Can the *Dana Desa* programme bridge the digital divide in rural Indonesia?

January 2026

Source: Cenrana village

1. Cenrana village case study

Many rural communities in the Republic of Indonesia face significant barriers to digital connectivity, especially those that are remote, and **Cenrana**, a village in Sidenreng Rappang Regency, South Sulawesi, exemplifies this issue. With just over 800 residents dispersed across hilly, often rugged terrain, Cenrana constitutes a small and financially unattractive market for Internet service providers (ISPs). The combination of high infrastructure costs, limited purchasing power, and difficult terrain discourages private investment, leaving the village digitally isolated.

The **Dana Desa (Village Fund)** programme offers a practical mechanism to address these challenges. Administered by the Ministry of Villages, Development of Disadvantaged Regions, and Transmigration/*Kementerian Desa, Pembangunan Daerah Tertinggal, dan Transmigrasi* – Kemendesa PDTT, Dana Desa functions as a grant, providing direct financial support to rural communities to promote local development, reduce poverty, and empower villagers.

This case study[1] examines **how the village of Cenrana strategically utilized the Dana Desa programme to establish sustainable Internet connectivity and demonstrates how strategic planning, effective use of local resources, and community participation can expand rural connectivity and drive digital transformation**.

This case study comprises three principal objectives:

1. To analyse and document current practices in developing Internet access in rural areas using Dana Desa.
2. To extract lessons learned and provide recommendations for village governments and development organizations in implementing sustainable ICT initiatives.
3. To showcase the village of Cenrana as a **replicable model** for other villages, particularly those facing similar geographic, economic, and social challenges.

[1] This case study has been prepared by Khairun Nisa Fachry in her capacity as an ITU expert, in support of ITU work on Digital Inclusion and in partnership with the United Kingdom Foreign, Commonwealth and Development Office (FCDO).

2. Cenrana village profile

Cenrana is a remote sparsely populated village community covering an area of 29 square kilometres and is home to 846 residents across 252 households. The village is divided into three *dusun*[2] (hamlets): Pakkasaloe, Coppo Sulureng, and Bukkere. The majority of villagers are either farmers (30.6%) or housewives[3] (29.9%), and formal employment, such as civil service or private-sector jobs are limited. Educational attainment is limited, with about 85 per cent of villagers having completed only primary school or less, and only 1.76 per cent holding a university degree.[4]

Geographically, Cenrana is located 27 kilometres from the district capital and over 202 kilometres from the provincial capital[5], at an elevation of 100 to 500 metres above sea level[6]. Land use is mainly for agriculture and plantations, and inadequate road infrastructure combined with hilly terrain makes access to and from the village challenging.

2 *Dusun* (Hamlet/Sub-village) is a smaller administrative unit within a village.

3 Managing the household (*mengurus rumah tangga*) or housewife is formally acknowledged as work in Indonesia and appears on citizens' ID cards (*Kartu Tanda Penduduk*) under occupation.

4 Data is based on the 2018 Cenrana Village Accountability Report (*Laporan Pertanggungjawaban* 2018), as cited in the Cenrana Village Medium-Term Development Plan (*Rencana Pembangunan Jangka Menengah Desa Cenrana* – RPJMDes) 2021-2026.

5 Data is based on the 2020 Village Data (*Data Desa* 2020), as cited in the Cenrana Village Medium-Term Development Plan (*Rencana Pembangunan Jangka Menengah Desa Cenrana* – RPJMDes) 2021-2026.

6 Data is based on interviews with the Head of the Village.

Figure 1: Views of Cenrana village

Source: ITU

Challenges constraining ISP investment

With a population of only 846 residents spread across roughly 29 km², Cenrana constitutes a small and geographically dispersed market. ISP business models typically rely on achieving scale, and profitability depends on a large customer base to ensure a rapid return on investment. Given the small population and limited purchasing power in Cenrana, the commercial limitations to deployment of Internet infrastructure pose a barrier to attracting private investment.

Box 1: Dana Desa and Digital Village initiatives

Dana Desa is a key government initiative in Indonesia, managed by the Ministry of Villages, Development of Disadvantaged Regions, and Transmigration (Kemendesa PDTT). The programme provides direct financial support to rural communities to promote local development, reduce poverty, and empower villagers. Established in 2015 under Village Law No. 6 of 2014, this programme enables villages to allocate funds to initiatives tailored to their specific needs, focusing on public infrastructure such as roads, bridges and irrigation schemes, economic growth, and social welfare. Regulations No. 16 and No. 21 of 2020, issued by the Minister of Villages further enable Dana Desa to support the development of digital infrastructure, Internet access, and e-governance tools, expanding the scope of village development into the digital domain.

The remote location of the village further exacerbates these challenges as being situated 27 kilometres from the district capital, both installation and maintenance costs are significantly increased. Limited road access and hilly terrain further impede the transport of equipment and the deployment of network infrastructure. From a technical perspective, the elevation of the village at 100-500 metres above sea level, and the uneven topography complicate the establishment of stable radio-based or wired networks. The presence of extensive farmland and plantation areas further constrains infrastructure deployment and necessitates high upfront capital investment.

In addition, low levels of digital literacy and limited purchasing power reduces potential demand. With approximately 85 per cent of villagers attaining only primary level education or less, and most households dependent on agriculture or informal work, subscription-based Internet models pose financial risks for providers. Consequently, ISPs perceive a high investment risk with limited prospects for sustainable long-term revenue.

3. A local response: Leveraging Dana Desa funds for digital connectivity

Considering the combined economic, technical, and social barriers, Cenrana village faced a persistent connectivity gap that conventional market mechanisms were unlikely to resolve. Recognizing that private-sector investment alone would not extend Internet connectivity to their community, the village government, led by the Village Head, decided to take proactive steps to develop and manage a locally operated Internet network financed through the Dana Desa scheme. At that time, limited 2G coverage existed only in the mountainous areas, and did not extend to village residential areas. While villagers could make basic voice calls they were still required to travel considerable distances to access Internet services, reinforcing the need for a local solution.

Box 2: Operational guidelines for 2025

The operational guidelines for 2025, outlined by the Ministry of Villages and Development of Disadvantaged Regions (Kemendesa PDTT) in Regulation No. 2 of 2024, specify the objectives and priorities in the digital domain:

Objective: To accelerate the implementation of digital villages through the use of information and communication technology (ICT).

Primary targets:

- Villages located in remote areas
- Villages with limited access to telecommunication and Internet services

Eligible funded activities:

- Procurement, development, and maintenance of telecommunication services, including:
  - Village Internet access
  - Local Internet networks
  - Internet subscription services
- Development of supporting technology infrastructure such as:
  - Internet infrastructure
  - Laptops and computers for village administrative purposes

Implementation approach:

- Activities must be based on the specific needs of each village, determined through Village Meetings (*Musyawarah Desa*).
- Dana Desa enables direct financial support (i.e. not a loan) and their use must follow participatory planning and training, ensuring accountability and community involvement.
- Activities must remain within the scope of the village authority and comply with existing regulations.

By 2020, electricity access in the village of Cenrana was nearly universal, with only ten households remaining without power. With this essential and foundational infrastructure in place, the village government then shifted focus toward expanding Internet connectivity as a core component of its digitization programme, which had become a local governance priority.

Dana Desa budgeting

The plan, which was developed by the Village Head with the support of a local ISP who provided budgeting and technical input, was first presented at a village meeting[7] (*Musyawarah Desa* – Musdes), where villagers discussed its potential benefits and needs. Following the village meeting, the Village Work Plan[8] (*Rencana Kerja Pemerintah Desa* – RKPDes) was finalized in June for implementation in the following year, and the necessary budget was approved later in December through the Village Revenue and Expenditure Budget[9] (*Anggaran Pendapatan dan Belanja Desa* – APBDes). Figure 2 shows the Approved Village Revenue and Expenditure Budget (APBDes) 2021, showing how the village of Cenrana allocated funds for the development of Internet infrastructure.

[7] *Musyawarah Desa (Musdes)*, or Village Meeting, is a village-level participatory forum in which villagers, community leaders, and the village council discuss and agree on development priorities and programmes.

[8] *Rencana Kerja Pemerintah Desa (RKPDes)*, or Village Work Plan, is an annual plan prepared by the village council that outlines programmes, projects, and activities scheduled for implementation in the following year.

[9] *APBDes* (Village Revenue and Expenditure Budget) is the official annual village budget, specifying revenue sources and planned expenditures, approved by the village council.

Figure 2: Approved Village Revenue and Expenditure Budget (*APBDes*) 2021

Account Code	Description	Budget	Funding Source
2.6	**Transportation, Communication, and Informatics Sub-sector**		
2.6.03	Development and Management of Village Local Communication and Information Network/Installation	151,343,400.00	Village Funds
2.6.03	Capital Expenditure	151,343,400.00	

- Printed by **Siskeudes**
- Date: **22/02/2021 13:50:19**

Source: ITU and Cenrana village

Infrastructure installation and implementation

In 2021, Cenrana village invested IDR 151 343 400 (USD 10 090) in connectivity infrastructure, entirely funded through the Dana Desa programme. This investment covered labour costs, installation of servers and hotspot equipment, construction of a 15-metre monopole tower, and deployment of cabling to connect the network across the village.

A local ISP provided technical implementation support and Internet services, acting solely as a supplier without any equity participation. The village solution involved extending the connectivity of the ISP and paying a fixed monthly fee for network access, as the coverage was expanded throughout Cenrana.

Figure 3: Technicians installing network infrastructure in Cenrana

Source: Cenrana village

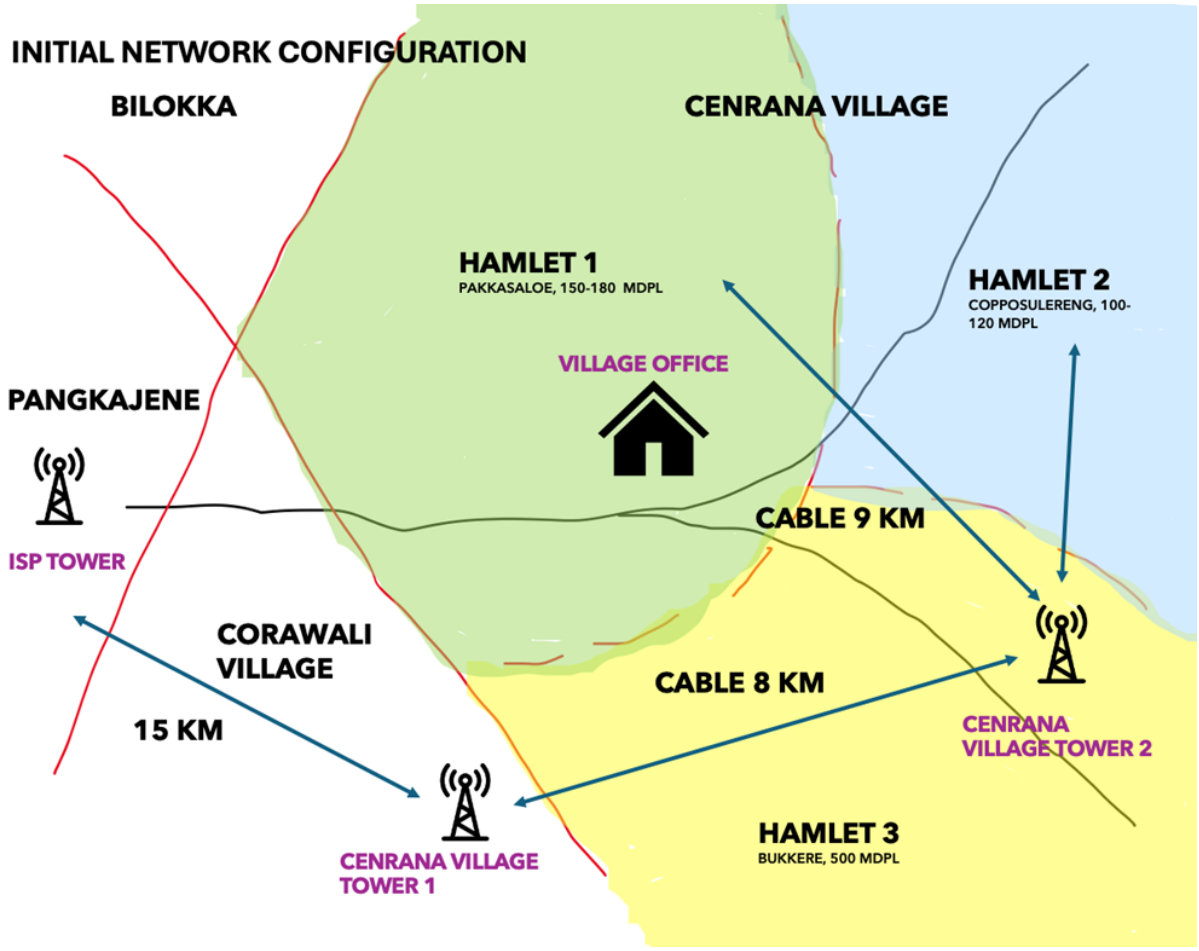
Table 1: Breakdown of investments for the Cenrana Village Internet Network

Category	Details / Description	Amount (IDR and equivalent USD)
Labour costs	Internet deposit, server and wireless installation, cable pulling, client setup, material mobilization	IDR 45 903 000 ≈ USD 3 060
Material and equipment costs	Server hotspot, server rack, power backup, tower (15m), cables (UTP Cat 6, Dropcore), converters, accessories	IDR 105 440 400 ≈ USD 7 030
Total initial investment	Fully funded by Dana Desa	IDR 151 343 400 ≈ USD 10 090

As shown in Figure 4, the network initially extended from Pangkajene to Cenrana Village Tower 1 (main tower) in Bilokka, covering a distance of approximately 15 kilometres. From there, it continued another 8 kilometres to Cenrana Village Tower 2, which provided connectivity to Dusun Bukkere (Hamlet 3). Additionally, a 9-kilometre cable connection from Tower 2 provided Internet access to Dusun Pakkasaloe (Hamlet 1) and Dusun Coppo Sulureng (Hamlet 2), covering the main residential areas of the village.

From the outset, the village adopted a voucher-based business model, with Internet access sold by the village government. Villagers could purchase six hours of daily access for IDR 5 000 (USD 0.30) which was an expansion from the initial pilot phase, which provided three hours of access over a 12-hour period.

Figure 4: Initial network configuration in Cenrana (2021)

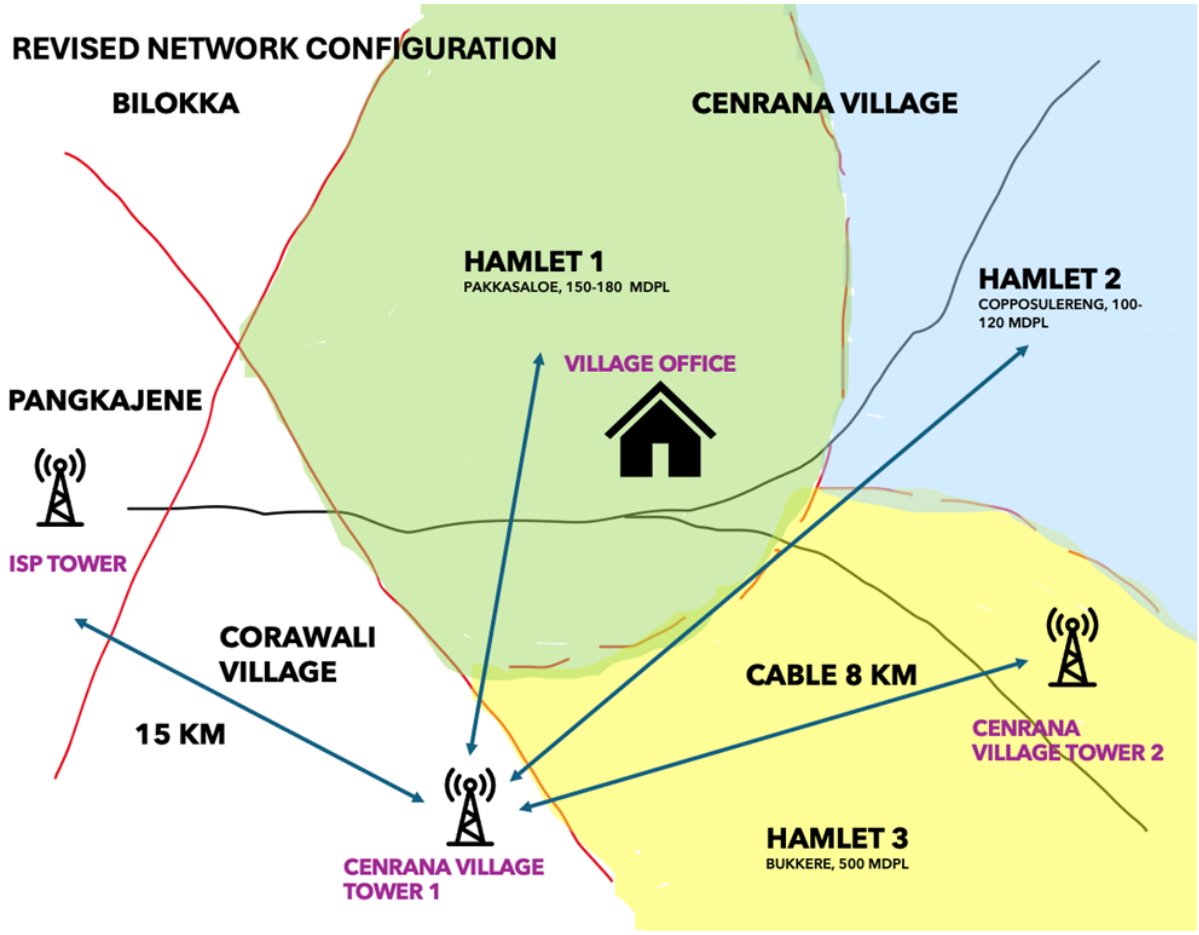


Source: ITU

Later however, in 2021, the network experienced disruptions caused by fallen trees that damaged the overhead cables. As shown in Figure 5, following an evaluation, the configuration was revised in 2022, directly connecting Dusun Pakkasaloe (Hamlet 1) and Dusun Coppo Sulureng (Hamlet 2) to Cenrana Village Tower 1. With this adjustment, Tower 1 became the primary access point, delivering connectivity to all parts of the village, improving network stability, and reducing maintenance challenges. Hamlet 3 continues to be served by Cenrana Village Tower 2.

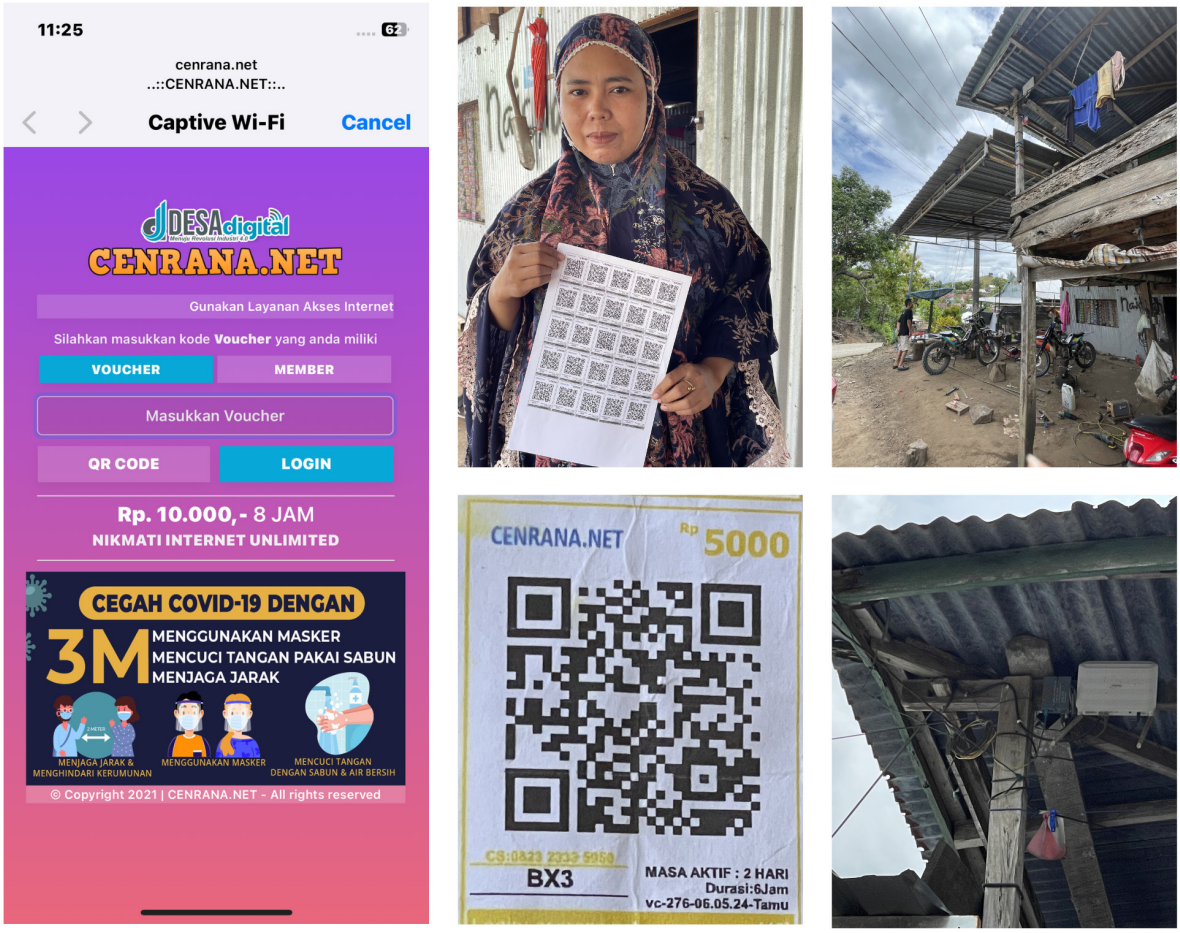
Importantly, funding for these adjustments came from profits generated through Internet voucher sales, ensuring the sustainability of the network. Dana Desa resources were no longer required for maintenance or system upgrades, marking a shift toward a community-driven and self-sustaining digital infrastructure model.

Figure 5: Revised network configuration after adjustments (2022)



Source: ITU

Figure 6: Internet voucher system in Cenrana



Source: ITU

Village Network Sustainment and Expansion

By 2023, the operation of the village network had become self-sustaining. Voucher sales fully covered operational and maintenance costs, with those villagers hosting routers or towers, earning commissions. The village reinvested profits into network expansion and maintenance, eliminating dependence on Dana Desa funding. By 2024–2025, the network had scaled to cover additional households, leaving less than ten isolated homes without Internet connection in Cenrana. A Wi-Fi modem was installed for these isolated homes, ensuring that they too gained access to the network. The voucher pricing was adjusted to improve community affordability, supporting growing daily usage.

Table 2 summarizes the progress of the Internet network development over time, highlighting the stages from planning to financially sustainable operations, and demonstrating how the Dana Desa programme enabled both connectivity and long-term community ownership.

Table 2: Timeline of the Internet network development and sustainability (2020–2025) in Cenrana

Year	Stage	Key milestones	Funding (IDR / USD)	Outcomes
2020	Dana Desa budgeting	Most households had electricity. Village Head initiated plan for village Internet network and approved by the villagers during the Village Meeting (*Musdes*). Village Work Plan (RKP) drafted in June; Village Budget (APBDes) approved in December.	Planning stage	Prepared groundwork for implementation; ensured funding and formal planning in place.
2021	Installation	Internet network installed 15 metre tower built in Hamlet 3; signal distributed to Hamlet 1 & 2 via cables. Initial voucher system launched: 3 hours access per 12 hours.	Total investment: IDR 151 343 400 ≈ USD 10 090	Pilot network operational; voucher system introduced; Initial disruptions due to fallen trees.
2022	Implementation	Evaluated network issues; revised network configuration. Hamlet 1 & 2 connected directly to the main tower to improve reliability.	CAPEX covered by revenue OPEX covered by revenue	Network stability improved; maintenance easier.
2023	Sustainment	Network became self-sustaining; voucher sales covered operational & maintenance costs. Villagers hosting routers/towers earned commissions. Voucher agents received a commission based on their sales Village reinvested profits into maintenance and expansion.	OPEX covered by revenue; no additional Dana Desa funding required	Eliminated dependence on Dana Desa funding; community ownership strengthened; financial sustainability achieved.
2024	Expansion & optimization	Voucher pricing adjusted for community affordability. Daily users increased; coverage expanded to additional households.	Funded via revenue from voucher sales	Increased accessibility; economic model strengthened; network reached more villagers.
2025 (in progress)	Legalization & governance	Network formalized as village asset via village regulation. Revenue treated as village income for network maintenance, and other village priorities. Strengthened e-governance, digital literacy, and e-commerce initiatives.	Funded via revenue from voucher sales	Sustainable, community-managed ICT model established; long-term planning for socio-economic impact.

4. Impact of Internet access on the village of Cenrana

The introduction of Internet connectivity has had a transformative impact on Cenrana, improving access, usage, and socio-economic outcomes.

High usage and growing adoption

Internet access is now widely available within the village, and usage has steadily increased. Table 3 summarizes key metrics.

Table 3: Growth in Internet usage and community adoption in Cenrana (2022–2024)

Year	Population within network coverage area	Average number of daily users	Average number of users during peak periods (9 PM)	Total number of access vouchers sold per year
2022	700	65	80	8 280
2023	710	80	100	Not known[1]
2024	730	100	120	28 000

[1] Information not available at the time of reporting.

Although the population within the network coverage area increased slightly, average daily users and peak-period usage grew substantially, demonstrating high adoption and strong community engagement. Voucher sales confirm that villagers are actively utilizing the service.

Affordable Internet services

Table 4: Evolution of Cenrana village Internet voucher packages, 2022–2024

Voucher	Price (IDR)	Price[1] (USD)	2022 Duration	2023 Duration	2024 Duration	Service Duration
Voucher 01	5 000	0.30	3 hours/12 hours	3 hours/12 hours	6 hours/24 hours	
Voucher 02	10 000	0.60	8 hours	8 hours	16 hours	72 hours
Voucher 03	30 000	1.80	30 hours	30 hours	60 hours	1 month
Voucher 04	50 000	3.00	10 GB	10 GB	20 GB	1 month

[1] The conversion is based on an exchange rate of 1 USD = 17 700 IDR, using the currency rate as of 8 December 2025.

The nominal price of each voucher has remained stable since 2022, ensuring affordability for the community. At the same time, the service duration or data allocation for each voucher has increased, effectively doubling in 2024, which reduces the price per hour or per gigabyte and provides greater value to users. For instance, Voucher 04, priced at IDR 50 000 (USD 3) for 20 GB, results in a cost of IDR 2 500 per GB, which is well below average mobile broadband price in Indonesia of IDR 4 669 per GB (USD 0.28 per GB), as reported by the Ministry of Communication and Digital Affairs[10].

Most importantly, pricing was negotiated with the community to ensure affordability. When villagers requested lower prices, the village government adjusted the voucher prices accordingly, reflecting a community-centred approach. By providing greater value at the same or adjusted price, the vouchers have encouraged higher usage and contributed to the rapid growth in adoption.

Socio-economic and administrative benefits

According to the Village Head of Cenrana, Internet connectivity in the village has begun to improve public services and daily life. Villagers can request administrative documents, such as birth, health, or marriage certificates, online, reducing travel time

[10] *Laporan Kinerja Kementerian Komunikasi dan Digital 2024* (2024 Performance Report of the Ministry of Communication and Digital Affairs), Kementerian Komunikasi dan Digital. Available at: Link. Accessed: 2 December 2025.

and costs. Village officials already use Siskeudes[11] to manage financial administration tasks, and plan to adopt additional digital platforms, such as Spades[12] and SIKS-NG,[13] in the future to further improve administrative efficiency.[14]

Economic opportunities have expanded through online marketplaces, enabling the sale of local products such as forest-sourced honey. While direct delivery to the village remains limited, villagers can purchase goods online and collect orders in nearby towns. Initially, connectivity was limited to about 70 households, but growing demand driven by villagers purchasing affordable Internet vouchers for access to online services, education, and marketplaces, enabled the village to expand coverage and provide compensation to households hosting routers or other infrastructure. Revenue from voucher sales has become an important source of village income, helping to support network maintenance and other local priorities. In the education sector, the village government provides schools with vouchers for using School TV.[15] Additionally, the income generated from Internet services has been submitted to PAD (*Pendapatan Asli Desa* – Village Own-Source Revenue). These funds are planned to be used for road maintenance and to purchase an excavator for village development projects.

Socially, Internet access has enhanced communication, knowledge sharing, and participation in wider digital networks. The network is now central to the development of Cenrana, improving governance, economic activity, and overall quality of life.

5. Conclusion

The Cenrana Internet project demonstrates that the strategic use of Dana Desa funding to increase connectivity, coupled with community-centred planning and transparent governance, can serve as an effective mechanism to overcome the technical, economic, and social barriers that typically hinder digital connectivity in remote areas. It also provides an alternative to Indonesia's universal service fund (USF). Despite being a small community of just over 800 residents scattered across hilly terrain, Cenrana has managed to address challenges such as difficult topography, limited purchasing power, and low digital literacy, which are factors that often discourage commercial ISPs from investing.

Through the strategic allocation of funds, the community was able to finance essential infrastructure, procure equipment, and support local training programmes, thereby reducing both the upfront and ongoing costs that normally make such projects unfeasible. This locally driven investment model also ensured community ownership, encouraged efficient use of resources, and built trust and participation among residents.

11 *Siskeudes* (Village Financial Management System) is a government-developed digital platform used for recording, monitoring, and reporting village financial management activities.

12 *Spades* (Village Planning Information System) is a government digital tool used for managing village assets, including infrastructure, spatial planning, and development programmes.

13 *SIKS-NG* (Sistem Informasi Kesejahteraan Sosial – Next Generation) is a government-managed digital system under the Ministry of Social Affairs of Indonesia. It serves as a unified social welfare database for collecting, verifying, and updating household and individual socioeconomic data, which is used to determine eligibility for social assistance and welfare programmes across national and local levels.

14 Training was provided by the district-level coordinator at the PMD office. The PMD Kabupaten (Village Community Empowerment Office at the district level) serves as the local extension of the Ministry of Villages, offering guidance, training, and support to village officials and communities while coordinating with other relevant local government offices.

15 School TV refers to a government programme to equip all schools in Indonesia with television screens, as part of a broader effort to support the "digitization of schools" and provide access to educational content, particularly in remote or under-served areas.

As a result, the Dana Desa programme in Cenrana has achieved affordable and sustainable Internet access, improved public service delivery, expanded economic opportunities, and strengthened social connectivity. The experience illustrates that when funds are managed strategically and inclusively for connectivity, they can transform structural barriers into opportunities for equitable digital inclusion. Cenrana thus offers a practical and replicable model for other rural communities seeking to bridge the digital divide and foster sustainable socio-economic development.

Acknowledgements

ITU extends its gratitude to the Head of Cenrana village (2019-2027), Mr. Kartono S.Pdi, and his dedicated team for their warm welcome, openness, and unwavering support which have made this work possible. Their willingness to share their experience has been truly invaluable in presenting their story in an accurate and meaningful way and in bearing firsthand witness to the spirit of Cenrana village.

In partnership with

UK International Development

Partnership | Progress | Prosperity

ITUPublications

International Telecommunication Union
Place des Nations, CH-1211 Geneva Switzerland

Published in Switzerland, Geneva, 021