

Importance of community networks for meaningful and sustainable connectivity



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Rural connectivity challenges in India



Unavailability of Fiber Backhaul



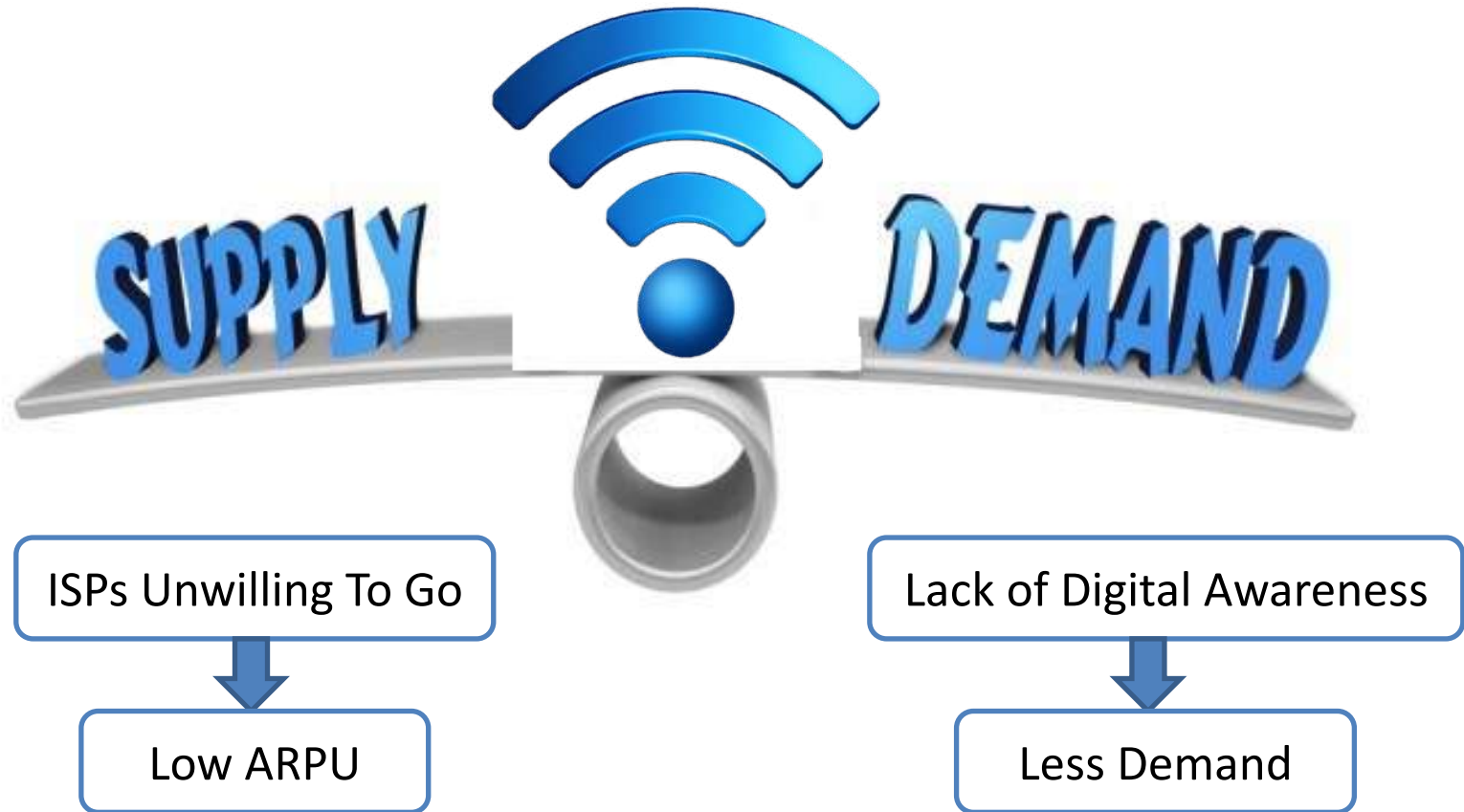
Low Average Revenue Per User (ARPU)



Intermittent Availability of Electricity



Uneven Demand and Supply



Rural India's dependency on connectivity

- Use of manual records by ANMs and ASHA workers Primary Health Care Centers
- Unable to upload attendance, scholarships of students in schools
- No ATMs and Banks in villages
- E Governance services unable to reach the people



Why community networks?

- Network BY the people, FOR the people.
- Connectivity based on community needs.
- Owned by the community.
- Setting up the connectivity is paid by the community.
- Sustainability of connectivity is enabled through partnerships and entrepreneurship models.
- Enables gender equality for use and utilisation.
- Everything local!!!!



Role of organisations supporting CNs

- Internet Society
 - Country chapters of Internet Society
- Association for Progressive Communications
 - Community Networks Learning Grants
 - 12 CN peer grantees (4 each from Asia, Africa and Latin America)



Why connect?

- First determine the need
- Your need or their need
- Value of connectivity
- Uses of connectivity
- Who will enable the connectivity?
- Online? Offline?
- Gather funds
- Sustainable business model



Infrastructure Reuse and Sharing

- Use of 12 defunct towers in the test-bed
 - 10 - 15 meter heighted towers at GP location
 - Old towers strengthened for use
- In GPs without a defunct tower, 15 meter tower or 9 meter pole has been set up
- In some GPs, the roof is used or devices are clamped on to the GP walls.



Use of Solar Power

- All the towers/poles at GPs are equipped with solar panels and 48 hour battery backups
- All the devices run on solar power making it less dependent on grid electricity

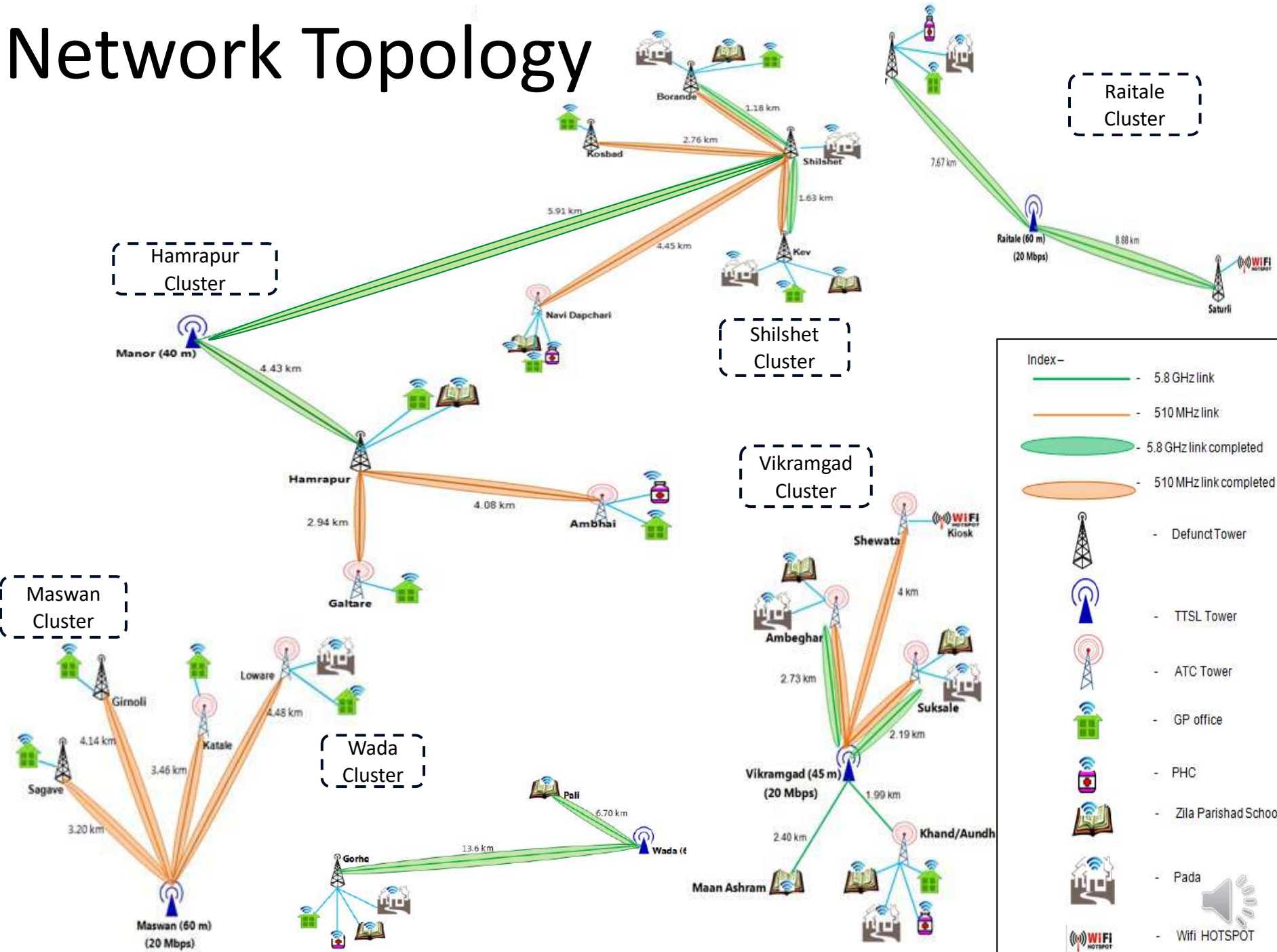


Indigenous technology development

- Routers
Eg. LibreRouter/LibreMesh
www.librerouter.org
- Community Radio
- Intranet mesh network
- Community content
- Community Platform
- E Commerce website for the community



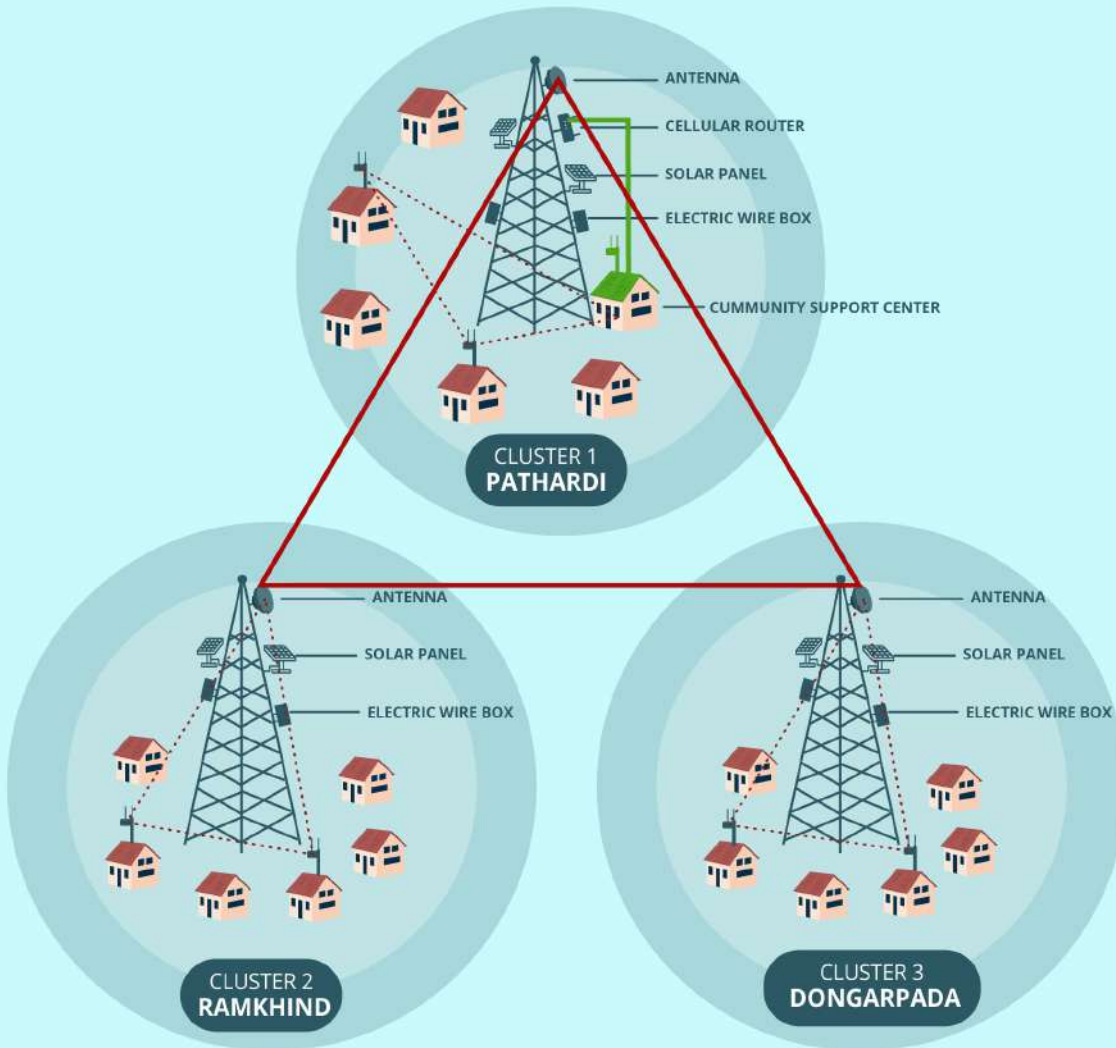
Network Topology



Index -

- 5.8 GHz link
- 510 MHz link
- 5.8 GHz link completed
- 510 MHz link completed
- Defunct Tower
- TTSL Tower
- ATC Tower
- GP office
- PHC
- Zila Parishad School
- Pada
- Wifi HOTSPOT

NETWORK ARCHITECTURE: IN PATHARDI VILLAGE



Ensuring community participation

- Co-creating Internet
- Traditional knowledge sharing
- Tribal art and craft
- Community radio
- Local language news



WOMEN FIRST APPROACH IN COMMUNITY NETWORK

Focus on Pathardi village in Jawhar, Maharashtra



The place where



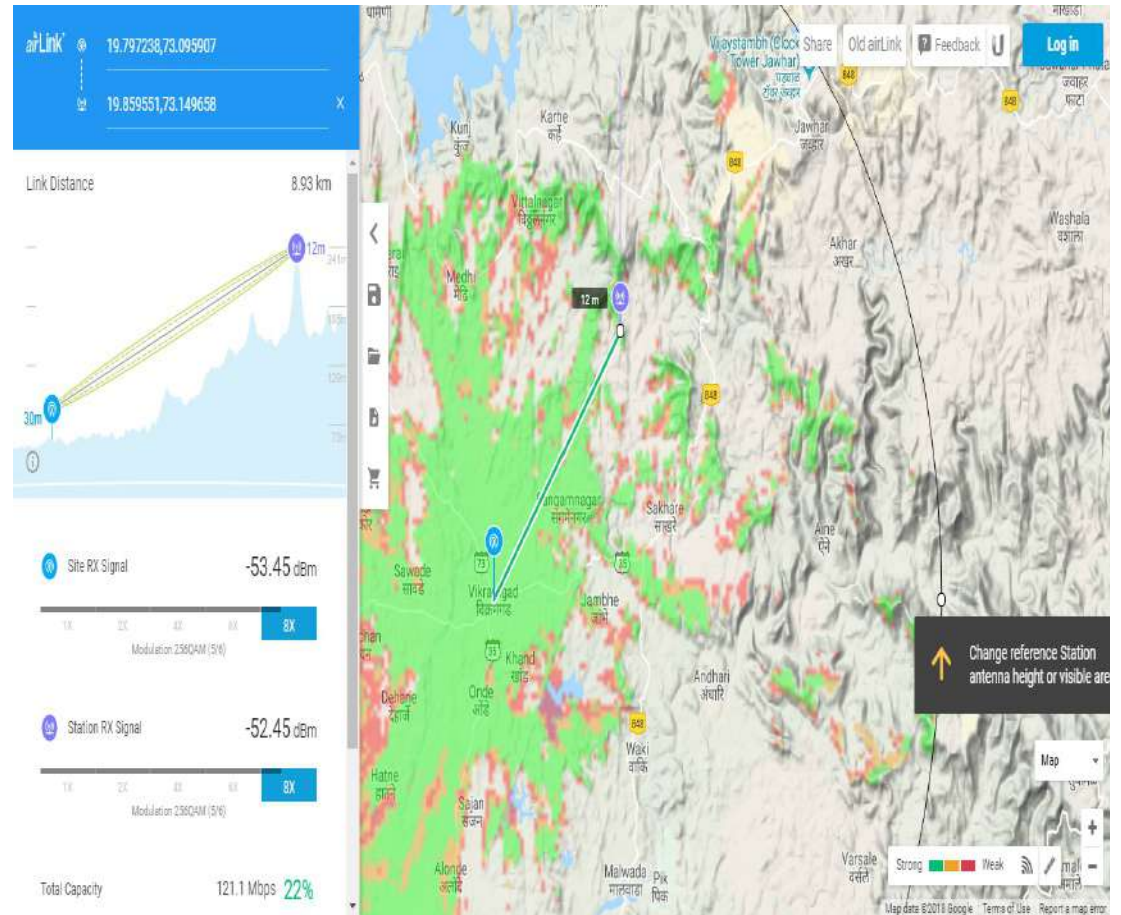
Pathardi is located



Our inception



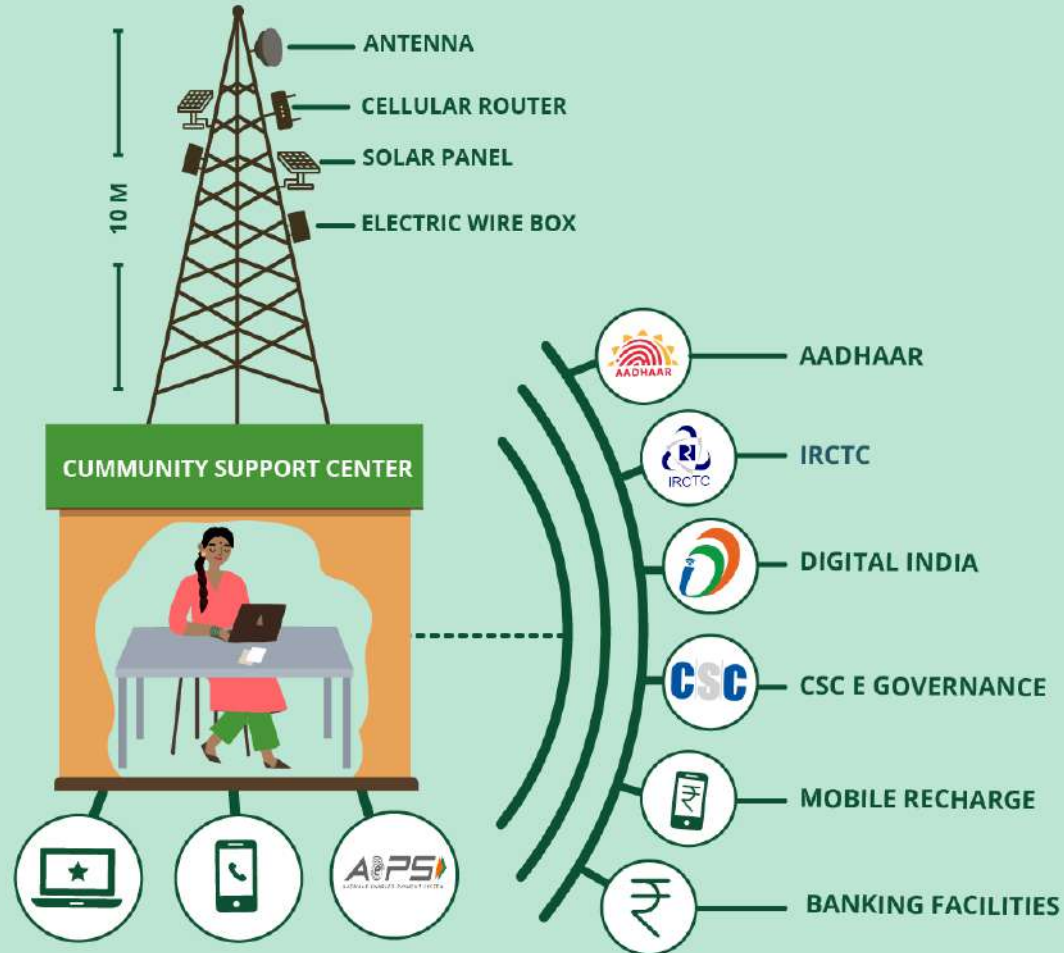
Our technical assessments



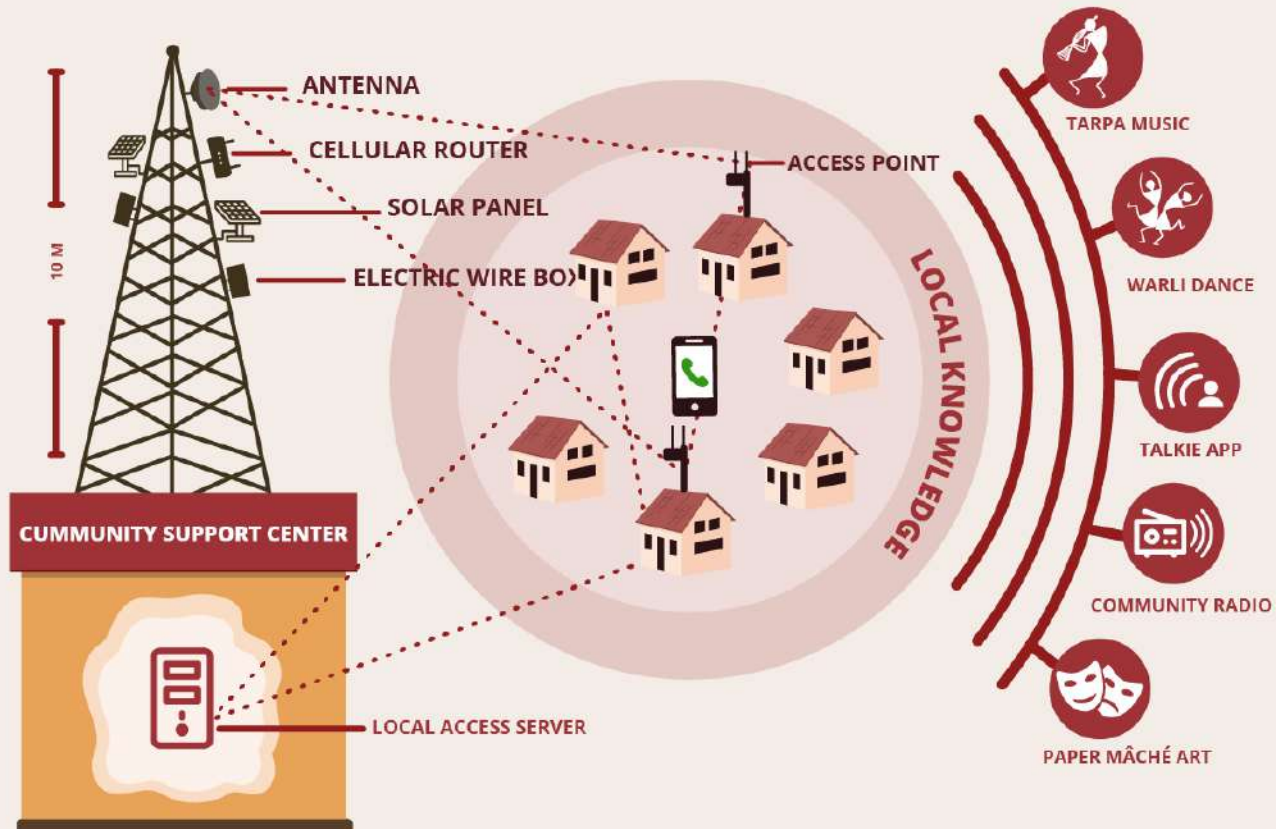
Tribal art and craft



ONLINE CONNECTIVITY AND USES



OFFLINE MESH NETWORK



Deployment by the community



eDost

Digital Village Catalyst

Financial services

AePS: cash withdrawal
and cash deposit
Mobile Recharge
Financial mobile apps



Life skills

Digilocker
Agricultural market prices
Weather information



Surveys / mapping / documentation

Digital surveys: Epicollect
Traditional resource documentation
Mapping of resources



e Governance

Citizenship documents
Mahalabharthi
Aaple Sarkar



Literacy / Education

e Learning facilitation
How to get things done online
Portal form filling



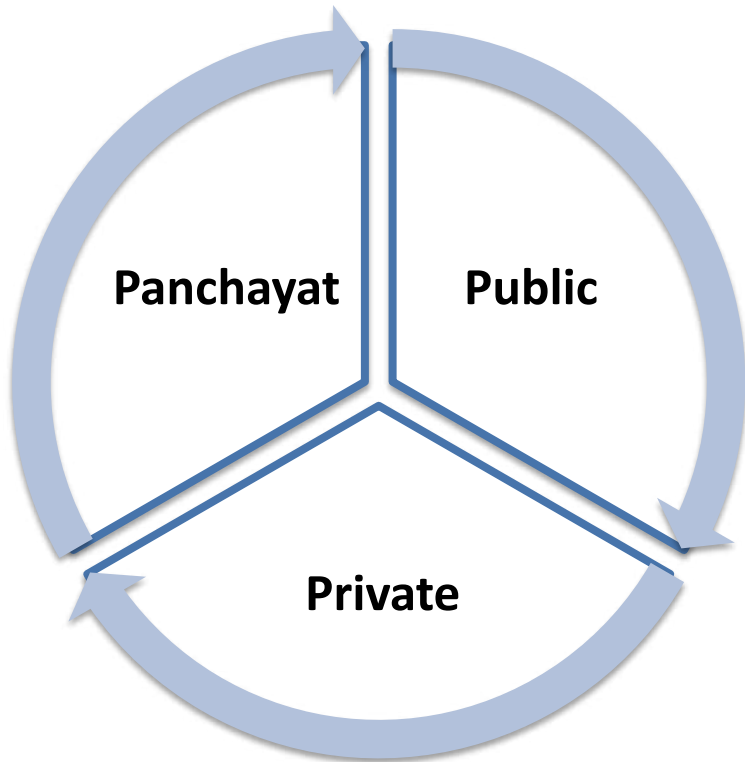
Value chains / e Commerce

Value chain digitisation
Portfolio development
Sell local produce



Sustainable Economic Model: Public Private Panchayat Partnership Model

4-P Model



Multi stakeholder partnership model

Involvement of local entrepreneur and community

Recovering OPEX the key principle

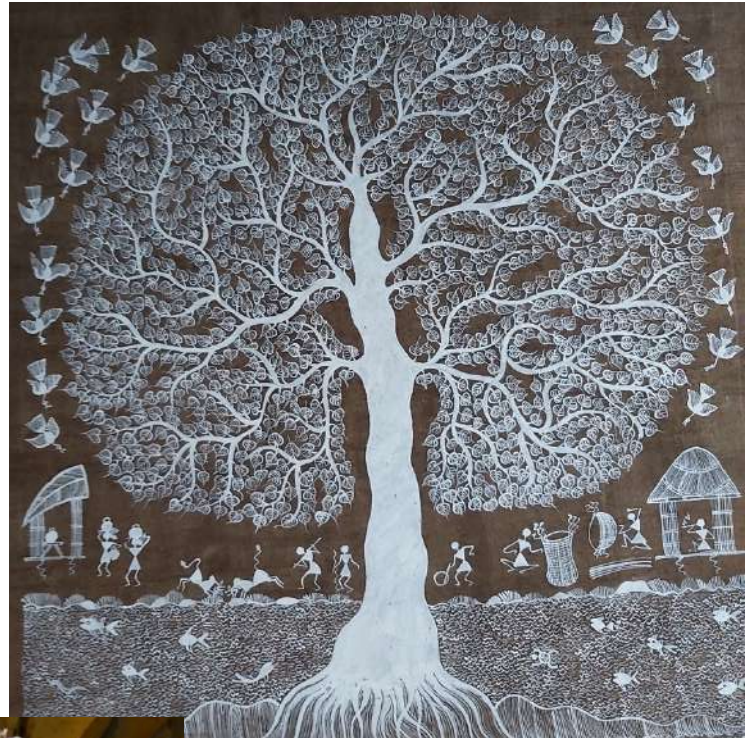
Revenue sharing community model

Localised model (can be adapted to regions)

Modular and scalable model



Entrepreneurship model



Satisfied users of connectivity



Publications

1. S.B.Belur and R.Srivastava, New Age women and their approach towards internet connectivity in rural India, GenderIT, October 2019.
2. M.Khaturia, J.Singh, A.Patil, S.Banerjee Belur, A.Karandikar, P.Chaporkar and T.Ghadge, Towards Frugal 5G: A case study of Palghar test-bed in India, IEEE WCNC Future Networking Workshop for 5G and Beyond Test-bed and trials, April 2019.
3. S. Banerjee Belur (2018), Addressing sustainability in rural connectivity: A case study of Gram Marg community-led networks, Book Title: Global Information Society Watch 2018, Community Networks, published by Association for Progressive Communications (APC).
4. S. Banerjee Belur, M.Khaturia and N.P. Rao, Community led networks for sustainable rural broadband in India: The case study of Gram Marg, Paper presented at Internet Governance Forum 2017 at United Nations, Geneva, Switzerland, December 18-21, 2017.
5. M.Khaturia, S.Banerjee and A.Karandikar (2017), TV White Space technology for affordable Internet connectivity in developing countries, Book Title: TV White Space Communications and Networks, Eds: Robert Stewart, David Crawford and Andrew Stirling, Elsevier Publications.



Thank You

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