



Telecom Regulatory Authority of India

Recommendations on Improving Telecom Connectivity/
Infrastructure in far-flung areas of Himachal Pradesh

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Chapter-I

INTRODUCTION

- 1.1. Himachal Pradesh (HP) is a state of India, which lies in the extreme northern part of the Asian subcontinent. It is bordered by the states of Uttarakhand to the southeast, Haryana to the south, Punjab to the west, union territories of Jammu and Kashmir and Ladakh in the northwest and Tibet Autonomous Region of China in the east, respectively. There are various parallel physiographic zones that correspond to the northwest-southeast trending ranges of the Himalayan Mountain chain within the varied landscape of Himachal Pradesh. While elevations in the northern tract of the region range between 3,000 and 5,000 feet, they are on average around 1,600 feet (500 metres) in the southern tract (900 and 1,500 metres). The Lower Himalayas, which reach heights of roughly 15,000 feet, are located to the north of the Shivaliks (4,500 metres). The Zaskar Range, to further the north, towers over the other mountains in the area with elevations of more than 22,000 feet (6,700 metres). Various active mountain glaciers are located in this region.
- 1.2. It is quite evident from the above-mentioned data that the terrain profile of central HP (comprising of the districts of Kullu and Mandi) and northern HP (comprising of the districts of Chamba and Lahaul & Spiti) are relatively more inhospitable and experience more extremities during winters compared to its southern counter parts (comprising of the districts of Shimla, Solan and Sirmaur). Further analysis of the implications of terrain profile of the HP is conclusive of the fact that, the population pockets in northern parts of HP are relatively sparse, transient (comprising of temporary hutments meant only for occupancy during the summer months) and are scattered over the northern landscape so as to suit the farming and rearing of livestock-based livelihood requirements of the inhabitants.

- 1.3. Road, rail, power, and telecom services are all crucial for any region's development. It supports the region's overall social cohesion and economic prosperity. A declared national priority is the provision of high-quality telecom services as well as robust telecom and broadband connectivity with deeper penetration into the entire socio-economic strata of all Indian states. Telecom services, specifically the internet, have grown to be significant contributors of socio-economic development in the age of digital economy. In the current environment, the intertwined services of telecom and internet has become a necessity for everyone, and its significance was successfully established during the most recent global pandemic of COVID-19, wherein various socio-economic requirements were successfully undertaken over telecom and internet through the underpinning network of robust digital infrastructure in the country. Himachal Pradesh although is one of India's least urbanized states¹, however, according to TRAI report of 31 July 2022, the average tele-density of India as of June 2022 stood at 85.11% with Himachal Pradesh enjoying an average tele-density of 133.41%. The inherent disparity in the terrain profile of HP has thus led to non-uniform proliferation of telecom and internet infrastructure cum services in the state, with major Telecom Service Providers (TSPs) emphasizing on rollout and consolidation of digital infrastructure mostly in southern HP (in districts of Shimla, Solan and Sirmaur), southeastern HP (in districts of Kangra, Una, Hamirpur and Bilaspur) and southwestern HP (in district of Kinnaur) compared to its northern counterparts.
- 1.4. The recent launch of 5G services in India in October 2022, will eventually lead to witnessing a paradigm shift in implementation of numerous 5G use cases in the B2B and B2C spheres for the target population, which is mostly concentrated in the hinterland and metropolitan areas. The state of HP, especially the remote and far-flung regions in the northern part continue to experience a substantial digital divide between its demographics and the

¹ <https://www.census2011.co.in/facts/topstaterural.html>

places that have easy access to the most cutting-edge information and communications technology services vis-a-vis those in unserved and under-served regions that are still devoid of basic telecom services and internet services. Therefore, bringing these high-quality services and connections to HP, especially in remote and far-flung regions of the central and northern part of HP is an inescapable part of implementing the Digital India strategy.

- 1.5. TRAI has been working towards improving telecom infrastructure in remote areas of the country from time to time. Earlier, TRAI had made the following key recommendations for improving telecom connectivity:

- a) *The Recommendations on “Improving Telecom Services in the Northeastern States: An Investment Plan” dated 26.09.2013.*
- b) *Recommendations on Improving Telecom Services in Andaman and Nicobar Islands and Lakshadweep dated 22.07.2014.*

Consultation with stakeholders

- 1.6. To assess the current situation of telecom infrastructure in the state of HP and the prevailing gaps due to poor telecom coverage situation in remote and far-flung northern regions of the state, the Authority accompanied by a team of TRAI officials visited HP in October 2021 and carried out a de-novo review of the telecom infrastructure with all concerned stakeholders. The Authority by exercising powers and functions as provisioned under Section 11(iv) of the TRAI Act, undertook extensive interactions with relevant stakeholders viz telecom service providers, Bharat Broadband network Limited (BBNL), senior state government officials, local consumer representatives, and local state government officials to evaluate the extant condition of poor telecom infrastructure in these remote and far-flung areas. The Authority during the aforementioned visit, also deliberated upon the views of consumers of Himachal Pradesh, Panchayat representatives of some of the villages in the Lahaul-Spiti district, and representatives of Consumer Groups.

- 1.7. As a fall-out of the above-mentioned visit, the Authority has suo-moto initiated this consultation, which is aimed at undertaking suitable efforts to bridge the extant digital divide in the state. During the aforementioned visit, a very deliberate interaction was undertaken with the Department of Information Technology (DIT) of the Govt. of HP to ascertain the verified details of uncovered villages and prioritize the suggested efforts via TRAI recommendation. In this regard, DIT initiated a letter (dated 18 November 2021 – attached as **Annexure I**) to all District Commissioners (DCs), with a copy to TRAI, wherein the aforesaid letter contained a list of 202 uncovered villages in HP in which, there is no immediate plan of DoT and/ or TSPs to address the void. Analyzing the letter, it was inferred by TRAI that the villages mentioned in the enclosed list are located in the remote and far-flung regions, majorly falling under the four distinct revenue districts of Lahaul & Spiti, Chamba, Kullu and Mandi of HP. TRAI, thus focussing upon the aforementioned four worst affected revenue districts of HP, further went on to obtain specific inputs pertaining to Lahaul & Spiti, Chamba, Kullu and Mandi, from operating TSPs, BBNL, Universal Services Obligation Fund (USOF) of DoT, power transmission and distribution companies, operating in the state.

Key challenges being encountered in rolling out telecom network in remote and far-flung regions of HP

- 1.8. The TSPs and associated stakeholders, operating telecom and internet services in HP have been extensively interacted with, and they have put forth some key challenges being encountered, with the TRAI delegation which needs to be addressed to improve extant state of digital divide in HP. Following are some of the major connectivity and digital infrastructure issues raised by various stakeholders that are typically associated with remote and far-flung regions in HP:

- a) **Inhospitable Terrain Conditions** - Most of the inhabited population pockets in the upper reaches of central and northern region of HP especially in Lahaul & Spiti District are located in inhospitable terrain with very limited or poor motorable road network. These regions have multiple ridge lines of varying heights and remain inaccessible and snow-clad during winter months and as a result, wireless coverage in shadow zones of cellular mobile tower (Base Trans-Receiver Station - BTS/ eNode B) is a major concern. Further, non-feasibility of Radio Line of Sight (RLOS) backhauls for microwave links due to inherent terrain conditions severely impedes the prospects of cellular mobile tower rollout in such regions.
- b) **Poor Availability of Power Supply** - The extant power supply arrangements and duration of availability of commercial power supply is not very encouraging for TSPs in these regions. This leads to existing BTSs being run on Diesel Generator sets (DG sets) however, augmented by poor road network and extreme weather conditions severely affecting the regular supply of diesel to these upper reaches, these towers mostly remain non-functional. M/s Bharti Airtel during its interaction with TRAI in October 2021 revealed that it shares a total of 123 BTS with M/s BSNL in HP however, DG remains non-functional at 96 out of the aforementioned 123 sites.
- c) **Transmission Media Related Limitations** - In the northern and central regions of HP, it is exceedingly challenging to lay Optical Fibre Cable (OFC) due to the predominately inhospitable terrain. As a result, there are very few OFC based Points of Presence (POP) in the four HP districts that TRAI has identified. Therefore, the lack of a reliable transmission medium (OFC) has also contributed to the presence of a subpar BTS footprint in these areas.
- d) **Poor Return of Investment (RoI) prospects for TSPs** - As mentioned in para 1.2 above, the identified four districts are very thinly populated

and the inhabitants in these regions mostly have two distinct settlements i.e., in upper and lower reaches of the hills for occupancy during summer and winter months, respectively. Factors like low population density further augmented with element of transient settlements pose very discouraging prospects towards RoI for operating TSPs and hence they channelize their efforts more on consolidation and further improvement of telecom infrastructure in revenue generating regions and districts within the HP circle. Hence, the majority of the previous and ongoing efforts being undertaken to extend telecom coverage to these remote and far-flung areas are being rolled out and operated through USOF schemes of DoT.

- e) **Right of Way (RoW) related issues** - Most of the operating TSPs during interaction with the Authority in October 2021 have highlighted the issue of high RoW costs (*Rs 2000/metre and attracts additional 25% development charges in tribal areas*) prevalent in HP along with delay experienced towards processing of pending RoW applications.

1.9. The development of telecom services in HP's northern areas thus lags behind compared to that of the state's lower, central and southern regions due to the above-mentioned key challenges. Additionally, adequate bandwidth for high-speed internet is not available at these places due to the lack of a commensurate transmission backbone (comprising of OFC, Microwave, and Satellite). As a result, there is a noticeable, rather considerable difference between the telecom infrastructure and service rollout in the Lahaul & Spiti, Chamba, Kullu, and Mandi vis-a-vis other districts of the state.

1.10. Based on detailed analysis of the data obtained from multiple stakeholders i.e., TSPs, BBNL, USOF and Power Distribution Companies (DISCOMs) operating in HP, the following recommendations have been prepared by TRAI. The rationale and methodology used to analyze the gaps in the

identified four revenue districts of HP (i.e., the districts of Lahaul & Spiti, Kullu, Chamba, and Mandi) and in estimating the volume of investments needed along with the identification of key stakeholders for telecom infrastructure development in the region is covered in Chapter II of this recommendation. All of the recommendations made have been compiled in Chapter III.

Chapter-II

APPROACH METHODOLOGY AND RECOMMENDATIONS ON IMPROVING TELECOM INFRASTRUCTURE IN REMOTE AND FAR- FLUNG AREAS OF HP

A. Brief Information on HP

- 2.1 Himachal Pradesh is a licensed service area that lies in the Mountains of the Himalayan region.

Figure 2.1 : District map of HP



Himachal Pradesh at a Glance (as per census data of 2011)

a. Geographical area of H.P. state	:	55,673 Sq Km
b. Population as per 2011 Census	:	67.4 Lakh
c. Revenue Districts	:	12
d. Gram Panchayats	:	3615
e. Villages (inhabited)	:	17882

2.2 The population density (based on the latest available census data of 2011) of the twelve revenue districts and the overall telecom scenario (as per TRAI data of **31 July 2022**) of the State are tabulated below:

Table 2.1: Population density of HP

Sl. No.	District	Population	Area (in Sq Km)	Population Density
a.	Bilaspur	381,956	1,167	327
b.	Chamba	519,080	6522	80
c.	Hamirpur	454,768	1,118	407
d.	Kangra	1,510,075	5,739	263
e.	Kinnaur	84,121	6401	13
f.	Kullu	437,903	547.71	80
g.	Lahaul & Spiti	31,564	13833	2
h.	Mandi	999,777	3,950	253
i.	Shimla	814,010	5131	159
j.	Sirmaur	529,855	2825	188
k.	Solan	580,320	1936	300
l.	Una	521,173	1540	338

Table 2.2: Overall Telecom scenario of HP

Parameters	Himachal Pradesh			All India		
	Total	Rural	Urban	Total	Rural	Urban
Subscriber base (wireline + wireless) (In million)	9.93	6.49	3.44	1173.66	523.26	650.4
Tele-density (wireline + wireless) (In %)	133.41	97.19	449.08	85.11	58.37	134.78
Wireless Subscribers (In million)	9.81	6.44	3.36	1148.03	521.29	626.74
Wireless Tele-density (In %)	131.68	96.42	438.96	83.25	58.15	129.88
Wireline Subscribers (In million)	0.13	0.05	0.08	25.63	1.97	23.66
Wireline Tele-density (In %)	1.74	0.78	10.12	1.86	0.22	4.9

Methodology used

- 2.3 TRAI has obtained the current status of available telecom network connectivity in Himachal and analyzed for gaps in telecom infrastructure. Based on the gap analysis, a detailed plan is being suggested for improving connectivity in some of the districts of Himachal Pradesh.
- 2.4 For arriving at the current status and gaps thereof, data was called from all TSPs. Detailed analysis of the coverage details furnished by operating TSPs in the state was done to arrive at those areas which are lagging behind as far as telecom connectivity is concerned. It was inferred that four districts of HP which are in the North have major coverage gaps.
- 2.5 The village-wise coverage details furnished by operating TSPs were compared with the list of overall rural villages (obtained from census data of 2011), in the identified four revenue districts of HP to ascertain the exact number of covered villages and type of existing cellular mobile service. This analysis also led to the conclusion that there are 181 villages in these four districts that have no cellular coverage at all.
- 2.6 For planning cellular coverage in 181 uncovered villages in the selected four revenue districts of HP, following additional information was also obtained by TRAI:
- (a) Latest details of prospective coverage plans from all operating TSPs including incremental efforts undertaken by them (apart from USOF schemes).
 - (b) Details of villages being covered under ongoing and/or recently concluded USOF projects for far-flung regions of Himachal Pradesh.
 - (c) Details of the BBNL OFC coverage rollout to villages.

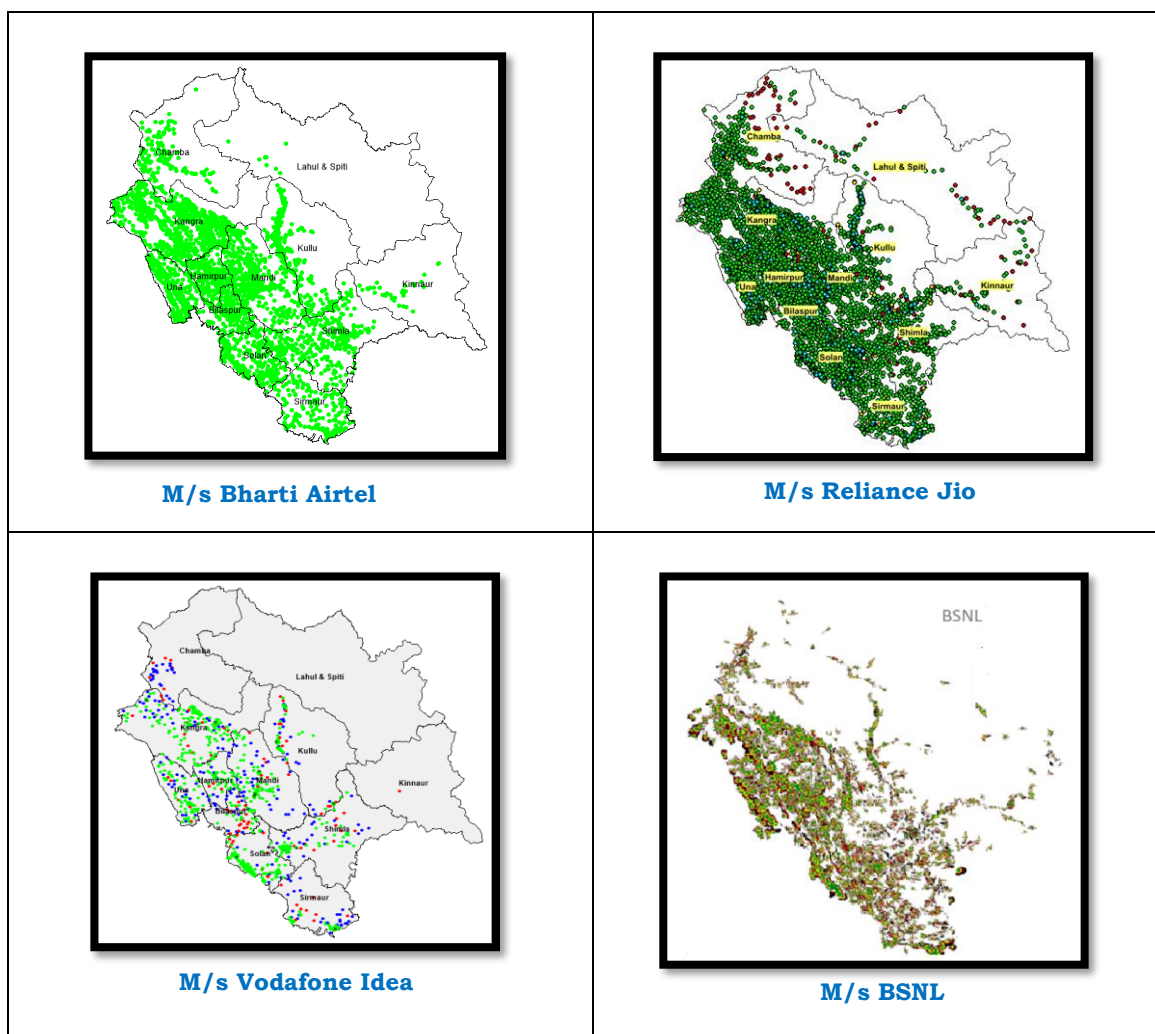
- (d) Details of Point of Presence (PoP) of Optical Ground Wire (OPGW) based power transmission layout of M/s Himachal Pradesh Power Transmission Corporation Limited (HPPTCL) and M/s Himachal State Electricity Board Limited (HPSEBL) in the identified far-flung regions of HP.
 - (e) Details of OFC based backhaul network, rolled out by operating TSPs in the state.
- 2.7 The data obtained from USOF with regard to ongoing schemes covering the remote/ far-flung regions of HP was analyzed to further narrow down to 25 villages that are not being covered in any other scheme.
- 2.8 These remaining 25 uncovered villages have thereafter been further analyzed for presence of OFC of BharatNet, OFC of TSPs and OPGW network in vicinity, to cater for optical fiber based high-bandwidth transmission backhaul.
- 2.9 If OFC backhaul is not available in the near vicinity, VSAT based backhaul has been proposed to cover the uncovered villages. In such cases, the CAPEX and OPEX requirements have been worked out on the basis of data obtained in respect of recently concluded/ ongoing USOF schemes for keeping the sites functional in remote and far-flung regions of HP on VSAT backhaul.

Present Status of Telecom connectivity in HP

- 2.10 As has been mentioned earlier, Himachal Pradesh has a good tele-density of 133.41% (as of June 2022) in comparison to All-India average tele-density of 85.11%. This is despite the fact that Himachal Pradesh is one of India's least-urbanized states. To understand the presence of telecom network in the entire state of HP, the state map-based coverage details were obtained

from TSPs providing telecom services in the state. The details obtained are as depicted below:

Figure 2.2: Telecom coverage concentration areas of TSPs operating in HP



2.11 From the coverage maps provided by the TSPs (Figure 2.1 above), it is clearly evident that inherent disparity in terrain profile of HP has led to non-uniform proliferation of telecom services in the state. TSPs have focused on rollout and consolidation of digital infrastructure mostly in southern HP (in districts of Shimla, Solan and Sirmaur), southeastern HP (in districts of Kangra, Una, Hamirpur and Bilaspur) and southwestern HP (in district of Kinnaur) compared to its northern counterparts.

- 2.12 Amongst TSPs, M/s RJIL is offering 4G Volte based coverage throughout all its operational sites in HP whereas M/s Bharti Airtel is offering predominantly 4G with 4G or 2G based coverage at select operational sites in the state. M/s BSNL is predominantly providing 2G or 3G based services with 4G services limited only to 14 of its overall sites in the state. M/s BSNL is the sole implementing agency for rolling out cellular network under USOF sponsored ‘*Saturation of 4G Mobile Services*’ at remote and far-flung regions of the country including HP, using indigenous 4G stack. M/s VI is majorly offering 4G services at most of its operating sites with 3G/ 2G services limited to a very few locations of its overall telecom footprint in the state.
- 2.13 The number of villages covered by telecom service providers in districts such as Lahaul & Spiti, Chamba, Kullu and Mandi areas has been relatively sparse as compared to the other districts (adjoining hinterland) in the state. As can be seen from Table 2.1, the population density of these districts viz. Chamba, Kullu, Mandi, and Lahaul & Spiti districts is relatively very low as compared to other revenue districts of the state. The details of total number of villages in aforementioned four districts (as per latest census data of 2022) are as tabulated at table 2.3 below:

Table 2.3: Rural village details in Chamba, Kullu, Mandi and Lahaul & Spiti

S. No.	District	Total Villages in the District
(a)	Chamba	1,110
(b)	Kullu	331
(c)	Lahaul & Spiti	280
(d)	Mandi	2,850
Total		4,571

- 2.14 Amongst these four revenue districts, the TSPs have remained focused on consolidating their roll-out and maintenance efforts mostly towards Mandi

and Chamba districts in chronological order of mention, possibly due to better road network and population density as compared to Lahaul & Spiti which has the least telecom service footprint.

- 2.15 Owing to low population density compounded by inhospitable terrain conditions especially in the difficult regions of Chamba, Kullu and entire district of Lahaul & Spiti, the existing layout of OFC for backhaul is extremely scarce. In order to facilitate backhaul connectivity, the BTS/eNode B sites in such locations are being operated using VSATs as backhaul transmission media (in point-to-point/ Multi-Frequency Time Division Multiple Access (MF-TDMA) mode). However, hefty recurring OPEX components majorly involving fuel cost for DG set and annual recurring bandwidth charges for VSAT, compounded with low RoI prospects, force TSPs to intermittently cease their operation in due course.
- 2.16 Based on the present status of telecom connectivity in HP, the Authority has decided to focus in improving connectivity in only four districts of HP viz. Lahaul & Spiti, Chamba, Kullu and Mandi.
- 2.17 As mentioned in Chapter 1 above, during the interaction of TRAI with the state government officials of HP, details of uncovered villages in HP were requested. However, the state government officials could not furnish the exact count of uncovered villages in the state within the requested time. Three different numbers were submitted by them on three different occasions. Therefore, TRAI approached all the major operating TSPs in HP to furnish their respective existing telecom coverage details for further analysis. A total of 4571 rural villages were considered by TRAI from the census data of 2011 (based on the above-tabulated data) in identified four districts. The data obtained from TSPs have been analyzed for four identified revenue districts of Chamba, Kullu, Mandi, and Lahaul & Spiti, under two main criteria as mentioned below:

(a) Villages that have cellular mobile coverage due to presence of cellular tower(s) in those villages.

(b) Villages that have incidental coverage due to presence of cellular tower(s) in other villages as mentioned at paragraph 2.5 (a) above.

2.18 Based on data submitted by various stakeholders, the details of villages which are having cellular coverage (including 4G and non-4G) due to presence of cellular tower(s) in those villages, is as tabulated below at Table 2.4.

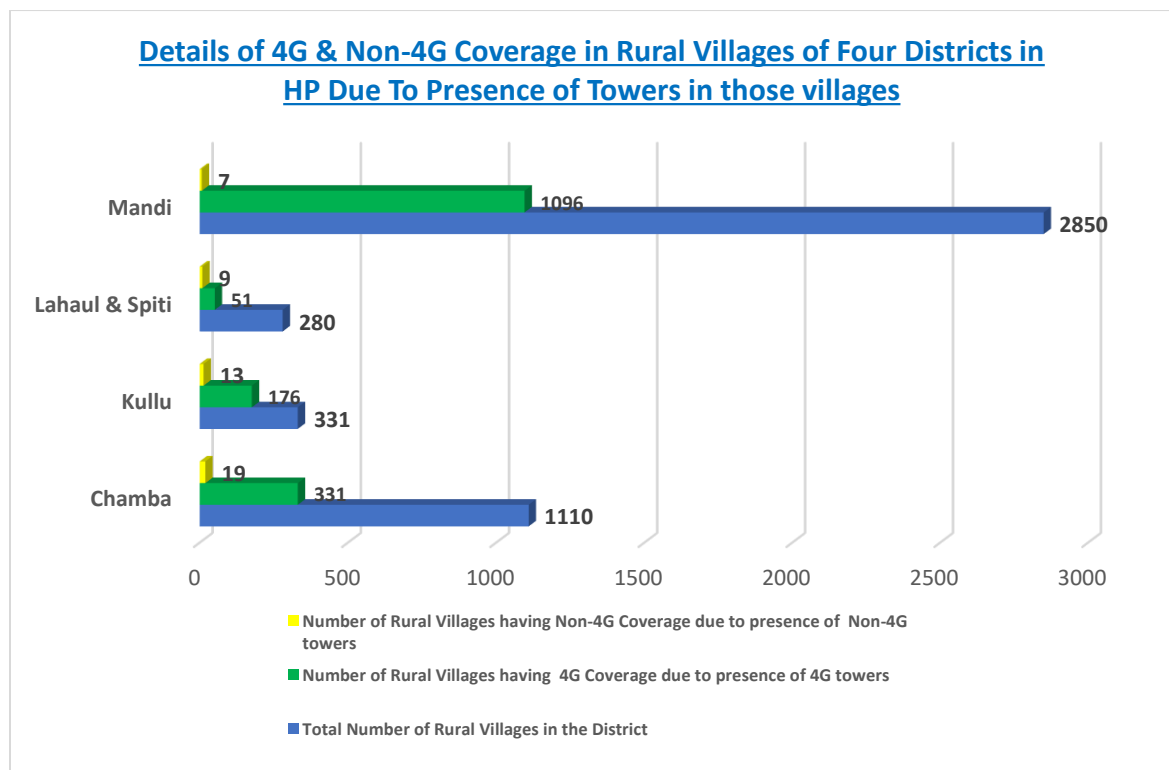
Table 2.4: Details of villages having 4G & non-4G coverage due to presence of cellular tower(s) in those villages

Name of District	Total Identified Rural Villages in the District	No of Villages having 4G coverage due to presence of 4G cellular towers (a)	No of villages having cellular coverage due to non-4G cellular tower (b)	Total Number of villages having cellular mobile coverage due to presence of cellular tower(s) in those villages (a) + (b)
Chamba	1110	331	19	350
Kullu	331	176	13	189
Lahaul & Spiti	280	51	9	60
Mandi	2850	1096	7	1103
Total	4571	1654	48	1702

2.19 To arrive at the above figure of 48 villages that have non-4G coverage presently, the Authority has relied on the data submitted by various TSPs that are providing mobile services in HP Licensed service Area (LSA). Authority has asked them to indicate against each census village whether mobile service is available in the village and in case it is available, what is the technology (2G/3G/LTE) of the available coverage. The list of villages that had non-4G coverage was compared with the data submitted by USOF about the villages that are planned to be covered under 4G saturation

scheme. It is likely that after subsequent field level survey by BSNL (who is the agency that is implementing 4G saturation scheme), some of the villages might have been dropped or added from the list of villages to be covered under 4G saturation project that was submitted by USOF to TRAI. The authority therefore is of the opinion that a ground level survey of villages will be required to arrive at the exact number of villages that have non-4G coverage and are yet not planned to be upgraded to 4G. However, for the sake of these recommendations, the Authority has used the figure of 48 for such villages. The graphical representation of the rural villages having cellular mobile coverage due to presence 4G and non-4G towers has been depicted vide Figure 2.3 below:

Figure 2.3: Comparative depiction of total villages vs villages having cellular coverage due to presence of towers

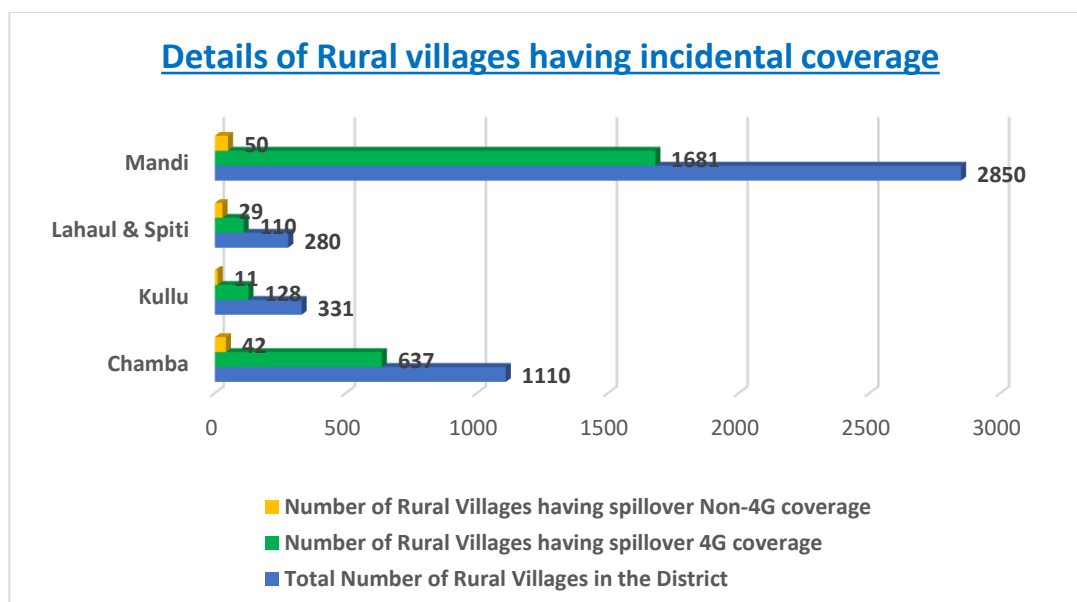


2.20 TRAI also sought details of villages having incidental cellular coverage due to presence of towers installed in neighboring villages. The details of these villages are tabulated below in Table 2.5:

Table 2.5: Details of villages having cellular footprint due to incidental coverage

Name of District	Total Identified Rural Villages in the District	No of Villages having incidental 4G coverage (due to presence of towers installed in neighboring villages) (a)	No of villages having incidental non-4G coverage (due to presence of towers installed in neighboring villages) (b)	Total Number of villages having incidental coverage (due to presence of towers installed in neighboring villages) (a) + (b)
Chamba	1110	637	42	679
Kullu	331	128	11	189
Lahaul & Spiti	280	110	29	139
Mandi	2850	1681	50	1731
Total	4571	2556	132	2688

Figure 2.4: Details of villages in HP having 4G & non-4G incidental coverage (due to presence of towers installed in neighboring villages)



Analysis for Coverage Gaps

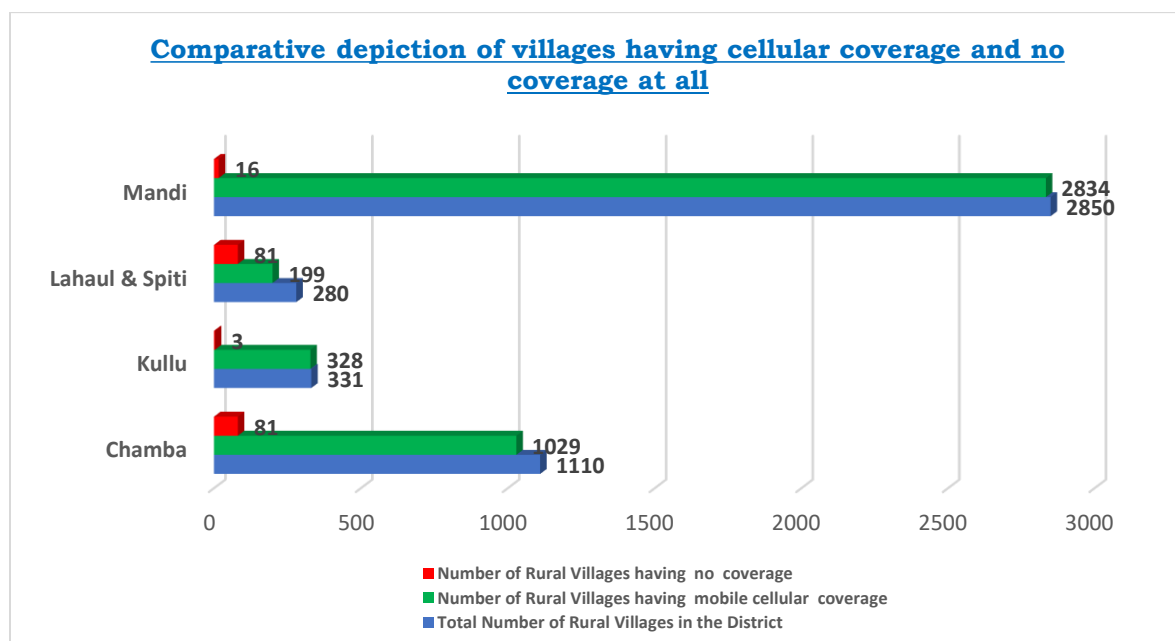
2.21 Taking the details of covered villages from Table 2.4 and 2.5 respectively into consideration, the consolidated figures and graphical representation of

overall covered and uncovered villages has been depicted below in Table 2.6 and Figure 2.5 respectively:

Table 2.6: Details of overall covered and uncovered villages

Name of District	Total Identified Rural Villages in the District (a)	No of Villages having 4G cellular coverage (b)	No of villages having non-4G cellular coverage (c)	Total Number of villages having cellular coverage (d) = (b) + (c)	Total number of uncovered villages left (d) – (a)
Chamba	1110	968	61	1029	81
Kullu	331	304	24	328	3
Lahaul & Spiti	280	161	38	199	81
Mandi	2850	2777	57	2834	16
Total	4571	4210	180	4390	181

Figure 2.5: Details of overall cellular coverage in four districts of HP



2.22 The district wise detailed list of these 181 uncovered villages has been annexed at [Annexure II](#).

Proposed plan based on coverage gap analysis

- 2.23 Efforts have already been undertaken by USOF through initiation of projects for rolling out cellular mobile networks to cover the uncovered villages and through rollout of OFC based project (BharatNet) towards rollout of telecom and internet services to cover remote and far-flung uncovered villages. The details of ongoing USOF efforts for both mobile coverage and internet connectivity based respectively, affecting the four identified revenue districts of HP are as mentioned below:

A. USOF Schemes for Mobile Connectivity

- i. **Mobile connectivity in 354 villages of uncovered border areas** - The initiative was designed to erect 354 mobile towers in 354 unconnected villages in border regions of Jammu and Kashmir, Ladakh, Himachal Pradesh, Uttar Pradesh, Bihar, Rajasthan, Gujarat, Uttarakhand, and other important areas in order to provide mobile services. On April 28, 2020, a contract was signed with M/s Reliance Jio Infocomm Limited (the implementing agency). As a result of earlier coverage, certain villages were later excluded from the project, leaving only 302 villages to be covered with Probable Date of Completion (PDC) as on 30 September 2022. The project has been accorded extension by USOF and its current PDC is 30 December 2022. Out of the 181 uncovered villages in the identified four districts ([refer Table 2.9 below](#)), there are 14 villages that are planned to be covered under the '**354 Villages scheme**'.
- ii. **Saturation Of 4G Mobile Services in Uncovered Villages Across the Country** - On 27 July 2022, Central Government approved the USOF sponsored initiative to provide 4G mobile coverage to all unconnected villages in the nation. The project seeks to provide 4G mobile services in 24,680 untapped villages in challenging and isolated places (including the villages in State of HP). The project also incorporates a clause that allows for the addition of 20% more communities (approximately, additional 5000 villages) due to

reasons like rehabilitation, new settlements, withdrawal of services by existing providers, etc. Additionally, 6,279 villages with only 2G or 3G access will also be upgraded to 4G. M/s Bharat Sanchar Nigam Limited (BSNL), utilizing the indigenously developed 4G technology stack, is carrying out the project execution. The project is being supported by the Universal Service Obligation Fund with current PDC as December 2023. The status of sites included under this scheme in HP, as on October 2022, is tabulated below:

Table 2.7: Status of ‘Saturation of 4G mobile services’ in HP

Circle	Villages to be covered	Villages Surveyed	4G site proposed	Villages with power connection	New Towers	% Survey completed
HP	1646	1641	359	336	328	100

B. USOF Scheme for connecting villages on Optical Fiber

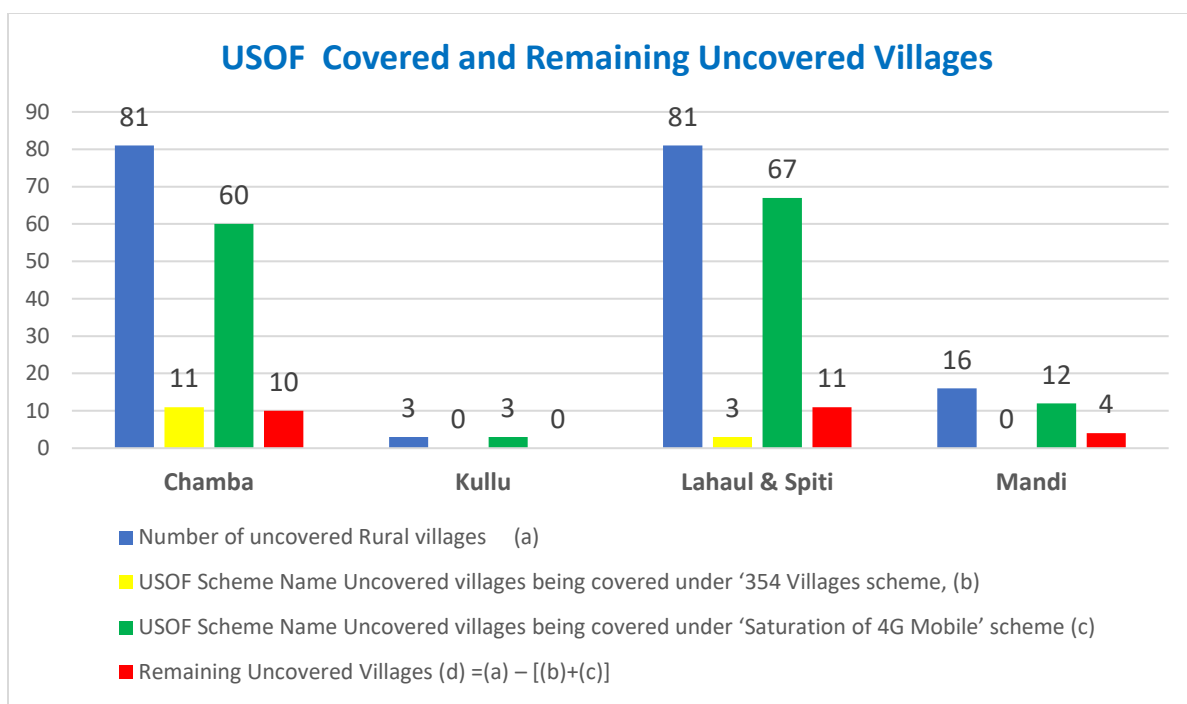
- i. **BharatNet** - To deliver broadband access to all Gram Panchayats (about 2.5 lakh) in the nation, BharatNet, one of the largest USOF sponsored rural telecom project in the world, is being deployed in stages. With the installation of BharatNet Phase-I in over 1 lakh GPs, it was finished in December 2017. With the Cabinet's permission in July 2017, the scope of Phase-I was subsequently expanded to include 1.25 lakh GPs. The revised BharatNet plan, which incorporates the Phase-I project execution experience and aligns it with the vision of Digital India, was approved by the Cabinet in July 2017. The revised approach offers the best possible media mix (OFC, Radio, and Satellite) to link Gram Panchayats (GPs). Phase II calls for the connection of GPs using a variety of implementation options, including the State-led Model, the Private Sector Model, and the CPSU Model, as well as Last Mile connectivity in GPs using Wi-Fi or any other compatible broadband technology.

2.24 Out of the 181 uncovered villages in the identified four districts (refer table 2.9 below), there are 14 villages that are planned to be covered under the **‘354 Villages scheme’** and 142 villages that are planned to be covered under **‘Saturation of 4G Mobile’ scheme of USOF**. This leaves only 25 villages that neither have any mobile coverage, nor are being planned to be covered in any of the two USOF schemes. The district-wise summarized details of the remaining uncovered villages (25 villages) post exclusion of the villages being covered under running/planned USOF schemes, has also been given in Table 2.9 and graphically depicted at Figure 2.6. The district-wise detailed list of rural villages being covered under both the USOF schemes is annexed at Annexure III and the list of 25 villages remaining uncovered is annexed at Annexure IV.

Table 2.8: Summarized details of villages in effect remaining uncovered in HP

Name of the District	Number of uncovered Rural villages (a)	USOF Scheme Name		Remaining Uncovered Villages (d) =(a) – [(b)+(c)]
		Uncovered villages being covered under ‘354 Villages scheme,’ (b)	Uncovered villages being covered under ‘Saturation of 4G Mobile’ scheme (c)	
Chamba	81	11	60	10
Kullu	3	0	3	0
Lahaul & Spiti	81	3	67	11
Mandi	16	0	12	4
Total	181	14	142	25

Figure 2.6 : USOF covered and in effect remaining uncovered villages



2.25 In order to suggest suitable backhaul transmission plan for identified 25 uncovered villages, TRAI has also obtained details from BBNL to ascertain the nearest PoP of BharatNet OFC with respect to these villages. Details of OPGW layout have also been obtained from M/s HPPTCL and HPSEBL to find out whether OPGW based backhaul can be proposed for these 25 villages. The district-wise details as obtained from M/s BBNL has been enclosed as **Annexure V** to these recommendations. The list of district-wise details obtained from M/s HPPTCL and HPSEBL has been enclosed as **Annexure VI & VII**, respectively. The Authority found that for uncovered 25 locations, the nearest POP are quite far. And therefore, the backhaul for all these 25 villages has been suggested on VSAT.

Recommendations

A. Uncovered Villages

- 2.26 TSPs and Infrastructure providers agencies are not very forthcoming in rolling out services in remote/ far-flung locations in four identified districts of HP for want of commercial viability. **The Authority recommends that Capital Expenditure (CAPEX) and Operating Expenditure (OPEX) required for providing telecom infrastructure and connectivity to the 25 uncovered villages (falling under the three revenue districts of Lahaul & Spiti, Kullu and Chamba) of Himachal Pradesh (HP) should be funded by Government through USOF.**
- 2.27 These 25 identified uncovered villages mostly fall in far-flung regions having inhospitable terrain conditions with no presence of BharatNet OFC or OPGW network of state power transmission companies in near vicinity to act as a potential backhaul network. Therefore, rolling out 4G based cellular infrastructure with VSAT based backhaul media (in point-to-point or point to multi-point mode using Multi-Frequency Time Divisional Multiple Access (MF-TDMA)) seems to be the practical solution to connect these villages with digital mainstream. The Authority has broadly arrived at the requirement of CAPEX and OPEX for providing and running the services in these villages. The Authority has arrived at these figures, based on the data provided by leading TSPs towards installation of a 1.2 m antenna based, VSAT backhaul link, engineered on a GSAT 12 satellite and for erecting 4G mobile towers and putting mobile equipment in these villages. The Authority would like to put a caveat that these are ballpark figures and are likely to change depending on the volumes of procurement and the time of procurement. In addition, the cost may likely vary depending upon the configuration of operation chosen and the actual tower height required.

2.28 While arriving at the calculations following assumptions have been made:

- a. All sites have been considered on 30-meter Ground based tower. The tower expenditure figures include costs for providing diesel generator, batteries, power plant, solar panels, associated material, and installations.
- b. All sites have been considered with battery backup and solar power backup, as the transportation of diesel and running of DGs is extremely difficult in these areas during winters.
- c. All sites will have VSAT based 20 Mbps uplink and 10 Mbps downlink backhaul which will be shared between a group of 10 villages.
- d. Miscellaneous operating expense of Rs. 20,000 per month per site has been taken for O&M related expenses including power/diesel.

2.29 Based on the above, broad estimation of CAPEX and OPEX for providing and running 4G services in 25 uncovered villages is as tabulated at Table 2.9. **As the extant provisions in USOF sponsored “Saturation Of 4G Mobile Services in Uncovered Villages Across the Country” allows for inclusion of additional 20% communities under its present scope, the Authority recommends USOF to carry out on-ground survey of these 25 uncovered villages (falling under the three revenue districts of Lahaul & Spiti, Kullu and Chamba) for evaluating the rollout feasibility of telecom infrastructure at these villages. Subject to feasibility, the Authority recommends that USOF should immediately include these 25 uncovered villages under its 20% additional scope for providing 4G services and also cater for the requisite overall additional expenditure (as suggested at [Table 2.9](#)) for providing 4G coverage in these 25 villages:**

Table 2.9: Broad estimation of CAPEX and OPEX (per annum) required for providing 4G mobile service to 25 Villages on VSAT Backhaul

Broad estimation of CAPEX and OPEX (per annum) required for providing 4G mobile service to 25 Villages on VSAT Backhaul			
Item Breakup	Approximated Cost for one unit (₹) (a)	No of units required per village (b)	Approximate cost for 25 Villages (₹) 25 * (b) *(a)
A) CAPEX (one-time)			
i) VSAT Terminal Hardware cost	1,25,000	1	33,75,000
ii) VSAT Terminal Installation & Commissioning	45,000	1	12,15,000
iii) Cost of Tower and other installations	30,00,000	1	8,10,00,000
iv) Cost of Mobile equipment	10,00,000	1	2,70,00,000
		Total CAPEX	11,25,90,000
B) OPEX (per annum)			
i) Bandwidth cost for 20 Mbps uplink and 10 Mbps downlink /Annum, shared per 10 villages	63,30,000	0.1	1,58,25,000
iv) Other Misc operating expenses /Annum	2,40,000	1	60,00,000
		Total OPEX (per annum)	2,18,25,000

B. Villages that have non-4G coverage and are yet not planned for 4G upgradations

2.30 The 48 villages (as mentioned at para 2.19) having non-4G coverage was analyzed with the USOF furnished data of villages being included under ***“Saturation Of 4G Mobile Services in Uncovered Villages Across the Country”***. Post analysis, it was inferred that 10 out these 48 villages have already been included in the aforementioned USOF scheme, thus resulting into 38 villages, now effectively remaining to be upgraded from non-4G to 4G coverage. In view of the aforesaid, **the Authority also recommends that cellular mobile infrastructure at these 38 villages (detailed list enclosed at [Annexure VIII](#)) having non-4G based coverage, must also be upgraded to 4G based telecom service under the 20% additional scope**

that exists in USOF sponsored “Saturation Of 4G Mobile Services in Uncovered Villages Across the Country”.

C. Backhaul planning for 4G saturation project

2.31 The Authority has taken status of site survey that is being carried out by BSNL in respect of 4G saturation project. The status as on 02.11.2022 is provided in the table below:

Table 2.10: 4G Saturation project – BSNL Site Survey as on 02.11.2022

4G Saturation Project – BSNL Site Survey Status as on 02.11.2022											
Circle	Villages to be covered	Villages surveyed	4G sites proposed	Villages with power connection	New Towers	Existing Towers	OFC	MW	V-SAT	OFC Required (Km)	% Survey Completion
HP	1629	1629	348	336	328	20	69	246	33	359.7	100

As can be seen from the above table, out of the 348 proposed 4G sites in Himachal Pradesh, only 33 are being planned on VSAT. “4G saturation Scheme”, USOF is to be completed by December 2023. Given the implementation status of Phase-I and Phase-II of BharatNet, the Authority feels that USOF should seriously consider connecting all such villages that do not have existing OFC or other media backhaul, on Satellite medium. Even the status of permissions applied seeking clearances from various State Government Authority for the identified sites by BSNL for this project (as shown below in table) is not very encouraging.

Table 2.11: 4G Saturation Project - Status of clearances applied and given as on 02.11.2022

State	Villages to be covered	Sites Identified	No. of applications submitted	No. of sites allotted	EB Connections applied	RoW Applications submitted	Forest Clearance applications submitted
Himachal Pradesh	1629	215	215	0	0	0	0

For all sites that will be connected on OFC and for most of the sites where microwave backhaul is planned, ROW permissions and subsequent OFC and microwave tower installation works will take substantial time. This can jeopardize the envisaged timeline of December 2023 for completion of 4G Saturation project. **The Authority therefore recommends that for 4G saturation scheme, USOF should initially plan VSAT medium backhaul connectivity for all such villages where OFC or other media backhaul is not currently available. The VSAT equipment can be taken on monthly rental model or other prevailing models including shared bandwidth model. The VSAT connectivity can be surrendered as soon as the OFC backhaul is made available.**

D. OFC connectivity to villages (BharatNet project)

2.32 As brought out at paragraph 2.23 B (iii) above, the implementation of BBNL Phase II involves connection of GPs using a variety of implementation options, including the State-led Model, the Private Sector Model, and the CPSU Model, as well as last mile connectivity in GPs using Wi-Fi or any other compatible broadband technology. In Himachal Pradesh, Phase-II was planned under Public Private Partnership (PPP) mode. However, there were no interested bidders against tender floated by USOF for connecting the villages through OFC. Now there is a thought process to call for bids on

DBOM (Design, Built, Operate & Maintain) model. However, this is still in its initial ideation phase and might take time to plan and implement. Fortunately, 158 villages that were planned in Phase-II on Satellite backhaul have seen interest and out of these, 156 villages are already service ready (refer table below for details) indicating that Satellite based connectivity can be an immediate option for planning basic connectivity to villages. This can be replaced by OFC backhaul as and when the OFC reaches the villages:

Table 2.12: Himachal Pradesh – BharatNet Villages Planned & Connected

Himachal Pradesh - BharatNet Villages Planned & connected							
District	Planned				Service Ready		
	PH-I OFC	PPP/ DBOM	Satellite	Total	PH-I OFC	Satellite	Total
BILASPUR		176		176			0
CHAMBA		264	45	309		43	43
HAMIRPUR	172	76		248	172		172
KANGRA		814		814			0
KINNAUR		8	65	73		65	65
KULLU		235		235			0
LAHUL AND SPITI		4	41	45		41	41
MANDI	25	534		559	25		25
SHIMLA		406	6	412		6	6
SIRMAUR		258	1	259		1	1
SOLAN	55	185		240	55		55
UNA		245		245			0
Total	252	3205	158	3615	252	156	408

As can be seen from the status of implementation of BharatNet, Phase-II Project, out of 3,205 villages of Himachal Pradesh that were planned in PPP model to be connected on optical fiber cable, none of the villages have yet been connected. It has been informed to TRAI that bids for Phase-II PPP model have not received any response. It is, therefore, likely that connecting these villages by laying optical fiber cable will take three to four years. The Authority, therefore, suggests following three approaches as a stopgap measure:

- a. The Authority has also collected the data pertaining to OPGW presence in the area, which has been provided at [Annexures VI and VII](#) respectively. As the USOF sponsored schemes (as mentioned at paragraph 2.12 b (i) to (iii) are currently under rollout in these four identified districts, **the Authority recommends that BSNL and USO may suitably examine the OPGW data collected by TRAI (and provisioned at Annexure VI & VII respectively) for its gainful utilization towards expediting the rollout of BharatNet Phase-II and USOF sponsored schemes for 4G mobile coverage respectively.**
- b. *Project Kranti* (also known as *Network For Spectrum (NFS)*) is a Nationwide OFC Network being implemented by BSNL, wherein almost 60,000 km of OFC is being rolled out for exclusive use by defence forces in lieu of surrendered spectrum by the latter (40 Mhz in 2G band and 25 Mhz in 3G band). Owing to deployment of defense forces along the border areas in the state, the aforementioned OFC has percolated extensively into the remote regions. The continued serviceability of this network is also being ensured using microwave and satellite-based overlay to cater for disruptions occurring in terrestrial based fiber network. **The Authority recommends that DoT should take up with Ministry of Defence (MoD) for allocation of one/ two pair of OFC on NFS network for extending telecom coverage (including broadband services) to the villages located in far-flung or border areas in the state under BharatNet project. In case the same is not feasible, MoD may be approached to allocate suitable bandwidth on its existing functional OFC to extend the telecom coverage to such villages.**
- c. **The Authority recommends that for the identified four districts, the villages that are yet to be connected under BharatNet Project should be immediately connected on VSAT media. As has been**

suggested previously, the VSAT equipment can be taken on a monthly rental model or other prevailing models including shared bandwidth model. The VSAT connectivity can be surrendered as soon as the OFC backhaul is made available.

- 2.33 **The Authority in its recommendations “Roadmap to Promote Broadband Connectivity and Enhanced Broadband Speed” dated 31.08.2021 has recommended in para 4.26, that in order to enhance the mobile broadband speed in rural and remote areas, using BharatNet network, optical fiber connectivity with Service Level Agreements (SLA) should be made available to service providers for fiberization of the cellular networks backhaul connectivity. The Authority reiterates these recommendations.** DoT should ensure that they are implemented across India including four districts of Himachal Pradesh. This will help in better utilization of BharatNet assets as well.

E. Transmission Core network to service the area

- 2.34 The Authority has collected preliminary data on the transmission of network of access service providers that are present in these four districts of Himachal Pradesh. From the data, it is evident that the presence of optical fiber network of the TSPs is confined to major national highways. There is no ring structure planned for the transmission network. An optical fiber cut can severely impact connectivity to large areas. The Authority, in its recommendation on “Improving the Telecom Services in the North Eastern States: An Investment Plan” dated 26.09.2013, had recommended funding of mobile towers in Northeastern States through USOF along with a detailed transmission media plan for the region. This was to ensure that redundant high bandwidth transmission backhaul connectivity for the Northeastern states is also simultaneously planned. DoT/USOF, while implementing these recommendations, have only focused on funding mobile network presence in these states and have not implemented TRAI suggested

backhaul core transmission network. As a result, even after passage of considerable time, the backhaul connectivity to some of the Northeastern states still remains precarious. Therefore, the Authority is of a firm view that for all remote hilly areas where mobile coverage is being planned through USOF, there is a need to strengthen transmission core network by planning it in a high bandwidth ring topology. For the identified four districts of HP also the Authority would like to suggest a core transmission backhaul network in a ring structure covering all *tehsils/talukas*. However, this will require a detailed analysis of existing transmission network, the planned BharatNet connectivity and other OFC projects of service providers that are in pipeline. Since the weather during winters is not conducive in this area to visit and carry out this study, the Authority will submit these recommendations separately.

- 2.35 **The Authority recommends that for the identified districts of Himachal Pradesh, apart from providing mobile coverage to uncovered villages, a core transmission backhaul network in a ring structure covering all *tehsils/talukas* should also be funded through USOF. TRAI will work on a detailed investment plan for the same and will recommend it separately.**

F. Other Miscellaneous Important issues

- 2.36 As brought out at paragraph 1.8 (e), the TSPs have highlighted the aspect of high RoW charges being imposed by the HP Govt. for laying out underground / overheard OFC. **The Authority recommends that DoT may take up the case with State Government of HP for not levying any RoW charges to TSPs/IP-Is for connecting remote and hilly areas in the State including all locations in four districts of Lahaul & Spiti, Mandi, Kullu and Chamba. The RoW rules of the State should also immediately be aligned to the latest amendments carried out by DoT in ROW Rules 2016.**

2.37 Power is the lifeline of telecom networks, and they cannot function without the availability of reliable, continuous uninterrupted power supply. Delay in providing power connectivity to sites results in delay in rolling out telecom related schemes. It has been brought out by the stakeholders that many times the charges levied for pulling the last mile electricity connection to telecom sites are exorbitant, thus making the site unviable. Further, high electricity tariffs also affect the financial viability of providing telecom services. As a result, the essential connectivity required for Government service delivery, commerce, education, health and other sectors suffer. In view of the importance of digital networks and services for Government to Citizen (G2C) and Government to Business (G2B) service delivery, **the Authority recommends that DOT should take with the State Government to consider providing electricity to telecom sites on priority (within 15 days of connections request) at Utility/Industrial tariff. DoT should also take up with the State Government of HP to consider waiving off last mile installation charges for extending electric connection to telecom sites in remote and hilly areas (including all locations in districts of Lahaul & Spiti, Mandi, Kullu and Chamba) as this will facilitate early roll out of telecom services in these areas and will help bridging the digital divide.**

2.38 The National Highways Authority of India (NHAI), Border Roads Organization (BRO), local road construction authorities, Public Health Engineering (PHE) Department and other such agencies carrying out digging work, formation cutting, road construction work and/or road widening projects tend to inadvertently cause damage to the underlying telecom infrastructure. It has been observed that due to lack of funds or unviability of overall business obtained from remote areas, the connectivity once damaged, is not being restored by the TSPs. **Road widening or other related works disrupt telecom networks considerably leading to**

connectivity issues. The Authority recommends that DoT should take up with the State Government, NHAI and BRO, that in all road construction, road widening or other related works should be done (through prior notice) with prior coordination with TSPs, and the liability of Contractor for making payments for damages to telecom networks should be included ab-initio in the contracts. DoT should also take up with the state government of HP to explore the possibility of constructing utility ducts in all future road widening and new road construction projects. This will help in quick rollout of all utility infrastructure, including telecom, in the state. The Authority further reiterates that DoT should immediately implement its recommendations for planning and development of common ducts and posts infrastructure across the country, as mentioned in its “Recommendations on Roadmap to Promote Broadband Connectivity and Enhanced Broadband Speed”, issued on 31 August 2021 and its response to the back reference dated 25.07.2022..

2.39 Stakeholders have also submitted that due to extreme climate conditions and erratic power supply in the tribal areas of HP it is difficult to maintain the battery backup and up-time of the equipment. In such a situation solar power can be a better alternative. However, providing solar power backups to sites may adversely impact their commercial viability. **The Authority recommends that DoT should take up with the MNRE and Himachal Pradesh Government for coming up with a scheme to fund installation of solar panels at important strategic telecom sites in remote hilly areas.**

2.40 During the interactions with stakeholders, BSNL had submitted to Authority that 20 BTS locations in tribal and remote border areas of Himachal Pradesh are working on VSAT media which are commercially non-viable for BSNL due to huge spectrum charges being paid and negligible

revenue coming from these sites. At present the bandwidth charges of approximately Rs. 5 Cr per annum are being paid by BSNL to DoT for the 20 BTS locations which are working on satellite media (VSAT & IDR). BSNL has requested the Authority that in line with practice being adopted for Andaman & Nicobar and Lakshdweep islands, HP State Government should bear these Spectrum Charges of Rs. 5 Crore per annum from the 'Tribal Fund' as BSNL is not in a position to sustain these huge charges for loss making BTS sites. The Authority agrees with the concerns raised by BSNL and is of the opinion that spending huge capital and operational costs for any TSPs, for running unviable sites in hilly and remote areas primarily for purposes that serve strategic or service delivery needs of Government, is not possible in long run. **The Authority therefore recommends that DoT should do a site-wise analysis of all such sites that are being run by BSNL on VSAT in remote and hilly areas of Himachal Pradesh. For all such sites that are being run to serve strategic or service delivery needs of the Government, the entire operational costs of running these sites should be borne by the Government.**

- 2.41 The hilly regions falling under these identified four revenue districts of HP are prone to natural disasters. Incidents like landslides, cloud bursts, flash floods, avalanches, earthquakes, etc. can severely affect the connectivity and relief operations in such areas. Cellular communication, especially with Intra-Circle Roaming (ICR) facility enabled, plays a key role in such areas for quick reaction and effective mitigation of disaster. **TRAI is already in receipt of a reference on enabling ICR for remote and hilly regions frequently prone to natural disaster-based emergency situations. The subject is currently under examination and TRAI will come up with separate recommendations in this regard after due consultations.**

- 2.42 Based on a meeting where Hon'ble Chief Minister of Sikkim had raised concerns with respect to inadequate mobile and Internet connectivity at

schools, health centres and at Homestay locations in Sikkim, the Authority had written a letter to DoT on 07.10.2022 in which certain action points were proposed for Improving Telecom Connectivity/ Infrastructure in Sikkim State (Copy of the letter is attached as [Annexure IX](#)). Some of the action points of the letter are –

- operating a separate escrow account for managing BharatNet/USOF funded project by BSNL,
- creation of state-wise special project division under LSA field units with personnel having technical expertise and experience for project implementation and maintenance of BharatNet and other USOF funded projects,
- putting in a mechanism for instant information about lit GPUs to states,
- enforcing license condition on TSPs to maintain waiting list of each every wired-line service demand raised to them, etc.

are equally relevant for the State of Himachal Pradesh as well.

The Authority, therefore, recommends that DoT should immediately initiate action on all points related to Sikkim, as mentioned in TRAI's DO Letter No M-5/9/(4)/2021-QoS dated 07.10.2022 ([Copy at Annexure-IX](#)). The points mentioned in the aforementioned DO letter, to the extent relevant for Himachal Pradesh, should also be implemented at the earliest.

Chapter-III

SUMMARY OF RECOMMENDATIONS

- 3.1 The Authority recommends that Capital Expenditure (CAPEX) and Operating Expenditure (OPEX) required for providing telecom infrastructure and connectivity to the 25 uncovered villages (falling under the three revenue districts of Lahaul & Spiti, Kullu and Chamba) of Himachal Pradesh (HP) should be funded by Government through USOF.**

[Para 2.26]

- 3.2 As the extant provisions in USOF sponsored “*Saturation Of 4G Mobile Services in Uncovered Villages Across the Country*” allows for inclusion of additional 20% communities under its present scope, the Authority recommends USOF to carry out on-ground survey of these 25 uncovered villages (falling under the three revenue districts of Lahaul & Spiti, Kullu and Chamba) for evaluating the rollout feasibility of telecom infrastructure at these villages. Subject to feasibility, the Authority recommends that USOF should immediately include these 25 uncovered villages under its 20% additional scope for providing 4G services and also cater for the requisite overall additional expenditure (as suggested at [Table 2.9](#) above) for providing 4G coverage in these 25 villages.**

[Para 2.29]

- 3.3 Further, the Authority also recommends that cellular mobile infrastructure at these 38 villages (detailed list enclosed at [Annexure VIII](#)) having non-4G based coverage, must also be upgraded to 4G based telecom service under the 20% additional scope that exists in USOF sponsored “*Saturation Of 4G Mobile Services in Uncovered Villages Across the Country*”.**

[Para 2.30]

3.4 The Authority recommends that for 4G saturation scheme, USOF should initially plan VSAT medium backhaul connectivity for all such villages where OFC or other media backhaul is not currently available. The VSAT equipment can be taken on monthly rental model or other prevailing models including shared bandwidth model. The VSAT connectivity can be surrendered as soon as the OFC backhaul is made available.

[Para 2.31]

3.5 The Authority recommends that BSNL and USO may suitably examine the OPGW data collected by TRAI (and provisioned at Annexure VI & VII respectively) for its gainful utilization towards expediting the rollout of BharatNet Phase-II and USOF sponsored schemes for 4G mobile coverage respectively.

[Para 2.32(a)]

3.6 The Authority recommends that DoT should take up with Ministry of Defence (MoD) for allocation of one/ two pair of OFC on NFS network for extending telecom coverage (including broadband services) to the villages located in far-flung or border areas in the state under BharatNet project. In case the same is not feasible, MoD may be approached to allocate suitable bandwidth on its existing functional OFC to extend the telecom coverage to such villages

[Para 2.32(b)]

3.7 The Authority recommends that for the identified four districts, the villages that are yet to be connected under BharatNet Project should be immediately connected on VSAT media. As has been suggested previously, the VSAT equipment can be taken on a monthly rental model or other prevailing models including shared bandwidth model. The VSAT connectivity can be surrendered as soon as the OFC backhaul is made available.

[Para 2.32(c)]

3.8 The Authority in its recommendations “Roadmap to Promote Broadband Connectivity and Enhanced Broadband Speed” dated 31.08.2021 has recommended in para 4.26, that in order to enhance the mobile broadband speed in rural and remote areas, using BharatNet network, optical fiber connectivity with Service Level Agreements (SLA) should be made available to service providers for fiberization of the cellular networks backhaul connectivity. The Authority reiterates these recommendations.

[Para 2.33]

3.9 Authority recommends that for the identified districts of Himachal Pradesh, apart from providing mobile coverage to uncovered villages, a core transmission backhaul network in a ring structure covering all *tehsils/talukas* should also be funded through USOF. TRAI will work on a detailed investment plan for the same and will recommend it separately.

[Para 2.35]

3.10 The Authority recommends that DoT may take up the case with State Government of HP for not levying any RoW charges to TSPs/IP-Is for connecting remote and hilly areas in the State including all locations in four districts of Lahaul & Spiti, Mandi, Kullu and Chamba. The RoW rules of the State should also immediately be aligned to the latest amendments carried out by DoT in ROW Rules 2016.

[Para 2.36]

3.11 The Authority recommends that DOT should take up with the State Government to consider providing electricity to telecom sites on priority (within 15 days of connections request) at Utility/Industrial tariff. DoT should also take up with the State Government of HP to consider waiving off last mile installation charges for extending electric connection to telecom sites in remote and hilly areas (including all locations in districts of Lahaul & Spiti, Mandi, Kullu and Chamba) as this will facilitate early roll out of telecom services in these areas and will help bridging the digital divide.

[Para 2.37]

3.12 The Authority recommends that DoT should take up with the State Government, NHAI and BRO, that in all road construction, road widening or other related works should be done (through prior notice) with prior coordination with TSPs, and the liability of Contractor for making payments for damages to telecom networks should be included ab-initio in the contracts. DoT should also take up with the state government of HP to explore the possibility of constructing utility ducts in all future road widening and new road construction projects. This will help in quick rollout of all utility infrastructure, including telecom, in the state. The Authority further reiterates that DoT should immediately implement its recommendations for planning and development of common ducts and posts infrastructure across the country, as mentioned in its “*Recommendations on Roadmap to Promote Broadband Connectivity and Enhanced Broadband Speed*”, issued on 31 August 2021 2021 and its response to the back reference dated 25.07.2022.

[Para 2.38]

3.13 The Authority recommends that DoT should take up with the MNRE and Himachal Pradesh Government for coming up with a scheme to

fund installation of solar panels at important strategic telecom sites in remote hilly areas.

[Para 2.39]

3.14 The Authority recommends that DoT should do a site-wise analysis of all such sites that are being run by BSNL on VSAT in remote and hilly areas of Himachal Pradesh. For all such sites that are being run to serve strategic or service delivery needs of the Government, the entire operational costs of running these sites should be borne by the Government.

[Para 2.40]

3.15 The Authority recommends that DoT should immediately initiate action on all points related to Sikkim, as mentioned in TRAI's DO Letter No *M-5/9/(4)/2021-QoS dated 07.10.2022* ([Copy at Annexure-IX](#)). The points mentioned in the aforementioned DO letter, to the extent relevant for Himachal Pradesh, should also be implemented at the earliest.

[Para 2.42]

Annexure I

Refer paragraph 1.7 of Chapter 1.

LETTER ISSUED BY DIT OF HP GOVT. SEEKING VERIFIED DETAILS OF UNCOVERED VILLAGES FROM ALL DEPUTY COMMISSIONERS

No. E-25606 -SITE-F05(6)/2/2019-IT SECTION-GoHP- 167
Department of Information Technology
Himachal Pradesh

From **Director,
Department of Information Technology,
Himachal Pradesh.**

To **All the Deputy Commissioners in
Himachal Pradesh.**

Dated: Shimla-171013 18th Nov., 2021

Subject: Regarding to prioritise uncovered villages.

Sir,

I would like to inform you that a meeting was held under the chairmanship of Chairman, TRAI (Telecom Regulatory Authority of India) dated 14.10.2021 to review the status of Telecom connectivity in Himachal Pradesh. Representatives of Telecom Service Providers were also present in the meeting. During the discussion it was observed that there are 202 villages in the State which are still uncovered with wireless/wire line connectivity and there is no immediate plan of DoT or the TSPs to provide connectivity in these villages. List of uncovered villages is attached herewith for your reference.

After detailed discussions with TRAI and TSPs, it was decided that State IT Department would share list of uncovered villages with DOT, GoI to release funds to TSPs to cover these villages under USOF scheme.

In this regard, it is requested to kindly go through the list of 202 uncovered villages and priorities the list with respect to installation of towers so that same could be shared with DoT, GoI. Details about 202 uncovered villages in Himachal Pradesh is attached as **Annexure-A** for reference.

Yours sincerely,

Mukesh Repaswal, (IAS)
**Director (IT),
Department of Information Technology,
Himachal Pradesh.**

Endst. No.: As above
Copy forwarded to:

1. The Principal Secretary (IT) for information please.
2. Sh. Sanjeev Banzal, Advisor (Consumer Affairs) Room No 719, Mahanagar Doorsanchar Bhawan, Jawaharlal Nehru Marg, next to Zakir Hussain College, New Delhi, Delhi 1100

Dated: Shimla-13 18th Nov., 2021

**Director,
Department of Information Technology,
Himachal Pradesh.**

O/o Advisor (IT & CA)
Dy. No. 420
Date 02/12/2021

18/11/21

Annexure-A

Details about 202 uncovered villages in Himachal Pradesh					
Sr. No.	State Name	District Name	Block	Gram Panchayat Name	Village Name
1	HIMACHAL PRADESH	Chamba	Pangi	LUJ	Kuthah (12)
2	HIMACHAL PRADESH	Chamba	Pangi	SURAL	Sural Bhatari (16)
3	HIMACHAL PRADESH	Chamba	Pangi	KARYUNI KOTHI	Seri (37)
4	HIMACHAL PRADESH	Chamba	Pangi	KUMAR	Khinan (46)
5	HIMACHAL PRADESH	Chamba	Tisa	GUILA	Alwas (365)
6	HIMACHAL PRADESH	Chamba	Tisa	GUILA	Guila (357)
7	HIMACHAL PRADESH	Chamba	Tisa	GHULEI	Ghulei (370)
8	HIMACHAL PRADESH	Chamba	Tisa	MANGLI	Mangli (345)
9	HIMACHAL PRADESH	Chamba	Tisa	MANGLI	Bhauras (347)
10	HIMACHAL PRADESH	Chamba	Tisa	SANWAL	Dhar Makkan (311)
11	HIMACHAL PRADESH	Chamba	Tisa	SANWAL	Makkan (310)
12	HIMACHAL PRADESH	Chamba	Tisa	SHALELA BADI	Baraila (313)
13	HIMACHAL PRADESH	Chamba	Tisa	SHALELA BADI	Dhar Kalopar (312)
14	HIMACHAL PRADESH	Chamba	Tisa	GHULEI	Meas (384)
15	HIMACHAL PRADESH	Chamba	Tisa	DEHRA	Kunda (483)
16	HIMACHAL PRADESH	Chamba	Saluni	BHANDAL	Dhar Supacholu (141)
17	HIMACHAL PRADESH	Chamba	Saluni	BHANDAL	R.F. Langeri (136)
18	HIMACHAL PRADESH	Chamba	Saluni	BHANDAL	Langeri (143)
19	HIMACHAL PRADESH	Chamba	Saluni	BHANDAL	Dhar Gamgul (148)
20	HIMACHAL PRADESH	Chamba	Saluni	BHANDAL	Pringul (134)
21	HIMACHAL PRADESH	Chamba	Saluni	BHANDAL	Dhar Sontith (159)
22	HIMACHAL PRADESH	Chamba	Saluni	BHAJOTRA	Gri Jindu (107)
23	HIMACHAL PRADESH	Chamba	Saluni	NADDAL	Kunda (2)
24	HIMACHAL PRADESH	Chamba	Saluni	BHUNAD	Thal (12)
25	HIMACHAL PRADESH	Chamba	Bhattiyat	JANDROG	Aru - da - Pher (250)
26	HIMACHAL PRADESH	Chamba	Bhattiyat	JANDROG	Chakki (251)

27	HIMACHAL PRADESH	Chamba	Bhattiyat	JANDROG	Dharsana (256)
28	HIMACHAL PRADESH	Chamba	Bhattiyat	KHARGETA	Godhal (284)
29	HIMACHAL PRADESH	Chamba	Bhattiyat	KHARGETA	Manjhoi (285)
30	HIMACHAL PRADESH	Chamba	Bhattiyat	RAJAIN	Karah (296)
31	HIMACHAL PRADESH	Chamba	Bhattiyat	MOTLA	Draon (317)
32	HIMACHAL PRADESH	Chamba	Bhattiyat	MOTLA	Sakhiar (318)
33	HIMACHAL PRADESH	Chamba	Mehla	KHUNDEL	Khundail (123)
34	HIMACHAL PRADESH	Chamba	Mehla	BALOTH	Aghara (136)
35	HIMACHAL PRADESH	Chamba	Mehla	PREENA	Lower Digaid Jangal (144)
36	HIMACHAL PRADESH	Chamba	Mehla	PREENA	Upar Digaid Jangal (139)
37	HIMACHAL PRADESH	Chamba	Mehla	PREENA	Sakraina (142)
38	HIMACHAL PRADESH	Chamba	Mehla	PREENA	Gan (143)
39	HIMACHAL PRADESH	Chamba	Bharmaur	KUWARSI	Bharwali (152)
40	HIMACHAL PRADESH	Chamba	Bharmaur	KUWARSI	Kuarsi (159)
41	HIMACHAL PRADESH	Chamba	Bharmaur	NAYAGRAN	R.F. Ghalor (158)
42	HIMACHAL PRADESH	Chamba	Bharmaur	DIYOL	Kiur (202)
43	HIMACHAL PRADESH	Chamba	Bharmaur	NAYAGRAN	Thanetar (243)
44	HIMACHAL PRADESH	Chamba	Bharmaur	NAYAGRAN	Dhar Jalsu (251)
45	HIMACHAL PRADESH	Chamba	Bharmaur	BAJOL	Garaunda (224)
46	HIMACHAL PRADESH	Chamba	Bharmaur	KUTHER	Kalah (191)
47	HIMACHAL PRADESH	Chamba	Bharmaur	SANH	Barari (109)
48	HIMACHAL PRADESH	Chamba	Bharmaur	KUGATI	Uparli Kugti (72)
49	HIMACHAL PRADESH	Chamba	Bharmaur	KUGATI	Jhikli Kugti (75)
50	HIMACHAL PRADESH	Chamba	Pangi	LUJ	Luj (7)
51	HIMACHAL PRADESH	Chamba	Pangi	KARYUNI KOTHI	Kothi (38)
52	HIMACHAL PRADESH	Chamba	Pangi	SACH	Phindru (40)
53	HIMACHAL PRADESH	Chamba	Pangi	MINDHAL	Phindpar (88)
54	HIMACHAL PRADESH	Chamba	Pangi	SHOON	Tuwan (61)
55	HIMACHAL PRADESH	Chamba	Pangi	SHOON	Udeen (57)
56	HIMACHAL PRADESH	Chamba	Pangi	SECHU	Chasak (66)

57	HIMACHAL PRADESH	Chamba	Pangi	SECHU	Chasak Bhatore (68)
58	HIMACHAL PRADESH	Chamba	Tisa	SATYAS	Guddan (374)
59	HIMACHAL PRADESH	Chamba	Tisa	KHAJUA	Khajwa (431)
60	HIMACHAL PRADESH	Chamba	Tisa	CHARDA	Paraba (468)
61	HIMACHAL PRADESH	Chamba	Saluni	BHAJOTRA	Sagoti (109)
62	HIMACHAL PRADESH	Chamba	Saluni	BHUNAD	Bhalogi (10)
63	HIMACHAL PRADESH	Chamba	Saluni	BHUNAD	Panjola (9)
64	HIMACHAL PRADESH	Chamba	Saluni	AUHRA	Sikaryah (16)
65	HIMACHAL PRADESH	Chamba	Saluni	AUHRA	Saren (17)
66	HIMACHAL PRADESH	Chamba	Saluni	AUHRA	Sangrut (33)
67	HIMACHAL PRADESH	Chamba	Mehla	KHUNDEL	Kanhetar (124)
68	HIMACHAL PRADESH	Chamba	Mehla	KHUNDEL	Girad (128)
69	HIMACHAL PRADESH	Chamba	Mehla	KHUNDEL	Almi (132)
70	HIMACHAL PRADESH	Chamba	Mehla	BALOTH	Kalaunce (135)
71	HIMACHAL PRADESH	Chamba	Bharmaur	NAYAGRAN	Navei (217)
72	HIMACHAL PRADESH	Chamba	Bharmaur	NAYAGRAN	Urna (237)
73	HIMACHAL PRADESH	Chamba	Bharmaur	BAJOL	Khmar (227)
74	HIMACHAL PRADESH	Chamba	Bharmaur	BAJOL	Sindi (223)
75	HIMACHAL PRADESH	Chamba	Bharmaur	BAJOL	Gowari (220)
76	HIMACHAL PRADESH	Chamba	Bharmaur	BADGRAN	Bhadar (37)
77	HIMACHAL PRADESH	Kangra	Nurpur	DANNI	Kansari (138)
78	HIMACHAL PRADESH	Kangra	Nurpur	DANNI	Hathi Dhar (137)
79	HIMACHAL PRADESH	Kangra	Fatehpur	DIANA	Palela (155)
80	HIMACHAL PRADESH	Kangra	Rait	RULEHAD	Batuni (17)
81	HIMACHAL PRADESH	Kangra	Baijnath	GUNEHAD	Biling (1034)
82	HIMACHAL PRADESH	Kangra	Baijnath	SANSAL	Chogan Thati (1041)
83	HIMACHAL PRADESH	Kangra	Baijnath	SANSAL	Thatwal Thati (858)
84	HIMACHAL PRADESH	Kangra	Baijnath	SANSAL	Barahan (857)
85	HIMACHAL PRADESH	Kangra	Baijnath	BARA BHANGAL	Bara Bangahal (1081)
86	HIMACHAL PRADESH	Kangra	Pragpur	RAIL	Baslahr (60)

87	HIMACHAL PRADESH	Kangra	Dera	MAJHEEN	Dabkehri (876)
88	HIMACHAL PRADESH	Kinnaur	Pooh	NAKO	Ka (21/3)
89	HIMACHAL PRADESH	Kinnaur	Pooh	CHARANG	Charang Khas (59/1)
90	HIMACHAL PRADESH	Kinnaur	Nichar	KATGAON	Surcho (30/14)
91	HIMACHAL PRADESH	Kinnaur	Pooh	KANAM	Up Mohal Gyamil (6/4)
92	HIMACHAL PRADESH	Kinnaur	Pooh	CHARANG	Surting Ting (59/4)
93	HIMACHAL PRADESH	Kinnaur	Kalpa	CHHITKUL	Dhar Shonchayo (71)
94	HIMACHAL PRADESH	Kullu	Kullu	MANJHALI	Manjhli (37/93)
95	HIMACHAL PRADESH	Lahul & Spiti	Lahul	TINGRET	Khanjar (186)
96	HIMACHAL PRADESH	Lahul & Spiti	Lahul	TINGRET	D.P.F.Churput (175)
97	HIMACHAL PRADESH	Lahul & Spiti	Lahul	CHIMRET	Ghari (204)
98	HIMACHAL PRADESH	Lahul & Spiti	Lahul	CHIMRET	D.P.F.Tumru (203)
99	HIMACHAL PRADESH	Lahul & Spiti	Lahul	TINDI	R.F.Krakun (117)
100	HIMACHAL PRADESH	Lahul & Spiti	Lahul	TINDI	Harsar (132)
101	HIMACHAL PRADESH	Lahul & Spiti	Lahul	TINDI	Kurched (140)
102	HIMACHAL PRADESH	Lahul & Spiti	Lahul	MOORING	Chhogjing (1/3)
103	HIMACHAL PRADESH	Lahul & Spiti	Lahul	DARCHA	Chhika-Be (8/11)
104	HIMACHAL PRADESH	Lahul & Spiti	Lahul	DARCHA	Rarik (8/12)
105	HIMACHAL PRADESH	Lahul & Spiti	Spiti	LOSSAR	Hansa (44)
106	HIMACHAL PRADESH	Lahul & Spiti	Spiti	HULL	Pangmo Khas (52/1)
107	HIMACHAL PRADESH	Lahul & Spiti	Spiti	KIBBER	Tashi Gang (63)
108	HIMACHAL PRADESH	Lahul & Spiti	Spiti	LANGCHA	Langja (66)
109	HIMACHAL PRADESH	Lahul & Spiti	Spiti	LANGCHA	Hikam (68)
110	HIMACHAL PRADESH	Lahul & Spiti	Spiti	LANGCHA	Komik (69)
111	HIMACHAL PRADESH	Lahul & Spiti	Spiti	HULL	Morang (80)
112	HIMACHAL PRADESH	Lahul & Spiti	Spiti	KUNGRI	Chhidang (89)
113	HIMACHAL PRADESH	Lahul & Spiti	Spiti	KUNGRI	Barpa (92)
114	HIMACHAL PRADESH	Lahul & Spiti	Spiti	KUNGRI	Minsar (101)
115	HIMACHAL PRADESH	Lahul & Spiti	Spiti	SAGNAM	Mud (128/1)
116	HIMACHAL PRADESH	Lahul & Spiti	Spiti	SAGNAM	Teling (130/1)

117	HIMACHAL PRADESH	Lahul & Spiti	Spiti	SAGNAM	Chamling (131)
118	HIMACHAL PRADESH	Lahul & Spiti	Spiti	SAGNAM	Todnam (141)
119	HIMACHAL PRADESH	Lahul & Spiti	Spiti	SAGNAM	Khar (142)
120	HIMACHAL PRADESH	Lahul & Spiti	Spiti	DANKHAR	Newpur (149/5)
121	HIMACHAL PRADESH	Lahul & Spiti	Spiti	DEMUL	Gangdo Demul (155/2)
122	HIMACHAL PRADESH	Lahul & Spiti	Spiti	LALUNG	Kibri (163/3)
123	HIMACHAL PRADESH	Lahul & Spiti	Spiti	TABO	Lapcha (174/2)
124	HIMACHAL PRADESH	Lahul & Spiti	Spiti	GUE	Duphuk (177/2)
125	HIMACHAL PRADESH	Lahul & Spiti	Spiti	TABO	Dhar Chhochhodun (178)
126	HIMACHAL PRADESH	Lahul & Spiti	Lahul	TINDI	D.P.F.Thanwani (137)
127	HIMACHAL PRADESH	Lahul & Spiti	Lahul	TINDI	R.F.Dhandal (139)
128	HIMACHAL PRADESH	Lahul & Spiti	Lahul	TRILOKNATH	D.P.F.Gilding (221)
129	HIMACHAL PRADESH	Lahul & Spiti	Spiti	LOSSAR	Kaito (46)
130	HIMACHAL PRADESH	Lahul & Spiti	Spiti	KIBBER	Chicham Khas (56/1)
131	HIMACHAL PRADESH	Lahul & Spiti	Spiti	KIBBER	Kibber Khas (61/1)
132	HIMACHAL PRADESH	Lahul & Spiti	Spiti	KHURIK	Sumling (79)
133	HIMACHAL PRADESH	Lahul & Spiti	Spiti	LALUNG	Samling (149/6)
134	HIMACHAL PRADESH	Lahul & Spiti	Spiti	LALUNG	Rama Khas (151/1)
135	HIMACHAL PRADESH	Lahul & Spiti	Spiti	LALUNG	Chobrang (152/1)
136	HIMACHAL PRADESH	Lahul & Spiti	Spiti	LALUNG	Sanglung (153)
137	HIMACHAL PRADESH	Lahul & Spiti	Spiti	DEMUL	Demul Khas (155/1)
138	HIMACHAL PRADESH	Lahul & Spiti	Spiti	DEMUL	Mulche (155/3)
139	HIMACHAL PRADESH	Lahul & Spiti	Spiti	LALUNG	Lalung Khas (163/1)
140	HIMACHAL PRADESH	Lahul & Spiti	Spiti	DANKHAR	Dhar Gangchhumi (165)
141	HIMACHAL PRADESH	Mandi	Drang	LATRAN (DRG)	Khaban (445)
142	HIMACHAL PRADESH	Mandi	Drang	LATRAN (DRG)	Jhukan (444)
143	HIMACHAL PRADESH	Mandi	Drang	LATRAN (DRG)	Gahang (446)

144	HIMACHAL PRADESH	Mandi	Drang	SILHBADHWANI	Kortang (465)
145	HIMACHAL PRADESH	Mandi	Drang	ROPA (DRG)	Droon (499)
146	HIMACHAL PRADESH	Mandi	Chauntra	TIKARI MUSERA	Nika Thana (57)
147	HIMACHAL PRADESH	Mandi	Chauntra	TIKARI MUSERA	Uparla Marhola (59)
148	HIMACHAL PRADESH	Mandi	Chauntra	GALU	Miharah (62)
149	HIMACHAL PRADESH	Mandi	Chauntra	GALU	Pat (61)
150	HIMACHAL PRADESH	Mandi	Drang	HARGUNAIN (DRG)	Digli (386)
151	HIMACHAL PRADESH	Mandi	Chauntra	KOLANG	Kolang (185)
152	HIMACHAL PRADESH	Mandi	Mandi Sadar	SHEGLI (SDR)	Kalang (420)
153	HIMACHAL PRADESH	Mandi	Mandi Sadar	KOT DHALYASH	Bhanuthi (482)
154	HIMACHAL PRADESH	Mandi	Mandi Sadar	KOT DHALYASH	Pub (479)
155	HIMACHAL PRADESH	Mandi	Mandi Sadar	KOT DHALYASH	Piun (478)
156	HIMACHAL PRADESH	Mandi	Seraj	BHALI DHAR	D.P.F.Kala Kamisher (462)
157	HIMACHAL PRADESH	Mandi	Gohar	JAHAL (GHR)	Chaun Doghra (219)
158	HIMACHAL PRADESH	Mandi	Sundarnagar	JARAL (SNR)	Basahu (229)
159	HIMACHAL PRADESH	Mandi	Sundarnagar	JARAL (SNR)	D.P.F.Barbat (233)
160	HIMACHAL PRADESH	Mandi	Sundarnagar	SERI (SNR)	Seri (252)
161	HIMACHAL PRADESH	Mandi	Sundarnagar	BELEG (SNR)	Manjehli (247)
162	HIMACHAL PRADESH	Mandi	Sundarnagar	BANDLI (SNR)	D.P.F.Dayoli (266)
163	HIMACHAL PRADESH	Mandi	Gohar	JHUNGI (GHR)	D.P.F. Baneshiti (227)
164	HIMACHAL PRADESH	Mandi	Gohar	MASOGAL	D.P.F. Chuhar (249)
165	HIMACHAL PRADESH	Mandi	Karsog	RICHNI	Pathrebi (545)
166	HIMACHAL PRADESH	Mandi	Karsog	KAHNU (KSG)	Padli (65)
167	HIMACHAL PRADESH	Mandi	Karsog	BAGSHAD (KSG)	Guma-II (272)
168	HIMACHAL PRADESH	Mandi	Karsog	BAGSHAD (KSG)	Dudhali-II (273)
169	HIMACHAL PRADESH	Mandi	Karsog	SARTYOLA	Dudhali-I (263)
170	HIMACHAL PRADESH	Mandi	Karsog	PARLOG	Ropari (305)
171	HIMACHAL PRADESH	Mandi	Karsog	PARLOG	Loharli (308)
172	HIMACHAL PRADESH	Mandi	Karsog	BALI DHAR (KSG)	Genshar (450)
173	HIMACHAL PRADESH	Mandi	Drang	VARDHAN (DRG)	Lachhyan (435)

174	HIMACHAL PRADESH	Mandi	Drang	ROPA PAADHAR	Badan (385)
175	HIMACHAL PRADESH	Mandi	Seraj	NALBAGI (SRJ)	Nalwagi (536)
176	HIMACHAL PRADESH	Mandi	Seraj	KHALWAN (SRJ)	Dhalut (662)
177	HIMACHAL PRADESH	Mandi	Seraj	KHAULI	D.P.F. Bagra (692)
178	HIMACHAL PRADESH	Mandi	Seraj	KHAULI	Khauri (690)
179	HIMACHAL PRADESH	Mandi	Seraj	GUDAH (SRJ)	D.P.F.Lambi Dhar (370)
180	HIMACHAL PRADESH	Mandi	Sundarnagar	JARAL (SNR)	Dharli (230)
181	HIMACHAL PRADESH	Mandi	Sundarnagar	SERI (SNR)	D.P.F.Salana (219)
182	HIMACHAL PRADESH	Mandi	Sundarnagar	SERI (SNR)	Garahan (251)
183	HIMACHAL PRADESH	Mandi	Sundarnagar	SERI (SNR)	Lalag (253)
184	HIMACHAL PRADESH	Mandi	Karsog	BINDLA	Bhora (269)
185	HIMACHAL PRADESH	Mandi	Karsog	SARTYOLA	D.P.F.Nagaltha (312)
186	HIMACHAL PRADESH	Shimla	Basantpur	KARYALI	Nalah (39)
187	HIMACHAL PRADESH	Shimla	Chaupal	SARANH	Jangal Amta - I
188	HIMACHAL PRADESH	Shimla	Chaupal	LINGZAR	Shawala (116)
189	HIMACHAL PRADESH	Shimla	Chaupal	LINGZAR	Chiuna (117)
190	HIMACHAL PRADESH	Shimla	Chaupal	LINGZAR	Bhatna (119)
191	HIMACHAL PRADESH	Shimla	Chaupal	JOKHAR (BP)	Jangal Runah
192	HIMACHAL PRADESH	Shimla	Chaupal	BHALOO (BP)	Digah (133)
193	HIMACHAL PRADESH	Shimla	Chauhara	JAKHA (BP)	Jakha (3)
194	HIMACHAL PRADESH	Shimla	Chauhara	JISKOON	Pandar (19)
195	HIMACHAL PRADESH	Shimla	Chauhara	KAWAR (BP)	D.P.F. Chanaun (15)
196	HIMACHAL PRADESH	Shimla	Rampur	DARKALI (BP)	Darkali (151/1)
197	HIMACHAL PRADESH	Shimla	Chaupal	JODNA	Lihat (98)
198	HIMACHAL PRADESH	Shimla	Chaupal	JODNA	Bhaila
199	HIMACHAL PRADESH	Shimla	Chauhara	SARIBASA (BP)	Dumrera (3)
200	HIMACHAL PRADESH	Sirmaur	Nahan	KATAHA SHITLA	Khairi Chaingan (79)
201	HIMACHAL PRADESH	Solan	Solan	MASHIWAR	Sunnu Tikri (543)
202	HIMACHAL PRADESH	Una	Bangana	LATHIANI	Govind Sagar Jheel

District wise list of Uncovered Villages having no TSP facilitated Cellular coverage

#	State/ UT	District	District Code as per Census 2011 data	Sub District Code as per Census 2011 data	Village Code as per Census 2011 data	Population	Name of Village
1	HP	Chamba	023	00083	006674	625	Luj (7)
2	HP	Chamba	023	00083	006675	718	Dharwas (11)
3	HP	Chamba	023	00083	006679	307	Kuthah (12)
4	HP	Chamba	023	00083	006681	228	Rusmas (14)
5	HP	Chamba	023	00083	006682	319	Tai (15)
6	HP	Chamba	023	00083	006683	216	Sural Bhatore (16)
7	HP	Chamba	023	00083	006685	408	Hundan Bhatore (18)
8	HP	Chamba	023	00083	006686	157	Tundru (19)
9	HP	Chamba	023	00083	006687	165	Takwas (20)
10	HP	Chamba	023	00083	006688	162	Seri Bhatwas (21)
11	HP	Chamba	023	00083	006706	387	Parmas (22)
12	HP	Chamba	023	00083	006712	289	Parmar (45)
13	HP	Chamba	023	00083	006713	334	Kumar (44)
14	HP	Chamba	023	00083	006724	608	Sach (47)
15	HP	Chamba	023	00083	006725	11	Khinan (46)
16	HP	Chamba	023	00083	006729	50	Micham (53)
17	HP	Chamba	023	00083	006736	267	Shoon (56)
18	HP	Chamba	023	00083	006737	164	Leu (55)
19	HP	Chamba	023	00083	006738	269	Sahli (54)
20	HP	Chamba	023	00083	006739	102	Dhanala (75)
21	HP	Chamba	023	00083	006741	14	R.F.Bambal (86)
22	HP	Chamba	023	00083	006743	193	Kulal (92)
23	HP	Chamba	023	00083	006750	155	Chhau (83)
24	HP	Chamba	023	00083	006753	99	Ajog (100)
25	HP	Chamba	023	00083	006760	727	Shour (79)
26	HP	Chamba	023	00083	006761	2	R.F.Shour (80)
27	HP	Chamba	023	00083	006762	6	D.P.F.Purthi (81)
28	HP	Chamba	023	00083	006765	546	Thandal (77)
29	HP	Chamba	023	00083	006767	78	Mojhi (73)
30	HP	Chamba	023	00083	006770	294	Saichu (65)
31	HP	Chamba	023	00083	006777	121	Chasak Bhatore (68)
32	HP	Chamba	023	00084	006781	133	Alwas (365)
33	HP	Chamba	023	00084	006789	745	Guila (357)
34	HP	Chamba	023	00084	006792	105	Guddan (374)
35	HP	Chamba	023	00084	006798	438	Chalonj (371)
36	HP	Chamba	023	00084	006800	789	Ghulei (370)
37	HP	Chamba	023	00084	006809	194	Mangli (345)
38	HP	Chamba	023	00084	006811	460	Bhauras (347)
39	HP	Chamba	023	00084	006812	15	R.F.Hailera (344)
40	HP	Chamba	023	00084	006819	8	Dhar Makkan (311)
41	HP	Chamba	023	00084	006827	520	Makkan (310)
42	HP	Chamba	023	00084	006830	224	Baraila (313)
43	HP	Chamba	023	00084	006831	18	Dhar Kalopar (312)

District wise list of Uncovered Villages having no TSP facilitated Cellular coverage

#	State/ UT	District	District Code as per Census 2011 data	Sub District Code as per Census 2011 data	Village Code as per Census 2011 data	Population	Name of Village
44	HP	Chamba	023	00084	006913	212	Galua (380)
45	HP	Chamba	023	00084	006914	70	Meas (384)
46	HP	Chamba	023	00084	006943	797	Khajwa (431)
47	HP	Chamba	023	00084	007077	233	Mawa (473)
48	HP	Chamba	023	00084	007078	362	Juri (476)
49	HP	Chamba	023	00085	007094	52	Dhar Supacholu (141)
50	HP	Chamba	023	00085	007100	65	R.F. Langer (136)
51	HP	Chamba	023	00085	007101	123	Langer (143)
52	HP	Chamba	023	00085	007103	57	Dhar Gamgul (148)
53	HP	Chamba	023	00085	007108	380	Pringul (134)
54	HP	Chamba	023	00086	007270	178	Gri Jindu (107)
55	HP	Chamba	023	00086	007278	282	Kunda (2)
56	HP	Chamba	023	00086	007290	117	Thal (12)
57	HP	Chamba	023	00089	007671	117	Draon (317)
58	HP	Chamba	023	00090	007824	173	West Chhuwaru (59)
59	HP	Chamba	023	00090	007891	56	Kanhetar (124)
60	HP	Chamba	023	00090	007896	156	Almi (132)
61	HP	Chamba	023	00090	007901	400	Aghara (136)
62	HP	Chamba	023	00090	007909	104	Lower Digaid Jangal (144)
63	HP	Chamba	023	00090	007910	113	Upur Digaid Jangal (139)
64	HP	Chamba	023	00090	007913	407	Sakraina (142)
65	HP	Chamba	023	00090	007914	314	Gan (143)
66	HP	Chamba	023	00090	007916	817	Jiyoti (152)
67	HP	Chamba	023	00090	008011	311	Thundu (251)
68	HP	Chamba	023	00091	008033	45	Bharwali (152)
69	HP	Chamba	023	00091	008044	192	Kuarsi (159)
70	HP	Chamba	023	00091	008047	21	R.F. Ghalor (158)
71	HP	Chamba	023	00091	008084	39	Kiur (202)
72	HP	Chamba	023	00091	008094	4	Thanetar (243)
73	HP	Chamba	023	00091	008108	2	Dhar Jalsu (251)
74	HP	Chamba	023	00091	008114	47	Urna (237)
75	HP	Chamba	023	00091	008118	80	Khnar (227)
76	HP	Chamba	023	00091	008122	243	Garaunda (224)
77	HP	Chamba	023	00091	008123	92	Sindi (223)
78	HP	Chamba	023	00091	008126	46	Gowari (220)
79	HP	Chamba	023	00091	008133	75	Kalah (191)
80	HP	Chamba	023	00092	008188	165	Bhadar (37)
81	HP	Chamba	023	00092	008257	589	Chobhia (55)
82	HP	LahaulSpiti	025	00114	012150	66	Khanjar (186)
83	HP	LahaulSpiti	025	00114	012154	141	Chaling (191)
84	HP	LahaulSpiti	025	00114	012160	90	D.P.F.Churput (175)
85	HP	LahaulSpiti	025	00114	012164	224	Karpat (196)
86	HP	LahaulSpiti	025	00114	012167	55	D.P.F.Shiling (198)

District wise list of Uncovered Villages having no TSP facilitated Cellular coverage

#	State/ UT	District	District Code as per Census 2011 data	Sub District Code as per Census 2011 data	Village Code as per Census 2011 data	Population	Name of Village
87	HP	LahaulSpiti	025	00114	012168	6	Dhar Jhatul (193)
88	HP	LahaulSpiti	025	00114	012170	152	Chamrat (202)
89	HP	LahaulSpiti	025	00114	012171	3	D.P.F.Shakoli (168)
90	HP	LahaulSpiti	025	00114	012172	130	Ghari (204)
91	HP	LahaulSpiti	025	00114	012173	625	Shakoli (157)
92	HP	LahaulSpiti	025	00114	012176	20	D.P.F.Tumru (203)
93	HP	LahaulSpiti	025	00114	012184	4	R.F.Krakun (117)
94	HP	LahaulSpiti	025	00114	012191	180	Bhujund (109)
95	HP	LahaulSpiti	025	00114	012194	113	Baraur (124)
96	HP	LahaulSpiti	025	00114	012201	99	D.P.F.Lohni (122)
97	HP	LahaulSpiti	025	00114	012207	2	Harsar (132)
98	HP	LahaulSpiti	025	00114	012210	39	D.P.F.Thanwani (137)
99	HP	LahaulSpiti	025	00114	012211	12	R.F.Dhandal (139)
100	HP	LahaulSpiti	025	00114	012213	67	Kurched (140)
101	HP	LahaulSpiti	025	00114	012215	271	Salgaraon (143)
102	HP	LahaulSpiti	025	00114	012244	14	Auhar (207)
103	HP	LahaulSpiti	025	00114	012256	114	Chokhang (1/4)
104	HP	LahaulSpiti	025	00114	012257	30	Chhogjing (1/3)
105	HP	LahaulSpiti	025	00114	012258	11	Gwar (1/2)
106	HP	LahaulSpiti	025	00114	012259	52	Nain Gahar (1/1)
107	HP	LahaulSpiti	025	00114	012260	131	Kamring (1/6)
108	HP	LahaulSpiti	025	00114	012261	28	Dandak (1/7)
109	HP	LahaulSpiti	025	00114	012262	68	Murang (1/8)
110	HP	LahaulSpiti	025	00114	012263	49	Chambak (1/9)
111	HP	LahaulSpiti	025	00114	012266	71	Leh Baring (1/14)
112	HP	LahaulSpiti	025	00114	012267	61	Sheling (1/12)
113	HP	LahaulSpiti	025	00114	012268	6	Shenwar (1/11)
114	HP	LahaulSpiti	025	00114	012269	22	Kuang (1/15)
115	HP	LahaulSpiti	025	00114	012270	35	Delda (1/16)
116	HP	LahaulSpiti	025	00114	012271	48	Bha Chewar (1/17)
117	HP	LahaulSpiti	025	00114	012273	33	Bhayadi (1/19)
118	HP	LahaulSpiti	025	00114	012274	227	Nalda (1/21)
119	HP	LahaulSpiti	025	00114	012275	34	Galing (1/23)
120	HP	LahaulSpiti	025	00114	012276	122	Junde (1/24)
121	HP	LahaulSpiti	025	00114	012277	9	Khuruti (1/20)
122	HP	LahaulSpiti	025	00114	012278	28	Lomach (1/27)
123	HP	LahaulSpiti	025	00114	012279	13	Tibok (1/28)
124	HP	LahaulSpiti	025	00114	012280	35	Othang (1/29)
125	HP	LahaulSpiti	025	00114	012281	28	Yang Thang (1/30)
126	HP	LahaulSpiti	025	00114	012282	70	Taljon (1/25)
127	HP	LahaulSpiti	025	00114	012283	126	Jasrath (1/22)
128	HP	LahaulSpiti	025	00115	012288	22	Kothi (3/2)
129	HP	LahaulSpiti	025	00115	012294	149	Rape (2/2)

District wise list of Uncovered Villages having no TSP facilitated Cellular coverage

#	State/ UT	District	District Code as per Census 2011 data	Sub District Code as per Census 2011 data	Village Code as per Census 2011 data	Population	Name of Village
130	HP	LahaulSpiti	025	00115	012295	83	Rashil (2/5)
131	HP	LahaulSpiti	025	00115	012310	2	Muchhling (5/2)
132	HP	LahaulSpiti	025	00115	012311	192	Lot (5/4)
133	HP	LahaulSpiti	025	00115	012313	31	Karing (5/5)
134	HP	LahaulSpiti	025	00115	012314	37	Yangrang (5/7)
135	HP	LahaulSpiti	025	00115	012315	75	Lapshak (5/6)
136	HP	LahaulSpiti	025	00115	012356	72	Meh (8/5)
137	HP	LahaulSpiti	025	00115	012357	65	Bok (8/8)
138	HP	LahaulSpiti	025	00115	012358	1	Gemur-Gompa (8/6)
139	HP	LahaulSpiti	025	00115	012361	80	Chhika-Be (8/11)
140	HP	LahaulSpiti	025	00115	012362	60	Rarik (8/12)
141	HP	LahaulSpiti	025	00115	012368	95	Yoche (8/19)
142	HP	LahaulSpiti	025	00115	012370	60	Gemur (8/7)
143	HP	LahaulSpiti	025	00115	012371	125	Tinno (8/1)
144	HP	LahaulSpiti	025	00116	012471	209	Hansa (44)
145	HP	LahaulSpiti	025	00116	012479	138	Pangmo Khas (52/1)
146	HP	LahaulSpiti	025	00116	012495	40	Tashi Gang (63)
147	HP	LahaulSpiti	025	00116	012498	158	Langja (66)
148	HP	LahaulSpiti	025	00116	012517	81	Morang (80)
149	HP	LahaulSpiti	025	00116	012526	14	Chhidang (89)
150	HP	LahaulSpiti	025	00116	012529	177	Barpa (92)
151	HP	LahaulSpiti	025	00116	012538	9	Minsar (101)
152	HP	LahaulSpiti	025	00116	012568	213	Mud (128/1)
153	HP	LahaulSpiti	025	00116	012572	184	Teling (130/1)
154	HP	LahaulSpiti	025	00116	012574	15	Chamling (131)
155	HP	LahaulSpiti	025	00116	012584	58	Todnam (141)
156	HP	LahaulSpiti	025	00116	012597	3	Newpur (149/5)
157	HP	LahaulSpiti	025	00116	012609	7	Mulche (155/3)
158	HP	LahaulSpiti	025	00116	012621	2	Kibri (163/3)
159	HP	LahaulSpiti	025	00116	012645	1	Duphuk (177/2)
160	HP	LahaulSpiti	025	00116	012647	9	Dhar Chhochhodun (178)
161	HP	LahaulSpiti	025	00116	012649	223	Gipu (180/1)
162	HP	LahaulSpiti	025	00116	012650	8	Lirit (180/2)
163	HP	Kullu	026	00118	012755	0	Up Muhal Jalog
164	HP	Kullu	026	00118	012756	0	Up Muhal Jigling
165	HP	Kullu	026	00120	012941	1716	Mashyar (14/39)
166	HP	Mandi	027	00123	013209	161	Mandra (503)
167	HP	Mandi	027	00133	014418	88	Kalang (420)
168	HP	Mandi	027	00135	014922	743	Kholanal (541)
169	HP	Mandi	027	00135	014958	5	D.P.F. Rajan Kura (653)
170	HP	Mandi	027	00136	015152	19	D.P.F.Kala Kamisher (462)
171	HP	Mandi	027	00137	015480	252	Marhawala (194)
172	HP	Mandi	027	00138	015571	54	D.P.F.Barbat (233)

District wise list of Uncovered Villages having no TSP facilitated Cellular coverage

#	State/ UT	District	District Code as per Census 2011 data	Sub District Code as per Census 2011 data	Village Code as per Census 2011 data	Population	Name of Village
173	HP	Mandi	027	00138	015591	52	Manjehli (247)
174	HP	Mandi	027	00138	015596	207	Badhu (262)
175	HP	Mandi	027	00138	015597	1	D.P.F.Dayoli (266)
176	HP	Mandi	027	00138	015602	625	Dogri (274)
177	HP	Mandi	027	00138	015617	205	Kandhi (62)
178	HP	Mandi	027	00138	015672	94	Maihap (60)
179	HP	Mandi	027	00138	015710	5	D.P.F. Baneshti (227)
180	HP	Mandi	027	00139	015972	98	Padli (65)
181	HP	Mandi	027	00139	016097	1	Ropari (305)

District wise detailed list of 166 Villages where two ongoing USOF Schemes for Cellular Coverage are planned

#	State/ UT	District	Village Code as per Census 2011 data	Name of Village	Name Ongoing Scheme	Name and Detail of scheme	Type of coverage - (2G/3G/4G)
1	HP	Chamba	006674	Luj (7)	Ongoing scheme	4G Saturation Scheme	Cellular 4G
2	HP	Chamba	006675	Dharwas (11)	Ongoing scheme	4G Saturation Scheme	Cellular 4G
3	HP	Chamba	006679	Kuthah (12)	Ongoing scheme	4G Saturation Scheme	Cellular 4G
4	HP	CHAMBA	006680	Chaloli (13)	Ongoing scheme	4G Saturation Scheme	Cellular 4G
5	HP	Chamba	006681	Rusmas (14)	Ongoing scheme	4G Saturation Scheme	Cellular 4G
6	HP	Chamba	006682	Tai (15)	Ongoing scheme	4G Saturation Scheme	Cellular 4G
7	HP	Chamba	006683	Sural Bhatori (16)	Ongoing scheme	4G Saturation Scheme	Cellular 4G
8	HP	Chamba	006685	Hundan Bhatori (18)	Ongoing scheme	4G Saturation Scheme	Cellular 4G
9	HP	Chamba	006686	Tundru (19)	Ongoing scheme	4G Saturation Scheme	Cellular 4G
10	HP	Chamba	006687	Takwas (20)	Ongoing scheme	4G Saturation Scheme	Cellular 4G
11	HP	Chamba	006688	Seri Bhatwas (21)	Ongoing scheme	4G Saturation Scheme	Cellular 4G
12	HP	Chamba	006706	Parmas (22)	Ongoing scheme	4G Saturation Scheme	Cellular 4G
13	HP	Chamba	006712	Parmar (45)	Ongoing scheme	4G Saturation Scheme	Cellular 4G
14	HP	Chamba	006713	Kumar (44)	Ongoing scheme	4G Saturation Scheme	Cellular 4G
15	HP	CHAMBA	006723	Mindhal (87)	Ongoing scheme	4G Saturation Scheme	Cellular 4G
16	HP	CHAMBA	006724	Sach (47)	Ongoing scheme	4G Saturation Scheme	Cellular 4G
17	HP	Chamba	006725	Khinan (46)	Ongoing scheme	4G Saturation Scheme	Cellular 4G
18	HP	Chamba	006729	Micham (53)	Ongoing scheme	4G Saturation Scheme	Cellular 4G
19	HP	Chamba	006736	Shoon (56)	Ongoing scheme	4G Saturation Scheme	Cellular 4G

District wise detailed list of 166 Villages where two ongoing USOF Schemes for Cellular Coverage are planned

#	State/ UT	District	Village Code as per Census 2011 data	Name of Village	Name Ongoing Scheme	Name and Detail of scheme	Type of coverage - (2G/3G/4G)
20	HP	Chamba	006737	Leu (55)	Ongoing scheme	4G Saturation Scheme	Cellular 4G
21	HP	Chamba	006738	Sahli (54)	Ongoing scheme	4G Saturation Scheme	Cellular 4G
22	HP	Chamba	006739	Dhanala (75)	Ongoing scheme	4G Saturation Scheme	Cellular 4G
23	HP	Chamba	006741	R.F.Bambal (86)	Ongoing scheme	4G Saturation Scheme	Cellular 4G
24	HP	Chamba	006743	Kulal (92)	Ongoing scheme	4G Saturation Scheme	Cellular 4G
25	HP	CHAMBA	006748	Rei (85)	Ongoing scheme	4G Saturation Scheme	Cellular 4G
26	HP	Chamba	006750	Chhau (83)	Ongoing scheme	4G Saturation Scheme	Cellular 4G
27	HP	Chamba	006753	Ajog (100)	Ongoing scheme	4G Saturation Scheme	Cellular 4G
28	HP	Chamba	006760	Shour (79)	Ongoing scheme	4G Saturation Scheme	Cellular 4G
29	HP	Chamba	006761	R.F.Shour (80)	Ongoing scheme	4G Saturation Scheme	Cellular 4G
30	HP	Chamba	006762	D.P.F.Purthi (81)	Ongoing scheme	4G Saturation Scheme	Cellular 4G
31	HP	CHAMBA	006763	Purthi (82)	Ongoing scheme	4G Saturation Scheme	Cellular 4G
32	HP	Chamba	006765	Thandal (77)	Ongoing scheme	4G Saturation Scheme	Cellular 4G
33	HP	Chamba	006767	Mojhi (73)	Ongoing scheme	4G Saturation Scheme	Cellular 4G
34	HP	Chamba	006770	Saichu (65)	Ongoing scheme	4G Saturation Scheme	Cellular 4G
35	HP	Chamba	006777	Chasak Bhatore (68)	Ongoing scheme	USOF- PH1-354 Village	Cellular 4G
36	HP	Chamba	006781	Alwas (365)	Ongoing scheme	4G Saturation Scheme	Cellular 4G
37	HP	Chamba	006789	Guila (357)	Ongoing scheme	4G Saturation Scheme	Cellular 4G
38	HP	Chamba	006798	Chalonj (371)	Ongoing scheme	4G Saturation Scheme	Cellular 4G

District wise detailed list of 166 Villages where two ongoing USOF Schemes for Cellular Coverage are planned

#	State/ UT	District	Village Code as per Census 2011 data	Name of Village	Name Ongoing Scheme	Name and Detail of scheme	Type of coverage - (2G/3G/4G)
39	HP	Chamba	006809	Mangli (345)	Ongoing scheme	4G Saturation Scheme	Cellular 4G
40	HP	Chamba	006819	Dhar Makkan (311)	Ongoing scheme	4G Saturation Scheme	Cellular 4G
41	HP	Chamba	006827	Makkan (310)	Ongoing scheme	4G Saturation Scheme	Cellular 4G
42	HP	Chamba	006830	Baraila (313)	Ongoing scheme	4G Saturation Scheme	Cellular 4G
43	HP	Chamba	006831	Dhar Kalopar (312)	Ongoing scheme	4G Saturation Scheme	Cellular 4G
44	HP	Chamba	006913	Galua (380)	Ongoing scheme	4G Saturation Scheme	Cellular 4G
45	HP	Chamba	006914	Meas (384)	Ongoing scheme	4G Saturation Scheme	Cellular 4G
46	HP	Chamba	006943	Khajwa (431)	Ongoing scheme	USOF- PH1-354 Village	Cellular 4G
47	HP	CHAMBA	007068	Chachoga (466)	Ongoing scheme	4G Saturation Scheme	Cellular 4G
48	HP	Chamba	007077	Mawa (473)	Ongoing scheme	4G Saturation Scheme	Cellular 4G
49	HP	Chamba	007078	Juri (476)	Ongoing scheme	USOF- PH1-354 Village	Cellular 4G
50	HP	Chamba	007094	Dhar Supacholu (141)	Ongoing scheme	USOF- PH1-354 Village	Cellular 4G
51	HP	Chamba	007100	R.F. Langer (136)	Ongoing scheme	4G Saturation Scheme	Cellular 4G
52	HP	Chamba	007101	Langer (143)	Ongoing scheme	4G Saturation Scheme	Cellular 4G
53	HP	Chamba	007103	Dhar Gamgul (148)	Ongoing scheme	4G Saturation Scheme	Cellular 4G
54	HP	Chamba	007270	Gri Jindu (107)	Ongoing scheme	4G Saturation Scheme	Cellular 4G
55	HP	Chamba	007278	Kunda (2)	Ongoing scheme	4G Saturation Scheme	Cellular 4G
56	HP	Chamba	007290	Thal (12)	Ongoing scheme	4G Saturation Scheme	Cellular 4G
57	HP	Chamba	007824	West Chhuwaru (59)	Ongoing scheme	4G Saturation Scheme	Cellular 4G

District wise detailed list of 166 Villages where two ongoing USOF Schemes for Cellular Coverage are planned

#	State/ UT	District	Village Code as per Census 2011 data	Name of Village	Name Ongoing Scheme	Name and Detail of scheme	Type of coverage - (2G/3G/4G)
58	HP	Chamba	007896	Almi (132)	Ongoing scheme	USOF- PH1-354 Village	Cellular 4G
59	HP	Chamba	007909	Lower Digaid Jangal (144)	Ongoing scheme	4G Saturation Scheme	Cellular 4G
60	HP	Chamba	007910	Upur Digaid Jangal (139)	Ongoing scheme	4G Saturation Scheme	Cellular 4G
61	HP	Chamba	007913	Sakraina (142)	Ongoing scheme	4G Saturation Scheme	Cellular 4G
62	HP	CHAMBA	007916	Jiyoti	Ongoing scheme	4G Saturation Scheme	Cellular 4G
63	HP	Chamba	008011	Thundu (251)	Ongoing scheme	4G Saturation Scheme	Cellular 4G
64	HP	Chamba	008033	Bharwali (152)	Ongoing scheme	4G Saturation Scheme	Cellular 4G
65	HP	Chamba	008044	Kuarsi (159)	Ongoing scheme	4G Saturation Scheme	Cellular 4G
66	HP	Chamba	008047	R.F. Ghalor (158)	Ongoing scheme	4G Saturation Scheme	Cellular 4G
67	HP	Chamba	008084	Kiur (202)	Ongoing scheme	4G Saturation Scheme	Cellular 4G
68	HP	Chamba	008094	Thanetar (243)	Ongoing scheme	USOF- PH1-354 Village	Cellular 4G
69	HP	Chamba	008108	Dhar Jalsu (251)	Ongoing scheme	USOF- PH1-354 Village	Cellular 4G
70	HP	Chamba	008114	Urna (237)	Ongoing scheme	USOF- PH1-354 Village	Cellular 4G
71	HP	Chamba	008118	Khnar (227)	Ongoing scheme	USOF- PH1-354 Village	Cellular 4G
72	HP	Chamba	008122	Garaunda (224)	Ongoing scheme	4G Saturation Scheme	Cellular 4G
73	HP	Chamba	008123	Sindi (223)	Ongoing scheme	USOF- PH1-354 Village	Cellular 4G
74	HP	Chamba	008133	Kalah (191)	Ongoing scheme	4G Saturation Scheme	Cellular 4G
75	HP	Chamba	008188	Bhadar (37)	Ongoing scheme	USOF- PH1-354 Village	Cellular 4G
76	HP	Chamba	008257	Chobhia (55)	Ongoing scheme	4G Saturation Scheme	Cellular 4G

District wise detailed list of 166 Villages where two ongoing USOF Schemes for Cellular Coverage are planned

#	State/ UT	District	Village Code as per Census 2011 data	Name of Village	Name Ongoing Scheme	Name and Detail of scheme	Type of coverage - (2G/3G/4G)
77	HP	LAHUL AND SPITI	012146	Tingrat (176)	Ongoing scheme	4G Saturation Scheme	Cellular 4G
78	HP	LahaulSpiti	012150	Khanjar (186)	Ongoing scheme	4G Saturation Scheme	Cellular 4G
79	HP	LahaulSpiti	012154	Chaling (191)	Ongoing scheme	4G Saturation Scheme	Cellular 4G
80	HP	LahaulSpiti	012164	Karpas (196)	Ongoing scheme	4G Saturation Scheme	Cellular 4G
81	HP	LahaulSpiti	012167	D.P.F.Shiling (198)	Ongoing scheme	4G Saturation Scheme	Cellular 4G
82	HP	LahaulSpiti	012168	Dhar Jhatul (193)	Ongoing scheme	4G Saturation Scheme	Cellular 4G
83	HP	LahaulSpiti	012170	Chamrat (202)	Ongoing scheme	4G Saturation Scheme	Cellular 4G
84	HP	LahaulSpiti	012171	D.P.F.Shakoli (168)	Ongoing scheme	4G Saturation Scheme	Cellular 4G
85	HP	LahaulSpiti	012172	Ghari (204)	Ongoing scheme	4G Saturation Scheme	Cellular 4G
86	HP	LahaulSpiti	012173	Shakoli (157)	Ongoing scheme	4G Saturation Scheme	Cellular 4G
87	HP	LahaulSpiti	012176	D.P.F.Tumru (203)	Ongoing scheme	4G Saturation Scheme	Cellular 4G
88	HP	LahaulSpiti	012184	R.F.Krakun (117)	Ongoing scheme	4G Saturation Scheme	Cellular 4G
89	HP	LahaulSpiti	012194	Baraur (124)	Ongoing scheme	4G Saturation Scheme	Cellular 4G
90	HP	LAHUL AND SPITI	012199	Tindi (129)	Ongoing scheme	4G Saturation Scheme	Cellular 4G
91	HP	LahaulSpiti	012207	Harsar (132)	Ongoing scheme	4G Saturation Scheme	Cellular 4G
92	HP	LahaulSpiti	012213	Kurched (140)	Ongoing scheme	4G Saturation Scheme	Cellular 4G
93	HP	LahaulSpiti	012244	Auhar (207)	Ongoing scheme	4G Saturation Scheme	Cellular 4G
94	HP	LahaulSpiti	012256	Chokhang (1/4)	Ongoing scheme	4G Saturation Scheme	Cellular 4G
95	HP	LahaulSpiti	012257	Chhogjing (1/3)	Ongoing scheme	4G Saturation Scheme	Cellular 4G

District wise detailed list of 166 Villages where two ongoing USOF Schemes for Cellular Coverage are planned :HP

#	State/ UT	District	Village Code as per Census 2011 data	Name of Village	Name Ongoing Scheme	Name and Detail of scheme	Type of coverage - (2G/3G/4G)
96	HP	LahaulSpiti	012258	Gwar (1/2)	Ongoing scheme	4G Saturation Scheme	Cellular 4G
97	HP	LahaulSpiti	012260	Kamring (1/6)	Ongoing scheme	4G Saturation Scheme	Cellular 4G
98	HP	LahaulSpiti	012261	Dandak (1/7)	Ongoing scheme	4G Saturation Scheme	Cellular 4G
99	HP	LahaulSpiti	012262	Murang (1/8)	Ongoing scheme	4G Saturation Scheme	Cellular 4G
100	HP	LahaulSpiti	012263	Chambak (1/9)	Ongoing scheme	4G Saturation Scheme	Cellular 4G
101	HP	LAHUL AND SPITI	012265	Bha Baring (113)	Ongoing scheme	4G Saturation Scheme	Cellular 4G
102	HP	LahaulSpiti	012266	Leh Baring (1/14)	Ongoing scheme	4G Saturation Scheme	Cellular 4G
103	HP	LahaulSpiti	012267	Sheling (1/12)	Ongoing scheme	4G Saturation Scheme	Cellular 4G
104	HP	LahaulSpiti	012268	Shenwar (1/11)	Ongoing scheme	4G Saturation Scheme	Cellular 4G
105	HP	LahaulSpiti	012269	Kuang (1/15)	Ongoing scheme	4G Saturation Scheme	Cellular 4G
106	HP	LahaulSpiti	012270	Delda (1/16)	Ongoing scheme	4G Saturation Scheme	Cellular 4G
107	HP	LahaulSpiti	012271	Bha Chewar (1/17)	Ongoing scheme	4G Saturation Scheme	Cellular 4G
108	HP	LahaulSpiti	012273	Bhayadi (1/19)	Ongoing scheme	4G Saturation Scheme	Cellular 4G
109	HP	LahaulSpiti	012274	Nalda (1/21)	Ongoing scheme	4G Saturation Scheme	Cellular 4G
110	HP	LahaulSpiti	012275	Galing (1/23)	Ongoing scheme	4G Saturation Scheme	Cellular 4G
111	HP	LahaulSpiti	012276	Junde (1/24)	Ongoing scheme	4G Saturation Scheme	Cellular 4G
112	HP	LahaulSpiti	012277	Khuruti (1/20)	Ongoing scheme	4G Saturation Scheme	Cellular 4G
113	HP	LahaulSpiti	012278	Lomach (1/27)	Ongoing scheme	4G Saturation Scheme	Cellular 4G
114	HP	LahaulSpiti	012279	Tibok (1/28)	Ongoing scheme	4G Saturation Scheme	Cellular 4G

District wise detailed list of 166 Villages where two ongoing USOF Schemes for Cellular Coverage are planned

#	State/ UT	District	Village Code as per Census 2011 data	Name of Village	Name Ongoing Scheme	Name and Detail of scheme	Type of coverage - (2G/3G/4G)
115	HP	LahaulSpiti	012280	Othang (1/29)	Ongoing scheme	4G Saturation Scheme	Cellular 4G
116	HP	LahaulSpiti	012281	Yang Thang (1/30)	Ongoing scheme	4G Saturation Scheme	Cellular 4G
117	HP	LahaulSpiti	012282	Taljon (1/25)	Ongoing scheme	4G Saturation Scheme	Cellular 4G
118	HP	LahaulSpiti	012283	Jasrath (1/22)	Ongoing scheme	4G Saturation Scheme	Cellular 4G
119	HP	LahaulSpiti	012288	Kothi (3/2)	Ongoing scheme	4G Saturation Scheme	Cellular 4G
120	HP	LahaulSpiti	012294	Rape (2/2)	Ongoing scheme	4G Saturation Scheme	Cellular 4G
121	HP	LahaulSpiti	012295	Rashil (2/5)	Ongoing scheme	4G Saturation Scheme	Cellular 4G
122	HP	LAHUL AND SPITI	012296	Shansha (35)	Ongoing scheme	4G Saturation Scheme	Cellular 4G
123	HP	LahaulSpiti	012310	Muchhling (5/2)	Ongoing scheme	4G Saturation Scheme	Cellular 4G
124	HP	LahaulSpiti	012311	Lot (5/4)	Ongoing scheme	4G Saturation Scheme	Cellular 4G
125	HP	LahaulSpiti	012315	Lapshak (5/6)	Ongoing scheme	4G Saturation Scheme	Cellular 4G
126	HP	LahaulSpiti	012356	Meh (8/5)	Ongoing scheme	4G Saturation Scheme	Cellular 4G
127	HP	LahaulSpiti	012357	Bok (8/8)	Ongoing scheme	4G Saturation Scheme	Cellular 4G
128	HP	LahaulSpiti	012358	Gemur-Gompa (8/6)	Ongoing scheme	4G Saturation Scheme	Cellular 4G
129	HP	LahaulSpiti	012361	Chhika-Be (8/11)	Ongoing scheme	4G Saturation Scheme	Cellular 4G
130	HP	LahaulSpiti	012362	Rarik (8/12)	Ongoing scheme	4G Saturation Scheme	Cellular 4G
131	HP	LahaulSpiti	012368	Yoche (8/19)	Ongoing scheme	4G Saturation Scheme	Cellular 4G
132	HP	LahaulSpiti	012370	Gemur (8/7)	Ongoing scheme	4G Saturation Scheme	Cellular 4G
133	HP	LahaulSpiti	012371	Tinno (8/1)	Ongoing scheme	4G Saturation Scheme	Cellular 4G

District wise detailed list of 166 Villages where two ongoing USOF Schemes for Cellular Coverage are planned

#	State/ UT	District	Village Code as per Census 2011 data	Name of Village	Name Ongoing Scheme	Name and Detail of scheme	Type of coverage - (2G/3G/4G)
134	HP	LahaulSpiti	012471	Hansa (44)	Ongoing scheme	4G Saturation Scheme	Cellular 4G
135	HP	LahaulSpiti	012495	Tashi Gang (63)	Ongoing scheme	4G Saturation Scheme	Cellular 4G
136	HP	LahaulSpiti	012498	Langja (66)	Ongoing scheme	4G Saturation Scheme	Cellular 4G
137	HP	LahaulSpiti	012517	Morang (80)	Ongoing scheme	4G Saturation Scheme	Cellular 4G
138	HP	LahaulSpiti	012526	Chhidang (89)	Ongoing scheme	4G Saturation Scheme	Cellular 4G
139	HP	LahaulSpiti	012538	Minsar (101)	Ongoing scheme	4G Saturation Scheme	Cellular 4G
140	HP	LahaulSpiti	012568	Mud (128/1)	Ongoing scheme	4G Saturation Scheme	Cellular 4G
141	HP	LahaulSpiti	012572	Teling (130/1)	Ongoing scheme	4G Saturation Scheme	Cellular 4G
142	HP	LahaulSpiti	012574	Chamling (131)	Ongoing scheme	4G Saturation Scheme	Cellular 4G
143	HP	LahaulSpiti	012584	Todnam (141)	Ongoing scheme	4G Saturation Scheme	Cellular 4G
144	HP	LahaulSpiti	012597	Newpur (149/5)	Ongoing scheme	USOF- PH1-354 Village	Cellular 4G
145	HP	LahaulSpiti	012609	Mulche (155/3)	Ongoing scheme	USOF- PH1-354 Village	Cellular 4G
146	HP	LahaulSpiti	012621	Kibri (163/3)	Ongoing scheme	USOF- PH1-354 Village	Cellular 4G
147	HP	LAHUL AND SPITI	012627	Mane Yogma (1671)	Ongoing scheme	4G Saturation Scheme	Cellular 4G
148	HP	LahaulSpiti	012645	Duphuk (177/2)	Ongoing scheme	4G Saturation Scheme	Cellular 4G
149	HP	LahaulSpiti	012647	Dhar Chhochhodun (178)	Ongoing scheme	4G Saturation Scheme	Cellular 4G
150	HP	LahaulSpiti	012649	Gipu (180/1)	Ongoing scheme	4G Saturation Scheme	Cellular 4G
151	HP	LahaulSpiti	012650	Lirit (180/2)	Ongoing scheme	4G Saturation Scheme	Cellular 4G
152	HP	Kullu	012755	Up Muhal Jalog	Ongoing scheme	4G Saturation Scheme	Cellular 4G

District wise detailed list of 166 Villages where two ongoing USOF Schemes for Cellular Coverage are planned

#	State/ UT	District	Village Code as per Census 2011 data	Name of Village	Name Ongoing Scheme	Name and Detail of scheme	Type of coverage - (2G/3G/4G)
153	HP	Kullu	012756	Up Muhal Jigling	Ongoing scheme	4G Saturation Scheme	Cellular 4G
154	HP	Kullu	012941	Mashyar (14/39)	Ongoing scheme	4G Saturation Scheme	Cellular 4G
155	HP	Mandi	013209	Mandra (503)	Ongoing scheme	4G Saturation Scheme	Cellular 4G
156	HP	Mandi	014418	Kalang (420)	Ongoing scheme	4G Saturation Scheme	Cellular 4G
157	HP	Mandi	014922	Kholanal (541)	Ongoing scheme	4G Saturation Scheme	Cellular 4G
158	HP	Mandi	015152	D.P.F.Kala Kamisher (462)	Ongoing scheme	4G Saturation Scheme	Cellular 4G
159	HP	Mandi	015480	Marhawala (194)	Ongoing scheme	4G Saturation Scheme	Cellular 4G
160	HP	Mandi	015571	D.P.F.Barbat (233)	Ongoing scheme	4G Saturation Scheme	Cellular 4G
161	HP	Mandi	015591	Manjehli (247)	Ongoing scheme	4G Saturation Scheme	Cellular 4G
162	HP	Mandi	015597	D.P.F.Dayoli (266)	Ongoing scheme	4G Saturation Scheme	Cellular 4G
163	HP	Mandi	015602	Dogri (274)	Ongoing scheme	4G Saturation Scheme	Cellular 4G
164	HP	Mandi	015710	D.P.F. Baneshti (227)	Ongoing scheme	4G Saturation Scheme	Cellular 4G
165	HP	Mandi	015972	Padli (65)	Ongoing scheme	4G Saturation Scheme	Cellular 4G
166	HP	Mandi	016097	Ropari (305)	Ongoing scheme	4G Saturation Scheme	Cellular 4G

District wise detailed list of 25 Uncovered Villages where there is no coverage at all

#	State/ UT	District	District Code as per Census 2011 data	Sub District Code as per Census 2011 data	Village Code as per Census 2011 data	Population	Name of Village
1	HP	Chamba	023	00090	007901	400	Aghara (136)
2	HP	Chamba	023	00084	006811	460	Bhauras (347)
3	HP	Chamba	023	00089	007671	117	Draon (317)
4	HP	Chamba	023	00090	007914	314	Gan (143)
5	HP	Chamba	023	00084	006800	789	Ghulei (370)
6	HP	Chamba	023	00091	008126	46	Gowari (220)
7	HP	Chamba	023	00084	006792	105	Guddan (374)
8	HP	Chamba	023	00090	007891	56	Kanhetar (124)
9	HP	Chamba	023	00085	007108	380	Pringul (134)
10	HP	Chamba	023	00084	006812	15	R.F.Hailera (344)
11	HP	LahaulSpiti	025	00116	012529	177	Barpa (92)
12	HP	LahaulSpiti	025	00114	012191	180	Bhujund (109)
13	HP	LahaulSpiti	025	00114	012160	90	D.P.F.Churput (175)
14	HP	LahaulSpiti	025	00114	012201	99	D.P.F.Lohni (122)
15	HP	LahaulSpiti	025	00114	012210	39	D.P.F.Thanwani (137)
16	HP	LahaulSpiti	025	00115	012313	31	Karing (5/5)
17	HP	LahaulSpiti	025	00114	012259	52	Nain Gahar (1/1)
18	HP	LahaulSpiti	025	00116	012479	138	Pangmo Khas (52/1)
19	HP	LahaulSpiti	025	00114	012211	12	R.F.Dhandal (139)
20	HP	LahaulSpiti	025	00114	012215	271	Salgaraon (143)
21	HP	LahaulSpiti	025	00115	012314	37	Yangrang (5/7)
22	HP	Mandi	027	00138	015596	207	Badhu (262)
23	HP	Mandi	027	00135	014958	5	D.P.F. Rajan Kura (653)
24	HP	Mandi	027	00138	015617	205	Kandhi (62)
25	HP	Mandi	027	00138	015672	94	Maihap (60)

District wise detailed list of Villages where BharatNet Infrastruture has been presently planned/rolled out

#	District	Village Code as per Census 2011 data	Name of Village	Village telecom connectivity/coverage plan	Name of Bharatnet phase/ scheme	Connectivity available	Type of Backhaul connectivity available	Backhaul Bandwidth capacity (in Mbps)	Whether WiFi is available/being provided /planned. If Yes, total number of Wifi Hotspot activated	If WiFi is available/being provided /planned, total number of Wifi Hotspot activated	Name of the implementing agency
1	Chamba	8170	Auhra (22)	Village already covered	Satellite	VSAT	VSAT	10Mbps(Shared)	No	Planned	TCIL
2	Chamba	8124	Bajol (221)	Village already covered	Satellite	VSAT	VSAT	10Mbps(Shared)	No	Planned	TCIL
3	Chamba	8190	Bargaraon (40)	Village already covered	Satellite	VSAT	VSAT	10Mbps(Shared)	No	Planned	TCIL
4	Chamba	8215	Bharmour (97)	Village already covered	Satellite	VSAT	VSAT	10Mbps(Shared)	No	Planned	TCIL
5	Chamba	8039	Chanaota (144)	Village already covered	Satellite	VSAT	VSAT	10Mbps(Shared)	No	Planned	TCIL
6	Chamba	8257	Chobhia (55)	Village already covered	Satellite	VSAT	VSAT	10Mbps(Shared)	No	Planned	TCIL
7	Chamba	8081	Deol (206)	Village already covered	Satellite	VSAT	VSAT	10Mbps(Shared)	No	Planned	TCIL
8	Chamba	6675	Dharwas (11)	Village already covered	Satellite	VSAT	VSAT	10Mbps(Shared)	No	Planned	TCIL
9	Chamba	8020	Garola (134)	Village already covered	Satellite	VSAT	VSAT	10Mbps(Shared)	No	Planned	TCIL
10	Chamba	8210	Ghared (48)	Village already covered	Satellite	VSAT	VSAT	10Mbps(Shared)	No	Planned	TCIL
11	Chamba	8168	Ghurath (20)	Village already covered	Satellite	VSAT	VSAT	10Mbps(Shared)	No	Planned	TCIL
12	Chamba	8206	Grima (118)	Village already covered	Satellite	VSAT	VSAT	10Mbps(Shared)	No	Planned	TCIL
13	Chamba	8232	Hadsar (80)	Village coverage under implementation	Satellite	VSAT	VSAT	10Mbps(Shared)	No	Planned	TCIL
14	Chamba	8069	Holi (186)	Village already covered	Satellite	VSAT	VSAT	10Mbps(Shared)	No	Planned	TCIL
15	Chamba	6691	Hughal (25)	Village already covered	Satellite	VSAT	VSAT	10Mbps(Shared)	No	Planned	TCIL
16	Chamba	6685	Hundan Bhatori (18)	Village already covered	Satellite	VSAT	VSAT	10Mbps(Shared)	No	Planned	TCIL
17	Chamba	8165	Jagat (4)	Village already covered	Satellite	VSAT	VSAT	10Mbps(Shared)	No	Planned	TCIL
18	Chamba	8244	Jhikli Kugti (75)	Village already covered	Satellite	VSAT	VSAT	10Mbps(Shared)	No	Planned	TCIL
19	Chamba	6702	Karel (32)	Village already covered	Satellite	VSAT	VSAT	10Mbps(Shared)	No	Planned	TCIL
20	Chamba	8200	Khani (125)	Village already covered	Satellite	VSAT	VSAT	10Mbps(Shared)	No	Planned	TCIL
21	Chamba	6709	Kothi (38)	Village already covered	Satellite	VSAT	VSAT	10Mbps(Shared)	No	Planned	TCIL
22	Chamba	8044	Kuarsi (159)	Village already covered	Satellite	VSAT	VSAT	10Mbps(Shared)	No	Planned	TCIL
23	Chamba	8074	Kuleth (195)	Village already covered	Satellite	VSAT	VSAT	10Mbps(Shared)	No	Planned	TCIL
24	Chamba	6713	Kumar (44)	Village already covered	Satellite	VSAT	VSAT	10Mbps(Shared)	No	Planned	TCIL
25	Chamba	8162	Kutehr (17)	Village already covered	Satellite	VSAT	VSAT	10Mbps(Shared)	No	Planned	TCIL
26	Chamba	8060	Kuther (175)	Village already covered	Satellite	VSAT	VSAT	10Mbps(Shared)	No	Planned	TCIL
27	Chamba	8056	Lamu (169)	Village already covered	Satellite	VSAT	VSAT	10Mbps(Shared)	No	Planned	TCIL
28	Chamba	6674	Luj (7)	Village already covered	Satellite	VSAT	VSAT	10Mbps(Shared)	No	Planned	TCIL
29	Chamba	6703	Mahliat (33)	Village already covered	Satellite	VSAT	VSAT	10Mbps(Shared)	No	Planned	TCIL
30	Chamba	6723	Mindhal (87)	Village already covered	Satellite	VSAT	VSAT	10Mbps(Shared)	No	Planned	TCIL
31	Chamba	8102	Naya Graon (219)	Village already covered	Satellite	VSAT	VSAT	10Mbps(Shared)	No	Planned	TCIL
32	Chamba	8197	Palan Pulan (45)	Village already covered	Satellite	VSAT	VSAT	10Mbps(Shared)	No	Planned	TCIL
33	Chamba	8227	Paranghala (84)	Village already covered	Satellite	VSAT	VSAT	10Mbps(Shared)	No	Planned	TCIL
34	Chamba	6763	Purthi (82)	Village already covered	Satellite	VSAT	VSAT	10Mbps(Shared)	No	Planned	TCIL
35	Chamba	6748	Rei (85)	Village already covered	Satellite	VSAT	VSAT	10Mbps(Shared)	No	Planned	TCIL
36	Chamba	6724	Sach (47)	Village already covered	Satellite	VSAT	VSAT	10Mbps(Shared)	No	Planned	TCIL
37	Chamba	8212	Sachuin (99)	Village already covered	Satellite	VSAT	VSAT	10Mbps(Shared)	No	Planned	TCIL
38	Chamba	6738	Sahli (54)	Village already covered	Satellite	VSAT	VSAT	10Mbps(Shared)	No	Planned	TCIL
39	Chamba	6770	Saichu (65)	Village already covered	Satellite	VSAT	VSAT	10Mbps(Shared)	No	Planned	TCIL
40	Chamba	8143	Sanh (107)	Village already covered	Satellite	VSAT	VSAT	10Mbps(Shared)	No	Planned	TCIL
41	Chamba	6736	Shoon (56)	Village already covered	Satellite	VSAT	VSAT	10Mbps(Shared)	No	Planned	TCIL
42	Chamba	8150	Siunr (115)	Village already covered	Satellite	VSAT	VSAT	10Mbps(Shared)	No	Planned	TCIL

District wise detailed list of Villages where BharatNet Infrastruture has been presently planned/rolled out

#	District	Village Code as per Census 2011 data	Name of Village	Village telecom connectivity/coverage plan	Name of Bharatnet phase/ scheme	Connectivity available	Type of Backhaul connectivity available	Backhaul Bandwidth capacity (in Mbps)	Whether WiFi is available/being provided /planned. If Yes, total number of Wifi Hotspot activated	If WiFi is available/being provided /planned, total number of Wifi Hotspot activated	Name of the implementing agency
43	Chamba	6683	Sural Bhattori (16)	Village already covered	Satellite	VSAT	VSAT	10Mbps(Shared)	No	Planned	TCIL
44	Chamba	8177	Tundah (26)	Village already covered	Satellite	VSAT	VSAT	10Mbps(Shared)	No	Planned	TCIL
45	Chamba	8012	Ulnasa (126)	Village coverage under implementation	Satellite	VSAT	VSAT	10Mbps(Shared)	No	Planned	TCIL
46	LahaulSpiti	12380	Barbog (9/1)	Village already covered	Satellite	VSAT	VSAT	10Mbps(Shared)	No	Planned	TCIL
47	LahaulSpiti	12170	Chamrat (202)	Village already covered	Satellite	VSAT	VSAT	10Mbps(Shared)	No	Planned	TCIL
48	LahaulSpiti	12366	Darcha Sumdo (8/17)	Village already covered	Satellite	VSAT	VSAT	10Mbps(Shared)	No	Planned	TCIL
49	LahaulSpiti	12607	Demul Khas (155/1)	Village already covered	Satellite	VSAT	VSAT	10Mbps(Shared)	No	Planned	TCIL
50	LahaulSpiti	12593	Dhankhar (149/1)	Village already covered	Satellite	VSAT	VSAT	10Mbps(Shared)	No	Planned	TCIL
51	LahaulSpiti	12649	Gipu (180/1)	Village already covered	Satellite	VSAT	VSAT	10Mbps(Shared)	No	Planned	TCIL
52	LahaulSpiti	12390	Gondhla (12/3)	Village already covered	Satellite	VSAT	VSAT	10Mbps(Shared)	No	Planned	TCIL
53	LahaulSpiti	12290	Goruma (3/4)	Village already covered	Satellite	VSAT	VSAT	10Mbps(Shared)	No	Planned	TCIL
54	LahaulSpiti	12333	Gushal (11/1)	Village already covered	Satellite	VSAT	VSAT	10Mbps(Shared)	No	Planned	TCIL
55	LahaulSpiti	12478	Hull (51)	Village already covered	Satellite	VSAT	VSAT	10Mbps(Shared)	No	Planned	TCIL
56	LahaulSpiti	12284	Jahlma (1/31)	Village already covered	Satellite	VSAT	VSAT	10Mbps(Shared)	No	Planned	TCIL
57	LahaulSpiti	12291	Jobrang (2/1)	Village already covered	Satellite	VSAT	VSAT	10Mbps(Shared)	No	Planned	TCIL
58	LahaulSpiti	12381	Kardang (10/2)	Village already covered	Satellite	VSAT	VSAT	10Mbps(Shared)	No	Planned	TCIL
59	LahaulSpiti	12502	Kaza Khas (70/1)	Village already covered	Satellite	VSAT	VSAT	10Mbps(Shared)	No	Planned	TCIL
60	LahaulSpiti	12338	Keylong (7/2)	Village already covered	Satellite	VSAT	VSAT	10Mbps(Shared)	No	Planned	TCIL
61	LahaulSpiti	12394	Khangsar (12/8)	Village already covered	Satellite	VSAT	VSAT	10Mbps(Shared)	No	Planned	TCIL
62	LahaulSpiti	12409	Khawagling (13/7)	Village already covered	Satellite	VSAT	VSAT	10Mbps(Shared)	No	Planned	TCIL
63	LahaulSpiti	12425	Khoksar (14/10)	Village already covered	Satellite	VSAT	VSAT	10Mbps(Shared)	No	Planned	TCIL
64	LahaulSpiti	12515	Khurik (78)	Village already covered	Satellite	VSAT	VSAT	10Mbps(Shared)	No	Planned	TCIL
65	LahaulSpiti	12491	Kibber Khas (61/1)	Village already covered	Satellite	VSAT	VSAT	10Mbps(Shared)	No	Planned	TCIL
66	LahaulSpiti	12301	Kirting (4/7)	Village already covered	Satellite	VSAT	VSAT	10Mbps(Shared)	No	Planned	TCIL
67	LahaulSpiti	12353	Kolang (8/2)	Village already covered	Satellite	VSAT	VSAT	10Mbps(Shared)	No	Planned	TCIL
68	LahaulSpiti	12534	Kungri (97)	Village already covered	Satellite	VSAT	VSAT	10Mbps(Shared)	No	Planned	TCIL
69	LahaulSpiti	12619	Lalung Khas (163/1)	Village already covered	Satellite	VSAT	VSAT	10Mbps(Shared)	No	Planned	TCIL
70	LahaulSpiti	12498	Langja (66)	Village already covered	Satellite	VSAT	VSAT	10Mbps(Shared)	No	Planned	TCIL
71	LahaulSpiti	12466	Losar Khas (40/1)	Village already covered	Satellite	VSAT	VSAT	10Mbps(Shared)	No	Planned	TCIL
72	LahaulSpiti	12311	Lot (5/4)	Village already covered	Satellite	VSAT	VSAT	10Mbps(Shared)	No	Planned	TCIL
73	LahaulSpiti	12385	Muling (11/5)	Village already covered	Satellite	VSAT	VSAT	10Mbps(Shared)	No	Planned	TCIL
74	LahaulSpiti	12262	Murang (1/8)	Village already covered	Satellite	VSAT	VSAT	10Mbps(Shared)	No	Planned	TCIL
75	LahaulSpiti	12274	Nalda (1/21)	Village already covered	Satellite	VSAT	VSAT	10Mbps(Shared)	No	Planned	TCIL
76	LahaulSpiti	12543	Sagmam (106/1)	Village already covered	Satellite	VSAT	VSAT	10Mbps(Shared)	No	Planned	TCIL
77	LahaulSpiti	12173	Shakoli (157)	Village already covered	Satellite	VSAT	VSAT	10Mbps(Shared)	No	Planned	TCIL
78	LahaulSpiti	12296	Shansha (3/5)	Village already covered	Satellite	VSAT	VSAT	10Mbps(Shared)	No	Planned	TCIL
79	LahaulSpiti	12640	Tabo (174/1)	Village already covered	Satellite	VSAT	VSAT	10Mbps(Shared)	No	Planned	TCIL
80	LahaulSpiti	12332	Tandi (6/13)	Village already covered	Satellite	VSAT	VSAT	10Mbps(Shared)	No	Planned	TCIL
81	LahaulSpiti	12255	Thirot (1/5)	Village already covered	Satellite	VSAT	VSAT	10Mbps(Shared)	No	Planned	TCIL
82	LahaulSpiti	12199	Tindi (129)	Village already covered	Satellite	VSAT	VSAT	10Mbps(Shared)	No	Planned	TCIL
83	LahaulSpiti	12146	Tingrat (176)	Village already covered	Satellite	VSAT	VSAT	10Mbps(Shared)	No	Planned	TCIL
84	LahaulSpiti	12239	Triloknath (216)	Village already covered	Satellite	VSAT	VSAT	10Mbps(Shared)	No	Planned	TCIL

District wise detailed list of Villages where BharatNet Infrastruture has been presently planned/rolled out

#	District	Village Code as per Census 2011 data	Name of Village	Village telecom connectivity/coverage plan	Name of Bharatnet phase/ scheme	Connectivity available	Type of Backhaul connectivity available	Backhaul Bandwidth capacity (in Mbps)	Whether WiFi is available/being provided /planned. If Yes, total number of Wifi Hotspot activated	If WiFi is available/being provided /planned, total number of Wifi Hotspot activated	Name of the implementing agency
85	LahaulSpiti	12231	Udaipur (160)	Village already covered	Satellite	VSAT	VSAT	10Mbps(Shared)	No	Planned	TCIL
86	LahaulSpiti	12426	Yari-Khoksar (14/11)	Village already covered	Satellite	VSAT	VSAT	10Mbps(Shared)	No	Planned	TCIL
87	LahaulSpiti	12343	Yurnath (7/7)	Village already covered	Satellite	VSAT	VSAT	10Mbps(Shared)	No	Planned	TCIL
88	Mandi	15140	Bahal (485)	Village already covered	Phase-1	Optical Fiber	Optical Fiber	up to 1 Gbps	Yes		4 PGCIL
89	Mandi	14991	Bali Chowki (611)	Village already covered	Phase-1	Optical Fiber	Optical Fiber	up to 1 Gbps	Yes		4 PGCIL
90	Mandi	15242	Baryogi (413)	Village already covered	Phase-1	Optical Fiber	Optical Fiber	up to 1 Gbps	Yes		4 PGCIL
91	Mandi	14953	Bhanwas (637)	Village already covered	Phase-1	Optical Fiber	Optical Fiber	up to 1 Gbps	Yes		4 PGCIL
92	Mandi	15183	Bung (433)	Village already covered	Phase-1	Optical Fiber	Optical Fiber	up to 1 Gbps	Yes		4 PGCIL
93	Mandi	15265	Chhatra (414)	Village already covered	Phase-1	Optical Fiber	Optical Fiber	up to 1 Gbps	Yes		4 PGCIL
94	Mandi	14931	Dadwas (576)	Village already covered	Phase-1	Optical Fiber	Optical Fiber	up to 1 Gbps	Yes		4 PGCIL
95	Mandi	14979	Deodhar (606)	Village already covered	Phase-1	Optical Fiber	Optical Fiber	up to 1 Gbps	Yes		4 PGCIL
96	Mandi	15150	Dhar (458)	Village already covered	Phase-1	Optical Fiber	Optical Fiber	up to 1 Gbps	Yes		4 PGCIL
97	Mandi	15162	Dhim (439)	Village already covered	Phase-1	Optical Fiber	Optical Fiber	up to 1 Gbps	Yes		4 PGCIL
98	Mandi	15166	Janjehli (442)	Village already covered	Phase-1	Optical Fiber	Optical Fiber	up to 1 Gbps	Yes		4 PGCIL
99	Mandi	15291	Jharedh (709)	Village already covered	Phase-1	Optical Fiber	Optical Fiber	up to 1 Gbps	Yes		4 PGCIL
100	Mandi	15285	Karganu (702)	Village already covered	Phase-1	Optical Fiber	Optical Fiber	up to 1 Gbps	Yes		4 PGCIL
101	Mandi	14994	Mani (617)	Village already covered	Phase-1	Optical Fiber	Optical Fiber	up to 1 Gbps	Yes		4 PGCIL
102	Mandi	15109	Pakhrair (473)	Village already covered	Phase-1	Optical Fiber	Optical Fiber	up to 1 Gbps	Yes		4 PGCIL
103	Mandi	14975	Panjain (600)	Village already covered	Phase-1	Optical Fiber	Optical Fiber	up to 1 Gbps	Yes		4 PGCIL
104	Mandi	15174	Rord (455)	Village already covered	Phase-1	Optical Fiber	Optical Fiber	up to 1 Gbps	Yes		4 PGCIL
105	Mandi	15074	Shikawari (88)	Village already covered	Phase-1	Optical Fiber	Optical Fiber	up to 1 Gbps	Yes		4 PGCIL
106	Mandi	15120	Shilhi Bagi (502)	Village already covered	Phase-1	Optical Fiber	Optical Fiber	up to 1 Gbps	Yes		4 PGCIL
107	Mandi	14960	Somgad (634)	Village already covered	Phase-1	Optical Fiber	Optical Fiber	up to 1 Gbps	Yes		4 PGCIL
108	Mandi	15134	Sunah (494)	Village already covered	Phase-1	Optical Fiber	Optical Fiber	up to 1 Gbps	Yes		4 PGCIL
109	Mandi	15281	Thach (698)	Village already covered	Phase-1	Optical Fiber	Optical Fiber	up to 1 Gbps	Yes		4 PGCIL
110	Mandi	15113	Thunag (478)	Village already covered	Phase-1	Optical Fiber	Optical Fiber	up to 1 Gbps	Yes		4 PGCIL
111	Mandi	15263	Tipri (390)	Village already covered	Phase-1	Optical Fiber	Optical Fiber	up to 1 Gbps	Yes		4 PGCIL
112	Mandi	15167	Tungadhar (449)	Village already covered	Phase-1	Optical Fiber	Optical Fiber	up to 1 Gbps	Yes		4 PGCIL

District wise detailed list of villages with viability of OPGW of M/s HPPTCL

#	District	Village Code as per Census 2011 data	Name of Village	Whether OPGW cable present/ passing through the Village	If No, the nearest location/ village from where the OPGW cable present and the approx distance in KMs.	Remarks, if any
1	Chamba	007858	Adraund (93)	Yes	3.2	400 KV Lahal - RAJERA
2	Chamba	007958	Agahar (191)	Yes	7.15	400 KV Lahal - RAJERA
3	Chamba	007901	Aghara (136)	Yes	7.66	400 KV Lahal - RAJERA
4	Chamba	006838	Ail (297)	No	17.9	132 KV LILO KURTHALA- BATHRI
5	Chamba	006982	Airias (510)	No	15.93	132 KV LILO KURTHALA- BATHRI
6	Chamba	007896	Almi (132)	Yes	13	400 KV Lahal - RAJERA
7	Chamba	006781	Alwas (365)	No	34.11	132 KV LILO KURTHALA- BATHRI
8	Chamba	006813	Andwas (350)	No	15	132 KV LILO KURTHALA- BATHRI
9	Chamba	007978	Athlun (207)	No	11.65	220 KV MAZRA -KARIAN
10	Chamba	007934	Bagadu Jangal (168)	Yes	2.02	224 KV Karian -Rajera
11	Chamba	007063	Baghai Garh (465)	No	18.79	220 KV MAZRA -KARIAN
12	Chamba	007820	Baili (56)	Yes	0.65	220 KV MAZRA -KARIAN
13	Chamba	007839	Bakan (79)	Yes	1.3	400 KV Lahal - RAJERA
14	Chamba	007814	Bakhat Pur (47)	Yes	27	220 KV Karian -Rajera
15	Chamba	007904	Bakkal (147)	Yes	4	400 KV Lahal - RAJERA
16	Chamba	007706	Balohad (268)	Yes	5.08	132 KV LILO KURTHALA- BATHRI
17	Chamba	007772	Bamrauta (9)	Yes	8.9	220 KV MAZRA -KARIAN
18	Chamba	006974	Banaota (452)	No	19.28	132 KV LILO KURTHALA- BATHRI
19	Chamba	007974	Banjal (213)	No	10.62	220 Kv Karian -Rajera
20	Chamba	006830	Baraila (313)	No	20.59	132 KV LILO KURTHALA- BATHRI
21	Chamba	007789	Bari (34)	Yes	4.17	220 KV MAZRA -KARIAN
22	Chamba	007746	Baror (234)	Yes	3.25	220 KV MAZRA -KARIAN
23	Chamba	007801	Basudan (42)	Yes	8.63	220 KV MAZRA -KARIAN
24	Chamba	008141	Batara (106)	Yes		220KV Holi-Bjoli Line
25	Chamba	007964	Behigraan (197)	Yes	7.92	400 KV Lahal - RAJERA
26	Chamba	007715	Behra (297)	Yes	0.4	132 KV LILO KURTHALA- BATHRI
27	Chamba	007951	Benska (186)	Yes	2.62	220 KV MAZRA -KARIAN
28	Chamba	007884	Bhador (119)	Yes	0.63	400 KV Lahal - RAJERA
29	Chamba	007821	Bhagiar (57)	Yes	2.37	220 KV MAZRA -KARIAN
30	Chamba	007778	Bhanauta (14)	Yes	2.62	220 KV MAZRA -KARIAN
31	Chamba	007072	Bharandui (469)	No	22.19	220 KV MAZRA -KARIAN
32	Chamba	006966	Bharara (454)	No	22.61	132 KV LILO KURTHALA- BATHRI
33	Chamba	007819	Bharian Khas (55)	Yes	0.87	220 KV MAZRA -KARIAN
34	Chamba	007756	Bharo (285)	Yes	0.36	220 KV MAZRA -KARIAN

District wise detailed list of villages with viability of OPGW of M/s HPPTCL

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35	Chamba	007023	Bhatrudi (459)	No	18.14	220 KV MAZRA -KARIAN
36	Chamba	006860	Bhatsar (318)	No	17.49	132 KV LILO KURTHALA- BATHRI
37	Chamba	007906	Bhatwara (146)	Yes	2.16	400 KV Lahal - RAJERA
38	Chamba	007000	Bhauga (554)	Yes	8.28	132 KV LILO KURTHALA- BATHRI
39	Chamba	006811	Bhauras (347)	No	29	132 KV LILO KURTHALA- BATHRI
40	Chamba	007803	Bhowen (44)	Yes	6.58	220 KV MAZRA -KARIAN
41	Chamba	007948	Bhujja (182)	Yes	0.84	220 KV MAZRA -KARIAN
42	Chamba	007721	Bhuman (289)	Yes	1.74	220 KV MAZRA -KARIAN
43	Chamba	006977	Biala (449)	No	16.94	132 KV LILO KURTHALA- BATHRI
44	Chamba	007938	Biali (172)	Yes	1.26	400 KV Lahal - RAJERA
45	Chamba	006881	Bihun (281)	No	17.79	132 KV LILO KURTHALA- BATHRI
46	Chamba	007902	Bloth (137)	Yes	6.44	400 KV Lahal - RAJERA
47	Chamba	006900	Buin (409)	No	18.78	132 KV LILO KURTHALA- BATHRI
48	Chamba	006814	Bunderi (352)	No	25	132 KV LILO KURTHALA- BATHRI
49	Chamba	007068	Chachoga (466)	No	18.61	220 KV MAZRA -KARIAN
50	Chamba	006826	Chachul (309)	No	21.65	132 KV LILO KURTHALA- BATHRI
51	Chamba	007770	Chahla (6)	Yes	6.19	220 KV MAZRA -KARIAN
52	Chamba	007763	Chaklu (305)	Yes	4.94	132 KV LILO KURTHALA- BATHRI
53	Chamba	008208	Chaled (100)	Yes		220KV Holi-Bjoli Line
54	Chamba	006798	Chalonj (371)	No	29.38	132 KV LILO KURTHALA- BATHRI
55	Chamba	007999	Chambi (243)	Yes	5.07	220 KV MAZRA -KARIAN
56	Chamba	007775	Chamrauli (11)	Yes	5.3	220 KV MAZRA -KARIAN
57	Chamba	007033	Chanan (539)	No	10.13	220 KV MAZRA -KARIAN
58	Chamba	006918	Chandru (391)	No	33.46	132 KV LILO KURTHALA- BATHRI
59	Chamba	007032	Charauri (529)	No	11.14	220 KV MAZRA -KARIAN
60	Chamba	007828	Chari (63)	Yes	1.74	400 KV Lahal - RAJERA
61	Chamba	007777	Chehli (13)	Yes	3.35	220 KV MAZRA -KARIAN
62	Chamba	006963	Chhajaut (437)	No	19.83	132 KV LILO KURTHALA- BATHRI
63	Chamba	007800	Chhajun (41)	Yes	9.46	220 KV MAZRA -KARIAN
64	Chamba	007977	Chhaloga (210)	No	11.71	220 Kv Karian -Rajera
65	Chamba	006939	Chhapa (420)	No	24.16	132 KV LILO KURTHALA- BATHRI
66	Chamba	006890	Chihi (240)	No	15.92	132 KV LILO KURTHALA- BATHRI
67	Chamba	007771	Chil Bangla (8)	Yes	8	220 KV MAZRA -KARIAN
68	Chamba	006883	Chili (275)	No	17.22	132 KV LILO KURTHALA- BATHRI

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69	Chamba	007880	Chitrari (117)	Yes	0.4	400 KV Lahal - RAJERA
70	Chamba	007006	Choli (567)	Yes	7.04	220 KV MAZRA -KARIAN
71	Chamba	007811	Chuliari (48)	Yes	3.62	220 KV MAZRA -KARIAN
72	Chamba	006886	Chundi (277)	No	16.82	132 KV LILO KURTHALA- BATHRI
73	Chamba	007851	Churi (89)	Yes	0.24	400 KV Lahal - RAJERA
74	Chamba	007791	D.P.F. Karangar Rakh Jangal (32)	Yes	6.27	220 KV MAZRA -KARIAN
75	Chamba	006994	D.P.F.Chanjla (553)	Yes	8.73	132 KV LILO KURTHALA- BATHRI
76	Chamba	006991	D.P.F.Gutkar (551)	No	10.53	132 KV LILO KURTHALA- BATHRI
77	Chamba	006990	D.P.F.Kyani (517)	No	10.86	132 KV LILO KURTHALA- BATHRI
78	Chamba	007009	D.P.F.Seri (544)	Yes	8.62	220 KV MAZRA -KARIAN
79	Chamba	006892	Dakala (245)	No	14.27	132 KV LILO KURTHALA- BATHRI
80	Chamba	007003	Dand (566)	Yes	6.11	132 KV LILO KURTHALA- BATHRI
81	Chamba	006902	Daonri (408)	No	21.4	132 KV LILO KURTHALA- BATHRI
82	Chamba	007767	Darada (3)	Yes	9	220 KV MAZRA -KARIAN
83	Chamba	007781	Daroga (23)	Yes	4.17	220 KV MAZRA -KARIAN
84	Chamba	007836	Darwin (70)	Yes	0.88	400 KV Lahal - RAJERA
85	Chamba	006835	Dehgran (317)	No	19.74	132 KV LILO KURTHALA- BATHRI
86	Chamba	007087	Dehra (485)	No	11.11	220 KV MAZRA -KARIAN
87	Chamba	007015	Dehra (521)	Yes	10.99	220 KV MAZRA -KARIAN
88	Chamba	008201	Deoki (123)	Yes		220KV Holi-Bjoli Line
89	Chamba	007026	Deola (504)	No	16.6	220 KV MAZRA -KARIAN
90	Chamba	006923	Devi Kothi (383)	No	31.8	132 KV LILO KURTHALA- BATHRI
91	Chamba	006880	Dhabbi (279)	No	17.71	132 KV LILO KURTHALA- BATHRI
92	Chamba	007796	Dhamgaraon (30)	Yes	10.5	220 KV MAZRA -KARIAN
93	Chamba	007922	Dhanara (155)	Yes	1.5	400 KV Lahal - RAJERA
94	Chamba	006997	Dhand (520)	Yes	11.39	132 KV LILO KURTHALA- BATHRI
95	Chamba	007005	Dhandor (565)	Yes	6.5	220 KV MAZRA -KARIAN
96	Chamba	006938	Dhaneli (418)	No	23.17	132 KV LILO KURTHALA- BATHRI
97	Chamba	007726	Dhanoi (266)	Yes	4.51	220 KV MAZRA -KARIAN
98	Chamba	006831	Dhar Kalopar (312)	No	22	132 KV LILO KURTHALA- BATHRI
99	Chamba	006819	Dhar Makkan (311)	No	24	132 KV LILO KURTHALA- BATHRI
100	Chamba	007024	Dhar Tundara (460)	No	18.77	220 KV MAZRA -KARIAN
101	Chamba	007847	Dharairi (80)	Yes	2.3	400 KV Lahal - RAJERA
102	Chamba	007840	Dharbeta (78)	Yes	2.3	400 KV Lahal - RAJERA

District wise detailed list of villages with viability of OPGW of M/s HPPTCL

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103	Chamba	007738	Dharonda (261)	Yes	3.53	220 KV MAZRA -KARIAN
104	Kullu	012891	Diar (37/92)	Yes		220 kV Charor- Banala T/L
105	Chamba	007955	Diggar (185)	Yes	3.35	220 KV MAZRA -KARIAN
106	Chamba	006934	Dob Dikriund (413)	No	21.59	132 KV LILO KURTHALA- BATHRI
107	Chamba	007031	Drabbar (528)	No	12.45	220 KV MAZRA -KARIAN
108	Chamba	007788	Dramman (19)	Yes	3.9	220 KV MAZRA -KARIAN
109	Chamba	006931	Dudra (419)	No	24.8	132 KV LILO KURTHALA- BATHRI
110	Chamba	007001	Dughli (568)	Yes	7.44	132 KV LILO KURTHALA- BATHRI
111	Chamba	007725	Dulhar (265)	Yes	3.06	220 KV MAZRA -KARIAN
112	Chamba	007714	Dular (295)	Yes	0.78	132 KV LILO KURTHALA- BATHRI
113	Chamba	007923	Dulara (158)	Yes	1.8	400 KV Lahal - RAJERA
114	Chamba	007792	Fatehpur (21)	Yes	5.16	220 KV MAZRA -KARIAN
115	Chamba	007020	Gadiog (507)	No	15.31	220 KV MAZRA -KARIAN
116	Chamba	007930	Gagla (164)	Yes	Crossing	400 KV Lahal - RAJERA
117	Chamba	007754	Gaila (280)	Yes	1.11	220 KV MAZRA -KARIAN
118	Chamba	007807	Gajhnuhi (37)	Yes	6.29	220 KV MAZRA -KARIAN
119	Chamba	007876	Galthan (114)	Yes	1.54	400 KV Lahal - RAJERA
120	Chamba	006913	Galua (380)	No	28.35	132 KV LILO KURTHALA- BATHRI
121	Chamba	007914	Gan (143)	Yes	5.37	400 KV Lahal - RAJERA
122	Chamba	006797	Garh (377)	No	28.22	132 KV LILO KURTHALA- BATHRI
123	Chamba	007007	Garh (556)	Yes	6.58	220 KV MAZRA -KARIAN
124	Chamba	006961	Garhphari (445)	No	17.65	132 KV LILO KURTHALA- BATHRI
125	Chamba	006893	Garhwalka (250)	No	13.51	132 KV LILO KURTHALA- BATHRI
126	Chamba	007903	Garondi (138)	Yes	5	400 KV Lahal - RAJERA
127	Chamba	007039	Gegana (562)	Yes	4.8	220 KV MAZRA -KARIAN
128	Chamba	007868	Gehra (104)	Yes	0.4	400 KV Lahal - RAJERA
129	Chamba	007062	Gewa (496)	No	17.64	220 KV MAZRA -KARIAN
130	Chamba	008009	Ghagrauta (252)	No	11.48	220 KV MAZRA -KARIAN
131	Chamba	007736	Ghar Garaon (240)	Yes	4.68	220 KV MAZRA -KARIAN
132	Chamba	007937	Gharmani (170)	Yes	1.87	220 KV MAZRA -KARIAN
133	Chamba	007966	Ghatrer (194)	Yes	7.06	220 KV MAZRA -KARIAN
134	Chamba	007764	Ghatta (306)	Yes	6.46	132 KV LILO KURTHALA- BATHRI
135	Chamba	006800	Ghulei (370)	No	31	132 KV LILO KURTHALA- BATHRI
136	Chamba	008168	Ghurath (20)	Yes		400KV line work in progress ,OPGW is expected to be instattedby the end of this year.

District wise detailed list of villages with viability of OPGW of M/s HPPTCL

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137	Chamba	007894	Girad (128)	Yes	9.2	400 KV Lahal - RAJERA
138	Chamba	008002	Gond (245)	Yes	7.74	220 KV MAZRA -KARIAN
139	Chamba	008206	Grima (118)	Yes		220KV Holi-Bjoli Line
140	Chamba	007933	Gudda (167)	Yes	1	224 KV Karian -Rajera
141	Chamba	006792	Guddan (374)	No	32.29	132 KV LILO KURTHALA- BATHRI
142	Chamba	006789	Guila (357)	No	31.76	132 KV LILO KURTHALA- BATHRI
143	Chamba	007921	Gurar (157)	Yes	0.14	400 KV Lahal - RAJERA
144	Chamba	007963	Gwar (200)	Yes	2.44	400 KV Lahal - RAJERA
145	Chamba	007853	Gwar (91)	Yes	1.54	400 KV Lahal - RAJERA
146	Chamba	006907	Gwari (400)	No	23.2	132 KV LILO KURTHALA- BATHRI
147	Chamba	006866	Haloga (337)	No	22.67	132 KV LILO KURTHALA- BATHRI
148	Chamba	007724	Hamal (273)	Yes	1.66	220 KV MAZRA -KARIAN
149	Chamba	007752	Haripur (283)	Yes	0.96	220 KV MAZRA -KARIAN
150	Chamba	006871	Hartwas (332)	No	22.11	132 KV LILO KURTHALA- BATHRI
151	Chamba	008169	Hat (21)	Yes		400KV line work in progress ,OPGW is expected to be instattedby the end of this year.
152	Chamba	007016	Helan (522)	No	12.06	220 KV MAZRA -KARIAN
153	Chamba	006876	Hiar (326)	No	18.61	132 KV LILO KURTHALA- BATHRI
154	Chamba	007765	Hunjar (1)	Yes	10	132 KV LILO KURTHALA- BATHRI
155	Chamba	007827	Huraid (62)	Yes	2.98	400 KV Lahal - RAJERA
156	Chamba	008001	Jadera (244)	Yes	7.59	220 KV MAZRA -KARIAN
157	Chamba	007875	Jaintra (110)	Yes	3	400 KV Lahal - RAJERA
158	Chamba	007041	Jandrah (560)	Yes	6.65	220 KV MAZRA -KARIAN
159	Chamba	007944	Jangal Jamwar (188)	Yes	2.24	220 KV MAZRA -KARIAN
160	Chamba	006952	Janjog (423)	No	24.75	132 KV LILO KURTHALA- BATHRI
161	Chamba	007808	Jankhar Jangal (36)	Yes	4.8	220 KV MAZRA -KARIAN
162	Chamba	007920	Janni (156)	Yes	0.63	400 KV Lahal - RAJERA
163	Chamba	006981	Jasaur Garh (509)	No	16.25	132 KV LILO KURTHALA- BATHRI
164	Chamba	007823	Jatkari (58)	Yes	4.8	400 KV Lahal - RAJERA
165	Chamba	006874	Jawari (329)	No	20.04	132 KV LILO KURTHALA- BATHRI
166	Chamba	006861	Jhaj (319)	No	18.52	132 KV LILO KURTHALA- BATHRI
167	Chamba	007069	Jhakla (488)	No	18.64	220 KV MAZRA -KARIAN
168	Chamba	007012	Jhanuh (546)	Yes	8.96	220 KV MAZRA -KARIAN
169	Chamba	008134	Jhikli Tiari (187)	Yes		220KV Holi-Bjoli Line
170	Chamba	007916	Jiyoti (152)	Yes	4.65	400 KV Lahal - RAJERA

District wise detailed list of villages with viability of OPGW of M/s HPPTCL

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171	Chamba	006807	Junas (355)	No	28	132 KV LILO KURTHALA- BATHRI
172	Chamba	006941	Jungra (422)	No	25.27	132 KV LILO KURTHALA- BATHRI
173	Chamba	007048	Jungrar (531)	No	12.33	220 KV MAZRA -KARIAN
174	Chamba	006867	Junth (338)	No	23.58	132 KV LILO KURTHALA- BATHRI
175	Chamba	007078	Juri (476)	No	22.77	220 KV MAZRA -KARIAN
176	Chamba	008000	Kaiga (255)	Yes	7.5	220 KV MAZRA -KARIAN
177	Chamba	007744	Kaila (242)	Yes	4	220 KV MAZRA -KARIAN
178	Chamba	007004	Kainthly (564)	Yes	5.74	132 KV LILO KURTHALA- BATHRI
179	Chamba	007947	Kakiyan (181)	Yes	0.55	220 KV MAZRA -KARIAN
180	Chamba	007900	Kalaunce (135)	Yes	11	400 KV Lahal - RAJERA
181	Chamba	006911	Kalei (399)	No	26.36	132 KV LILO KURTHALA- BATHRI
182	Chamba	006996	Kalhel (550)	Yes	9.63	132 KV LILO KURTHALA- BATHRI
183	Chamba	007954	Kalhuni Jangal (192)	Yes	3.59	220 KV MAZRA -KARIAN
184	Chamba	006889	Kalias (241)	No	17.15	132 KV LILO KURTHALA- BATHRI
185	Chamba	007915	Kalmala (151)	Yes	5	400 KV Lahal - RAJERA
186	Chamba	006888	Kalog (242)	No	16.47	132 KV LILO KURTHALA- BATHRI
187	Chamba	007919	Kalor (150)	Yes	2.3	400 KV Lahal - RAJERA
188	Chamba	006954	Kalwala (441)	No	20.81	132 KV LILO KURTHALA- BATHRI
189	Chamba	007950	Kamharka (187)	Yes	2.17	220 KV MAZRA -KARIAN
190	Chamba	007709	Kandla (270)	Yes	2.93	132 KV LILO KURTHALA- BATHRI
191	Mandi	014288	Kangoo (82)	Yes		220kV Dehar Kangoo Line
192	Chamba	007816	Kapara (51)	Yes	3	220 KV MAZRA -KARIAN
193	Chamba	007047	Kareri (530)	No	11.39	220 KV MAZRA -KARIAN
194	Chamba	007939	Kariana (174)	Yes	0.47	220 Kv Karian -Rajera
195	Chamba	006975	Karmari (447)	No	18.66	132 KV LILO KURTHALA- BATHRI
196	Chamba	007719	Karori (298)	Yes	0.13	132 KV LILO KURTHALA- BATHRI
197	Chamba	006936	Kasbati Tisa (411)	No	20.84	132 KV LILO KURTHALA- BATHRI
198	Chamba	006901	Kasbati-Bhunjraru (410)	No	20.44	132 KV LILO KURTHALA- BATHRI
199	Chamba	007943	Kathanna (177)	Yes	0.35	220 KV MAZRA -KARIAN
200	Chamba	007025	Katwar (461)	No	18.49	220 KV MAZRA -KARIAN
201	Chamba	006873	Kella (331)	No	20.6	132 KV LILO KURTHALA- BATHRI
202	Chamba	006992	Kella (552)	No	20.95	132 KV LILO KURTHALA- BATHRI
203	Chamba	007793	Khajiar (31)	Yes	7.01	220 KV MAZRA -KARIAN
204	Chamba	007795	Khajiar Jangal (29)	Yes	9.67	220 KV MAZRA -KARIAN

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205	Chamba	006943	Khajwa (431)	No	27.34	132 KV LILO KURTHALA- BATHRI
206	Chamba	007067	Khander (467)	No	19.79	220 KV MAZRA -KARIAN
207	Chamba	006897	Khandiaru (248)	No	13.76	132 KV LILO KURTHALA- BATHRI
208	Chamba	006851	Khangu (288)	No	16.66	132 KV LILO KURTHALA- BATHRI
209	Chamba	008200	Khani (125)	Yes		220KV Holi-Bjoli Line
210	Chamba	007888	Khundail (123)	Yes	5.66	400 KV Lahal - RAJERA
211	Chamba	007976	Kiri (212)	No	10.3	220 Kv Karian -Rajera
212	Chamba	007773	Kohlari (25)	Yes	9	220 KV MAZRA -KARIAN
213	Chamba	007815	Kolka (52)	Yes	3	220 KV Karian -Rajera
214	Chamba	006877	Kulthot (327)	No	18.38	132 KV LILO KURTHALA- BATHRI
215	Chamba	007038	Kumarka (559)	Yes	5.4	220 KV MAZRA -KARIAN
216	Chamba	006993	Kumauta (570)	Yes	8.03	132 KV LILO KURTHALA- BATHRI
217	Chamba	006891	Kunda (243)	No	15.55	132 KV LILO KURTHALA- BATHRI
218	Chamba	007088	Kunda (483)	No	22.51	220 KV MAZRA -KARIAN
219	Chamba	007856	Kundi (86)	Yes	0.86	400 KV Lahal - RAJERA
220	Chamba	007917	Kunedh (153)	Yes	3.62	400 KV Lahal - RAJERA
221	Chamba	007774	Kunha (10)	Yes	6.7	220 KV MAZRA -KARIAN
222	Chamba	007874	Kunr (109)	Yes	4	400 KV Lahal - RAJERA
223	Chamba	007931	Kuran (165)	Yes	Crossing	400 KV Lahal - RAJERA
224	Chamba	007988	Kureel (223)	No	14.86	220 KV MAZRA -KARIAN
225	Chamba	007995	Kurena (231)	Yes	9.49	220 KV MAZRA -KARIAN
226	Chamba	007927	Kutehr (162)	No	14.46	400 KV Lahal - RAJERA
227	Chamba	006906	Kutehr (403)	No	23.47	132 KV LILO KURTHALA- BATHRI
228	Chamba	006998	Kuthar (548)	Yes	10.16	132 KV LILO KURTHALA- BATHRI
229	Chamba	007710	Kuthara (272)	Yes	2.43	132 KV LILO KURTHALA- BATHRI
230	Chamba	007022	Kuther (505)	No	15.81	220 KV MAZRA -KARIAN
231	Chamba	006878	Kuther (328)	No	19.57	132 KV LILO KURTHALA- BATHRI
232	Chamba	007741	Kuthera Khas (257)	Yes	7.08	220 KV MAZRA -KARIAN
233	Chamba	007708	Kuthwari (271)	Yes	4.36	132 KV LILO KURTHALA- BATHRI
234	Chamba	007867	Ladda (102)	Yes	passing	400 KV Lahal - RAJERA
235	Chamba	007036	Ladhan (557)	Yes	6.78	220 KV MAZRA -KARIAN
236	Chamba	007971	Laga (203)	Yes	9.94	220 Kv Karian -Rajera
237	Chamba	008199	Lahal (124)	Yes		220KV Holi-Bjoli Line
238	Chamba	007834	Lakra (69)	Yes	3.54	400 KV Lahal - RAJERA

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239	Chamba	006984	Langha (511)	No	14.84	132 KV LILO KURTHALA- BATHRI
240	Chamba	007970	Lathon Jangal (204)	Yes	8.62	220 Kv Karian -Rajera
241	Chamba	007885	Lech (120)	Yes	1.93	400 KV Lahal - RAJERA
242	Chamba	006978	Leson (451)	No	17.81	132 KV LILO KURTHALA- BATHRI
243	Chamba	007837	Loa Jangal (71)	Yes	2.11	400 KV Lahal - RAJERA
244	Chamba	007723	Lohruin (292)	Yes	1	132 KV LILO KURTHALA- BATHRI
245	Chamba	007720	Loni (291)	Yes	0.76	220 KV MAZRA -KARIAN
246	Chamba	007852	Lothal (90)	Yes	0.5	400 KV Lahal - RAJERA
247	Chamba	007909	Lower Digaid Jangal (144)	Yes	6	400 KV Lahal - RAJERA
248	Chamba	006856	Ludrora (284)	No	15.5	132 KV LILO KURTHALA- BATHRI
249	Chamba	007942	Ludu (178)	Yes	0.37	220 KV MAZRA -KARIAN
250	Chamba	006865	Luinda (339)	No	23.94	132 KV LILO KURTHALA- BATHRI
251	Chamba	008171	Luna (3)	Yes		400KV line work in progress ,OPGW is expected to be instattedby the end of this year.
252	Chamba	007878	Maasu (115)	Yes	0.5	400 KV Lahal - RAJERA
253	Chamba	006933	Madan Shalancha (414)	No	22.62	132 KV LILO KURTHALA- BATHRI
254	Chamba	007081	Maihla (486)	No	20.99	220 KV MAZRA -KARIAN
255	Chamba	008010	Maingal (250)	No	13.83	220 KV MAZRA -KARIAN
256	Chamba	007850	Majhata (88)	Yes	0.49	400 KV Lahal - RAJERA
257	Chamba	006801	Majoga (379)	No	29	132 KV LILO KURTHALA- BATHRI
258	Chamba	006827	Makkan (310)	No	20.99	132 KV LILO KURTHALA- BATHRI
259	Chamba	007886	Malla (121)	Yes	2.19	400 KV Lahal - RAJERA
260	Chamba	007929	Malla (161)	Yes	2.69	400 KV Lahal - RAJERA
261	Chamba	007870	Mandhara (105)	Yes	2.12	400 KV Lahal - RAJERA
262	Chamba	007949	Mando (183)	Yes	1.89	220 KV MAZRA -KARIAN
263	Chamba	006958	Mangalwas (438)	No	19.27	132 KV LILO KURTHALA- BATHRI
264	Chamba	007810	Mangla (49)	Yes	2.5	220 KV MAZRA -KARIAN
265	Chamba	007969	Manglasa Jangal (205)	Yes	9.82	220 KV MAZRA -KARIAN
266	Chamba	006809	Mangli (345)	No	30	132 KV LILO KURTHALA- BATHRI
267	Chamba	006972	Manglo (455)	No	21.32	132 KV LILO KURTHALA- BATHRI
268	Chamba	006983	Manju (516)	No	14.42	132 KV LILO KURTHALA- BATHRI
269	Chamba	007802	Mankot (43)	Yes	8.23	220 KV Karian -Rajera
270	Chamba	006787	Mansa (359)	No	33.41	132 KV LILO KURTHALA- BATHRI
271	Chamba	007881	Maraur (118)	Yes	0.76	400 KV Lahal - RAJERA
272	Chamba	007707	Masrund (267)	Yes	5.46	132 KV LILO KURTHALA- BATHRI

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273	Chamba	006832	Matiund (322)	No	20.59	132 KV LILO KURTHALA- BATHRI
274	Chamba	007077	Mawa (473)	No	24.21	220 KV MAZRA -KARIAN
275	Chamba	006914	Meas (384)	No	32.1	132 KV LILO KURTHALA- BATHRI
276	Chamba	007835	Mehla (64)	Yes	1.01	400 KV Lahal - RAJERA
277	Chamba	007806	Miadi (39)	Yes	7.19	220 KV MAZRA -KARIAN
278	Chamba	007712	Moharhi (294)	Yes	1.08	132 KV LILO KURTHALA- BATHRI
279	Chamba	007907	Mokhari (149)	Yes	1.24	400 KV Lahal - RAJERA
280	Chamba	007940	Mugla (175)	Yes	1.16	220 KV MAZRA -KARIAN
281	Chamba	007716	Muhal (300)	Yes	1	132 KV LILO KURTHALA- BATHRI
282	Chamba	006808	Mulwas (348)	No	28	132 KV LILO KURTHALA- BATHRI
283	Chamba	007766	Naghun (2)	Yes	10	220 KV MAZRA -KARIAN
284	Chamba	007731	Nahuin (275)	Yes	2.62	220 KV MAZRA -KARIAN
285	Chamba	007735	Nandlera (276)	Yes	2.67	220 KV MAZRA -KARIAN
286	Chamba	006833	Nanori (321)	No	19.1	132 KV LILO KURTHALA- BATHRI
287	Chamba	007753	Nanu (281)	Yes	0.18	220 KV MAZRA -KARIAN
288	Chamba	006953	Nera (417)	No	22.58	132 KV LILO KURTHALA- BATHRI
289	Chamba	006868	Ohla (335)	No	23.19	132 KV LILO KURTHALA- BATHRI
290	Chamba	007817	Ohli (50)	Yes	2.45	220 KV MAZRA -KARIAN
291	Chamba	007790	Ora (33)	Yes	5.8	220 KV MAZRA -KARIAN
292	Chamba	006932	Paddar (415)	No	23.4	132 KV LILO KURTHALA- BATHRI
293	Chamba	007993	Padhar (229)	Yes	9.84	220 KV MAZRA -KARIAN
294	Chamba	007762	Palai (302)	Yes	3.21	132 KV LILO KURTHALA- BATHRI
295	Chamba	007040	Paleran (561)	Yes	5.11	220 KV MAZRA -KARIAN
296	Chamba	007745	Palhun (239)	Yes	2.73	220 KV MAZRA -KARIAN
297	Chamba	007997	Paliur (233)	Yes	4.95	220 KV MAZRA -KARIAN
298	Chamba	007776	Panjoh (7)	Yes	5.96	220 KV MAZRA -KARIAN
299	Chamba	007066	Paraba (468)	No	17.2	220 KV MAZRA -KARIAN
300	Chamba	006895	Parandri (249)	No	13.94	132 KV LILO KURTHALA- BATHRI
301	Chamba	007713	Parnohin (296)	Yes	Passing	132 KV LILO KURTHALA- BATHRI
302	Chamba	007829	Phagri (65)	Yes	4.3	400 KV Lahal - RAJERA
303	Chamba	007060	Phanaota (494)	No	17.43	220 KV MAZRA -KARIAN
304	Chamba	007883	Piura (111)	Yes	1.57	400 KV Lahal - RAJERA
305	Chamba	007992	Prauta (226)	No	12	220 KV MAZRA -KARIAN
306	Chamba	007908	Preena (145)	Yes	3.29	400 KV Lahal - RAJERA

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307	Chamba	007822	Priungal (53)	Yes	3.47	220 KV MAZRA -KARIAN
308	Chamba	007722	Pukhri (290)	Yes	0.6	220 KV MAZRA -KARIAN
309	Chamba	006912	Puktala (395)	No	26.28	132 KV LILO KURTHALA- BATHRI
310	Chamba	006812	R.F.Hailera (344)	No	25	132 KV LILO KURTHALA- BATHRI
311	Chamba	006927	R.F.Lowertain (393)	No	30.66	132 KV LILO KURTHALA- BATHRI
312	Chamba	006986	R.F.Saloh (513)	No	13.97	132 KV LILO KURTHALA- BATHRI
313	Chamba	007758	Raj Nagar Khas (287)	Yes	2.97	220 KV MAZRA -KARIAN
314	Chamba	007932	Rajara (166)	Yes	0.42	224 KV Karian -Rajera
315	Chamba	007986	Rajindu (225)	No	14.77	220 KV MAZRA -KARIAN
316	Chamba	007755	Rajpura (284)	Yes	0.88	220 KV MAZRA -KARIAN
317	Chamba	007925	Rakh(A) (159A)	Yes	0.3	400 KV Lahal - RAJERA
318	Chamba	007924	Rakh(B) (159B)	Yes	0.29	400 KV Lahal - RAJERA
319	Chamba	007838	Rambho (72)	Yes	2.61	400 KV Lahal - RAJERA
320	Chamba	006899	Ramund (239)	No	15.07	132 KV LILO KURTHALA- BATHRI
321	Chamba	007967	Ran (196)	Yes	7.95	220 KV MAZRA -KARIAN
322	Chamba	007805	Randoh (40)	Yes	7.81	220 KV MAZRA -KARIAN
323	Chamba	007804	Ratiar (38)	Yes	5.25	220 KV MAZRA -KARIAN
324	Chamba	007975	Rauni (211)	No	22.55	220 KV MAZRA -KARIAN
325	Chamba	008151	Retan (116)	Yes		220KV Holi-Bjoli Line
326	Chamba	007784	Rinda (22)	Yes	4.46	220 KV MAZRA -KARIAN
327	Kullu	012892	Rote-II (42/107)	Yes		220 kV Charor- Banala T/L
328	Chamba	006955	Rundal (443)	No	19.38	132 KV LILO KURTHALA- BATHRI
329	Chamba	007941	Rundega (173)	Yes	0.25	220 KV MAZRA -KARIAN
330	Chamba	007759	Rupani (288)	Yes	2.84	220 KV MAZRA -KARIAN
331	Chamba	007859	Sadoon (94)	Yes	4.9	400 KV Lahal - RAJERA
332	Chamba	006930	Sagloga (404)	No	24.21	132 KV LILO KURTHALA- BATHRI
333	Chamba	006898	Sai (247)	No	14.55	132 KV LILO KURTHALA- BATHRI
334	Chamba	006869	Sai Kothi (334)	No	24.04	132 KV LILO KURTHALA- BATHRI
335	Chamba	007913	Sakraina (142)	Yes	5.9	400 KV Lahal - RAJERA
336	Chamba	007760	Sal (304)	Yes	5	220 KV MAZRA -KARIAN
337	Chamba	007718	Salah (299)	Yes	1.5	132 KV LILO KURTHALA- BATHRI
338	Mandi	014290	Salaper (78)	Yes		220kV Dehar Kangoo Line
339	Chamba	007779	Salga (12)	Yes	3	220 KV MAZRA -KARIAN
340	Chamba	007994	Saloh (228)	No	11.52	220 KV MAZRA -KARIAN

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341	Chamba	008143	Sanh (107)	Yes		220KV Holi-Bjoli Line
342	Chamba	008006	Sanotha (248)	No	11.82	220 KV MAZRA -KARIAN
343	Chamba	006828	Sanwal (315)	No	19.57	132 KV LILO KURTHALA- BATHRI
344	Chamba	007705	Sapra (269)	Yes	5.3	132 KV LILO KURTHALA- BATHRI
345	Chamba	006926	Sapranjla (394)	No	27.42	132 KV LILO KURTHALA- BATHRI
346	Chamba	007042	Saprot (563)	Yes	6.63	220 KV MAZRA -KARIAN
347	Chamba	007987	Sara (222)	No	14.74	220 KV MAZRA -KARIAN
348	Chamba	007046	Sarana (538)	Yes	10.62	220 KV MAZRA -KARIAN
349	Chamba	007968	Sarol (206)	Yes	1.25	220 KV MAZRA -KARIAN
350	Chamba	007751	Sarol (282)	Yes	2.07	220 KV MAZRA -KARIAN
351	Chamba	007729	Saronda (264)	Yes	1.43	220 KV MAZRA -KARIAN
352	Chamba	007782	Saru (15)	Yes	2.08	220 KV MAZRA -KARIAN
353	Chamba	006979	Sarua (450)	No	18.9	132 KV LILO KURTHALA- BATHRI
354	Chamba	006796	Sathias (376)	No	28.61	132 KV LILO KURTHALA- BATHRI
355	Chamba	006825	Sau (304)	No	19	132 KV LILO KURTHALA- BATHRI
356	Chamba	006862	Saunda (323)	No	19.13	132 KV LILO KURTHALA- BATHRI
357	Chamba	006989	Sauti (518)	No	11.3	132 KV LILO KURTHALA- BATHRI
358	Chamba	007748	Sehi (237)	Yes	1.96	220 KV MAZRA -KARIAN
359	Chamba	007768	Seru (4)	Yes	6.71	132 KV LILO KURTHALA- BATHRI
360	Chamba	007956	Settal (189)	Yes	1.79	220 KV MAZRA -KARIAN
361	Chamba	006846	Shagwari (296)	No	16.51	132 KV LILO KURTHALA- BATHRI
362	Chamba	006909	Shalan (402)	No	24.33	132 KV LILO KURTHALA- BATHRI
363	Chamba	006836	Shalela Bari (316)	No	18.53	132 KV LILO KURTHALA- BATHRI
364	Chamba	006870	Shali (333)	No	22.79	132 KV LILO KURTHALA- BATHRI
365	Chamba	006976	Shannua (448)	No	16.55	132 KV LILO KURTHALA- BATHRI
366	Chamba	006960	Shantewa (444)	No	17.63	132 KV LILO KURTHALA- BATHRI
367	Chamba	006803	Shaol (353)	No	27	132 KV LILO KURTHALA- BATHRI
368	Chamba	006863	Shapriot (324)	No	20.27	132 KV LILO KURTHALA- BATHRI
369	Chamba	007962	Shar (201)	Yes	8.26	220 Kv Karian -Rajera
370	Chamba	006937	Shikari (416)	No	21.52	132 KV LILO KURTHALA- BATHRI
371	Kullu	012793	Shillihar (27/60)	Yes		220 kv Charor- Banala T/L
372	Chamba	006971	Shimbra (456)	No	20.95	132 KV LILO KURTHALA- BATHRI
373	Chamba	006999	Shind (545)	Yes	9.2	132 KV LILO KURTHALA- BATHRI
374	Chamba	006896	Shiunwai (246)	No	15.16	132 KV LILO KURTHALA- BATHRI

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375	Chamba	007037	Shohi (558)	Yes	6.64	220 KV MAZRA -KARIAN
376	Chamba	006942	Shri Garh (424)	No	26	132 KV LILO KURTHALA- BATHRI
377	Chamba	008008	Silla Gharat (253)	No	10.61	220 KV MAZRA -KARIAN
378	Chamba	006925	Silon (381)	No	30.11	132 KV LILO KURTHALA- BATHRI
379	Chamba	007780	Singi (24)	Yes	6	220 KV MAZRA -KARIAN
380	Chamba	007002	Singori (569)	Yes	6.96	132 KV LILO KURTHALA- BATHRI
381	Chamba	007732	Sira (277)	Yes	2.45	220 KV MAZRA -KARIAN
382	Chamba	008198	Sird (44)	Yes		400KV line work in progress ,OPGW is expected to be instattedby the end of this year.
383	Chamba	006802	Siri (378)	No	28.2	132 KV LILO KURTHALA- BATHRI
384	Chamba	008150	Siunr (115)	Yes		220KV Holi-Bjoli Line
385	Chamba	007070	Suala (487)	No	19.81	220 KV MAZRA -KARIAN
386	Chamba	006879	Sudla (278)	No	17.98	132 KV LILO KURTHALA- BATHRI
387	Chamba	007865	Sukrala (99)	Yes	0.57	400 KV Lahal - RAJERA
388	Chamba	007728	Sukreta (263)	Yes	2.68	220 KV MAZRA -KARIAN
389	Chamba	007787	Sultanpur (18)	Yes	2.65	220 KV MAZRA -KARIAN
390	Chamba	007849	Sunara (87)	Yes	0.94	400 KV Lahal - RAJERA
391	Chamba	007082	Sundari (489)	No	18.32	220 KV MAZRA -KARIAN
392	Chamba	007953	Sundu (193)	Yes	3.51	220 KV MAZRA -KARIAN
393	Chamba	007747	Sungal (235)	Yes	2.19	220 KV MAZRA -KARIAN
394	Chamba	007785	Suren (17)	Yes	2.9	220 KV MAZRA -KARIAN
395	Chamba	007750	Suri (236)	Yes	0.23	220 KV MAZRA -KARIAN
396	Chamba	007008	Swiga (555)	Yes	7.6	220 KV MAZRA -KARIAN
397	Chamba	007848	Taggi (83)	Yes	2	400 KV Lahal - RAJERA
398	Chamba	007809	Tapun (35)	Yes	4.65	220 KV MAZRA -KARIAN
399	Chamba	006905	Tatrog (405)	No	22.89	132 KV LILO KURTHALA- BATHRI
400	Chamba	006916	Teppa (386)	No	34.52	132 KV LILO KURTHALA- BATHRI
401	Chamba	007739	Thakrotha (260)	Yes	4.29	220 KV MAZRA -KARIAN
402	Chamba	007936	Thalla (171)	Yes	1.37	224 KV Karian -Rajera
403	Chamba	006959	Thalli (442)	No	18.45	132 KV LILO KURTHALA- BATHRI
404	Chamba	006875	Thanai Kothi (325)	No	19.31	132 KV LILO KURTHALA- BATHRI
405	Chamba	008011	Thundu (251)	No	10.57	220 KV MAZRA -KARIAN
406	Chamba	006980	Tikarigarh (458)	No	17.81	132 KV LILO KURTHALA- BATHRI
407	Chamba	006894	Tikri (254)	No	12.55	132 KV LILO KURTHALA- BATHRI
408	Chamba	007730	Tikri (274)	Yes	0.19	220 KV MAZRA -KARIAN

District wise detailed list of villages with viability of OPGW of M/s HPPTCL

#	District	Village Code as per Census 2011 data	Name of Village	Whether OPGW cable present/ passing through the Village	If No, the nearest location/ village from where the OPGW cable present and the approx distance in KMs.	Remarks, if any
409	Chamba	007996	Tipra (230)	Yes	6.65	220 KV MAZRA -KARIAN
410	Chamba	007769	Tipri (5)	Yes	6.6	220 KV MAZRA -KARIAN
411	Chamba	006935	Tisa (412)	No	20.26	132 KV LILO KURTHALA- BATHRI
412	Chamba	007733	Tosa (278)	Yes	2.92	220 KV MAZRA -KARIAN
413	Chamba	007980	Trittha (208)	No	17.53	132 KV LILO KURTHALA- BATHRI
414	Chamba	007742	Triya (256)	Yes	8.35	220 KV MAZRA -KARIAN
415	Chamba	007854	Tur (92)	Yes	0.54	400 KV Lahal - RAJERA
416	Chamba	007783	Udaipur Khas (16)	Yes	2.17	220 KV MAZRA -KARIAN
417	Chamba	008136	Uperli Tiari (188)	Yes		220KV Holi-Bjoli Line
418	Chamba	007945	Utip (179)	Yes	1.23	220 KV MAZRA -KARIAN
419	Chamba	007021	Utpur (506)	No	15.61	220 KV MAZRA -KARIAN
420	Chamba	007824	West Chhuwaru (59)	Yes	7	400 KV Lahal - RAJERA

District wise detailed list of villages with viability of OPGW of M/s HPSEB Ltd.

#	District	Village Code as per Census 2011 data	Name of Village	Whether OPGW cable present/ passing through the Village	If No, the nearest location/ village from where the OPGW cable present and the approx distance in KMs.	Remarks, if any
1	Chamba	007444	Bathri Jarai (82)	Yes		OPGW available on 132kV Jassore-Bathri Line.
2	Chamba	007390	Belli (106)	Yes		OPGW on 132 KV Bathri- Jassore line is crossing
3	Chamba	007462	Bhatoli (80)	Yes		OPGW on 132kV Bathri- Jassore is crossing
4	Chamba	007324	Brangal (38)	Yes		OPGW on 132 kV Bathri-Kurthala line is crossing.
5	Chamba	006883	Chili (275)	Yes		OPGW on 132kV Bathri-Kurthala line is crossing.
6	Chamba	007391	Dhundiara (107)	Yes		OPGW on 132 KV Bathri- Jassore line is crossing
7	Chamba	007514	Kakira Jarai (160)	Yes		OPGW on 12kV Bathri-Jassore is crossing.
8	Chamba	007476	Kehlu (121)	Yes		OPGW on 12kV Bathri-Jassore is crossing.
9	Chamba	007389	Khaddi (104)	Yes		OPGW on 132 KV Bathri- Jassore line is crossing
10	Chamba	007409	Lahar (105)	Yes		OPGW on 12kV Bathri-Jassore is crossing.
11	Chamba	007441	Maluda (94)	Yes		OPGW available on 132kV Jassore-Bathri Line.
12	Chamba	007722	Pukhri (290)	Yes		OPGW on 12kV Bathri-Jassore is crossing.
13	Chamba	007500	Salorka (146)	Yes		OPGW on 12kV Bathri-Jassore is crossing.
14	Chamba	006828	Sanwal (315)	Yes		OPGW on 132kV Bathri-Kurthala line is crossing.
15	Chamba	007319	Taleru (37)	Yes		OPGW on 132kV Bathri-Kurthala line is crossing.
16	Chamba	007730	Tikri (274)	Yes		OPGW on 12kV Bathri-Jassore is crossing.
17	Chamba	007317	Wangal (35)	Yes		OPGW on 132kV Bathri-Kurthala line is crossing.
18	Kullu	012880	Kashawri (25/49)	Yes		OPGW available 132KV Bajaura sub station.
19	Mandi	014715	Baggi (281)	Yes		OPGW Cable on 132 kV Kangoo- Larji line Crossing
20	Mandi	013788	Baggi (83)	Yes		OPGW on 132kV Kangoo-larji line is crossing
21	Mandi	015411	Chail (51)	Yes		OPGW on 132 Kangoo larji line crossing.
22	Mandi	014853	D.P.F. Katiras (528)	Yes		OPGW on 132kV Larji Bajuara line is crossing
23	Mandi	015386	Gohar (63)	Yes		OPGW Cable on 132 kV Kangoo- Larji line Crossing
24	Mandi	014882	Hanogi (456)	Yes		OPGW 132kV Kangoo-Larji line is crossing
25	Mandi	014824	Jhiri (508)	Yes		OPGW on 132kV Larji Bajuara line is crossing
26	Mandi	014226	Jugahan (8)	Yes		OPGW available on 132KV Kangoo- Larji LILO to Ratti
27	Mandi	014230	Kalahod (27)	Yes		OPGW available on 132KV Kangoo- Larji LILO to Ratti

District wise detailed list of villages with viability of OPGW of M/s HPSEB Ltd.

#	District	Village Code as per Census 2011 data	Name of Village	Whether OPGW cable present/ passing through the Village	If No, the nearest location/ village from where the OPGW cable present and the approx distance in KMs.	Remarks, if any
28	Mandi	014222	Kanaid (6)	Yes		OPGW available on 132KV Kangoo- Larji line
29	Mandi	014288	Kangoo (82)	Yes		OPGW available at 220 kV Kangoo Sub station.
30	Mandi	014863	Khamradha (534)	Yes		OPGW on 132kV Larji Bajura line is crossing
31	Mandi	014839	Kota Dhar (520)	Yes		OPGW on 132kV Larji Bajura line is crossing
32	Mandi	014826	Nagwain (509)	Yes		OPGW on 132kV Larji Bajura line is crossing
33	Mandi	014850	Naw (525)	Yes		OPGW on 132kV Larji Bajura line is crossing
34	Mandi	014835	Pali (518)	Yes		OPGW on 132kV Larji Bajura line is crossing
35	Mandi	014663	Ratti (193)	Yes		OPGW available at 132 kV Ratti Sub station
36	Mandi	014221	Sai (3)	Yes		OPGW available on 132KV Kangoo- Larji LILO to Ratti
37	Mandi	014891	Thalot (533)	Yes		OPGW on 132kV Larji- Bajura is crossing.

District wise detailed list of Villages having Non-4G coverage

#	State/ UT	District	District Code as per Census 2011 data	Sub District Code as per Census 2011 data	Village Code as per Census 2011 data	Population	Name of Village
1	HP	Chamba	023	00088	7517	122	Auhar (172)
2	HP	Chamba	023	00092	8252	272	Balmui (63)
3	HP	Chamba	023	00087	7453	231	Barinni (91)
4	HP	Chamba	023	00085	7148	1217	Bhasua (170)
5	HP	Chamba	023	00083	6728	403	Hilaur (50)
6	HP	Chamba	023	00090	7793	1136	Khajiar (31)
7	HP	Chamba	023	00086	7328	397	Kilor (47)
8	HP	Chamba	023	00087	7409	469	Lahar (105)
9	HP	Chamba	023	00087	7388	217	Lunna (103)
10	HP	Chamba	023	00088	7590	642	Mandhrar (242)
11	HP	Chamba	023	00087	7352	257	Manjdhar (44)
12	HP	Chamba	023	00090	7806	376	Miadi (39)
13	HP	Chamba	023	00088	7483	3	R.F. Mamul (164)
14	HP	Chamba	023	00085	7220	1629	Surgani (235)
15	HP	Kullu	026	00121	000000	0	Ani
16	HP	Kullu	026	00121	12954	2752	Jaban (25/78)
17	HP	Kullu	026	00118	12889	1857	Jallu (38/97)
18	HP	Kullu	026	00118	12880	4603	Kashawri (25/49)
19	HP	Kullu	026	00118	000000	0	Kullu
20	HP	Kullu	026	00117	12700	602	Muhal Pangan (22/38)
21	HP	Kullu	026	00122	12973	3444	Neether (20/63)
22	HP	Kullu	026	00121	12956	2275	Soidhar (25/80)
23	HP	Kullu	026	00118	12829	542	Up Muhal Ganesh Naggar
24	HP	Kullu	026	00118	12812	263	Up Muhal Kharga
25	HP	Kullu	026	00118	12834	0	Up Muhal Ladi Chanon - Ist
26	HP	Kullu	026	00118	12810	110	Up Muhal Lohadi
27	HP	Kullu	026	00118	12790	586	Up Muhal Pangan
28	HP	LahaulSpiti	025	00116	12502	667	Kaza Khas (70/1)
29	HP	LahaulSpiti	025	00116	12534	256	Kungri (97)
30	HP	LahaulSpiti	025	00116	12543	432	Sagnam (106/1)
31	HP	LahaulSpiti	025	00115	12426	15	Yari-Khoksar (14/11)
32	HP	Mandi	027	00132	14384	111	Balash (169)

District wise detailed list of Villages having Non-4G coverage

#	State/ UT	District	District Code as per Census 2011 data	Sub District Code as per Census 2011 data	Village Code as per Census 2011 data	Population	Name of Village
33	HP	Mandi	027	00133	14659	1690	Bhangrotu (221)
34	HP	Mandi	027	00135	14974	5	D.P.F. Jhalru (599)
35	HP	Mandi	027	00133	14470	9	D.P.F. Tandi (375)
36	HP	Mandi	027	00139	16151	466	Kalaihani (356)
37	HP	Mandi	027	00134	14826	2471	Nagwain (509)
38	HP	Mandi	027	00133	14664	3053	Ner (222)

वी. रघुनन्दन, आईटीएस

सचिव

**V. Raghunandan, ITS
Secretary**



भारतीय दूरसंचार विनियामक प्राधिकरण
महानगर दूरसंचार भवन, जवाहर लाल नेहरू मार्ग,
(पुराना मिनटो रोड), नई दिल्ली-110002
TELECOM REGULATORY AUTHORITY OF INDIA

Mahanagar Doorsanchar Bhawan,
Jawahar Lal Nehru Marg,
(Old Minto Road) New Delhi-110002
Tel. : 91-11-23237448 Fax : 91-11-23222816
E-mail : secretary@traigov.in

D.O. No. M-5/9/(4)/2021-QoS

Dated: 07th October 2022

Dear Sir,

Please refer to the meeting held under the chairmanship of Hon'ble Chief Minister of Sikkim with Chairman TRAI on 23.08.2021 wherein concern was raised with respect to inadequate mobile and Internet connectivity at schools, health centres and at Home Stay locations. Subsequently, Chairman TRAI and Chief Secretary & Chairman State Broadband Committee Govt. of Sikkim had a detailed review meeting with all TSPs, BSNL, BBNL, PGCIL, and DoT.

2. A standing Sub-Committee under the State Broadband Committee, consisting of DDG (Sikkim) DoT as chairman, Advisor TRAI RO Kolkata, and Secretary (DIT), Govt of Sikkim as members, was constituted for making suggestion for improving telecom services and infrastructure in Sikkim. Since the formation of committee and pursuance by it, certain progress has been made by some of the service providers in rolling out network in Sikkim State. The report of the committee (Annexure-I) has several observations/deliberations and recommendations which require detailed examination for their implementability. However, based on the interaction of Authority with the Stakeholders and the State Government of Sikkim, the Telecom regulatory Authority has identified the issues with respect to telecom infrastructure and connectivity in Sikkim (annexed as Annexure-II) and has also zeroed down on certain points that will require action on behalf of DoT/USOF as well as the State Government of Sikkim. TRAI has already written to DoT in respect of points (refer Annexure-III) on which action is required to be taken by DoT/USOF.

3. The points on which action is required to be taken by Sikkim State Government are as follows:

- (i) Road widening and Smart City related works have disrupted telecom networks considerably because of which the State Government offices are facing connectivity issues. In all future State Government works, prior coordination with TSPs may be done (through prior notice) and liability of Contractor for making payments for damages to telecom networks may be in-built in the contracts.
- (ii) State Government may make efforts to recover damages from the contractor for damage done to around 60km underground OFC of BharatNet during smart city works in Namchi and Jorethang. BSNL has submitted the requirement of Rs. 2.23 crore for restoration of BharatNet OFC routes and BSNL copper cable which were damaged during smart city work at Namchi and Gangtok.
- (iii) It has been informed that RoW permissions in Sikkim are being given through online portal which has now been linked to GatiShakti Sanchar Portal of DoT.

However, to tackle delays faced by TSPs in getting permission for OFC laying by Forest Department/ Defence Organizations, getting NoC for establishing new sites, connection of electricity for the new sites, Sikkim Government may ensure that all permissions including those for electricity connections are also given through this portal and are monitored regularly for delays, if any.

- (iv) The RoW Rules 2016 of DoT do not put any embargo in installing towers in any area, including residential. However, the required RoW permissions have to be taken in accordance with policy outlined in these rules. As a special one-time dispensation, State Government may consider regularizing towers installed in the residential premise.
- (v) Given the importance of connectivity in Government service delivery, commerce, education, health and other sectors, the State Government may consider providing electricity to Telecom sites on priority (within 15 days of connections request) at Utility/Industrial tariff. Currently the charges raised for providing electricity to telecom sites are very high and dissuade installation of new sites. The State Government should also consider waiving off last mile installation charges for extending electric connection to telecom sites as this will facilitate early roll out of Telecom services in these areas and help bridging the digital divide.
- (vi) The Authority is of the opinion that if all GPUs are covered and lit, most of the schools, government institutions and homestays should be able to get connectivity. While the connectivity to GPUs and villages are being planned by Central Government through USOF funding, the connectivity to schools, Police stations and Government offices is to be procured by the State Government. The State Government should raise their demand for such connectivity to TSPs and seek demand note from them for providing the connectivity through whichever media (like OFC, fixed wireless, Satellite or copper cable) they can. For such institutions where the connectivity is not being provided by any TSP, the list can be provided to DoT.
- (vii) TSPs are facing problems in running the sites during prolonged power cuts due to restriction in running DGs at night. This has impacted the services adversely. Provision of 24x7 electricity for running essential services is the responsibility of the State Government. Running DGs have their own operational challenges like higher cost of power, logistics of diesel supply to every site, pilferage of diesel, environmental effect etc. TSPs would prefer not to run DGs if continuous power supply is made available to the sites. The Authority would like to request the State Government to immediately review this policy and issue necessary instructions to local government bodies as well.
- (viii) One of the TSPs has informed that its launch of FTTH project is delayed due to non-availability of aerial permissions in Gangtok city area. Providing connectivity through Aerial Fiber is a cost effective and faster way of rolling out services and globally several national jurisdictions are facilitating overhead aerial fiber deployment including many States in India. DoT has already amended its RoW rules recently to facilitate laying of overhead optical fiber cables on posts, street light poles etc. State Government of Sikkim may facilitate the same by aligning its policies to National RoW rules as done by several States in India. Going forward, 5G network deployments already would require lot of small cell deployments on street furniture and these small cells may require aerial fibre connectivity. Delay in giving permissions for aerial fibre and small cell deployment on street furniture

like electricity poles, bus stops, billboards etc will adversely affect the 5G network rollouts in Sikkim.

- (ix) In case of road widening project, provisions for either incorporating ducts for telecom fibres should be made or mechanism need to be developed where the OFC laying work can run in parallel to road widening work. If works are carried out serially without collaborations, it will introduce delays in the roll out of networks and add to costs.
- (x) The Sikkim state government may also explore the possibility of constructing utility ducts in all future road widening and new road construction projects. This will help in quick rollout of all utility infrastructure in the state.

4. In view of above, it is requested that action with regard to points at para 3 above may please be initiated at the earliest for improving telecom infrastructure and connectivity in Sikkim.

with regards,

Encl: As above

V. Raghunandan
(V. Raghunandan)
Secretary, TRAI
Tel: 23237448

Shri V. B. Pathak
Chief Secretary
Government of Sikkim,
Annexe 1, Top Floor, Kazi Road,
Gangtok, Sikkim-737101

Sub: Report of the Sub-Committee for Improvement in the Coverage and Quality of Telecom Services in Sikkim

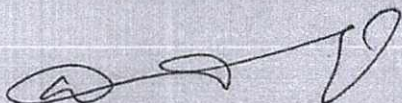
1. Introduction & Background:

A meeting was held between Chairman TRAI and Chief Secretary & Chairman State Broadband Committee Govt. of Sikkim on 23rd Aug 2021 to review the issues affecting the quality of Telecom services in Sikkim with emphasis in the City of Gangtok. Prior to this meeting Chairman TRAI and Chief Secretary (CS) Govt. of Sikkim had a brief meeting with Hon'ble Chief Minister (CM), Govt. of Sikkim. Hon'ble CM raised concern with respect to inadequate mobile and Internet connectivity in important sectors like **education** (i.e. connectivity at schools), **health** (i.e. connectivity at health centres), and **tourism** (e.g. connectivity at Home Stay locations). Hon'ble CM further emphasised that major part of the economy of Sikkim is dependent on tourism, and tourists are now preferring to stay in Home Stay's which does not have adequate Internet connectivity. Hon'ble CM requested Chairman TRAI to help in the improvement of mobile and Internet connectivity in Sikkim and especially in Schools, Health Centres, and for Home Stay locations. MOM is available in **Annexure-1**

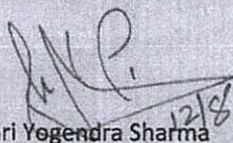
Subsequent to the meeting with Hon'ble CM Govt. of Sikkim Chairman TRAI and Chief Secretary & Chairman State Broadband Committee Govt. of Sikkim had a detailed review meeting with all TSPs, BSNL, BBNL, PGCIL, and DoT. CGM BSNL, CGM BBNL, CTO JIO, and representative of Airtel made brief presentation and discussed the issues which are creating bottlenecks in the establishment of network infrastructure, which in turn affecting quality of mobile and Internet services in City as well as in remote areas.

CGM BSNL informed that during road widening/drain repair works underground copper/OFC cables in Gangtok/Namchi City got damaged and as a result, the landline and broadband services provided to Govt. Offices and important organisations are getting interrupted frequently. BSNL does not have sufficient resources (including manpower, funds and materials) to lay cable afresh, and requested that DoT/USOF may provide some fund to restore the underground OFC networks especially in Gangtok and Namchi Cities. He has also informed that around 60km underground OFC of BharatNet got damaged in Namchi and Jorethang during constructions of Smart City works and, around Rs 5.5Cr is required for re-laying the OFC and providing BharaNet OFC connectivity to Gram panchayat Unit (GPUs) in these 2 Blocks.

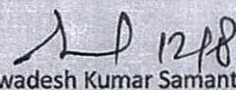
CGM BBNL informed that even though OFC laying were completed in 22 out of 52 GPUs & 9 BHQs in 9 Blocks of BharaNet under Ph-I, OFC of most of these GPUs & BHQs are now damaged in many places, and as a result not a single GPU can be made operational. CGM BBNL also informed that 5 GPUs out of these 22 have been handed over to CSC-SPV in Sikkim for restoration of OFC, and start services but CSC-SPV is taking time in restoring the connectivity. CGM BBNL also informed that revised estimate for BharatNet Ph-II (Rs96.28 Cr as CAPEX+ Rs14.46 Cr as OPEX for 3 years) has been approved by



Shri N. Murali Krishna
DDG Sikkim, WBLSA, DoT
Chairman



Shri Yogendra Sharma
Secretary IT, Govt. of Sikkim
Member



Dr. Swadesh Kumar Samanta
Advisor, TRAI, RO Kolkata
Member

DoT/USOF in May 2021. He further informed that BSNL is implementing the connectivity in 122 GPUs and 24 BHQs. CGM BBNL also informed that BSNL exchanges in around 9 Blocks are now non-operational and Sikkim Govt. may kindly allot space in these blocks for establishing connectivity to GPUs. **CGM BBNL also informed that 13 GPUs (i.e. 3 from Ph-I and 10 from Ph-II) are being connected using Satellite, as OFC connectivity in these GPUs is not feasible. Annexure-2**

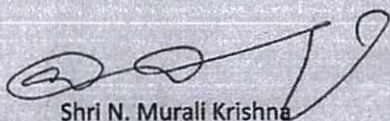
GM PGCIL Kolkata made a brief presentation giving the backhaul connectivity from Sikkim (Rangpo/Ranipool) to Siliguri via two power lines via Darjeeling: (i) 132 KV to Siliguri; (ii) 400 KV to Binagudi. It is learnt that all the TSPs including BSNL is now using the bandwidth from PGCIL for carrying the voice and Internet traffic from Sikkim. GM PGCIL informed that connectivity to all DHQs and important locations like Melli, Ravangla has been established using power line of Govt. of Sikkim and PGCIL is in the process of upgrading the equipment installed at DHQs to provide adequate bandwidth (e.g. 10 Gbps and above) to all TSPs including BSNL. He has also informed that PGCIL is constructing the power line and laying OFC (i.e. OPGW) along the power line on behalf of Sikkim Power department up to Block level. He requested that if Sikkim Govt. allocate 2 fibres from DHQ to respective Blocks and then PGCIL will be able to provide adequate bandwidth (e.g. 10 Gbps and above) to all TSPs including BSNL. This will allow high speed connectivity to all GPUs using BharatNet. In this regard Advisor TRAI Kolkata informed that Govt. of Sikkim had already allotted space (in 2012) to BSNL in all the BHQs.

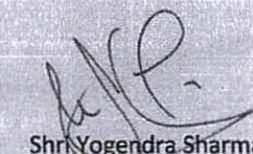
CTO JIO informed that State Govt. is extending helps in establishing the networks but still there are issues which are affecting the rollout of the infrastructure. Major issues which are being faced by most of the TSPs are:

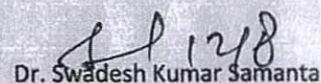
- Delay in permission for OFC laying by Forest Department/ Defence Organisations
- Delay in getting NoC for establishing new sites
- Delay in connection of electricity for the new sites
- Restriction in the movement of skilled manpower from Siliguri/Kolkata to Gangtok and other places

DDG (Sikkim) DoT WB LSA informed that backhaul connectivity from Sikkim to Siliguri need to be upgraded by BSNL as traffic has reached to the deployed capacity. Additionally, he emphasised that as all TSPs are using the backhaul connectivity from PGCIL, Gangtok will be isolated if any failure in PGCIL networks happen even for an hour. **He suggested that 2 nos of underground OFC routes of BSNL from Siliguri to Gangtok (via Darjeeling and via Kalimpong) need to be restored by re-laying, and if alternate funding sources to be explored. I.e USOF/any other source.**

DDG DoT also emphasised that rollout of BharatNet is already delayed by more than 4 years and both BSNL and BBNL should post exclusive manpower at DGM/ GM level at Gangtok to monitor, coordinate, and expedite the completion of the project. He also emphasised that all TSPs must post adequate manpower for day to day O&M activities and for resolving network issues in Gangtok and other District HQs.


Shri N. Murali Krishna
DDG Sikkim, WBSA, DoT
Chairman


Shri Yogendra Sharma
Secretary IT, Govt. of Sikkim
Member

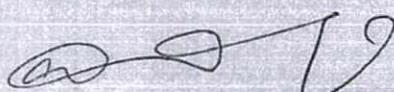

Dr. Swadesh Kumar Samanta
Advisor, TRAI, RO Kolkata
Member

Issues as informed above by respective stakeholders were discussed in detail by Chief Secretary Govt. of Sikkim and Chairman TRAI. **After detailed deliberations a standing Sub-Committee under the state Broadband Committee** was constituted consisting of DDG (Sikkim) DoT as chairman, Advisor TRAI RO Kolkata, and Secretary (DIT), Govt of Sikkim as members. The sub-committee was constituted to examine all the issues noted above and submit a comprehensive plan for the infrastructure development for improvement in the Telecom (i.e. Telephone, Internet and Television) services in the state of Sikkim.

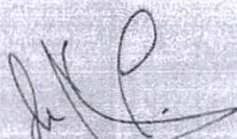
2. Tasks Assigned to the Sub-Committee:

Following tasks and line of actions are decided for the Sub-Committee:

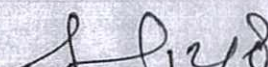
- a. The Sub-Committee shall take the inputs from BSNL, BBNL, PGCIL and other TSPs/ISPs/MSOs and submit the recommendation including required funding from USOF/DoT within 20 days' time.
 Sub-Committee to recommend immediate requirements of Internet connectivity for online education in 500 out of 800 Schools, in all Police Stations, Health Centres, and Gram Panchayats in the state of Sikkim.
 Sub-Committee should give priority for improving Internet connectivity (either using Fixed Wireless Access, Wi-Fi, or through 4G to the providers of **Home-Stay** to boost the tourism industry in Sikkim.
 Sub-Committee should make a recommendation for short- term goals to be achieved in 6 months, intermediate-term goals to be achieved in 12 months, and long-term goals to be achieved in 3 years (including recommendations for infrastructure development in line with PPP model).
- b. The reportedly damaged cable of BharatNet OFC during road construction/Smart City works is to be quantified after necessary test/examination by a committee with members from BBNL, BSNL and USOF/DoT. USOF/DoT shall set-up a committee and may recommend additional expenditure for materials/manpower charges to re-lay of OFC as per established norms of project works in BSNL/BBNL/DoT.
- c. BBNL/BSNL and USOF/DoT should re-examine the present status of OFC connectivity/availability of bandwidth from Block to DHQ/Gangtok and take a fresh decision for laying of further OFC in the pending Blocks. **Considering above Chief Secretary is of the strong opinion that in line with other North Eastern States (like Arunachal Pradesh) BBNL should immediately provide internet connectivity to all the GPUs through satellite where at present 4G coverage is not available.** As and when BharatNet connectivity on OFC will be made available, these satellite connectivity to be extended to uncovered villages based on priority decided by Govt. of Sikkim and DDG (Sikkim) DoT WB LSA.
- d. BBNL/BSNL should ensure to establishing the Internet Connectivity to GPUs where OFC laying has already been completed without further delay.
- e. BBNL/BSNL should submit Block wise target date for starting laying/re-laying of OFC and establishing Internet Connectivity of for all the 31 Blocks to the Sub-Committee latest by 10th Sep 2021.



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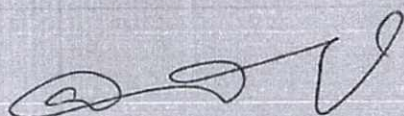
- f. BBNL/BSNL should submit the details of OFC damaged during Smart City works and estimated cost for re-laying of OFC and establishing Internet Connectivity for all the 22 GPs where OFC was damaged to the Sub-Committee latest by 10th Sep 2021.
- g. BSNL should submit details of underground OFC/Copper cable damaged in Gangtok and estimated cost and time lines for re-laying of OFC and establishing Internet Connectivity to important Govt. Offices where cable was damaged to the Sub-Committee latest by 10th Sep 2021.
- h. PGCIL should submit the detailed permission/resources required from Govt. of Sikkim (e.g. 2 no's of Fibre on lease from OPGW laid along the state power line) for providing adequate bandwidth from Gangtok, and other DHQs to individual Blocks to all TSPs including BSNL.
- i. All TSPs should submit proposal for sharing of tower of other TSPs (if any required) to DDG (Sikkim) DoT WB LSA latest by 10th Sep 2021
- j. All TSPs should apply for required permission immediately (e.g. NoC for new tower, emergency pass for permanent employees posted in Sikkim) /resources to Secretary (DIT) Govt. of Sikkim and a consolidated report shall be submitted monthly to DDG (Sikkim) DoT WB LSA for reviewing by issues by the Sub-Committee.
- k. Sub-Committee shall review the progress in the infrastructure development by all TSPs including BSNL, BBNL, and PGCIL and appraise the Chief Secretary & Chairman of State Broadband Committee in Sikkim on a monthly basis.
- l. All TSP's to ensure the periodic checks of all types of services provided to various departments of Govt of Sikkim and resolve issues if any without loss of time.

3. Activities, Observations and Reports of the Sub-Committee:

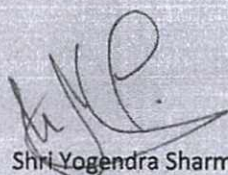
Sub-Committee held detailed review meetings on three occasions on 07.09.2021, 11.03.2022 and 12.07.2022 with all TSPs, BSNL, BBNL, and PGCIL.

3.1 First meeting of the sub-committee was held at Kolkata:


The first detailed review meeting of the sub-committee was held on 7th Sep 2021 in the conference hall of TRAI Regional Office at Kolkata in presence of CGM BSNL WBTC (looking after the charge of Sikkim), CGM BBNL Kolkata (in-charge of Sikkim), GM PGCIL, and CTOs of all the other 3 TSPs, and senior Officers of BSNL, PGCIL, and senior Executives of all 3 TSPs. Additional Director (DIT) Govt. of Sikkim Shri Sonam Wangdi represented Secretary (DIT) Govt. of Sikkim and participated in the meeting on-line. All TSPs, BBNL and BSNL was asked to submit para wise report based on minutes of the meeting held at Gangtok in Aug 2021. All TSPs were also asked to submit the requirement of bandwidth at Block level to PGCIL. MoM of the first Sub-Committee meeting is attached as **Annexure-3**



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3.2 Follow up meeting was held in TRAI Delhi vide Letter No. M-5/9/(4)/2021-QoS dated 26.11.2021

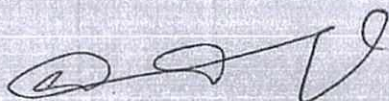
As a follow up action a detailed review meeting was held at Delhi held on 2nd Dec 2021 under the chairmanship of Chairman TRAI. Meeting was attended by CMD BSNL, and CMD BBNL to discuss progress on action plans for improving Telecom Services in the State of Sikkim.

- (i) At the outset, Secretary TRAI welcomed Chairman and participants in the meeting and set forth the context of the meeting.
- (ii) Chairman TRAI in his opening remarks emphasised need for reliable and good quality of the services in Sikkim and its adjoining parts of Bengal namely Siliguri, Kalimpong and Darjeeling. He also raised concern about non availability of any kind of telecom services in remote villages and locations having local habitants and defence establishments and thereby denying basic needs of connectivity to individuals and the personnel deployed at border posts and at difficult locations.
- (iii) Chairman further emphasised need for BSNL to be more proactive, not only in terms of continuity of its services provisioned to various state and central Govt Offices but also to expand their reach to meet current demands and be ready for futuristic challenges of 5G and beyond.
- (iv) On BharatNet project progress and functioning, Chairman conveyed his displeasure and asked both the CMDs BSNL & BBNL to synchronise various activities, not only to complete pending works of Phase-1 & 2 in time but also to ensure smooth functioning with adequate utilization of the Bharatnet assets.
- (v) CMD BSNL informed that all OFC laying contractors are now agreed to start laying of PLB/OFC but facing issues to get labours to Sikkim from outside. However, he said that all out efforts are made for making additional 12 GPs/BHQs of Phase 1 Service Ready by Jan 2022.
- (vi) With regard to BharatNet Phase 2, CMD BSNL told that required materials like PLB, Over Head ADSS Cable, U/G OFC required for completion of Phase 2 have been arranged and getting transported to Sikkim. He said that all out efforts are made for making additional 96 GPs/BHQs of Phase 2 Service Ready by Jan 2022.

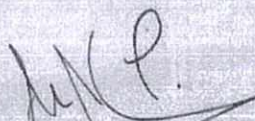
3.3 Second Sub Committee meeting held at Kolkata.

The 2nd detailed review meeting of the sub-committee was held on 11th March 2022 at Kolkata. At the outset Director Sikkim, DoT welcomed all the participants. Meeting was chaired by DDG DoT Sikkim, WB LSA, Advisor TRAI RO Kolkata along with senior officers of TRAI RO Kolkata was present in the meeting. Shri Wangdi, Addl. Director, Dept. of IT, Govt. of Sikkim joined online. Representatives from TSPs, BBNL and PGCIL joined the meeting. Brief of the main points discussed are:

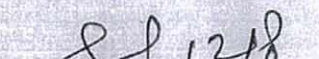
- (i) Shri Wangdi, Addl. Director, Dept. of IT, Govt. of Sikkim informed that Sikkim State RoW portal is ready and it has been integrated with Centralized RoW portal of Govt. of India. Now, TSPs need to file application through RoW portal only.



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- (ii) Airtel/VIL requested DDG DoT to help in regularization of tower in the residential premises of Hon'ble CM. Matter was discussed in detail and it was decided that matter will be taken up with State Broadband Committee.
- (iii) Shri Wangdi informed that RJIL signed agreement with state Govt. for providing coverage in GPUs, RJIL signed agreement for 134 sites but progress is not good. RJIL was asked to furnish progress/status report for all 134 sites based on this further course of action would be recommended. In the meanwhile, Other TSPs may approach Sikkim State Govt. for remaining 50 GPU locations.
- (iv) Power Department issue: Mr. Wangdi requested the TSPs to apply for the electricity permission in bulk with the knowledge of Secretary, Power department to expedite the process of approval. TSPs informed that PGCIL is demanding huge amount for renting out their OFC Bandwidth. Dr. S. K. Samanta, urged TSPs to get clarification from PGCIL whether they can provide bandwidth at reasonable price. Dr. Samanta also asked the TSPs to inform PGCIL in writing whether they need PGCIL BW or not.
- (v) DDG Sikkim stated since BW is perishable item and hence PGCIL may adopt flexible approach in order to utilize already created BW capacity. Accordingly, PGCIL should think of providing the BW at reasonable rate.

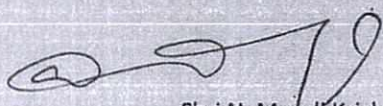
MoM of the 2nd Sub-Committee meeting is attached as Annexure-4

In addition to above two detailed review meetings, sub-committee members individually co-ordinated with TSPs, BSNL and BBNL on a number of occasions and received reports at regular interval on the development of infrastructure during the period of review by Sub-committee. In spite of regular persuasion with BBNL and BSNL and commitment given by CMD BBNL and CMD BSNL in the meeting with Chairman TRAI, very little progress has been made by BBNL and BSNL on the completion of BharatNet in Sikkim. Additionally, no firm targets could be given by BBNL and BSNL on the completion of BharatNet in Sikkim. However, TSPs (especially RJio and Airtel) and PGCIL made some progress in the infrastructure development in Sikkim.

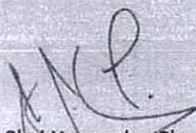
3.4 The third detailed review meeting of the sub-committee was held at Kolkata.

3rd sub-committee meeting was held on 12th Jul 2022 at Kolkata and the following deliberations have taken place:

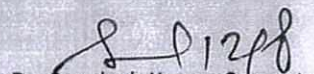
- i. DGM, BSNL Sikkim submitted that services have been provided in 3 GPUs in Passingdang Block under BharatNet Ph-II as on 30.06.2022. BSNL was asked to provide month-wise target up to March 2023 for commissioning and utilisation plan for all the pending GPUs/BHQ for both BharatNet Ph-I and Ph-II. In spite of repeated persuasions through mail and phone call, BSNL did not submitted any report so far. However, GM BSNL verbally informed that entire BharatNet project is being re-examined to execute the project through over-head instead of underground. Since decision is pending, exact time-frame for completion of project cannot be ascertained as of now.



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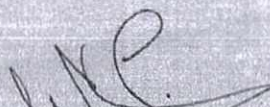


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- ii. PGCIL was asked to provide Block-wise availability of Bandwidth as on date and submit plan for establishing connectivity for the remaining blocks for FY 2022-23. PGCIL has submitted that in 16 Blocks they can provide vide **Annexure-5**
- iii. All TSPs were asked to provide Block-wise availability of OFC as on date and submit plan for OFC connectivity (including hiring bandwidth/OFC from PGCIL and other TSPs) for FY 2022-23. TSPs have informed that at present they do not have any plan to hire bandwidth from PGCIL at Block level.
- iv. All TSPs were asked to provide site-wise availability of OFC as on date and plan for fiberisation for remaining sites for FY 2022-23. TSPs are yet to provide complete information as desired.
- v. All TSPs were asked to provide infrastructure development plan including addition of new sites, laying OFC Km and upgradation of the existing sites (e.g. addition of 4G in existing sites, enhancement of bandwidth in the existing sites etc.) for FY 2022-23. TSPs submitted most of the information. Brief is placed in para e(i).
- vi. All TSPs were asked to submit site-wise issues including delay in power connections affecting the commissioning of new sites and upgradation of infrastructure in existing sites. TSPs are yet to submit complete information as desired.
- vii. All TSPs were asked to submit the list of existing sites working only on DG and issues preventing to obtain regular electric supply. TSPs are yet to submit complete information as desired.
- viii. All TSPs were asked to post senior level person (Nodal Officers or equivalent) at Gangtok for day-to-day coordination with DoT and State Govt. Departments. Respective CEO/CTO should provide a letter mentioning Name and Designation of such persons posted at Gangtok. Airtel Nodal officer has informed that one senior level personnel has been posted in Sikkim. VIL and RJIL are yet to submit in writing.
- ix. As desired by State Govt. authority, all announcement provided through mobile network/Landline network shall invariably be in local language in addition to Hindi and English. This is yet to be implemented.
- x. All TSPs have been asked to undertake physical survey and submit availability of 3G and 4G services in all 1300 schools and 1027 Homestays locations and submit report by 12.08.2022. Lists of schools and homestays have already been provided. TSPs are being perused and report will be examined by the sub-committee.
- xi. All TSPs were directed to undertake periodic and routine checks of connections and quality of service provided to all Govt. Departments and submit report on quarterly basis. TSPs are being perused and report will be examined by the sub-committee in the month of October 2022.
- xii. Immediate connectivity to GPUs, Police Stations and Health Care Centres:
 TRAI has identified 40 GPUs where 3G/4G coverage is poor. Additionally, RDD, Govt. of Sikkim has verified the internet connectivity in GPUs and in 50 GPUs video call is not possible or possible only through one TSP. There are 3 Police stations and 79 Health Care Centres where 3G/4G signal is either not available or available only from 1 or 2 TSPs. It was decided that internet connectivity to these 90 Number of



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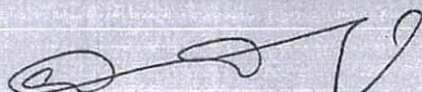
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GPUs and in 82 number of police stations and Health Centres may be provided through satellite connectivity as an interim measure. The Chief Secretary, Govt. of Sikkim may be requested to recommend to DoT to allot 172 of satellite connectivity as an interim measure to the Secretary Telecom, Govt. of India.

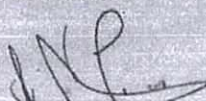
- xiii. With regards to restoration of existing BSNL OFC route between Gangtok and Siliguri, it was decided that BSNL should submit plan by 12.08.2022 along cost involved for the restoration of the routes for further examination of the committee and recommendations. BSNL will be pursued and report will be examined by the Sub-Committee.
- xiv. It was discussed and decided that RailTel shall be asked to provide their plan for providing OFC cable /bandwidth connectivity along the newly constructed railway route from Siliguri to Rangpo. If this route is established then Sikkim will have stable alternative connectivity from PGCIL and RailTel. Based on the readiness of the service TSP's may explore to hire from RailTel. RailTel is being pursued and report will be shared with The TSPs.
- xv. BSNL has submitted the requirement of Rs. 2.23 crore for restoration of BharatNet OFC routes and BSNL copper cable which were damaged during smart city work at Namchi and Gangtok. BSNL should submit separate cost-estimate for BSNL own cable and BharatNet OFC. Sub-Committee decided that BSNL and BBNL should undertake joint physical inspection and submit details of locations for BharatNet OFC, route Km damaged in each location along with copy of the Acceptance Testing report for further examination by Sub-Committee and submission of recommendation. **Annexure-6**
- xvi. BSNL has submitted requirement of Rs. 45 crores for upgradation of network in Gangtok City broadly for following head: as in **Annexure-7**
 - ❖ Cost of Broadband equipment: 1.96 crore
 - ❖ Cost of OFC equipment: 1.34 crore
 - ❖ Cost of OFC routes (Total 119 Km): 13.32 crore
 - ❖ Cost of GSM sites OFC network (90 Km): 10.07 crore
 - ❖ Cost of mobile equipment: 18.59 crore

It has been decided by Sub-Committee that DoT/USOF may be requested to provide fund for cost of OFC equipment, cost of OFC route (total 209 Km) amounting Rs. 24.73 crore subject to the condition that OFC equipment and OFC route created from this fund will be shared with all TSPs and others at a subsidised rate as decided by USOF/DoT.

- xvii. BSNL requested for Rs. 4.00 Crore per year as BW charges to be paid to PGCIL for connecting to District Hq as all the OFC routes are working in linear mode and districts are getting isolated frequently due to outage of the route. It has been decided by the Sub-Committee that the Bandwidth charges to be paid to PGCIL is the operational requirement of BSNL and as such Govt. of India/USOF cannot be requested for such funds. Letter is attached as **Annexure-8**



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3.5 A brief of the development by TSPs and PGCIL during the period of review by the sub-committee is given below. Telecom Infra development by TSPs during the period of review

TSP wise details of Mobile Networks and Mobile customers in Sikkim:

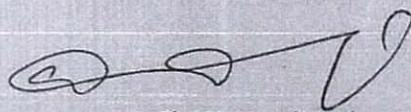
As on June 30, 2022, Airtel has 4G nodes in 209 sites out of existing 216 sites. In addition to this, it has also installed Low-Power 4G Nodes [LP-BTS] at 11 locations. However, Net 4G expansion at sites during the period is two [2] and 2 new LP-BTS.

- RJIO added 62 new 4G sites since August 2021 till June 2022 out of planned 78 4G sites. Moreover, RJio has also added 10 Small Cells [4G] in Sikkim State. RJio has laid 99 Km of OFC and fiberized additional 26 sites in this period. However, RJio has a plan to complete 204 km OFC (in WIP) and further 300km OFC after getting permission from Forest and other state govt. departments.
- VI has expanded its 4G coverage at 12 existing sites and at one new site. Overall 4G count increased by 13. However, one site at CM Bungalow had been dismantled during this period thereby shutting down one 2G and 3G nodes. It has been able to fiberize only one site during the period. Vodafone-Idea has submitted that it will implement LTE in 900 MHZ at Gangtok Town in FY 2022-22 at 150 Sites and has a plan to lay 6.5 Km optical fibre.
- No significant progress has been made by BSNL in development of Mobile Telecom network during this period.

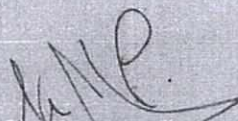
TSP	No of Sites		Active Mobile Subscribers	
	As on 31.07.21	As on 30.06.22	As on 31.07.21	As on 30.06.22
AIRTEL	219	216	245,527	263,518
BSNL	97	95	53,268	36,777
RJIO	243	305	279,671	281,701
VIL	215	215	334,160	322,510
TOTAL	773	831	912,626	904,506

3.6 Telecom Infra development by Powergrid Corporation of India Ltd. (PGCIL) during the period of review

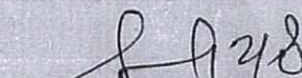
PGCIL has laid its own OFC from Siliguri to Gangtok (with its PoP located at Ranipool) on power line on two different routes. PGCIL is also laying OFC along the power line of the Sikkim State Govt. to all BHQs. As on Jun 2022, PGCIL is ready for providing up to 1 TB bandwidth to each TSPs in 16 BHQ in 2-4 weeks. PGCIL is having a plan to complete the OFC laying works for the remaining 15 BHQs by Dec 2022. All TSPs were informed



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several times to inform the requirement of bandwidth at BHQ level but all the TSPs have informed that they do not have any plan to hire bandwidth from PGCIL at Block level.

3.7 BharatNet Progress by BBNL and BSNL during the period of review

As directed by Chairman TRAI and Chief Secretary Govt. of Sikkim, Sub-committee spent much time for discussions, meetings, and report collection both from BSNL and BBNL. Sub-Committee held two detailed meetings: first one in Sep 2021, and the 2nd one in Mar 2022. Chairman TRAI also held a meeting with CMD BBNL and CMD BSNL at Delhi in Dec 2021 and CMD BSNL and CMD BBNL jointly agreed for targets on completion of additional 12 GPs & BHQs of Phase-1, and 96 GPs & BHQs of Phase-2 by Jan 2022. However, progress till Jun 2022 is extremely poor compared to targets agreed jointly by CMD BBNL and CMD BSNL in the meeting with Chairman TRAI at Delhi. During the period of review by the Sub-Committee, only 3 GPs of Phase-1 & 9 GPs of Phase-2 has been connected on Satellite by BBNL. Achievement of BSNL in Phase-1 is zero against the targets of 12 GPs & BHQs. BSNL connected only 3 GPs of Phase-2 on OFC against the targets of 96.

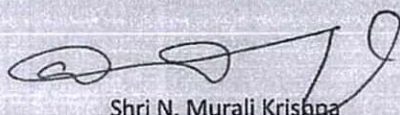
Till date BSNL could not provide any firm targets for completion of BharatNet Phase-1 and Phase-2. However, GM BSNL verbally informed that entire BharatNet project is being re-examined to execute the project through over-head instead of underground. Since decision is pending, exact time-frame for completion of project cannot be ascertained as of now.

4. Recommendations of the Sub-Committee:

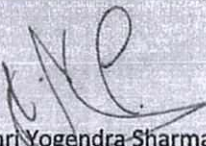
4.1 Connectivity to GPUs, Police Stations, Health Centres: There are 721 unique mobile tower in Sikkim; 3G/4G services are available in most of these sites (except few those with Satellite backhaul). Locations of these 4G sites are mapped with 176 GPU locations (planned to be connected by BharatNet OFC), and based on geographical locations of 3G/4G sites it is estimated that there are around 50 no of Gram Panchayats, and adjoining villages where mobile coverage (especially 4G) may not be adequate. RDD Department Govt. of Sikkim also carried out physical measurement on the availability of adequate Internet services in GPU, and compiled a list of 50 GPU where mobile Internet connectivity is not adequate. Based on these two lists a combined final list of 90 GPUs is made. The list of 90 GPs/BACs may be sent to DoT/USOF with a request to plan for immediate Internet connectivity on Wi-Fi via Satellite as BharatNet OFC laying by BBNL/BSNL is not progressing as expected. In addition, in 3 police stations and in 79 health care centres connectivity is not adequate. ***Sub-Committee recommends that DoT/USOF shall be requested through the Chief Secretary and Chairman, SBC for providing 172 Satellite terminals to provide good internet facility as an interim/immediate measure to 90 GPUs/BACs, 3 Police Stations and 79 Health Center's. Complete list is available Annexure-9***

4.2 Connectivity to Schools:

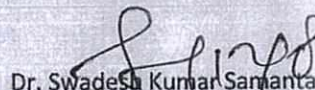
There are around 1300 schools in Sikkim; committee observes that 4G coverage in most of these schools and adjoining areas is not adequate. Govt. of Sikkim has given in



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principle approval (as per second SBC meeting minutes dated 30.09.2021) consent to install towers in the school premise subject to proper fencing and other safety measures are ensured. Further space and power may be allotted at free of cost by respective authorities of Govt. of Sikkim in all such locations for installation of telecom facilities. For this purpose, the funding arrangement may have to be from USO.

Sub-Committee recommends that respective school authority under the supervision of designated officer of government of Sikkim shall carry out physical verification on the availability of Internet/4G coverage at individual locations. TSPs have been provided the list of schools for submitting present coverage status. Sub-Committee will examine the report and submit the recommendation. List is available in Annexure-10

4.3 Connectivity to Home-Stay locations:

A List of total 1027 numbers of Home-stays was obtained from Tourism Department, Govt. of Sikkim. However, due to want of Lat-Long information, TSPs have not provided the telecom coverage status in those Home-Stays. Dept. of IT, Govt. of Sikkim has been requested to co-ordinate with the Tourism Department to provide the Lat-Long information of the Home-Stay locations so that TSPs can be asked to provide the present coverage details for further examination by the Sub-Committee. List is available in Annexure-11

4.4 Connectivity to uncovered villages:

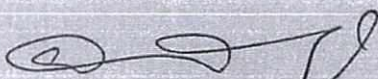
As per the DOT Hq instructions vide e-mail dated 31.12.2021, DOT Sikkim and Govt of Sikkim represented by IT Department has sent the list of 359 villages where coverage is less than 60% of habitable area. List is prepared based on the criteria that if a village is having total number of BTS (2G/3G/4G of all TSPs combined together) of 10 or less, then the coverage is less than 60% of habitable area. This is a broad-based criterion; list enclosed as Annexure-12. DoT Sikkim, WB LSA has already submitted the list to DOT Hq on 20.01.2022. Sub-Committee is of the opinion that Chief Secretary, Govt. of Sikkim and Chairman, State Broadband Committee may request Secretary DoT to accord approval on priority. Actual requirement can be finalised after physical survey once in-principle approval is received from DoT.

During the meeting held on 03.08.2022 with Addl. Secretary (Telecom), Govt. of India, it was confirmed that for the state of Sikkim 308 villages have been approved to take up survey works as USO norms and instructions list is available in Annexure-13

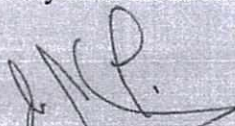
4.5 Completion of BharatNet – Both Ph-I and Ph-II

Progress of rollout of BharatNet is extremely poor even after a detailed review meeting with CMD BBNL and CMD BSNL with Chairman TRAI in Dec 2021. Sub-Committee strongly recommend to short close/ reduce the scope of the Bharatnet project depending on following:

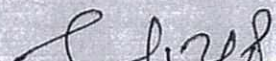
- (i) As per decision taken in the 3rd State Broadband Committee Meeting, BSNL/BBNL may explore any other mode of work execution to expedite the work



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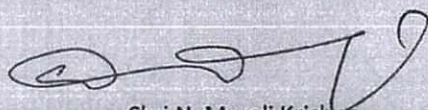
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Member



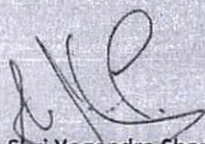
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on fast track mode. If no other option is available, then project may be short-closed/reduce the scope in Sikkim. In the event, the decision has been taken by the competent authority to short close BharatNet, then the remaining GPUs which are short closed, can be connected through PPP model or by State led model like other states (e.g. Odisha, Tamilnadu).

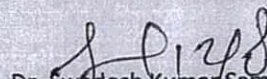
- (ii) BSNL/BBNL has not submitted any firm plan even after several persuasion through e-mail and phone call after 3rd Sub Committee meeting. However, GM BSNL verbally informed that entire BharatNet project is being re-examined to execute the project through over-head instead of underground. Since decision is pending, exact time-frame for completion of project cannot be ascertained as of now.
- (iii) Sub-Committee observed that even after 1027Km PLB, 930Km U/G OFC, and 45km O/H OFC has been laid for both Ph-I and Ph-II, internet services has been provided only in 3 numbers of GPUs. Considering this, Sub-Committee is of the opinion that BBNL/BSNL shall be asked not to take up OFC laying for connectivity to 59 GPU/BAC where OFC laying has not been started.
- (iv) Sub-Committee is of opinion that for future laying of OFC cable in GPU/BHQ preference may be given for overhead laying.
- (v) USOF/DoT may review in details (including sub-committee report and recommendation) and take decision on short closure of the execution of BharatNet by BSNL as deemed appropriate.
- (vi) Very large quantity of PLB/OFC has been laid as reported by BBNL/BSNL but till date only 3 GPUs are operational on OFC, either due to damage of Bharatnet OFC or due to non-availability of backhaul OFC connectivity of BSNL. There is an urgency to review the connectivity plan from actual utilisation perspective in detail, and revise the scope of BharatNet for Sikkim in totality from State Capital to GPs (in line with other NE states) so that laying of OFC by individual TSPs and consequent economic loss is minimized.
- (vii) After persuasions with BSNL Corporate Office, many officers have been posted in BSNL Sikkim. However, no details have been shared by BSNL manpower allocation made for BharatNet Project completion, operation and utilization.
- (viii) Additional CAPEX required (for the damaged routes) to be estimated jointly by BSNL and BBNL for further allotment of fund by USOF/DoT with detailed reasons and justification.
- (ix) BSNL/BBNL should submit details of BharatNet OFC/BW used for providing services (including Broadband, Wi-fi etc.) on monthly basis.
- (x) Installation of mobile tower in GPUs: RJIO was given space in 134 GPU locations by Govt. of Sikkim (vide letter No. 246/DIT/2022 dated 13.04.2022) for installation of mobile towers; progress of RJIO is not satisfactory. RJIL has informed that out of 134 GPU locations at present 4G coverage is available in 123 GPUs from the additional 62 towers commissioned by RJIL in the recent time. RJIL is in the process of installing new towers in 7 locations. RJIL already installed



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a BTS in 1 Site. RJIL has no plan for installation of towers in 3 locations as it is not commercially viable.

Sub-Committee recommends that there is a need for permanent telecom infrastructure at GPU level and hence this list of GPUs 134-8=126 shall be shared with the other TSPs for installation of mobile towers in line with the agreement between Govt. of Sikkim and RJIL. The committee further recommends that CAPEX for Building/Room/Tower is funded by USOF/DoT for setting up permanent infrastructure in these GPUs. List is available in Annexure-14

(xi) Additional recommendation based on 3rd Sub-committee meeting

a. **Rationalization of power charges:**

Commissioning of a large no of BTS sites by TSPs is getting delayed due to delay in provisioning of electricity connections by state govt/departments and also due to high charges compared to other states (even if compared with other hilly states). State Govt. shall put all out efforts for granting permissions and erecting electrical poles for providing electricity on priority for such sites. State Govt. shall also give priority for regular electricity supply (including those from other non-conventional energy sources e.g. Wind, solar, hydro, etc.) for all such site which are running only on DGs.

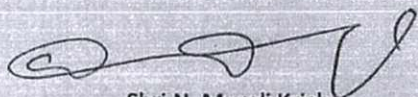
b. DoT/USOF may be requested for grant of CAPEX for setting up of such non-conventional energy resources.

4.6 Permanent Telecom infrastructure at individual BAC/GPU:

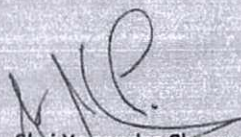
Most of the exchanges and BTSs of BSNL which were earlier installed in private premises are either closed or non-operational due to number of reasons. There is an urgent need to establish regular telecom infrastructure at each GPU/BAC. In this regard sub-committee has observed and recommend the following:

(i) Land has already been allotted by Govt. of Sikkim to BSNL in 2012 for establishing telecom infrastructure in BHQ; BSNL is yet to utilize these spaces. RJIO was given space in 134 GPU locations by Govt. of Sikkim (vide letter No 246/DIT/2022 dated 13.04.2022) for installation of mobile towers; progress of RJIO is not satisfactory. It has been submitted by RJIO, that RJIO has installed 62 additional towers during the period of review of the Sub-Committee and most of the above 134 GPU locations are having coverage from such sites. *Sub-Committee is of the opinion that there is a need for permanent telecom infrastructure at GPU level. It is appropriate that CAPEX for Building/Room/Tower is funded by USOF/DoT, and BSNL is given the job for installation of the permanent infrastructure so that all TSPs can utilize the tower, OFC connectivity, etc.*

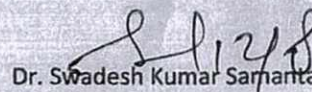
(ii) A time frame may be decided for completion of the infrastructure, and if BSNL fails to complete the project then it can be awarded to PGCIL as PGCIL is in the process of establishing OFC connectivity to Block level using Power line of Govt. of Sikkim.



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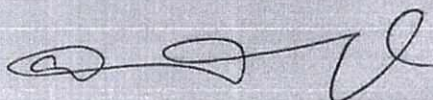
4.7 Efficient Utilisation of existing OFC/Bandwidth of PGCIL:

PGCIL has already established OFC/Bandwidth connectivity to 16 out of 31 blocks and are now ready to provide up to 10 Gbps bandwidth to each TSP. TSPs are not very much keen to use PGCIL bandwidth as they are finding that the bandwidth charges of PGCIL is very high, and it will not be commercially viable for connectivity to mobile towers. *In this regard sub-committee recommends that:*

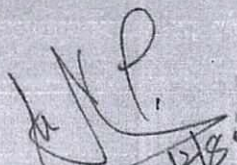
- (i) A reference/base tariff shall be fixed by Govt. of Sikkim and PGCIL for using PGCIL bandwidth up to block level, as Govt. of Sikkim is the owner of the OFC used by PGCIL for providing bandwidth at Block level
- (ii) BharatNet OFC of total 977Km (930Km U/G and 45Km O/H OFC) has been laid in phase1 and phase 2 for total 152 GPUs & BHQs out of planned 207 GPUs & BHQs. OFC laying work not started in 59 GPUs & BHQs. However, utilization of BharatNet will be limited to only up to GPUs and BHQ. The scope of utilization can be further enhanced if BharatNet OFC can be extended up to village/BTS level. ***Sub-Committee is of the opinion that Bharat Net OFC connectivity to GPU/BHQ wherever laying has already been completed shall be extended to individual BTS sites.*** For this BSNL has to work out the plan for GPUs which are being lit up, identify the number of nearby villages and BTSS, and estimate the OFC Km to be laid for the same. Further lit up GPU list shall also be shared periodically (e.g. monthly) with other TSP's for utilization to reach up to village level and fibrisation of tower /BTS. **This will help in achieving various targets of NBM including fiberisation of towers.**
- (iii) In view of TSPs non-submission of requirement of Bandwidth at Block level to PGCIL in spite of repeated reminders by Sub-Committee, following are the opinion of the Sub-Committee:
 - a. TSPs shall be advised to utilize BharatNet OFC for BTS fiberisation.
 - b. TSPs shall also be advised to utilize the OFCs already laid by PGCIL up to block level.
 - c. Govt. of Sikkim may accord permission to lay fresh OFC by TSPs after careful examination of already available OFC/Bandwidth laid through fund of Govt. of India or Govt. of Sikkim as the case may be.

4.8 Laying of Utility Duct by State Govt.:

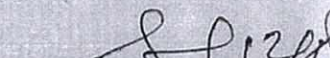
Sub-Committee recommends that Utility Duct for Telecom need to be made while repairing the roads/drains especially in cities/towns (e.g. Gangtok). Expenditure on such ducts need to be funded by USOF/DoT based on proposal by state Govt. State Gov. State Govt. authority shall charge the cost of maintenance of such ducts from the TSPs for using such ducts.



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Annexure-II

(Reference para 2 of D.O No. M-5/9/(4)/2021-QoS dated 07th October 2022)

Telecom infrastructure and connectivity in Sikkim - Issues identified

1. BharatNet related issues:

A. The status of BharatNet project implementation as of Dec 2021 is

S.No	Phase	Total GPs Including BHQ (Nos)	Service Ready GPs & Pending GPs	OFC to be laid	Laid & Balance OFC (KMs)	Target / Expected time line
		Nos	Nos	KM	Kms	
1	Phase-1 (by- BSNL)	9 BHq+ 51 GPs 60	26 SR (incl 3 vsat) Pending 34	697 (460 U/G+ 254 O/H)	Laid - 347 Balance- 367 (113 U/G + 254 O/H)	Original Target - 17-18 Expected completion- FY 22-23, (BSNL yet to commit firm target)
2	Phase-2 (by- BSNL)	22 BHq+ 114 GPs 136	SR- 5 (vsat) Pending: 22 BHq+114 GPs	1068 (859 U/G+ 209 O/F)	Laid - 648 (583 U/G, 65 O/H) Balance - 420 (276U/G+ 144 O/H)	DPR approved in May21 with target of Nov-21 (work started in 18-19) Expected completion - FY 22-23, (BSNL yet to commit firm target)
3	Satellite (by- TCIL)	13 GPs	SR- 8 GPs Pending - 5 GPs	--	N/A	Was Expected by Dec21 end. Out of 13 sites- - 5 sites: Working satisfactory. - 2 sites: Not working satisfactory - 2 sites: Not working. - 1 site: Installation pending

B. BharatNet targets for OFC laying and making GPUs service ready are much behind target. The work progress in last two years is almost NIL.

C. 13 GPUs (i.e. 3 from Ph-I and 10 from Ph-II) are being connected using Satellite, as OFC connectivity in these GPUs is not feasible. Even after 15 months, satellite connectivity is pending, despite the fact that Satellite connectivity can be rolled out very quickly.

- D. In some cases internet Connectivity to GPUs still not started even after completion of OFC laying.
- E. In 9 Blocks, space required to be allotted by Sikkim Govt. to BSNL for establishing connectivity to GPUs as no BSNL exchange is operational there.

2. Operational issues -

- A. **Damage to existing network by State Government agencies:**
- i. During road widening/drain repair works underground copper/OFC cables in Gangtok/Namchi City got damaged and as a result, the landline and broadband services provided to Govt. Offices and important organisations are getting interrupted frequently. BSNL does not have sufficient resources (including manpower, funds and materials) to lay cable afresh or restore the underground OFC networks especially in Gangtok and Namchi Cities.
 - ii. Around 60km underground OFC of BharatNet got damaged in Namchi and Jorethang during construction of Smart City works
- B. **Damage to BharatNet OFC of Phase-I:**
- i. Even though OFC laying were completed in 22 out of 52 GPUs & 9 BHQs in 9 Blocks of BharatNet under Ph-I, OFC of most of these GPUs & BHQs are now damaged in many places, and as a result not a single GPU is operational.
- C. **Outsourced maintenance of BharatNet Project not proper:**
- i. 5 GPUs out of 22 GPUs, where BharatNet Ph-I work of OFC was completed, but they are not operational due to OFC damages, have been handed over to CSC-SPV in Sikkim for restoration of OFC but CSC-SPV is taking time in restoring the connectivity.
- D. **Delay in Permissions by State Government:**
- i. TSPs are facing major delays in getting following permissions from State Government:
 - (a) Delay in permission for OFC laying by Forest Department/ Defence Organisations
 - (b) Delay in getting NoC for establishing new sites.
 - (c) Delay in connection of electricity for the new sites
 - (d) Restriction in the movement of skilled manpower from Siliguri/Kolkata to Gangtok and other places
- E. **Right of Way (RoW) permissions on several routes are pending due to ongoing road widening works.**
- F. **Towers installed in residential areas - The towers installed in residential areas without proper permission are being considered.**

3. Connectivity of Sikkim State to rest of country:

- A. **No redundancy - All TSPs are using the backhaul connectivity from PGCIL, Gangtok will be isolated if any failure in PGCIL networks happen even for an hour.**
- B. **Adequacy of backhaul capacity-Backhaul connectivity from Sikkim to Siliguri need to be upgraded by BSNL as traffic has reached to the deployed capacity.**

4. Other issues

- A. The tariff charged by PGCIL for their OFC Bandwidth is very high. TSPs are depending on PGCIL network in absence of proper underground OFC network.
- B. The charges for electricity are higher in comparison to other states.
- C. Night DG restriction impact the services during prolonged power cut.
- D. The launch of FTTH project of one of the TSPs has been delayed due to Non availability of aerial permissions in Gangtok city area.

(Reference para 2 of D.O No. M-5/9/(4)/2021-QoS dated 7th October 2022)

Action required by DoT

I. BharatNet Project related:

(a). Where the GPU OFC laying work is completed, the GPU may immediately be lit (connected to network). A mechanism to display all lit GPUs on BSNL/BBNL and USOF portal may be made so that information for those seeking connections/bandwidth on this connectivity is available. Mechanism to inform State Government for all lit GPUs should also be put in place.

(b). In many cases, GPU connectivity is not operational due to OFC damage/cuts. With merger of BBNL with BSNL, it is the understanding of the Authority that now the maintenance of BharatNet assets will be done by BSNL or designated outsourced agency. Post this merger, the Authority has its own concern on the maintenance aspects of BharatNet assets.

- Firstly, as can be seen from the attached report, BSNL has not been able to maintain its own assets. Several of them have been shut down or waiting for repairs due to lack of funds. During the meeting with the committee, BSNL has raised requirement of several crores for maintaining its own assets. In such a situation, it is highly unlikely that the assets of BharatNet Project can be maintained by BSNL until and unless a clear-cut mechanism for financial support, accounting and maintenance is formulated by USOF/DoT. A separate escrow account for managing BharatNet/USOF funded project needs to be operated by BSNL. The cashflows of this account needs to be monitored/audited for intended use of funds.
- Secondly, the role of O&M agency, post this merger, will require to be tightly monitored. BSNL needs to put in place an effective monitoring mechanism as there are delays in maintaining the assets of BharatNet from O&M outsourced agency side. O&M is a continuous process and maintenance/restorations need to be done as soon as the fault occurs. In Sikkim, it has been informed that the agency has not even started the work.
- Thirdly, the Authority is of opinion that if the optical fibre cable maintenance issue of BharatNet Project is not sorted out, it will render the entire project ineffective. The Authority, therefore, is of the opinion that DoT/USOF should seriously think of deploying VSAT based connectivity instead of OFC in the hilly and difficult terrain where maintenance is likely to suffer due to lack of required resources. For such GPUs, where OFC was damaged and is not likely to be made available immediately, connectivity through VSAT terminals should be extended on priority. As and when the OFC connectivity is restored, these VSAT terminals can be shifted to other GPUs/villages as per the requirement.

(c). The data submitted to Authority by various stakeholders indicate that for last two and half years, BSNL has barely made any progress as far as outcomes of the BharatNet project are concerned. The Authority is of the view that for monitoring progress (including maintenance aspects) of BharatNet and other USOF funded projects, DoT should exercise due control. Special project division with personnel having technical expertise and

experience of project implementation and maintenance aspects should be created state-wise under LSA field units for this purpose. In bigger states, even more than one unit should be created. Government of India is spending thousand of crores on these ambitious projects which are critical for development of rural economy. There are clear gaps in in overall framework of implementing USO funded projects and DoT should immediately take action, as proposed above, to rectify them.

(d). Several GPUs that were earlier declared service ready, are now not operational due to damage of OFC during smart city work at Namchi and Gangtok. BSNL has submitted the requirement of Rs. 2.23 crore to Sikkim Government for restoration of BharatNet OFC routes and BSNL copper cable which were damaged during smart city work at Namchi and Gangtok. However, despite repeated requests, BSNL has yet not submitted separate cost-estimate for BSNL own cable and BharatNet OFC. Also, the exact details of the patches where the cable has been damaged by contractors has not been provided. DoT should immediately take up with BSNL for submitting these details. Though Authority is writing to state government of Sikkim for making efforts to recover damages from the contractor, but at the same time Authority would like DoT/USOF to examine funding of restoration work of this critical network element. DoT/USOF can subsequently adjust payments received, if any, from State Government.

(e). USOF has informed the Authority that under the "4G saturation Scheme", USOF is planning to connect 246 Villages by December 2023 on 4G through USO funding. This project will also be executed by BSNL in Sikkim. Given the implementation status of Phase-I and Phase-II of BharatNet, the Authority feels that USOF should seriously consider connecting all such villages (out of these 246 villages) that do not have OFC backhaul on Satellite medium. The VSAT equipment can be taken on monthly rental model or other prevailing models. The VSAT connectivity can be surrendered as soon as the OFC backhaul is made available. In future, for execution of USOF projects in far flung areas, preference may be given for satellite connectivity and overhead OFC instead of underground OFC.

II. Connectivity of Sikkim with rest of the country

(a). PGCIL has backhaul connectivity from Sikkim (Rangpo/Ranipool) to Siliguri via two power lines via Darjeeling: (i) 132 KV to Siliguri; (ii) 400 KV to Binagudi. This is used by all the TSPs including BSNL. Authority has observed that JIO has formed a ring for its transmission network thus ensuring redundancy. It has been brought to the notice of Authority that two underground OFC routes of BSNL from Siliguri to Gangtok (via Darjeeling and via Kalimpong) need to be restored by re-laying some cable. This will ensure redundancy to BSNL network as well. DoT may take this up with BSNL or plan funding of these routes through USOF. This will also ensure that BSNL has adequate backhaul connectivity to Sikkim which is currently getting saturated.

III. Connectivity of Districts and BHQs

(a). PGCIL is constructing the power line and laying OFC (i.e. OPGW) along the power line on behalf of Sikkim Power department up to Block level. If Sikkim Govt. allocate 2 fibres from DHQ to respective Blocks, then PGCIL will be able to provide adequate bandwidth (e.g. 10 Gbps and above) to all TSPs. In case there is delay on part of BSNL to connect BHQs/GPUs, DoT/USOF may plan to take connectivity from PGCIL, wherever feasible, and lit BHQs/GPUs.

IV. Others

(a). As per licensing provisions, TSPs are supposed to maintain waiting list of each and every demand raised to them. The Authority in its recommendations on "Roadmap to Promote Broadband Connectivity and Enhanced Broadband Speed" dated 31.08.2022 has observed that a proper assessment of demand cannot be done unless the demand is registered properly. After due deliberation, the Authority had recommended that the licensee should declare the availability of fixed line broadband services in specific geographic areas on GIS map accessible to public through its website. It was also recommended that in each Telecom Circle/Metro, service providers should use all verifiable means of communication like the Website, App, Interactive Voice Response (IVR) system, text message etc. to register demand for fixed line connectivity and maintain a transparent, open to inspection, waiting list. DoT should ensure that implementation of this recommendation. In addition, DoT may explore to put in place a mechanism by which DoT's LSA field units get the data of waiting list from all TSPs/ISPs and analyse that on monthly basis.

LIST OF ACRONYMS

Sl. No.	Acronym	Description
1.	2G	Second Generation Technology
2.	3G	Third Generation Technology
3.	4G	Fourth Generation Technology
4.	ADSS	All Dielectric Self Supporting
5.	B2B	Business-to-business
6.	B2C	Business-to-consumer
7.	BBNL	Bharat Broadband Network Limited
8.	BRO	Border Road Organization
9.	BTS	Base Trans-Receiver Station
10.	CAPEX	Capital Expenditure
11.	CPSU	Central Public Sector Undertaking
12.	DG	Diesel Generator
13.	DISCOM	Distribution Company
14.	DoT	Department of Telecommunication
15.	GPs	Gram Panchayats
16.	GPU	Gram Panchayat Unit
17.	GSAT	Geosynchronous Satellite System
18.	HP	Himachal Pradesh
19.	HPPTCL	Himachal Pradesh Power Transmission Corporation Limited
20.	ICR	Intra-Circle Roaming
21.	J&K	Jammu and Kashmir
22.	MF-TDMA	Multi-Frequency Time Division Multiple Access
23.	MoD	Ministry of Defense

Sl. No.	Acronym	Description
24.	MoU	Memorandum of Understanding
25.	NFS	Network for Spectrum
26.	NHAI	National Highways Authority of India
27.	OFC	Optical Fiber Cable
28.	OPEX	Operational Expenditure
29.	OPGW	Optical Ground Wire
30.	PDC	Probable Date of Completion
31.	PGCIL	Power Grid Corporation of India Limited
32.	PHE	Public Health Engineering
33.	POP	Points of Presence
34.	PWD	Public Works Department
35.	RJIL	Reliance Jio Infocomm Limited
36.	RLOS	Radio Line of Sight
37.	ROI	Return of Investment
38.	ROW	Right of Way
39.	TSP	Telecom service Provider
40.	USO	Universal Services Obligation
41.	USOF	Universal Services Obligation Fund
42.	VSAT	Very Small Aperture Terminal
43.	Wi-Fi	Wireless Fidelity