

Rural Broadband Wireless in Karnali of Nepal

Kiran Devkota
World Link Communication



ABOUT KARNALI

- One of the most remote and poorest region of Nepal
- Population only Seven lakhs
- But the largest Zone of Nepal
- Two Largest National Park
- Largest Lake RARA
- The most pristine (as of today) and difficult Geography



















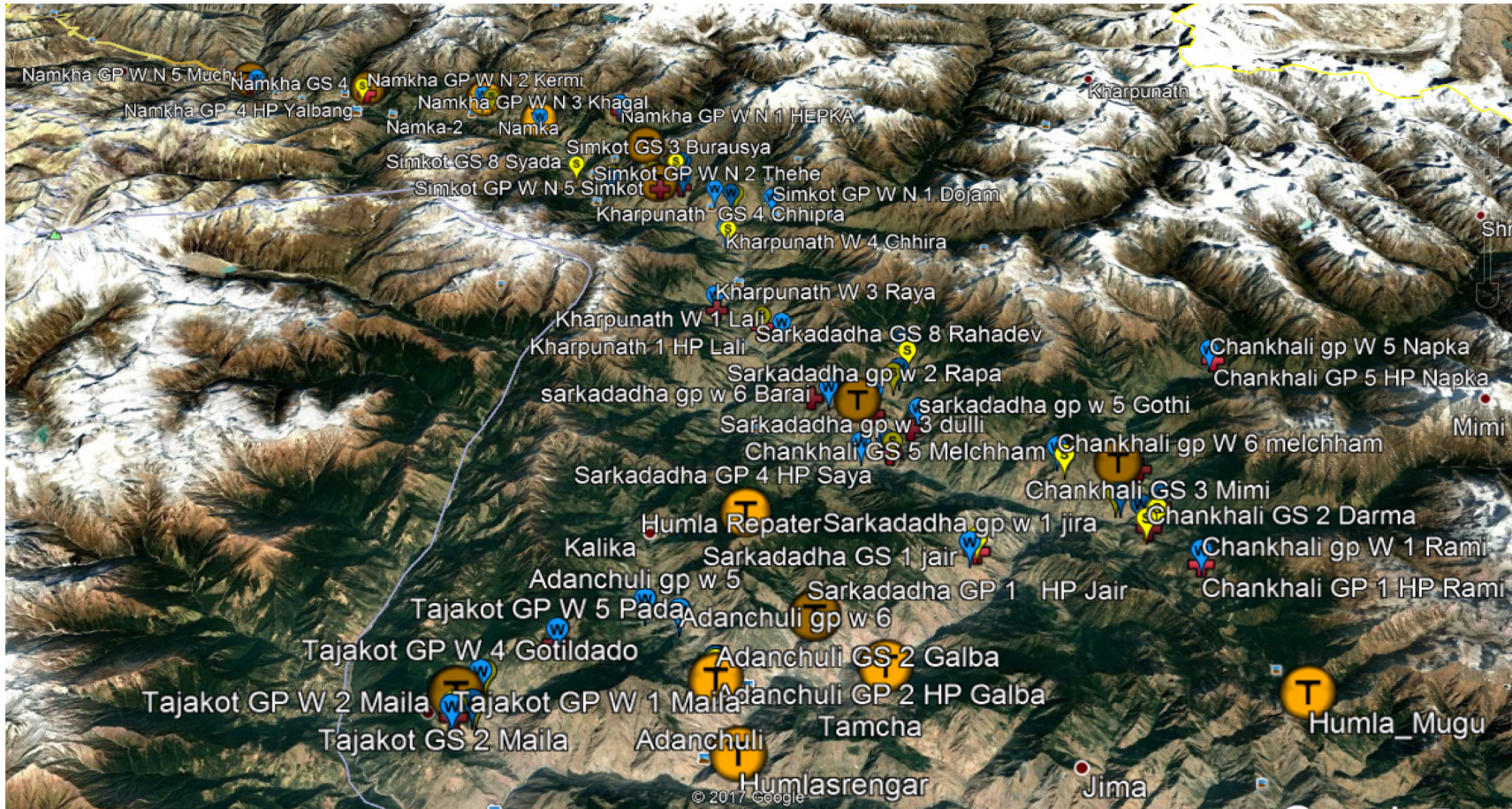
PROJECT AREA



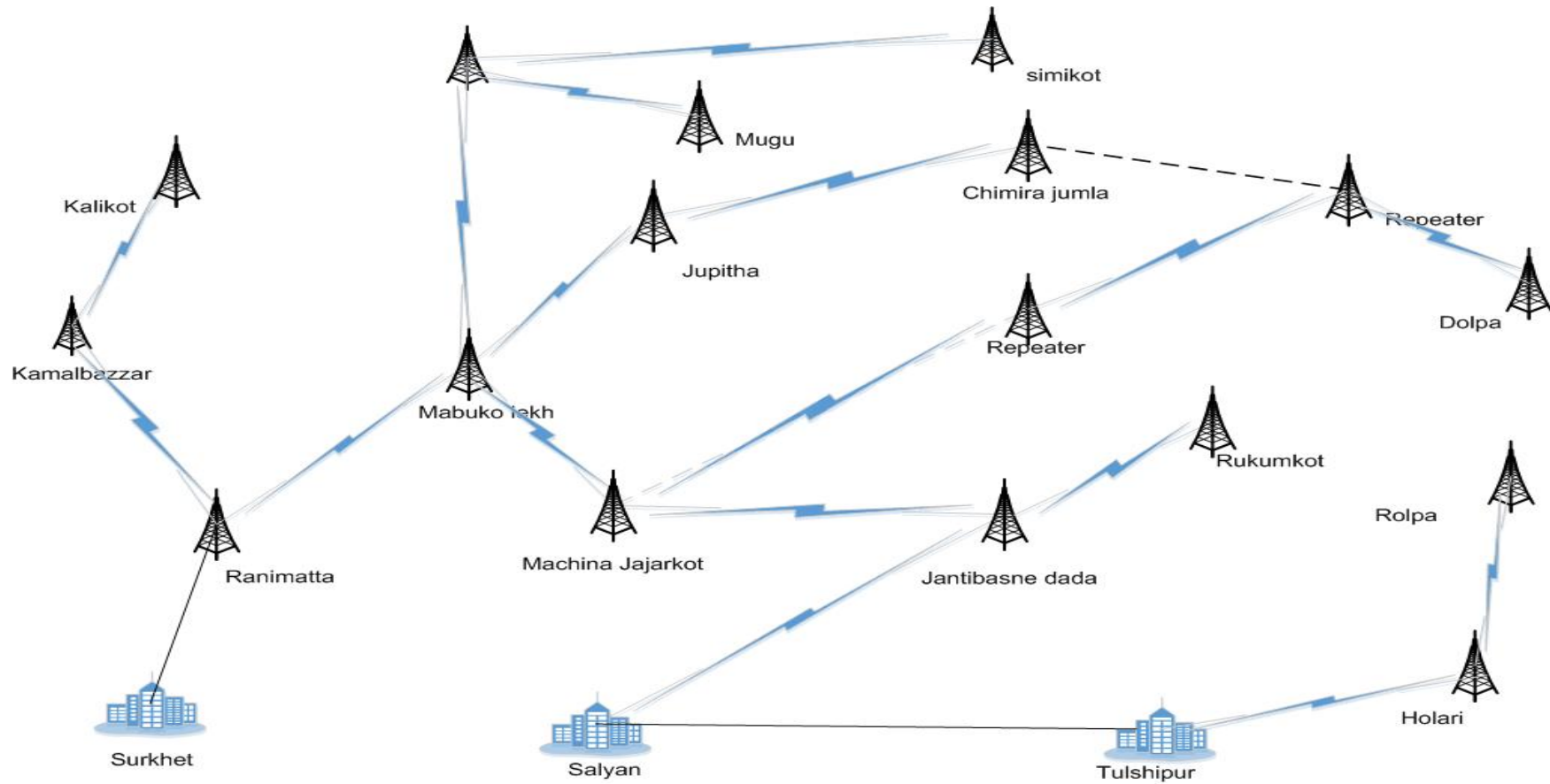
SCOPE OF PROJECT

- To build broadband network and provide Internet Access to:
 - Schools
 - Health Centers
 - Village/Municipality Development Committee offices
- Total: 1209 sites of 62 Rural Municipality/Municipality and 600 villages

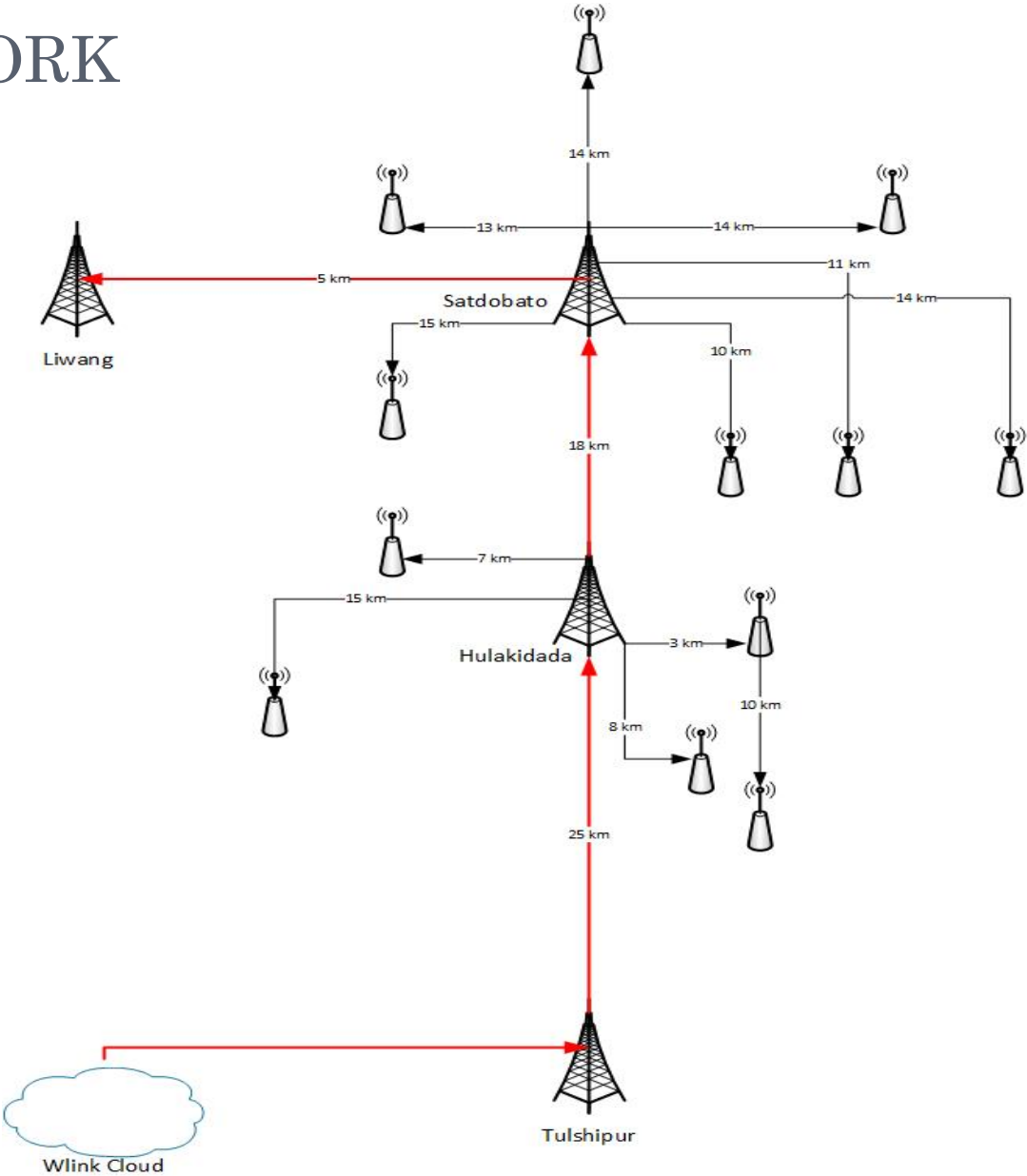
SITE GPS CO-ORDINATES



TRUNK LINK




NETWORK




TRUNK LINK

- Built 20 nos of 15 meter tower for core Backhaul link
- 4 nos of tower are above 3800 meter
- We have use 12 nos of 250 watt solar panel 12 nos 100 watt 12 volt batteries in all tower
- For back up there is generator in each site
- We have chemical earthling in all of these sites

LINK OF 61 KM PTP 670



Link: Site: Unit: Slave_58_1D_56



Home

Status

Alarms

» System

» Installation

» Management

» Security

Change Password


Logout

System Status - Point To Point - Slave

Attributes	Value	Units
Equipment		
Link Name		
Unit Name	Slave_58_1D_56	
Site Name		
Software Version	50670-02-65	
Hardware Version	B0P01.01-C-FPS	
Unit ESN	000456581D56	
Unit MSN	U9UA001QK34C	
Regulatory Band	62 - 5.1 GHz / 5.2 GHz - Other	
Elapsed Time Indicator	19 Days 03:19:00	
Ethernet / Internet		
Main PSU Port Status	Copper Link Up	
Main PSU Port Speed And Duplex	1000 Mbps Full Duplex	
Aux Port Status	Down	
Aux Port Speed And Duplex		
MAC Address	00:04:56:58:1d:56	
Remote Identification		
Remote Unit Name	Master_58_3A_2E	
Remote MAC Address	00:04:56:58:3a:2e	
Remote Internet Address	http://10.32.64.118	

Attributes	Value	Units
Wireless		
Wireless Link Status	Up	
Wireless Link Up Time	19 Days 03:18:31	
Wireless Encryption	None	
Maximum Transmit Power	27	dBm
EIRP	64.0	dBm
Remote Maximum Transmit Power	27	dBm
Transmit Power	24.0, 24.0, 24.0, 24.0	dBm
Receive Power	-64.7, -65.7, -67.5, -65.3	dBm
Vector Error	-22.7, -24.3, -25.5, -24.7	dB
Link Loss	165.5, 163.7, 162.7, 163.3	dB
Signal Strength Ratio	0.8, 0.4, 0.1, 0.4	dB
Transmit Data Rate	97.72, 97.72, 97.72, 97.72	Mbps
Receive Data Rate	97.72, 97.47, 79.85, 97.72	Mbps
Aggregate Data Rate	195.44, 195.19, 177.57, 195.44	Mbps
Link Capacity Variant	Full	
Link Capacity	352.48	Mbps
Wireless Link Availability	100.0000	%
Data Bridging Availability	100.0000	%
Transmit Modulation Mode	64QAM 0.92 (Dual) (45 MHz)	
Receive Modulation Mode	64QAM 0.92 (Dual) (45 MHz)	
Link Symmetry	Adaptive	
Receive Modulation Mode Detail	Limited by The Wireless Conditions	
Range	60.8	km

PTP 600 LINK OF 81 KM



System Status - Master

Equipment

Attributes	Value	Units
Link Name	rmt-chakute-13.121-122	
Site Name	Ranimatta	
Software Version	45600-10-05	
Hardware Version	D06-R01-C	
Region Code	Region Code 23	
Elapsed Time Indicator	103 Days 07:24:31	

Ethernet / Internet

Data Port Status	Copper Link Up	
Data Port Speed And Duplex	1000 Mbps Full Duplex	
MAC Address	00:04:56:88:00:ff	
Remote MAC Address	00:04:56:88:1d:2e	
Remote IP Address	http://192.168.13.122	

Telecoms

Channel A	Disabled	
Channel B	Disabled	

TDD Synchronization

TDD Synchronization Inactive	TDD Sync Disabled	
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Wireless

Attributes	Value	Units
Wireless Link Status	Up	
Maximum Transmit Power	27	dBm
Remote Maximum Transmit Power	27	dBm
Transmit Power	25.0, 25.0, 25.0, 25.0	dBm
Receive Power	-49.4, -51.9, -54.2, -51.5	dBm
Vector Error	-26.4, -28.2, -29.6, -28.3	dB
Link Loss	153.1, 150.9, 148.5, 150.5	dB
Transmit Data Rate	131.51, 84.28, 83.80, 83.80	Mbps
Receive Data Rate	83.80, 83.61, 65.86, 83.80	Mbps
Link Capacity	253.97	Mbps
Transmit Modulation Mode	256QAM 0.81 (Dual) (30 MHz)	
Receive Modulation Mode	256QAM 0.81 (Dual) (30 MHz)	
Link Symmetry	Adaptive	
Receive Modulation Mode Detail	Running At Maximum Receive Mode	
Range	81.4	km

LINK OF EPMP 1000 OF 71 KM

Cambium Networks ePMP 1000 37.19 -esm-bhatkhola-faci... Subscriber Module Administrator

Home Quick Start Configuration Monitor Performance System **Wireless** Throughput Chart Network System Log Tools

Monitor > Wireless

Registered AP SSID	bh-ddl-bhkt-18-19
Registered AP MAC Address	00:04:56:C7:0E:AB
Distance from AP	70.751 km
Operating Frequency	5745 MHz
Operating Channel Bandwidth	40 MHz
Downlink RSSI	-69 dBm
Downlink SNR	22 dB
Transmitter Output Power	22 dBm
Uplink MCS	MCS 11
Downlink MCS	MCS 12
Power Control Mode from AP	Closed Loop
Forced Sector Antenna	Disabled
Ethernet Status	100 Mbps / Full
Wireless Status	Up
Country	Other

Time Since Last Scan 0001:16:38:14
Registration Status Registered

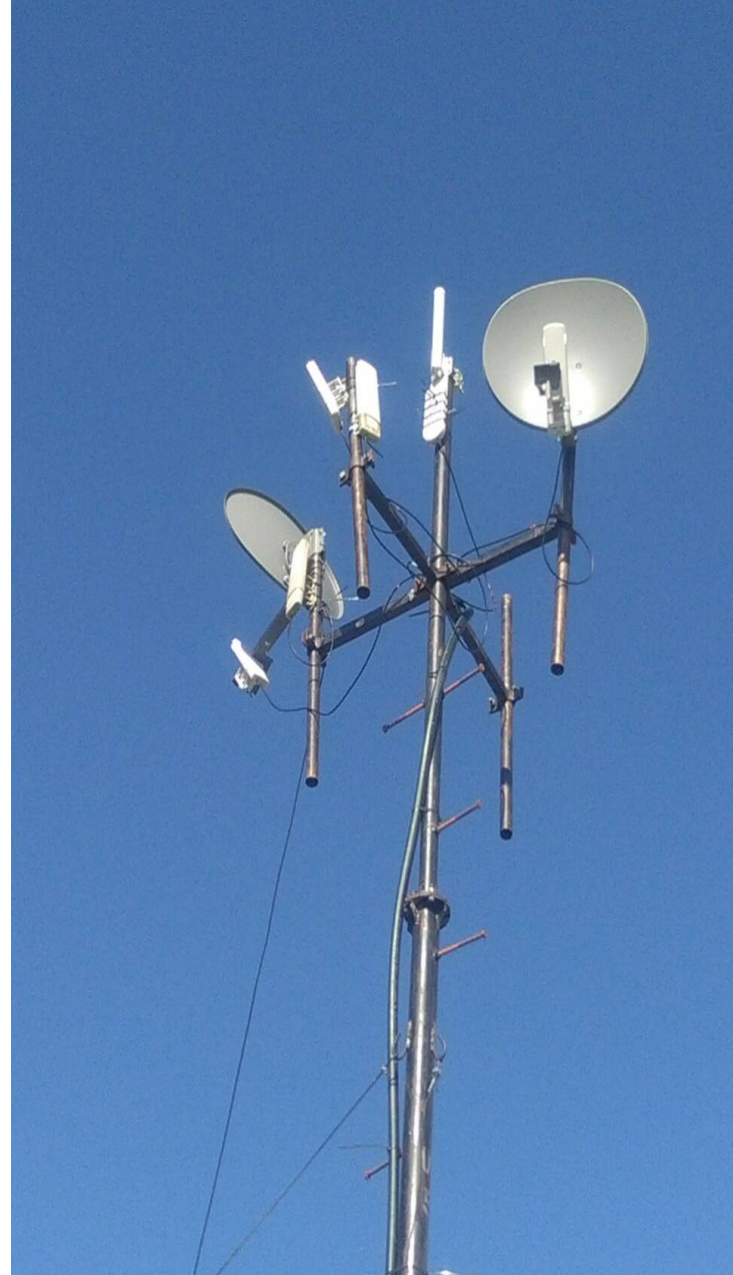
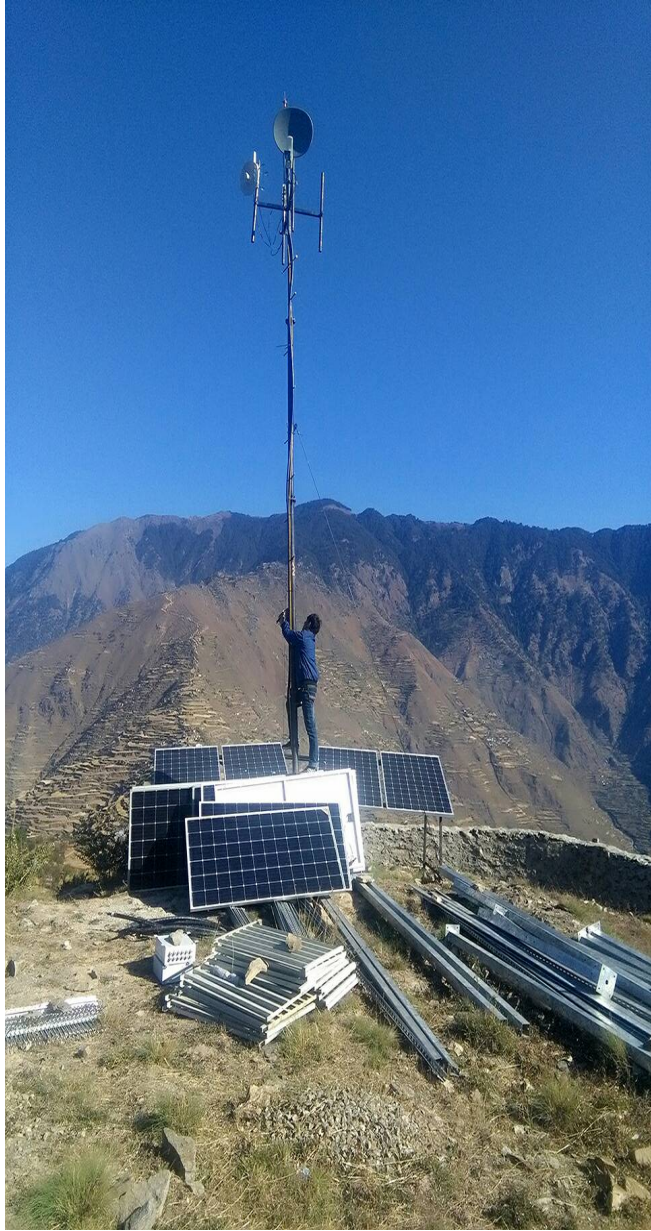




DISTRIBUTION TOWER

- There is more the 100 nos of distribution tower
- For the uplink of distribution tower we are using PTP 450i , PTP 450 and ePMP 1000 force 200, BH 20
- For the AP we are using ePMP 1000 , Canopy AP

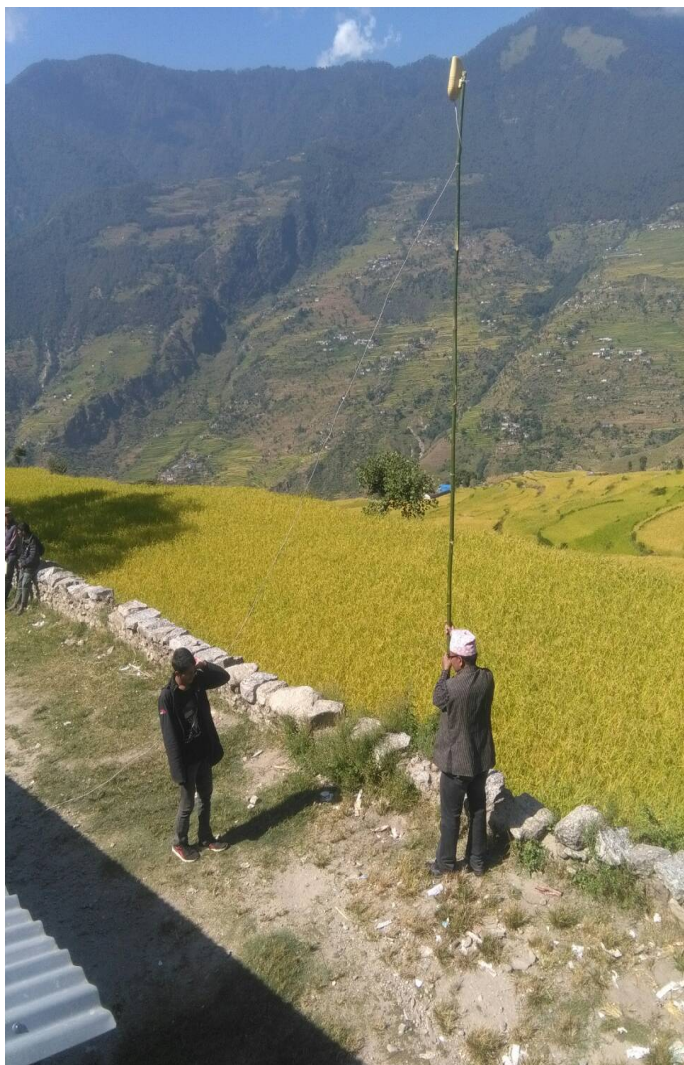




CLIENT

- We have use Cn pilot R190w broadband router in client side



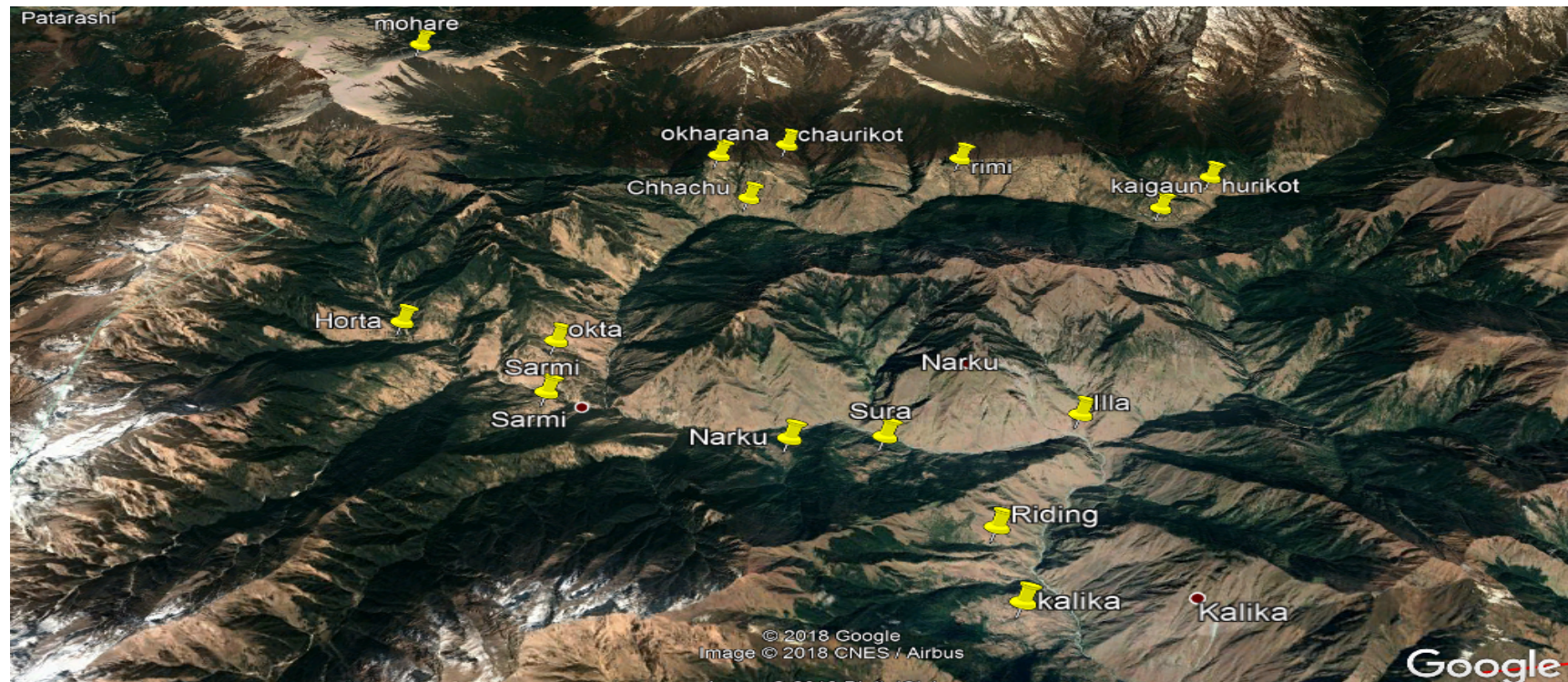


CHALLENGES

- Geographical Challenges

All the project area are in hilly region and villages are geographically spread so we have to make many distribution point

There is also villages in above 4300 meter



CHALLENGES

Most part of the project there is no Road facility so we have to use human, horses for transportation of goods



- Some time we have to make own road







FURTHER SCOPE

- Worldlink have just awarded another RTDF project of 4 district of province 4
- Connect 1148 sites
- Among then 60 % through Fixed Wireless and 40 % FTTH.
- Annapurna Circuit Trekking route and Annapurna Conversation are in this area



THANK
YOU