



Unlocking Nepal's Internet Potential: Infrastructure, QoS, Possible Roadmap

Presenter

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CEO, ISPAN

President WP Nepal, Senior Lecturer, IT Programme



ISPAN- Intro

- Consortium: Set up with a mission to provide Internet for everyone(घर घरमा इन्टरनेट)
- Focus- Quality infrastructure and resources to enable High Quality Services to be delivered by the Internet Service licensees.
- Bridging: Citizens, Regulator, Service Providers(NSPs, ISPs)



Internet Industry Deliverables: AAS(आइएएस)

- **Affordable**

As per the ITU reports(Broadband Commission A4AI) and independent report- Nepal FTTH Broadband, is ranked in the list of **Top 10 cheapest Broadband, globally.**

- **Accessible**

ISPAN members have connected each ward offices, health posts, and secondary and higher secondary schools around the country through 14 packages of RTDF subsidized projects.

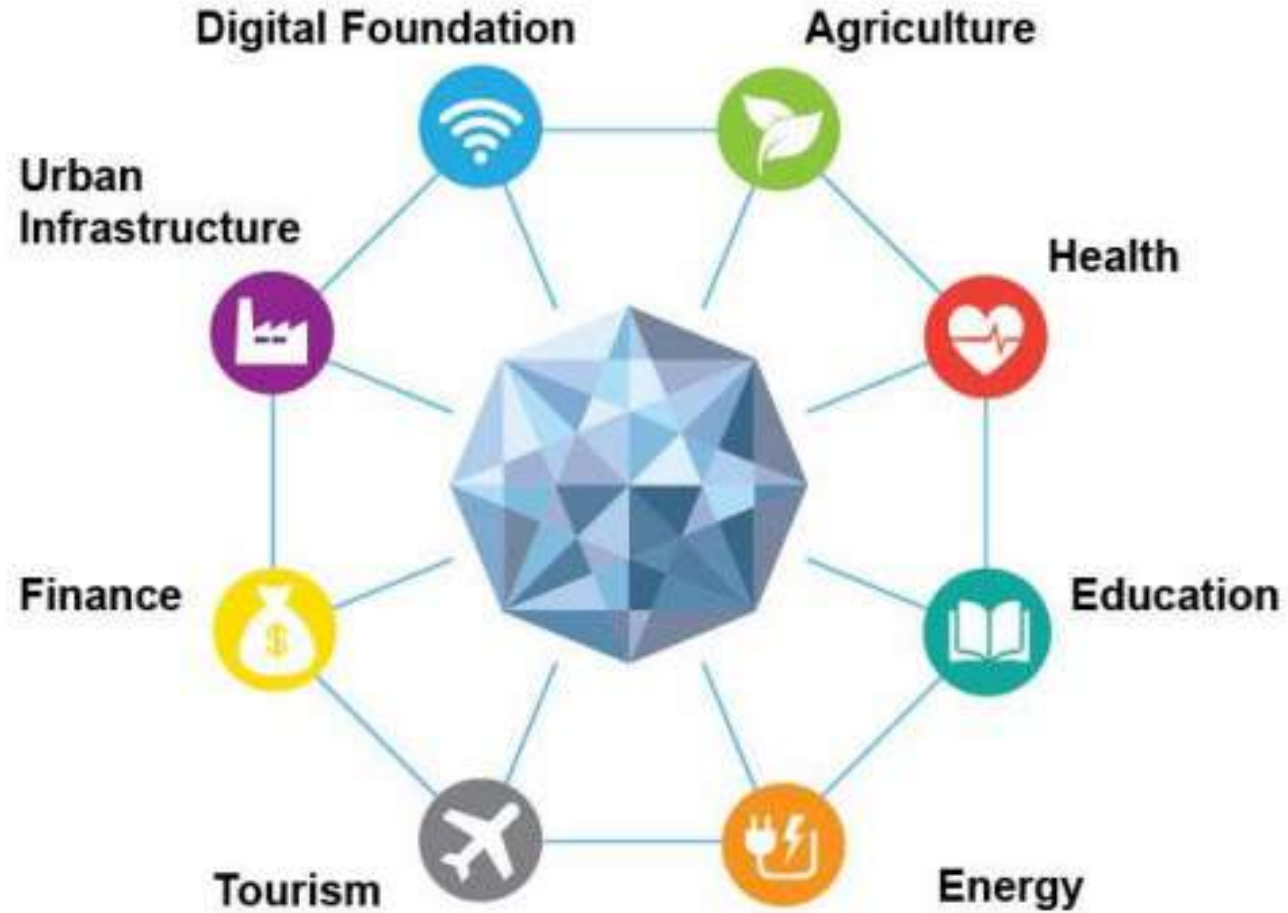
- **Stable**

We are working on this, with a roadmap.

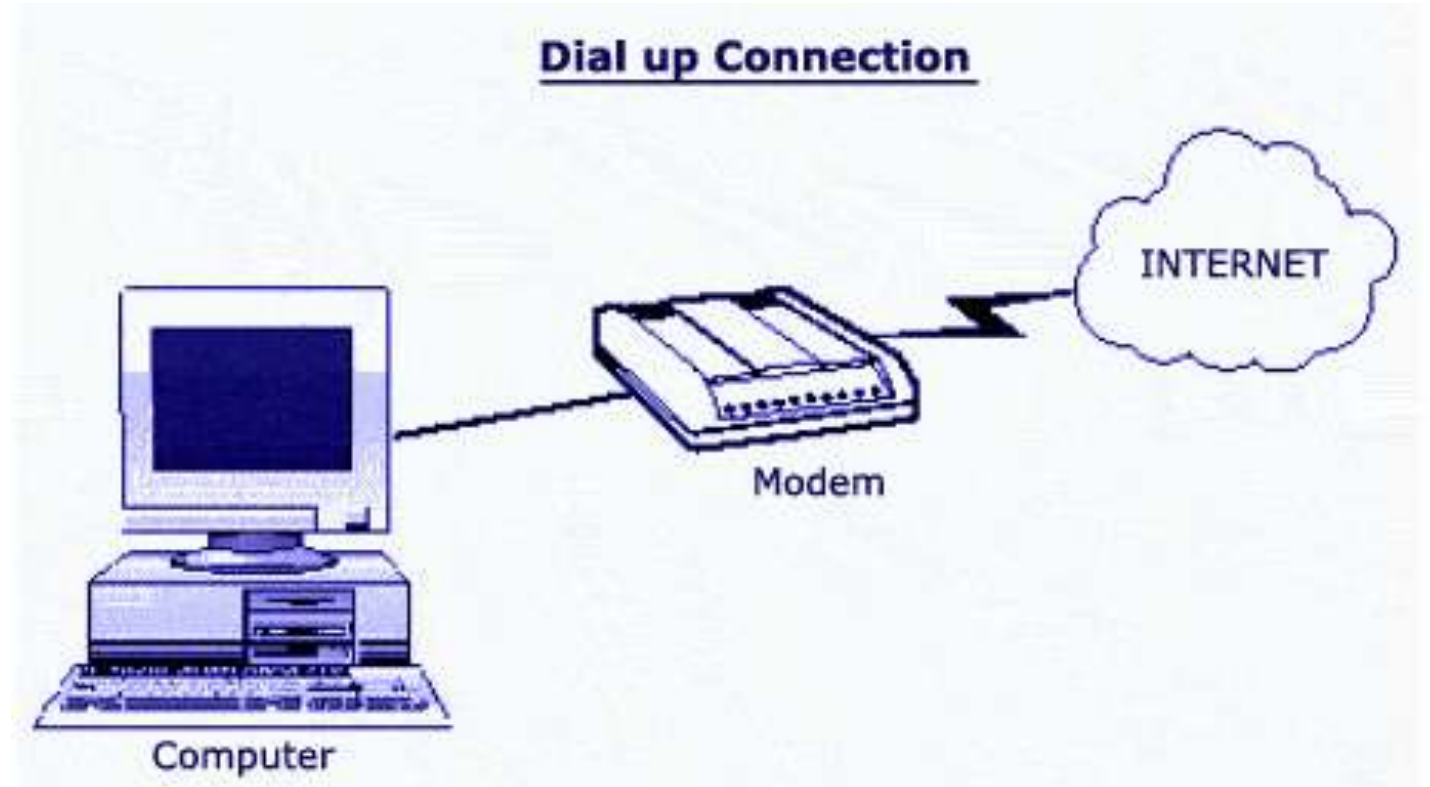
DIGITAL NEPAL



Digital Nepal Framework



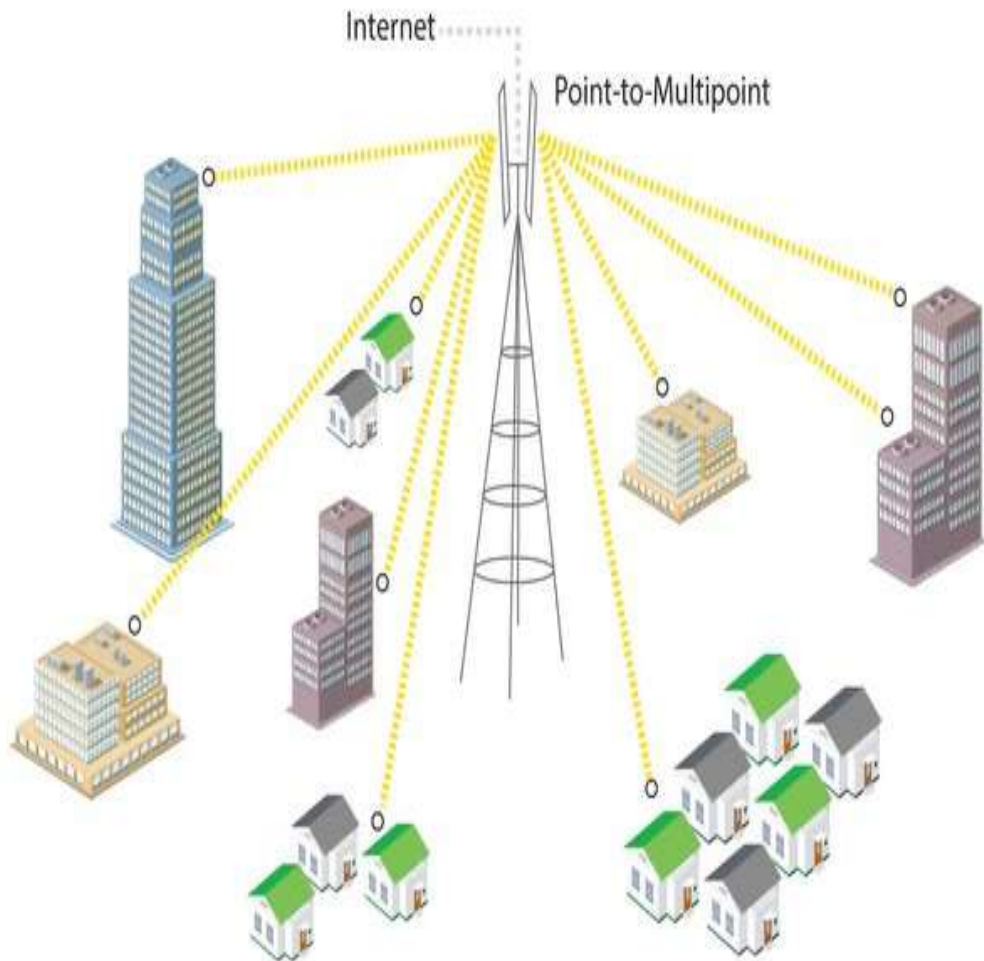
History of Internet Access in Nepal



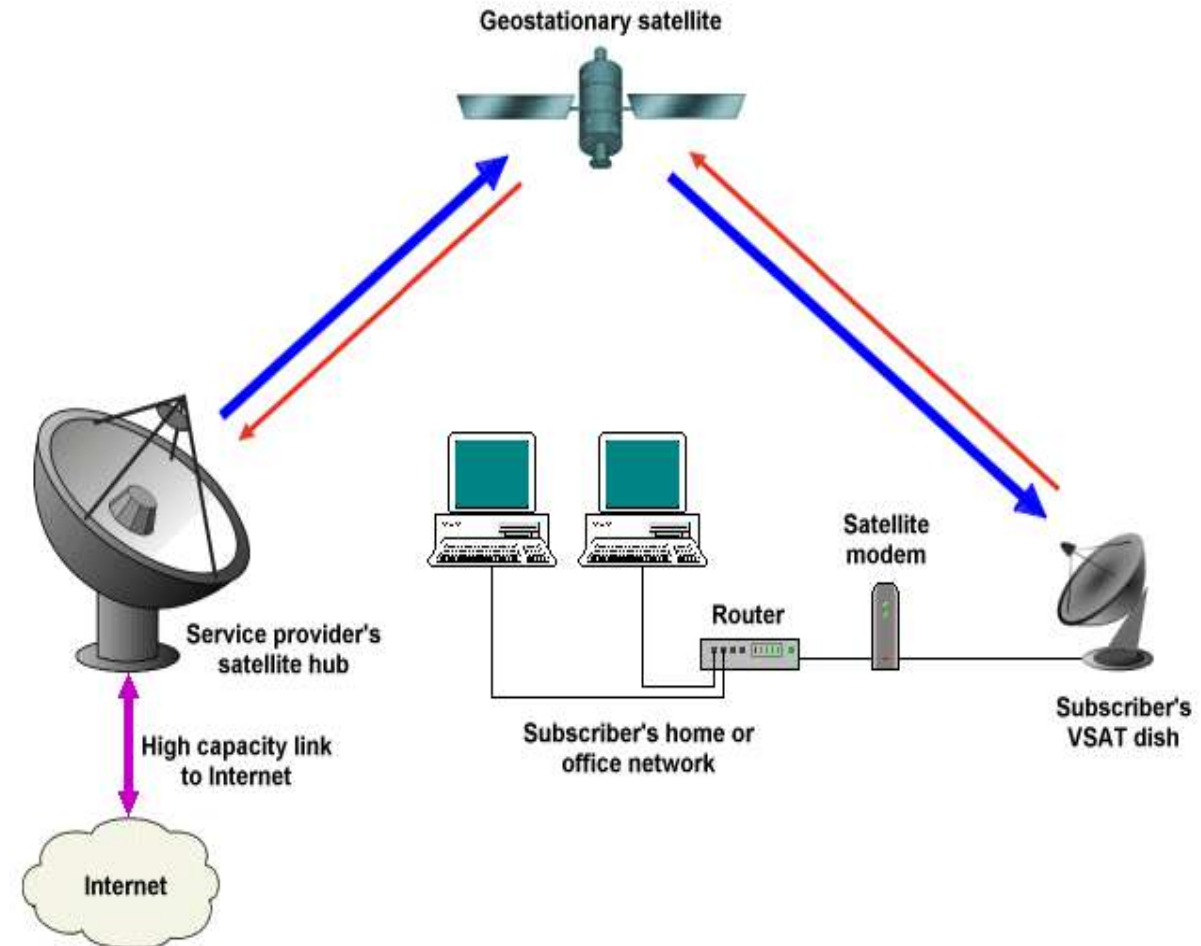
History of Internet Access in Nepal:



Wireless (2.4/5.8 GHz)

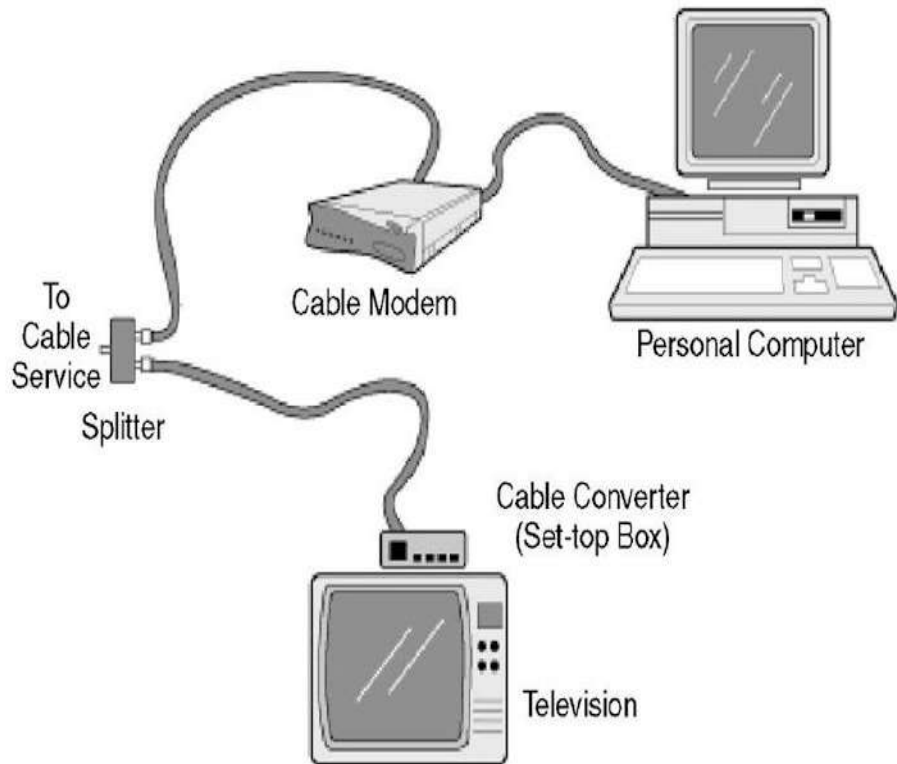


VSAT

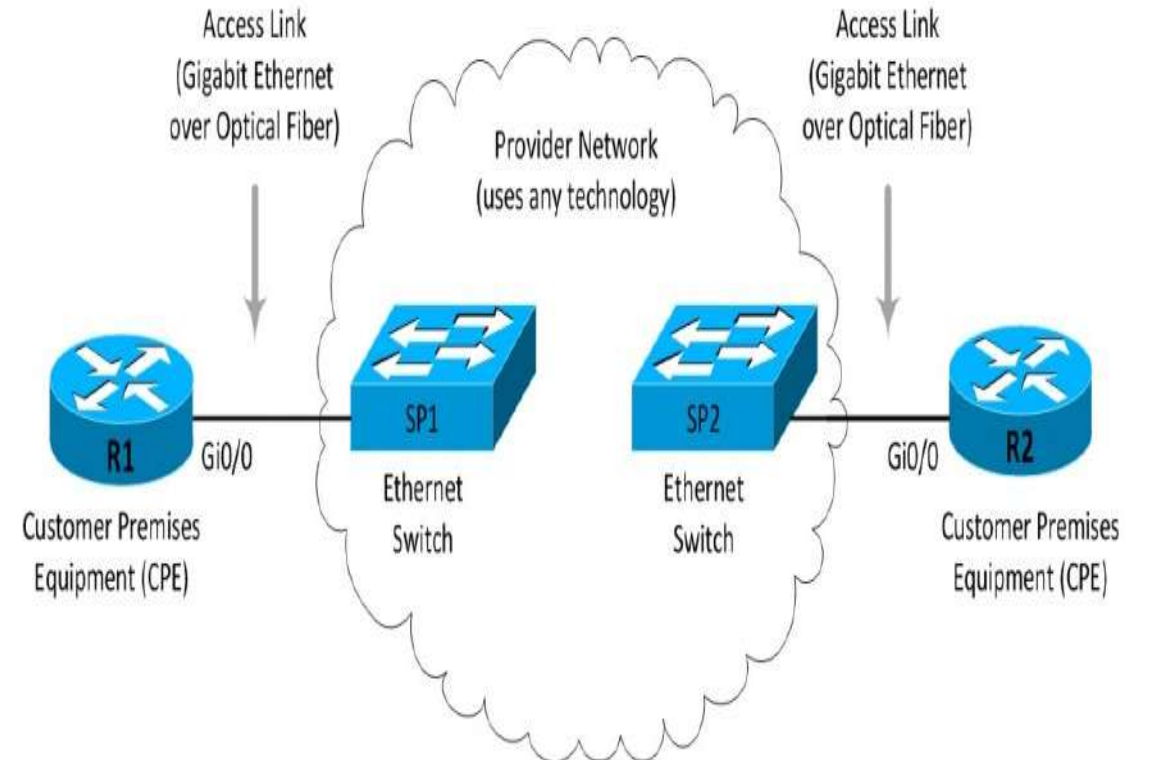


History of Internet Access in Nepal:

Cable Modem

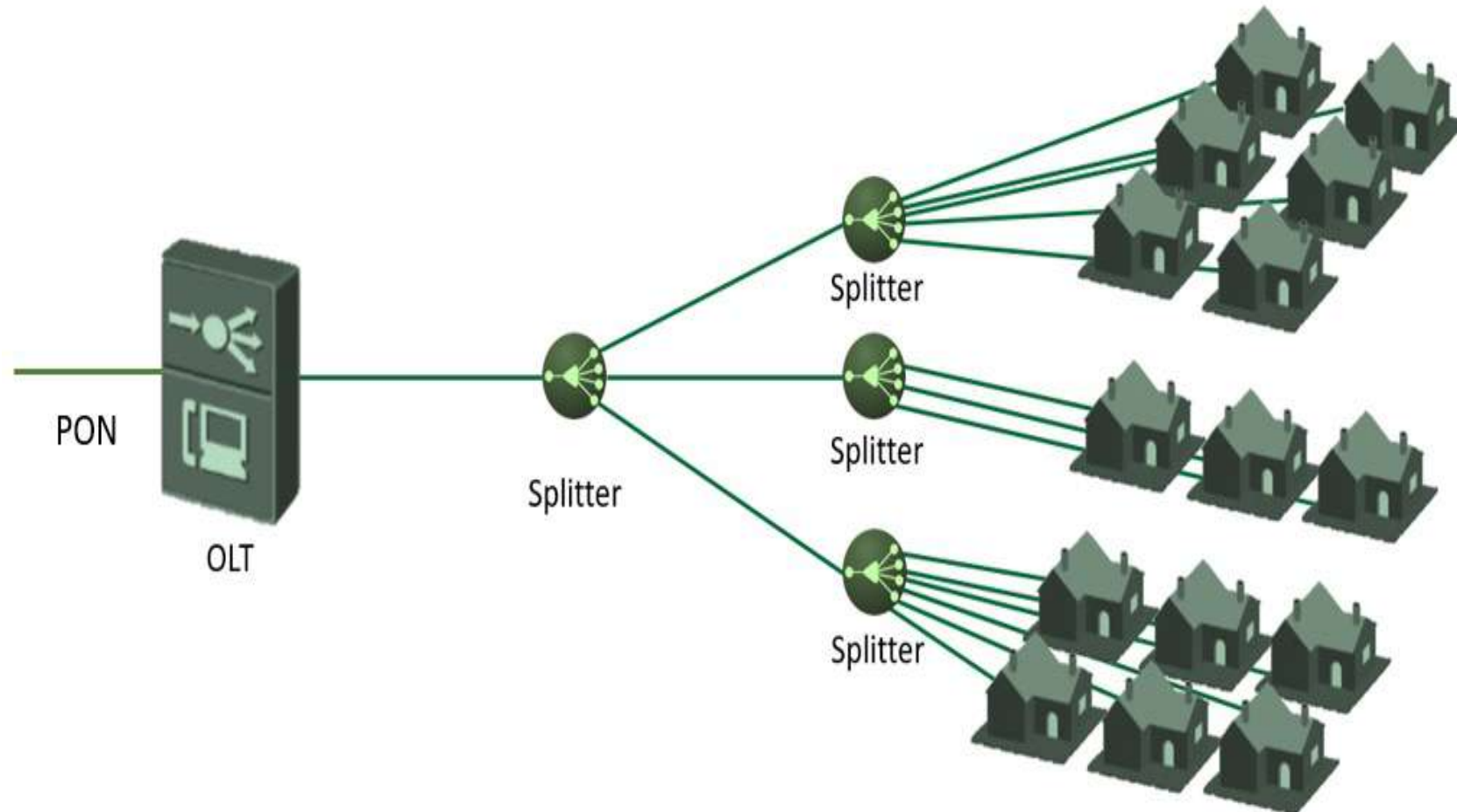


Ethernet WAN Technology



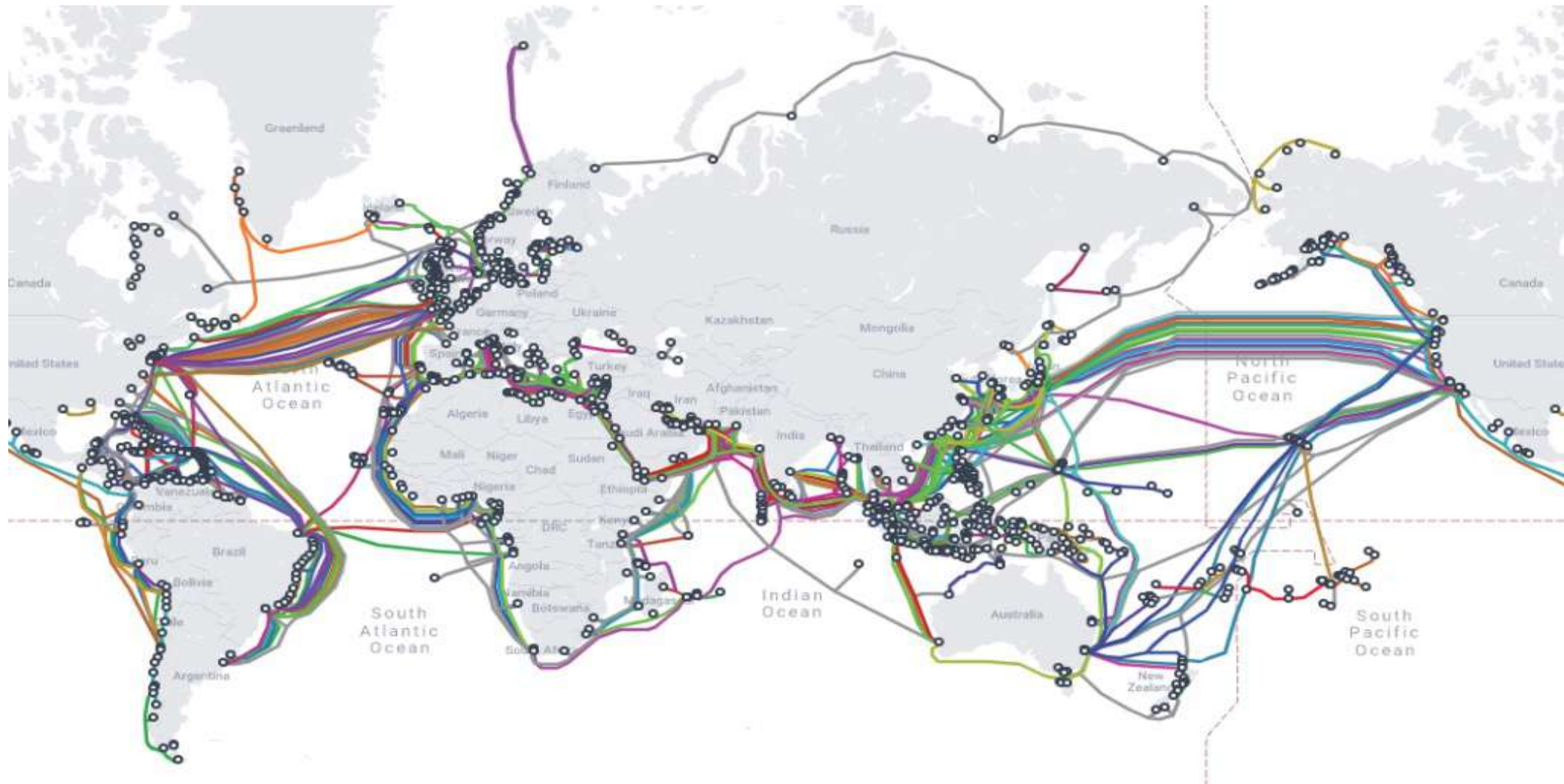
History of Internet Access:

FTTH(GPON)



INTERNET and Ecosystem

Global Internet



How Internet is Imported in Nepal:



Rasuwagadi

Tatopani

Kathmandu

Tanakpur

Bhairawa

Birgunj

Dhalkebar

Rani



पावरफिट

पावरफिट

Organizations working for Network/Internet



 **RIPE NCC**
RIPE NETWORK COORDINATION CENTRE

 **ARIN**

 **APNIC**

 **AFRINIC**
The Internet Numbers Registry for Africa

 **lacnic**

ACCESS

Infrastructure: BOON for NSP/ISP/TELCOs



OPGW



Poles





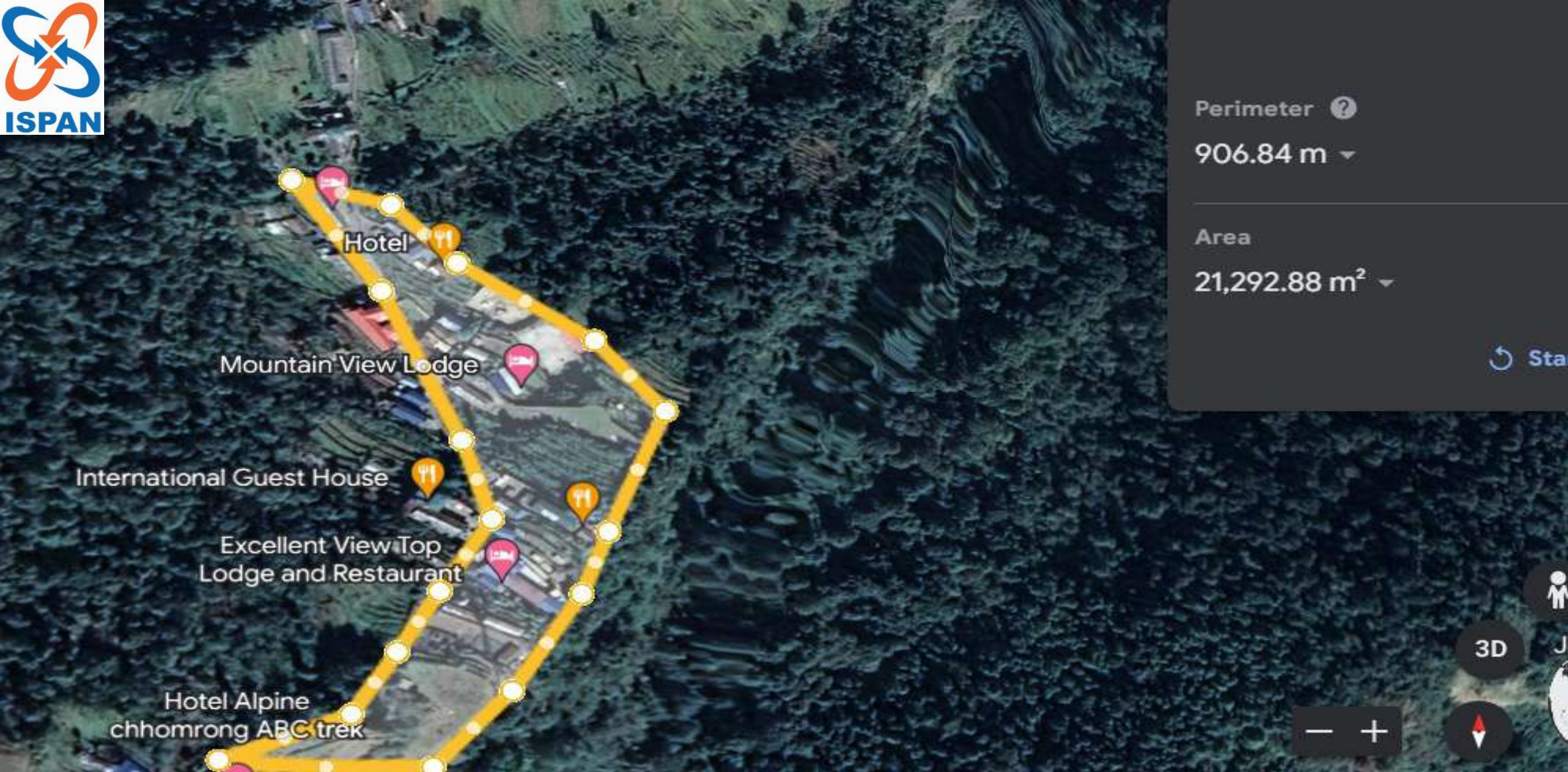
National Backhaul Networks

OPGW
ADSS
UG Infra.





RURAL
BROADBAND



Rural Nepal Scenario: Chhomrong, Ghandruk



Rural Nepal Scenario: Chhomrong,
Ghandruk



Distance ⓘ
 1,414.63 m ▾

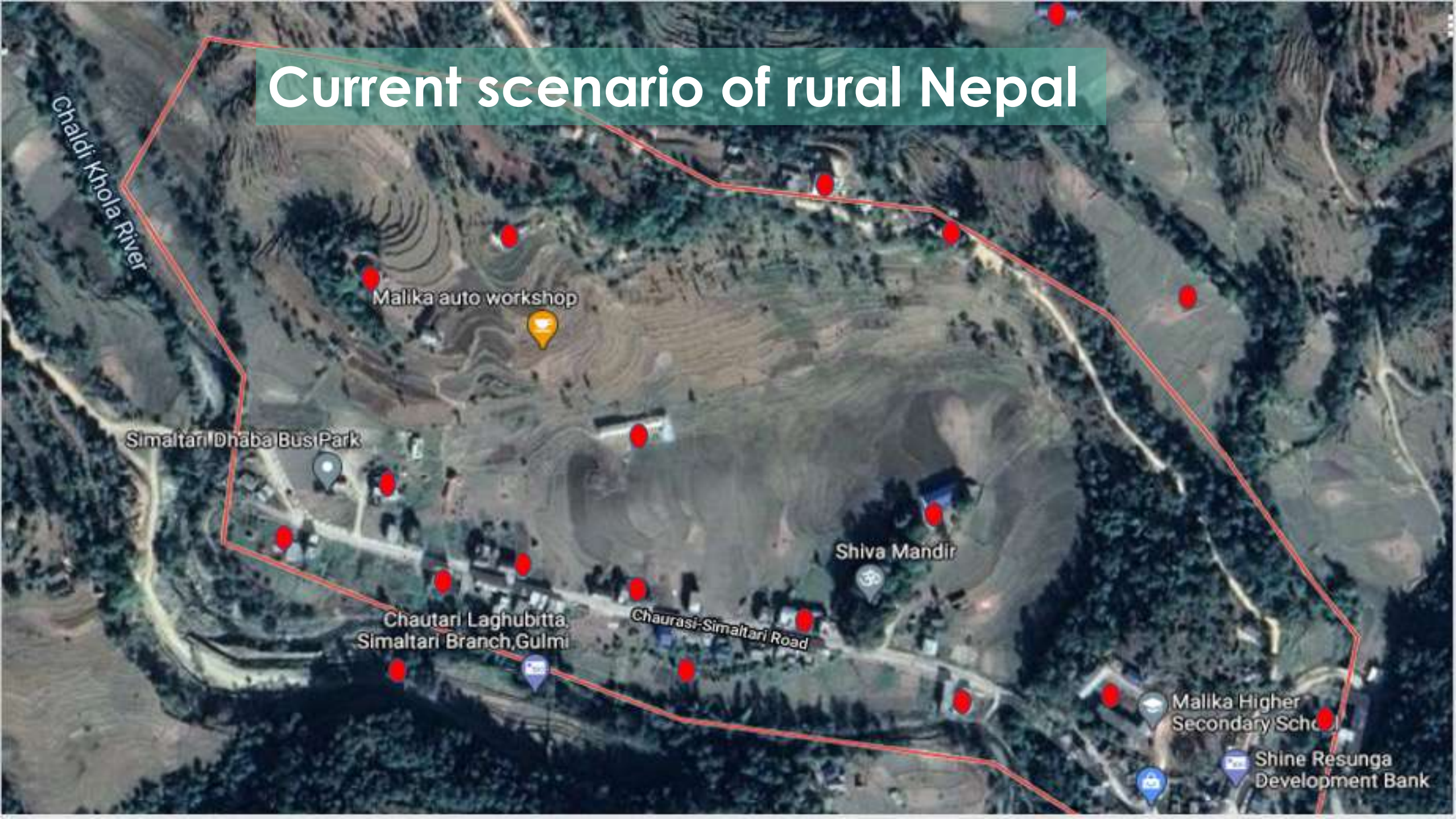
Start new

Shri Sudha
 Secondary School

Location and path icons

Map navigation controls: 3D, person icon, target icon, zoom in (+), zoom out (-), compass, and globe icon.

Current scenario of rural Nepal

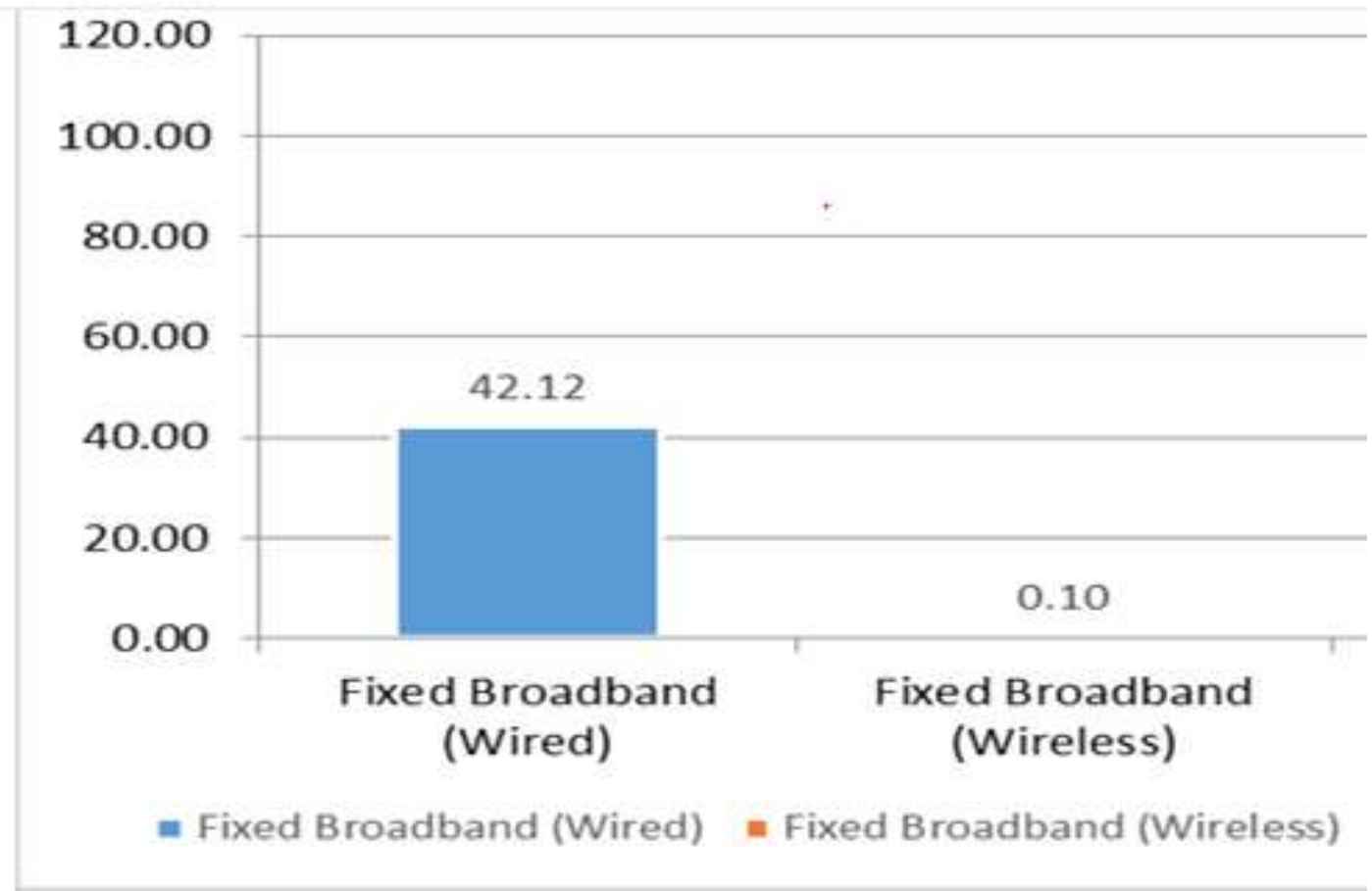


World Bank Report

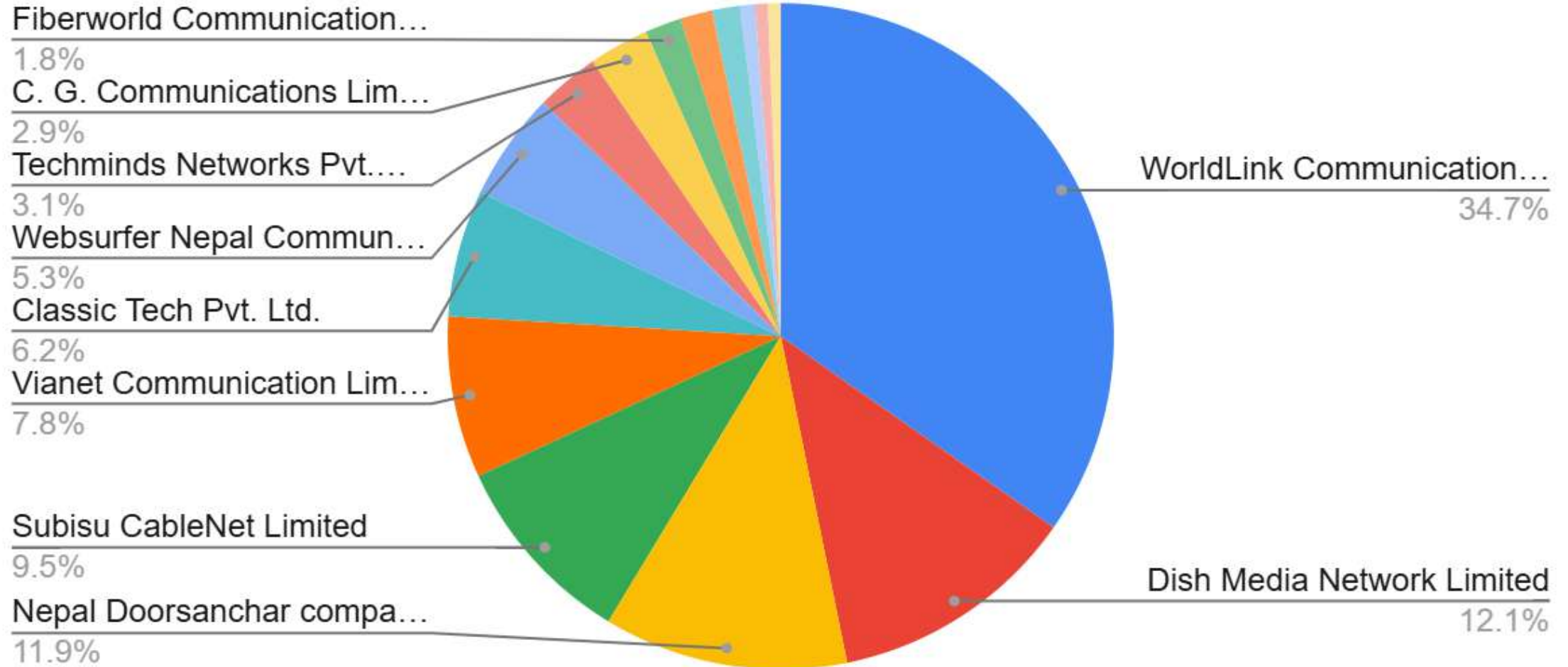


२. आजको सूचना संचार प्रविधिको वैज्ञानिक युगमा, इन्टरनेटले जीवनलाई सहज बनाउने मात्र नभई जीविकोपार्जन गर्न समेत इन्टरनेटको प्रयोग हुन्छ। विश्व बैङ्कको तथ्य अनुसार ब्रोडब्याण्डको पहुँचमा १०% ले वृद्धि हुँदा **GDP** पनि १.३८% ले वृद्धि हुन्छ। यही तथ्यलाई समेत नेपाल दूरसंचार प्राधिकरणले आधार मानेको छ। त्यसकारण ब्रोडब्याण्डको पहुँचमा वृद्धि हुनाले राष्ट्रलाई सम्बृद्धीको गन्तव्य तर्फ अगाडी बढ्न मद्दत गर्दछ।

Internet Penetration



Market Share (%)



AFFORDABILITY

AFFORDABILITY OF INTERNET

Nepal ranked in the list of **Top 10 cheapest Broadband**, globally.

Nepal is one of the country in the world with cheapest Internet price in FTTH (ITU, A4AI Global Price Basket List 2020).

Analytic



Internet Package	Average Daily Price (NPR)
50 Mbps	18.33
60 Mbps	28.33
100 Mbps	30.83
150 Mbps	38.33
200 Mbps	38.40



Beverage	Price (Rs)	Distance (km)	Fare (Rs)
Black Tea	10	5	19
Black Coffee	20	10	26
Milk Tea	20	15	31
Milk Coffee	50	20	35
Special Tea	30	>20	40
Lassi	90		





ISPAN

Internet Package

Average Daily Price (NPR)

50 Mbps

18.33

60 Mbps

28.33

100 Mbps

30.83

150 Mbps

38.33

200 Mbps

38.40

Item

Price (Rs)

Black Tea

20

Black Coffee

40

Milk Tea

40

Milk Coffee

100

Special Tea

60

Lassi

180

Bus Fare (5km)

38

Bus Fare (10km)

52

Bus Fare (15km)

62

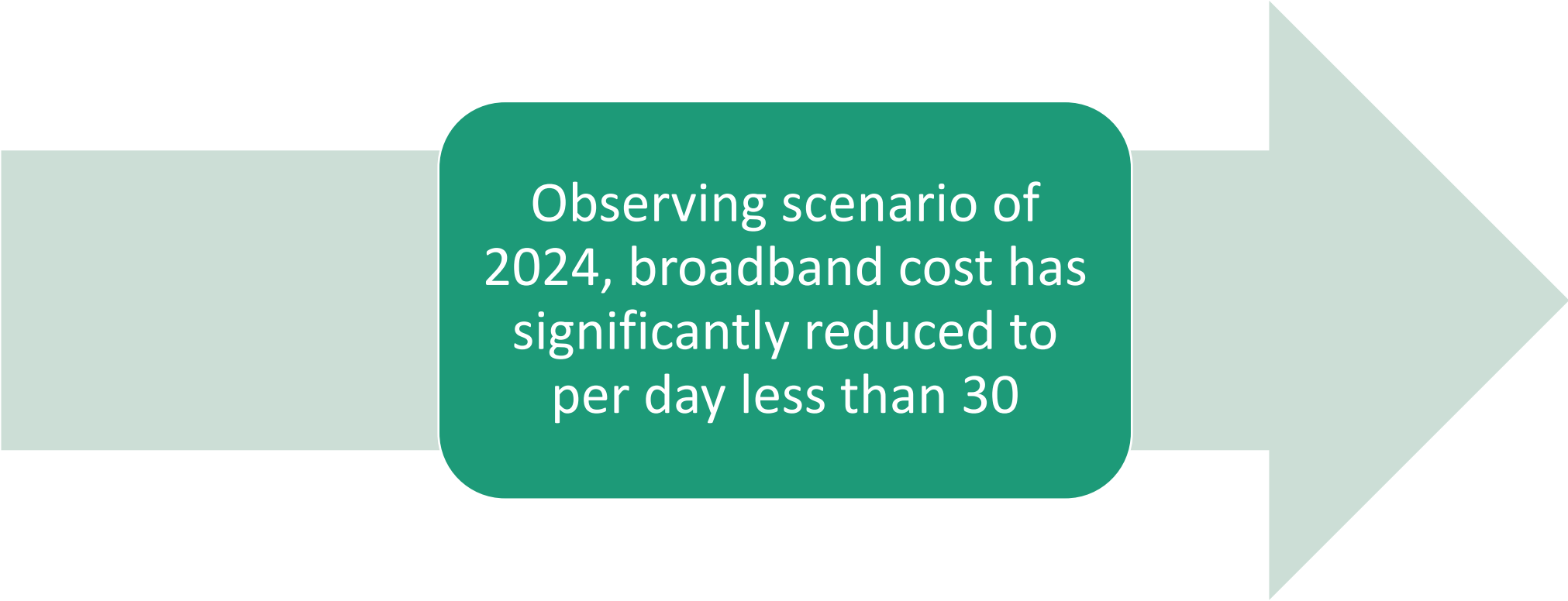
Bus Fare (20km)

70

Bus Fare (>20km)

80

Affordability

A large, light green arrow pointing to the right, with a dark green rounded rectangular box in the center containing white text.

Observing scenario of
2024, broadband cost has
significantly reduced to
per day less than 30

QoS Complaints

Complaint Address

Problem Domain	Total Number	Percentage
Internet Not working	9071	29%
Slow Browsing	2583	8%
Field Maintenance	18253	58%
Sales Related	1581	5%
Total	31488	100 %

CONSUMER ASSOCIATIONS REPORT

Cases of
complaint being
addressed

Force Majeure:
Alert

Customer complain and resolution:



Complaints

Most of the complaints are about internet not working.

Devices damage due to rain and bad weather.

Mishandling of devices (manual device reset from client, wires plug\unplug)

Resolution

- Checking source if its transmitting signals or not
- Informing clients about weather condition/ replacement of device or force majeure.
- Educate clients about the sensitivity of device handling.

Quality issues

Issues?

Fiber Breakage/cut



इन्टरनेटका तार काटेपछि दूरसञ्चार प्राधिकरण
रुष्ट, 'इन्टरनेट अवरुद्ध गर्ने काम दण्डनीय'



INFRASTRUCTURE COMPANY



- **Duplication of network and fibers** on overhead poles resulting in redundant investment.
- **Unmanaged fiber** are accident prone and make the city ugly.
- **Disruption in service** due to unnecessary fiber cuts.
- NTA recommendations are at MoCIT.
- **ISPAN has been continuously requesting MoCIT for Infrastructure Company Regulations which is still pending at MOICT. In the nutshell, this has caused a big problem for the development of Internet Industry.**



Cable management









Before



ISPAN, Inc.
4240338
422067
42318
4238185
9808679994
www.ispan.com

082



The word "After" is written in a large, bold, green sans-serif font. It is centered within a semi-transparent white rectangular box that has a thin green border. The background of the entire image is a photograph of a brick building with a curved facade and a row of windows, with trees and a street scene visible in the background.

After



After

The image shows a construction site for a multi-story building. The concrete frame is visible, with a yellow crane on the left. In the foreground, there are trees and a road with a white circular light fixture. A black arrow-shaped overlay points to the left, containing the word 'After' in green text. To the right, there are several flagpoles with red flags. The sky is clear and blue.



ललितपुर महानगरपालिका
स्व. महानगरपालिका
Lalitpur Metropolitan City
Pulchowk, Lalitpur, Bagmati Province, Nepal



२०७९/११/२०

ने.सं. ११४३ चिल्लागा मपतमी

प्रेस विज्ञापित

ललितपुर महानगरपालिका कला, संस्कृति र सम्पदाले सम्पन्न सहर हो। मूर्त र अमूर्त सम्पदा यो प्राचीन सहरको अमूल्य नीधि हुन्। सहरको सुन्दरता जोगाउँदै यहाँका अतीविक्रम धरोहरहरूको संरक्षण गर्न, सुरक्षित र बस्न योग्य सहर बनाउन ललितपुर महानगरपालिकाले भगीरथ प्रयास गरिरहेको छ।

यसै सन्दर्भमा, सहरलाई असुरक्षित बनाउने र सहरको सुन्दरतामा नै आँच पुग्ने गरी टाँगिएका तार व्यवस्थापन गर्न ललितपुर महानगरले गरेको प्रारम्भिक प्रयास सफल भएको छ। फलस्वरूप अव्यवस्थित तारको व्यवस्थापन भएको छ। तार व्यवस्थापनपछि ती क्षेत्र सफा र सुन्दर देखिएका छन्।

ललितपुर महानगरपालिकाले अव्यवस्थित तार व्यवस्थापनका लागि सरोकारवालाहरूसँग बैठक आयोजना गरेको थियो। उक्त बैठकको निर्णय अनुसार पहिलो चरणमा महानगरभित्रका चारवटा अशोक स्तुपा क्षेत्रमा टाँगिएका तार, कुम्भेश्वर मन्दिर परिसरमा टाँगिएका तार, पाटन दरवार क्षेत्र वरपरका तार र श्री रातो मछिन्द्रनाथको रथ निर्माण गर्ने ठाउँ पुल्चोकस्थित रथखेलमा टाँगिएका तार इन्टरनेट सर्भिस प्रोभाइडर एसोसियसन (आइएसएफ)को जिम्मेवारीमा दश दिन भित्र व्यवस्थापन गर्ने निर्णय भएको थियो। ती क्षेत्रको तार व्यवस्थापन गर्न दश दिनको समय अर्थात् तोकिएको थियो। ललितपुर महानगरपालिकाको नगर प्रहरीसहित आइएसएफले तोकिएको समय भन्दा तीन दिन अघि नै अर्थात् एक सातामा तार व्यवस्थापनको काम सम्पन्न गरेको छ।

ललितपुर महानगरपालिकाले वस्नयोग्य, सुरक्षित स्मार्ट सहर बनाउने अभियान अन्तर्गत तार व्यवस्थापनका लागि सडक भएका आइएसएफका प्रतिनिधि, ललितपुर महानगरका नगरप्रहरीलगायत यो काममा संलग्न सबैमा धन्यवाद ज्ञापन गर्दैछु। महानगरको अन्य क्षेत्रमा अव्यवस्थित तार अर्थात् बाँकी रहेकाले पुनः बैठक यसै तारहरूको व्यवस्थापनको कार्यतालिका बनाई क्रमशः कार्यान्वयन गर्दै जाने प्रतिवद्धता व्यक्त गर्दैछु।

चिरीयाव महर्जन
प्रमुख

Lalitpur Cable Management Work Appreciated:



Thamel, Work Appreciated by the then Vice President of Nepal at Jan 1, 2023:



Dispute with NEA , Impact on Digital Nepal Mission

Infrastructure	Initial Rate	Increased Rate	Reduced Rate (if applicable)
OPGW Rental	NRs. 14,000/year/km/core	NRs. 72,000	NRs. 32,000
ADSS Rental	NRs. 14,000/year/km/core	NRs. 30,000	
Pole Rental (Metro)	NRs. 205/pole/year	NRs. 850/pole/year	
Pole Rental (Municipalities)	NRs. 105/pole/year	NRs. 850/pole/year	
Pole Rental (VDCs)	NRs. 50/pole/year	NRs. 1600/pole/year	
Distribution Box	0	NRs. 600/year	

Pole rental
 9,000/km/year

- Equivalent to:
- Urban:850/pole/year
- Rural: 1600/pole/year

Underground Infra.

ISPs demand access to underground cable duct laid by NEA



Source: Nepalbuzz



Source: Techlekh



Underground Duct:



- **ISPAN working internally for constructing UG along with stakeholders' partnership.**
- **NEA Poles are removed without any discussion, planning, or information to us.**

- **However, we are jointly working to put the poles to run the internet services with our investment and share infrastructure(poles). For instance: Kamaladi(25 poles).**

दूरसञ्चार प्राधिकरणले भन्यो- 'पूर्वाधार कम्पनी नआएसम्म तारको दीर्घकालिन व्यवस्थापन हुँदैन'

Technology Khabar २० मंसिर २०७९, मंगलवार

405
Shares



Internet out in New Road after NEA removes cables off poles

by [Dinesh](#) — November 24, 2024 in Telco News · Reading Time: 4 mins read



बिनास कि
बिकास ??



Operational Challenges

- Theft of wireless devices
- Breakage of power source devices(Solar panel).
- NEA power outage\ unavailability.
- Forest fire.
- Lack of coordination from NEA regarding pole shifting and power outage.
- Office\POP power cutoff from NEA due to pole rent dispute.
- Lack of road access cause huge expenses on logistic \transportation .



कर(Tax):



- ब्यान्डविथ आयातबापत लाग्ने टिडिएस १० प्रतिशत कर बुझाउनु पर्ने।
- नेटवर्क सेवा प्रदायक (NSP) ले इन्टरनेट सेवा प्रदायक (ISP) लाई व्याण्डविथ बेच्दा १० प्रतिशत टिडिएस लाग्ने गरेको छ।
- NSP ले ISP लाई बिक्री गर्ने ब्याण्डविथमा लाग्ने ४% रोयल्टी र २% ग्रामीण दूरसञ्चार विकास कोष शुल्क रहेको छ।
- ग्रामीण दूरसञ्चार विकास कोषबापत: आफ्नो आम्दानीको २% वार्षिक रुपमा नेपाल दूरसञ्चार प्राधिकरणलाई बुझाउनु पर्ने।
- रोयल्टीबापत सूचना तथा सञ्चार प्रविधि मन्त्रालयलाई वार्षिक ४ प्रतिशत कर बुझाउनु पर्ने।
- दूरसञ्चार सेवा शुल्क १० प्रतिशत।
- **उल्लेखित करहरु जोड्दा कुल आयको ३२.६% कर नेपाल सरकारलाई करको रुपमा बुझाउनु पर्ने ।**
- **कर्पोरेट आय कर (Corporate income tax) ३० प्रतिशत रहेको छ।**

(इन्टरनेट सेवा सुर्तिजन्य तथा मदिराजन्य वस्तुमा भन्दा चर्को कर लगाइएको छ। सबै क्षेत्रमा कर्पोरेट ट्याक्स २५ प्रतिशत हुँदा इन्टरनेटमा भने मदिरा र सुर्तिजन्य उद्योग सरह कर्पोट ट्याक्स ३० प्रतिशत रहेको छ।)

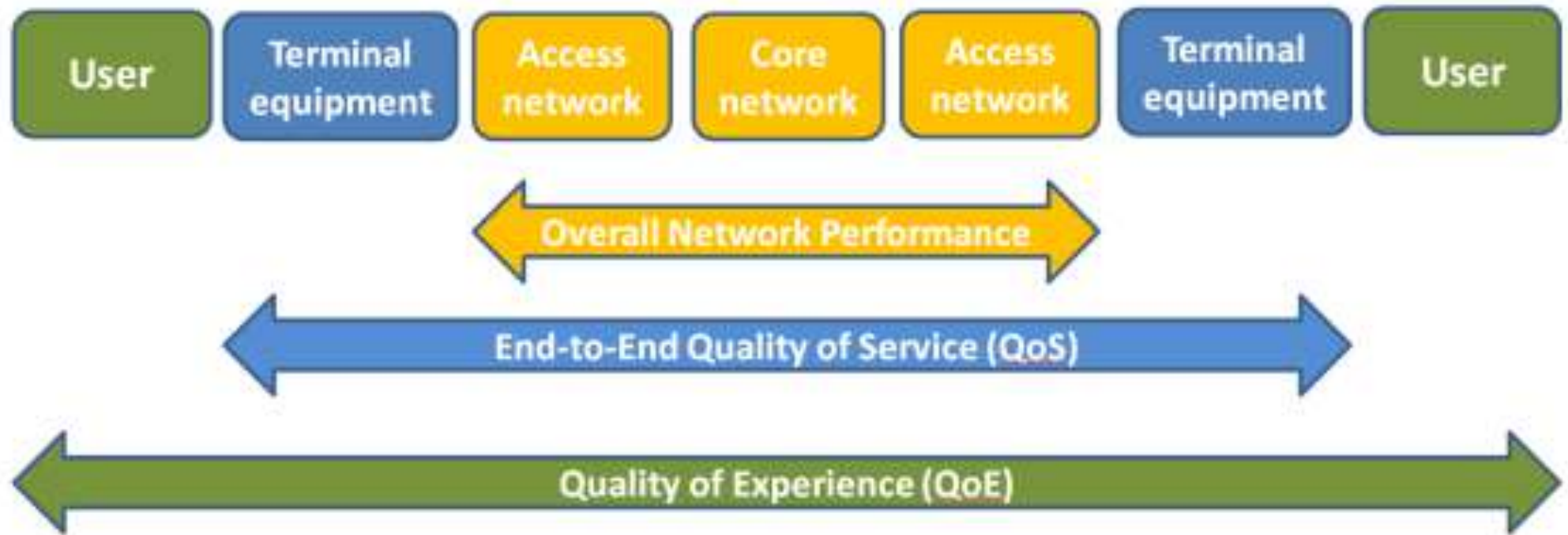
भन्सार कर:

विषयवस्तु	विद्यमान व्यवस्था
फाइवर केवल (ड्रम)	भन्सार कर १० प्रतिशत लाग्दै आएको छ।
फाइवर कनेक्टर	भन्सार कर १५ प्रतिशत लाग्दै आएको छ।
प्याच कर्ड	भन्सार कर १५ प्रतिशत लाग्दै आएको छ।
सेट टप बक्स	भन्सार कर १५ प्रतिशत लाग्दै आएको छ।
पावर सप्लाइ (यूपिएस)	भन्सार कर १५ प्रतिशत लाग्दै आएको छ।
नेटवर्क स्विच तथा मोडेम	भन्सार कर ५ प्रतिशत लाग्दै आएको छ।
वाइफाई राउटर	भन्सार कर ५ प्रतिशत लाग्दै आएको छ।
नेटवर्क ज्याक	भन्सार कर ३५ प्रतिशत लाग्दै आएको छ।

भन्सार कर:

जबकि इन्टरनेट बिना प्रयोग हुने
कम्प्युटर(टाईप राइटर) मा शुन्य
प्रतिशत भन्सार शुल्क रहेको
अवस्था बिध्यमान रहेको छ ।

Quality of services



Picture Credited to Actual Source(ITU)

BARRIERS TO ISPS

Roadblocks to ISPs



**Predatory
Pricing and
Unhealthy
Competition**

**Network
Stability Issues**

**Package
Standardization**

BARRIERS

License
Renewal
Issues

NEA

Pole shifting

Road
Construction

Municipality
Coordination/
Taxes

Biggest challenges to
secure and protect
the telecom
equipment.

Scattered Settlement



Picture: Credited to Internal Sources

Possible Roadmap, Recommendations

Phase 1: Infrastructure Development



Key Action

Sub-points

Establish a National Infrastructure Company

- Create a government-owned or public-private partnership company.
- Manage and share common internet infrastructure (e.g., fiber optic cables, poles, ducts).
- Avoid redundant infrastructure, reduce costs, and facilitate efficient network rollout.

Expand Fiber Optic Networks

- Prioritize laying fiber optic cables to rural and underserved areas.
- Offer incentives to ISPs for expanding their networks to these regions.

Develop Underground Cable Networks

- Gradually move towards underground cable networks in urban areas.
- Improve reliability, reduce visual pollution, and minimize damage from natural disasters.

Phase 2: Quality of Service Enhancement

Key Action	Sub-points
Implement Stricter Regulations	<ul style="list-style-type: none">- Enforce regulations on pricing and competition.- Ensure fair practices and protect consumers.- Prevent ISPs from engaging in price gouging or anti-competitive behavior.
Standardize Internet Packages	<ul style="list-style-type: none">- Introduce standardized internet packages and pricing.- Promote transparency and facilitate informed decision-making.- Make it easier for consumers to compare internet plans.
Encourage Network Upgrades	<ul style="list-style-type: none">- Incentivize ISPs to invest in network upgrades and capacity building.- Improve service stability and quality.- Offer tax breaks or subsidies for ISPs that invest in improving their network infrastructure.

Phase 3: Policy and Regulatory Reforms



Key Action	Sub-points
Reduce Taxes on Internet Services	<ul style="list-style-type: none">- Lower taxes on internet services.- Improve affordability and stimulate demand.- Make internet access more accessible to low-income households.
Amend the Telecommunication Act	<ul style="list-style-type: none">- Update the Telecommunication Act.- Address contemporary challenges and promote investment in the sector.- Ensure the regulatory framework is aligned with the evolving internet landscape.- Introduce Merger and Acquisition Regulations for the internet industry in line with the Nepal Rastra Bank (NRB) Merger and Acquisition Policy.- Implement Cross Holding Policies as ISPs/NSPs are not utilizing scarce national resources like frequency spectrum and right of way.
Streamline Forex Approvals	<ul style="list-style-type: none">- Simplify the process for obtaining forex approvals for investments in internet infrastructure.- Encourage foreign investment in Nepal's internet sector.

Phase 4: Collaborative Initiatives



Key Action	Sub-points
Foster Collaboration	<ul style="list-style-type: none">- Promote collaboration among ISPs, the government, and regulatory bodies.- Address common challenges and develop industry best practices.- Encourage a spirit of partnership and cooperation among stakeholders.
Encourage Knowledge Sharing	<ul style="list-style-type: none">- Support knowledge sharing and capacity building initiatives.- Enhance the skills and expertise of ISP personnel.- Facilitate training programs and workshops on the latest internet technologies and best practices.
Promote Consumer Awareness	<ul style="list-style-type: none">- Launch consumer awareness programs.- Educate users about internet safety, responsible usage, and available services.- Empower consumers to make informed decisions about internet usage and protect themselves online.

Internet is not only a Service:

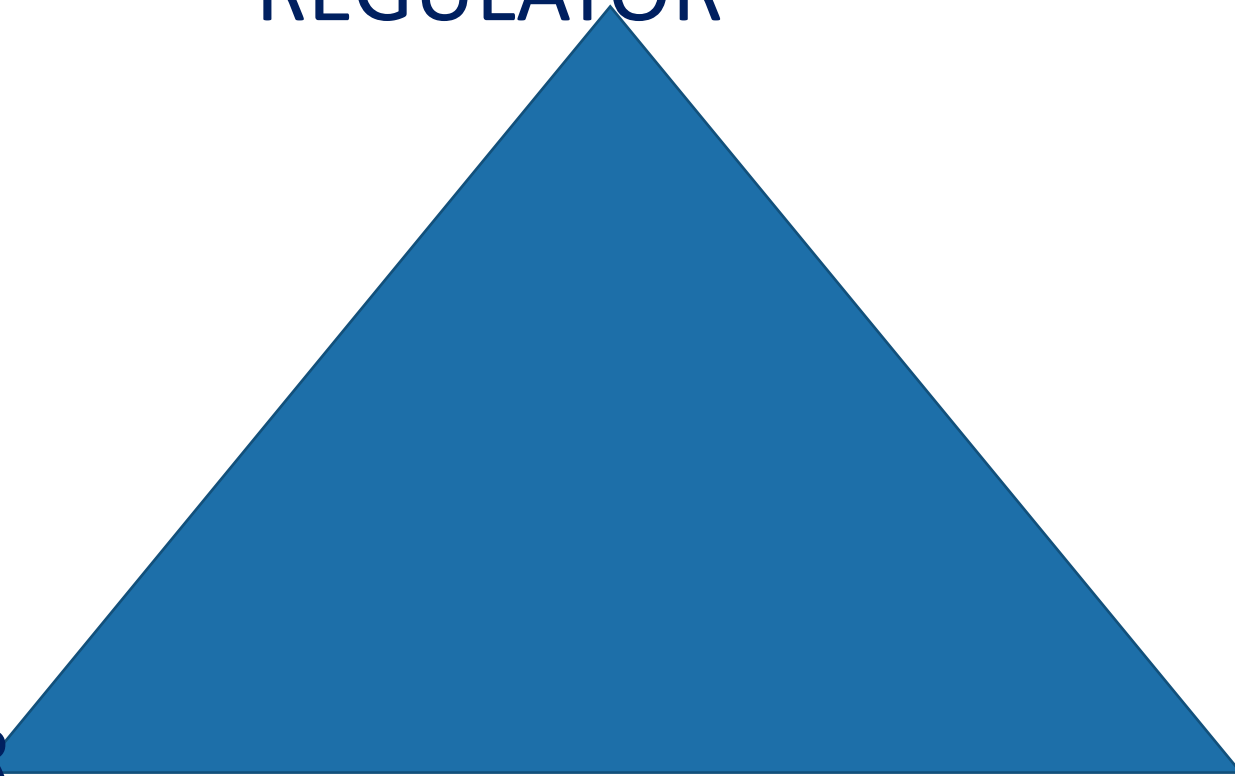
- Digital Foundation for Digital Nepal Mission.
- Digital Ecosystem (Primary need).
- Most Essentials Service(अति आवश्यक सेवा).
- Human Rights.
- Triggers- Freedom of Expression, Right to Information and other Rights,

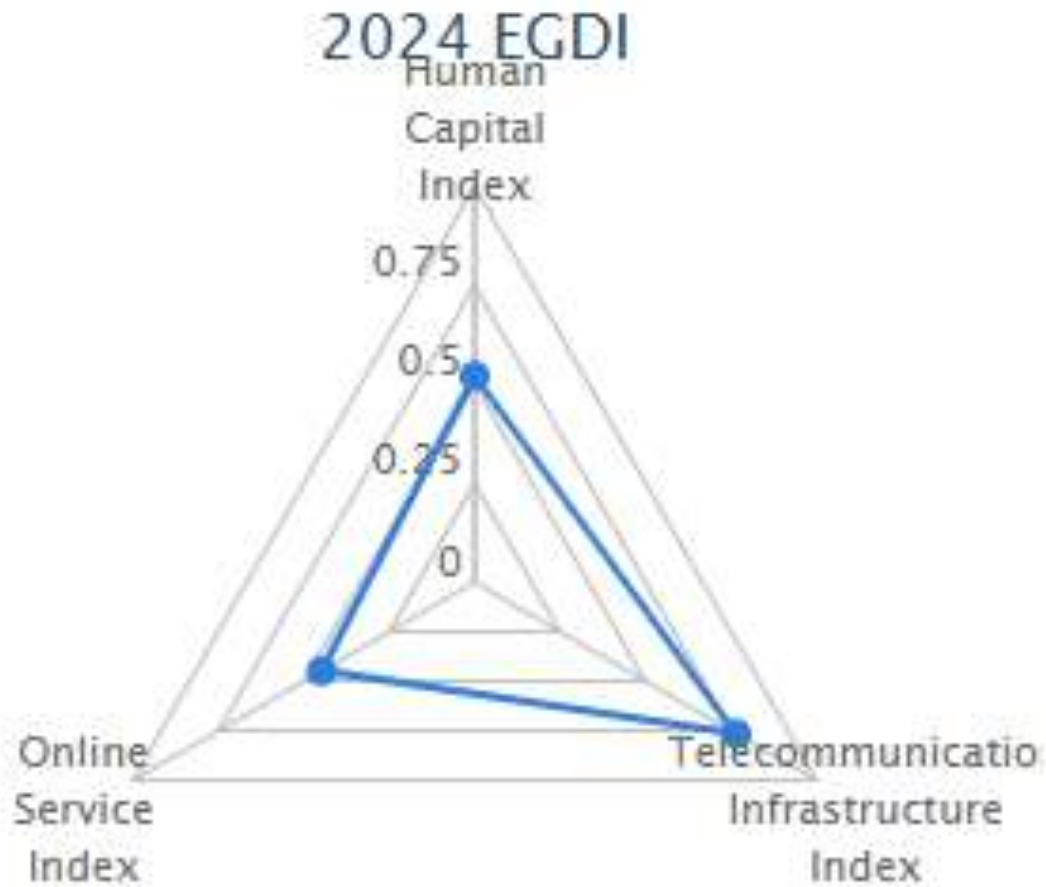
Triangular Balance

REGULATOR

CONSUMER

SERVICE
PROVIDER

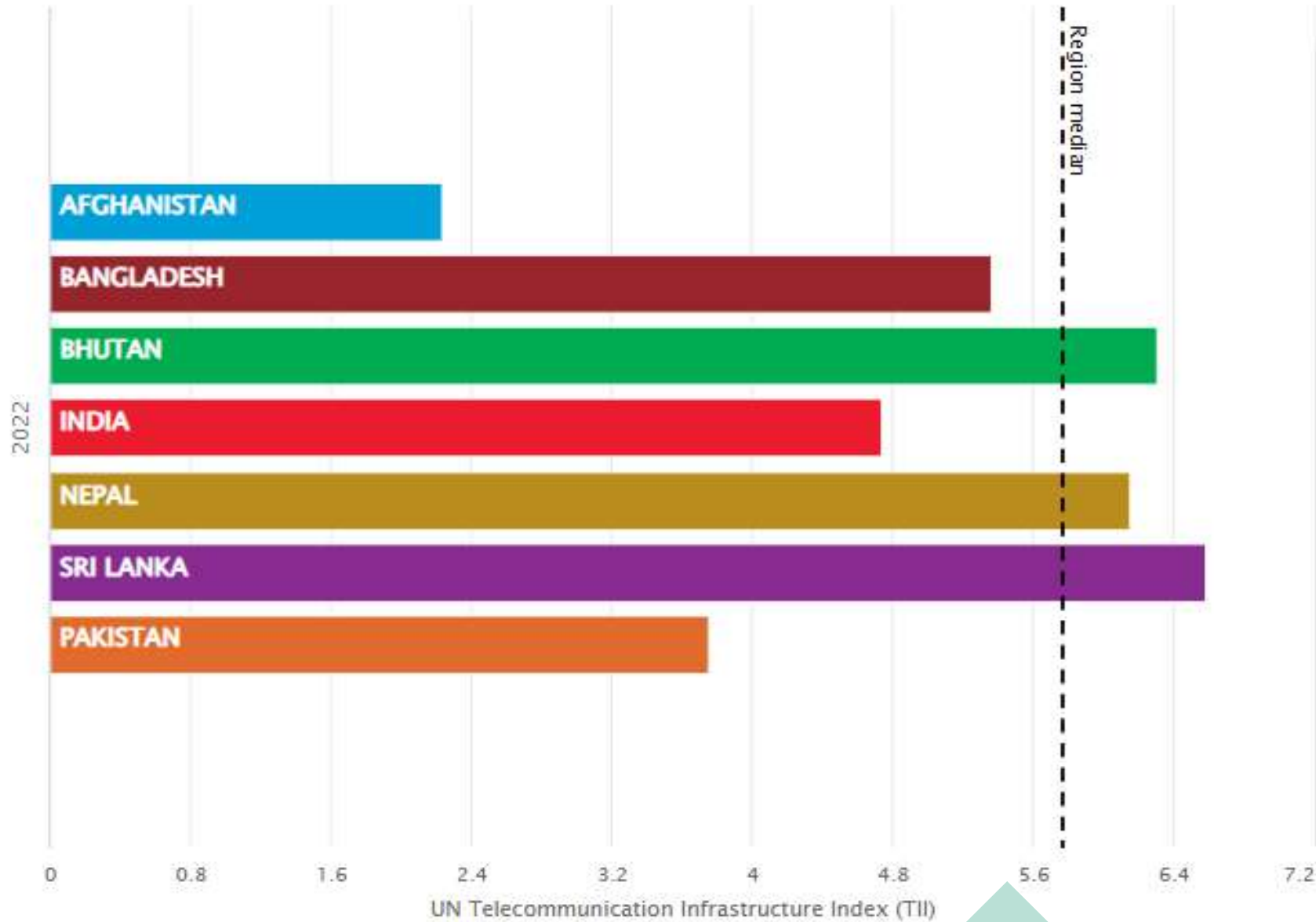




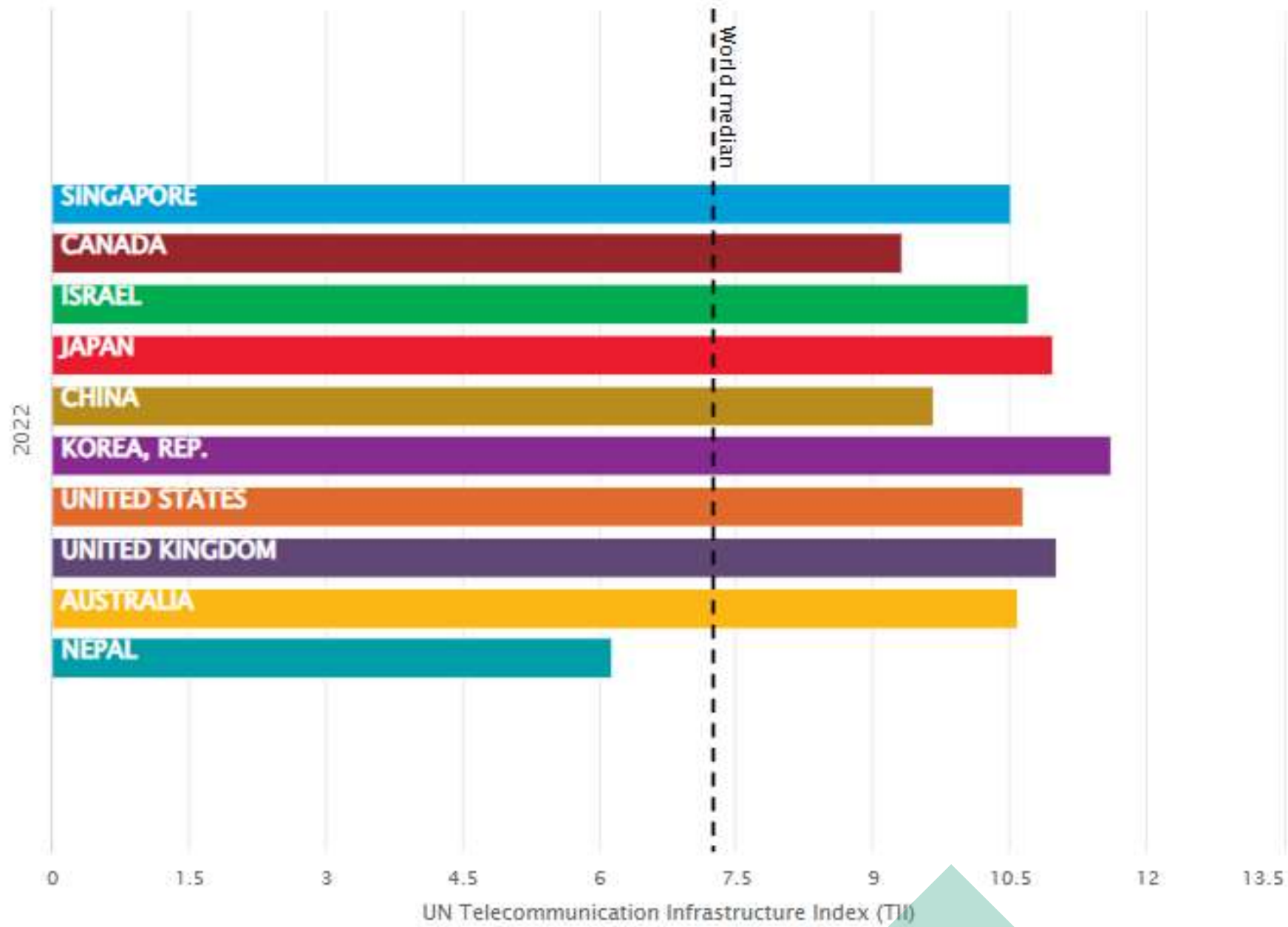
EGDI:119
HDI: 0.601 (146)

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Thank you