for marginalized groups like teen mothers and informal workers. Strengthening digital literacy and access to online work should remain a priority to amplify TandaNet's economic impact.

**The study also shows how environmental advocacy benefits from digital engagement.** The high stakeholder count in environmental awareness efforts suggests that social media and online educational tools effectively mobilize action on sustainability issues. Leveraging digital platforms for broader ecological initiatives could further scale these efforts.

**The study further shows how digital inclusion of women could positively impact on addressing gender issues and promote women's empowerment.** The sharp increase in women reporting gender-based violence online underscores the importance of digital safety and empowerment initiatives. Expanding programs for women-led governance in digital spaces can reinforce gender equity in community networks.

**Indeed, CCCIs need continuing investment and policy support to ensure sustainability of impact.** While governance and management engagement are strong, sustaining the expansion of CCCIs requires continued financial and policy support. Advocacy for favorable regulations, capacity-building programs, and infrastructure development will be critical in ensuring long-term viability. Moreover, TandaNet has proven effective in mobilizing resources, securing funding, and maintaining strong collaborations with grassroots, national, and international institutions — successes largely attributed to the expertise and dedication of its management and staff. However, TandaNet must further expand its subscriber base to optimize the use of its infrastructure and improve its financial stability. Diversifying funding sources beyond grants and user income by leveraging its alliances, reputation, and track record will be essential to maintain and sustain its growth.

Overall, this study highlights the transformative role of digital connectivity in ensuring inclusive economic growth, enhancing environmental action, promoting gender inclusion and women's empowerment as well as the role of sustained investment and policy support to enable CCCIs as vehicles in the pursuit of such transformative role.



## Annex A - About Kibera



At the time of the study, Kibera was Nairobi's largest slum, situated seven kilometers away from the city. Its 2019 population was 185,768, with the youth comprising 80% of its residents.<sup>[43]</sup> This vibrant but densely populated place had an area of 2.5 kilometers.

Kibera was characterized by high rates of unemployment, poor quality education, and high crime rates. Lack of basic services such as housing, electricity, running water, and medical care was also lacking. The majority of the residents lived below the poverty line, earning less than KES270 (USD2) per day. Food and shelter accounted for the major portion of expenses. The majority of the population had basic literacy skills, which led to low digital literacy skills. They were willing to spend KES 50 (USD 0.37) daily for internet access.<sup>[44]</sup>

However, there were several opportunities in Kibera: entrepreneurship, intuition, and extensive community activism.<sup>[45]</sup>

[43] Tanda Community Network Impact Needs Assessment Report, October 2023.

[44] Ibid.

[45] Ibid.

# About the Cooperating Organizations



The Association for Progressive Communications (APC) is an international network of Civil Society Organizations (CSOs), operating since 1990. Its work focuses on supporting Information and Communication Technology (ICTs) for social justice. In 2017, APC has embarked in exploring and supporting Community Networks, now called as Community-Centered Connectivity Initiatives (CCCI), in bridging the digital divide worldwide. APC is present in 20 countries from the Global South.

Visit APC's website here: [www.apc.org](http://www.apc.org)



Rhizomatica is driven by its mission to make alternative telecommunication infrastructures for vulnerable, poor, and isolated communities in Africa and Latin America. Using approaches combining regulatory activism and reform, critical engagement with, and development of, technology, design of novel sustainability models, and direct community involvement and participation, Rhizomatica aims to support communities towards building and maintaining self-governed and owned communication and energy infrastructure.

Visit Rhizomatica's website here: [www.rhizomatica.org](http://www.rhizomatica.org)



The Institute for Social Entrepreneurship in Asia (ISEA) is a learning and action network set-up by social enterprises, social enterprise resource institutions and scholars in 2008 to undertake research, education, advocacy and building of platforms for social entrepreneurship towards sustainable development. It pursues various platforms for multistakeholder collaboration to advance social entrepreneurship towards accelerating the achievement of the Sustainable Development Goals: Technological Innovations for Sustainable Development; Women's Empowerment, Livelihoods and Food in Agricultural Value Chains; Decent Work for All in Sustainable Value Chains; Rural Revitalization, Youth and Social Entrepreneurship; Health for All and Poverty Reduction through Social Entrepreneurship. It has a membership spanning 15 countries and territories in Asia and is based in the Philippines with a regional office hosted by the Ateneo Center for Social Entrepreneurship.

Visit ISEA's website here: [www.isea-group.net](http://www.isea-group.net)

# ISEA Project Team

**Dr. Marie Lisa Dacanay**

Project Director and Principal Researcher for Development Indexing

**Dr. Albert Teo**

Principal Researcher for Social Return on Investment

**Jay Berthram Lacsamana**

**Eulogio Martin Masilungan**

Case Writers

**Catherine Tiongson-Intalan**

Project Coordinator

**Cindy Love Falcutilla**

Project Associate

**Carmela Jessica Corado**

Copy Editor

**Bernadette Patañag**

Lay-out Design

**Norma Gonzaga**

Project Accountant

**Dolly Marcial**

Administrative and Financial Assistant



## BRIDGING THE DIGITAL DIVIDE IN THE LARGEST SLUM IN KENYA: The Tanda Community Network

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