Ward Level Annualized
Composite Risk

MAPS

Preparation of Multi-Hazard Mapping Analysis, Development of Exposure Database at city level with Resolution of ward level and Vulnerability Assessment.
(Physical, Economic, Social and Enviornment)

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Acknowledgements

It has been a thought-provoking experience to work on the assessment of Multi-Hazard Risk and Vulnerability Assessment (HRVA) of the City of Shimla (Himachal Pradesh State) under the MHA-USAID - UNDP Partnership on Climate Risk Management in Urban Areas through Disaster Preparedness and Mitigation. Taru wishes to express its deep gratitude to Municipal Commissioner and Deputy Mayor of Shimla for their cooperation and support. A special thanks to all key informants/ stakeholders who participated in this project and we are grateful for the significant contribution provided by the departments in Municipal Corporation i.e. Accounts, Architect Planner, Tax, Estate, Conservancy, Roads & Buildings, Water Supply & Sewerage, City Disaster Management cell and experts from other technical agencies and disaster management agencies at the state, district and city level.

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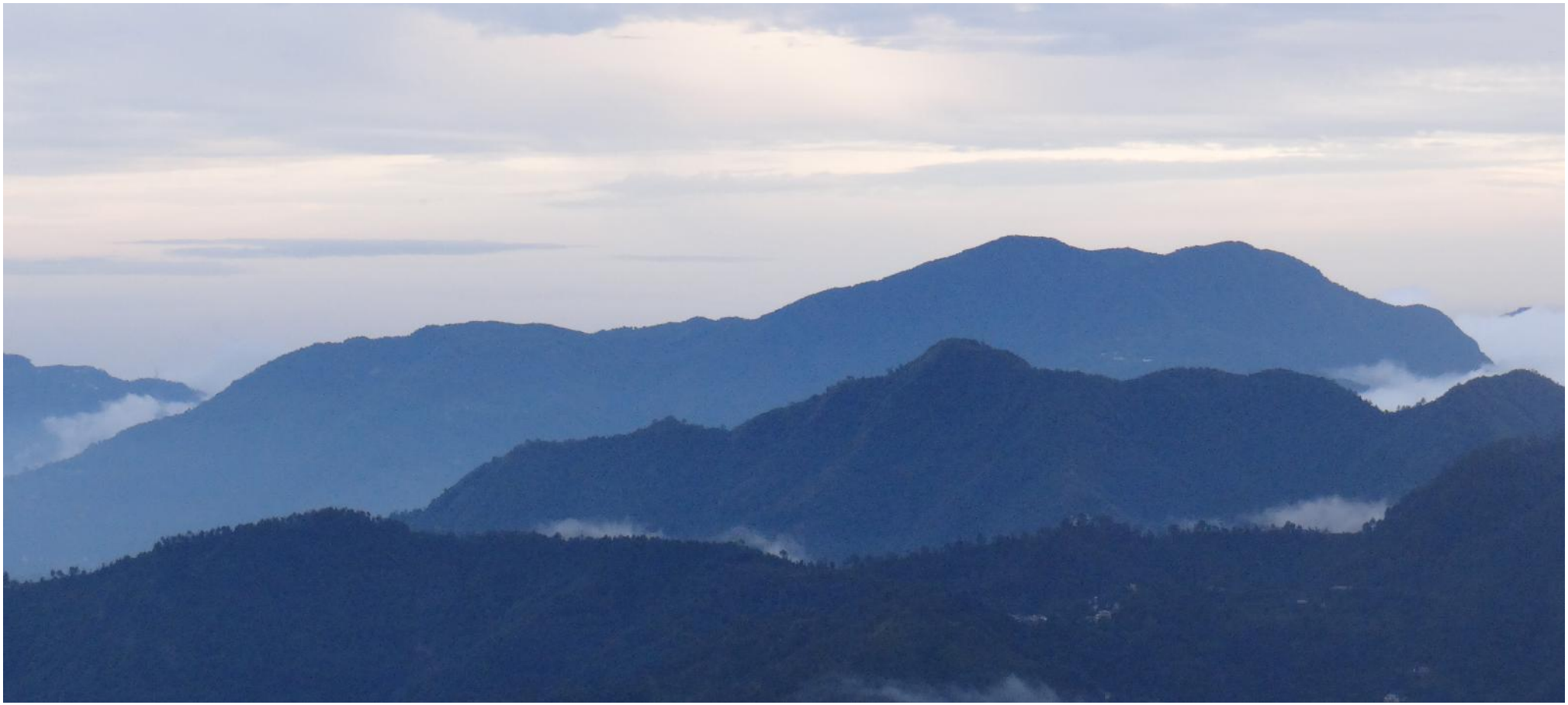
Graphics and Design by: SustainAbly, Ahmedabad

May 2016



Ward Level Annualized Risk Maps

Report on Multi-Hazard Mapping and Analysis, Development of Exposure and Vulnerability Assessment (Physical, Economic, Social and Environment) and Risk Assessement; Capacity Assessment

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Geophysical Settings

Hazard

Vulnerability

Risk

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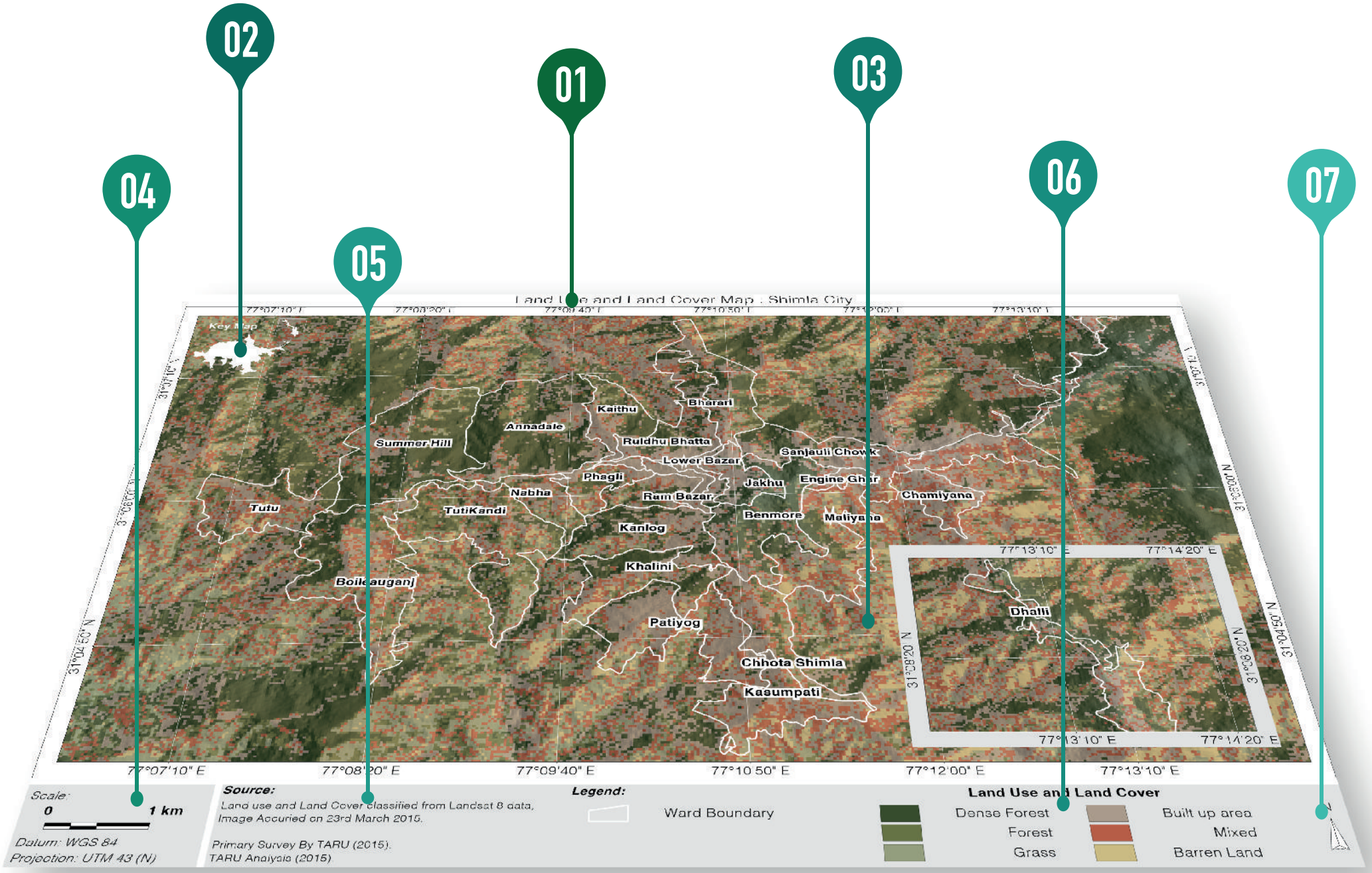
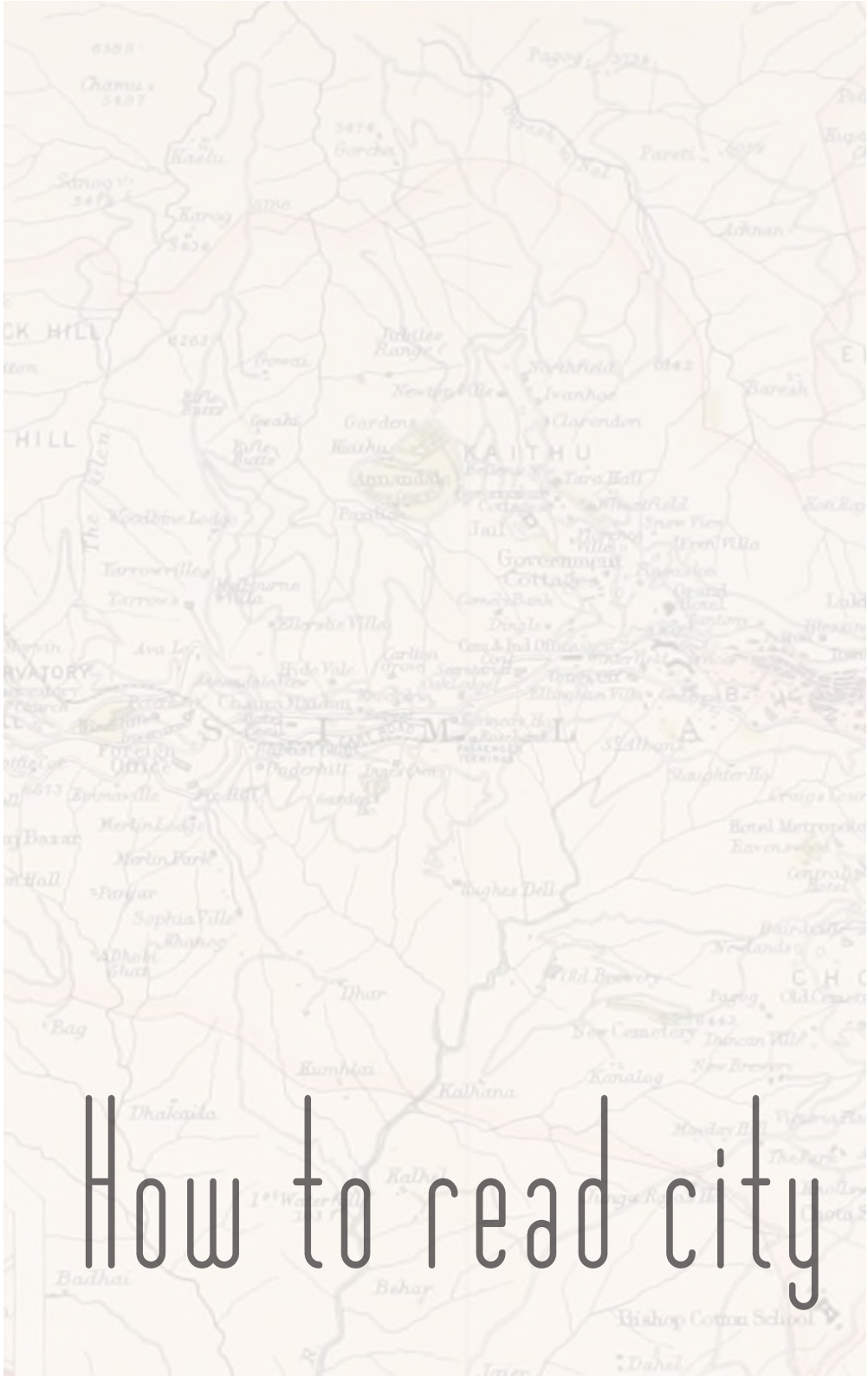
Ward Level Maps

1

City Level Maps


01
02
03
04
05
06
07
Land Use and Land Cover Map : Shimla City
Key Map
Kaithu
Bharari
Annadale
Summer Hill
Ruldhu Bhatta
Lower Bazar
Sanjauli Chowk
Phagli
Jakhu
Engine Ghar
Nabha
Ram Bazar
Chamiyana
Tutu
TutiKandi
Benmore
Maliyana
Kanlog
Khalini
Patiyog
Chhota Shimla
Kasumpati
Dhalli
77°13'10" E
77°14'20" E
31°08'20" N
77°07'10" E
77°08'20" E
77°09'40" E
77°10'50" E
77°12'00" E
77°13'10" E
Scale:
0
1 km
Datum: WGS 84
Projection: UTM 43 (N)
Source:
Land use and Land Cover classified from Landsat 8 data, Image Accuried on 23rd March 2015.
Primary Survey By TARU (2015).
TARU Analysis (2015)
Legend:
Ward Boundary
Land Use and Land Cover
Dense Forest
Forest
Grass
Built up area
Mixed
Barren Land
N



How to read city maps

01 Main Title of the Map

02 Key Map

03 Main Map Area

04 Map Scale

05 Data Source

06 Legehd

07 Direction North

Page No	Name of the Map	Classes	Description
9	Vs 30 Investigation Locations Along With Soil Profile	Very Low Low Moderate High Very High	It is recognized that the shear wave velocity of the top 30m of the strata is a good indicator of the elastic soil response. So, in order to understand the elastic soil response, a detailed Multi-Channel Analysis of Surface Wave has been carried out. In this map, the location of the sites where Vs 30survey has been carried out.
10,11,12,13	100 year Return Period Estimated Peak Ground Acceleration (PGA in g) 200 year Return Period Estimated Peak Ground Acceleration (PGA in g) 500 year Return Period Estimated Peak Ground Acceleration (PGA in g) 2500 year Return Period Estimated Peak Ground Acceleration (PGA in g)	Very Low Low Moderate High Very High	A PSHA has been carried out for the whole state of Himachal Pradesh, also district Shimla for estimating the Peak Ground Acceleration (PGA). A circular region of radius 500 km around the important settlements was taken and more than 195 faults have been considered in estimating the future seismic hazard. The recurrence relation for the seismic zones was found from the maximum likelihood method of Kijko and Sellevoll (1989) including incompleteness and uncertainty of the database. New ground motion relations including local soil conditions are derived for Himalayan and Indo-Gangetic regions. Detailed seismic hazard curves have been computed considering all the uncertainties. From these seismic hazard curves response spectra corresponding to 25-year, 50-year, 100-year, 200-year, 500-year, and 2500-year return periods have been calculated.
14	Earthquake Microzonation 2500 Years Return period	Very Low Low Moderate High Very High	Past events, PGA of varying return periods, presence of past epicentres, presence of fault lines, depth of the top soil, etc. are used to calculate the zones of more attenuation. The zones which may show higher PGA attenuation are classified as very high hazard zones, compared to the very lower hazard zones.
15	Landslide Hazard	Very High High Moderate Low Very Low	Any type of symptoms if landslides in the neighbourhood have been captured in the primary survey. Based on the recall of the people, these households are marked as more prone to landslides compared to the ones where not many symptoms are visible.
16	Landslide Susceptibility	Low High	Many places in the city are creeping, sliding or sinking. The same phenomena is captured by studying the deformation in the existing trees. More than 700 trees are mapped with their

Legend Description

Page No	Name of the Map	Classes	Description
17	Probabilistic Forest Fire Hazard Analysis	Very Low Low Moderate High Very High	Using various parameters like land use, nearness to roads, type of trees, density of the forests, etc., the forest fire susceptibility map has been created. The higher values here shows that that area is more prone to forest fire compared to the lower score area. Many natural and manmade phenomenon are considered while calculating this hazard.
18	Forest Fire Hazard Perception	Very Low Low Moderate High Very High	This is the recall based question, in which the households are asked to remember the last event of the forest fire in the surroundings of their household. In many cases, there was no forest fire, but in a minimal number of instances, there was some reporting of forest fire. Percentage of the households with in an area of 100sqmt is shown on a scale and classified as very low to very high hazard zone.
19	Household Fire Incidence Catalog	Very Low Low Moderate High Very High	Urban fires are also very prevalent in Shimla city. Based on the recall, households were asked to mention if they have experienced a fire within their house or in the very close proximity. Percentage of the households that have mentioned of a past fire scar are mapped and classified in these classes from very low to very high.
20	Urban Heat Island	Very Low Low Moderate High Very High	Using a well-accepted algorithm, a Land Surface Temperature map has been created. Some of the inputs in this analysis are: land use land cover data from LandSat, built up map, thermal imager, etc. Subsequently, using a thermal imager, ambient temperature in various parts of the city have been captured. After calibrating the initial map with the field data, we arrived at a heat island map. This will help in understanding the possible areas where heat wave conditions may
21	Snow Hazard Perception	Very Low Low Moderate High Very High	Households are asked to give the amount of snowfall that happens at their premise. This information is collected spatially in meters and then converted into a snow map. Based on the depth of the snow in inches, these areas are classified as very low hazard zone to very high hazard zone.
22	Hail Strom Hazard Perception	Very Low Low Moderate High Very High	This is one of the most remembered hazard in the city of Shimla. Many households have responded as experienced the hail storm, because it is very fresh in their memory. Moreover, because all the places in the city have experienced, many households have reported as experienced the hazard. Higher hazard is the more number of households reporting the event, compared to lesser number of households.

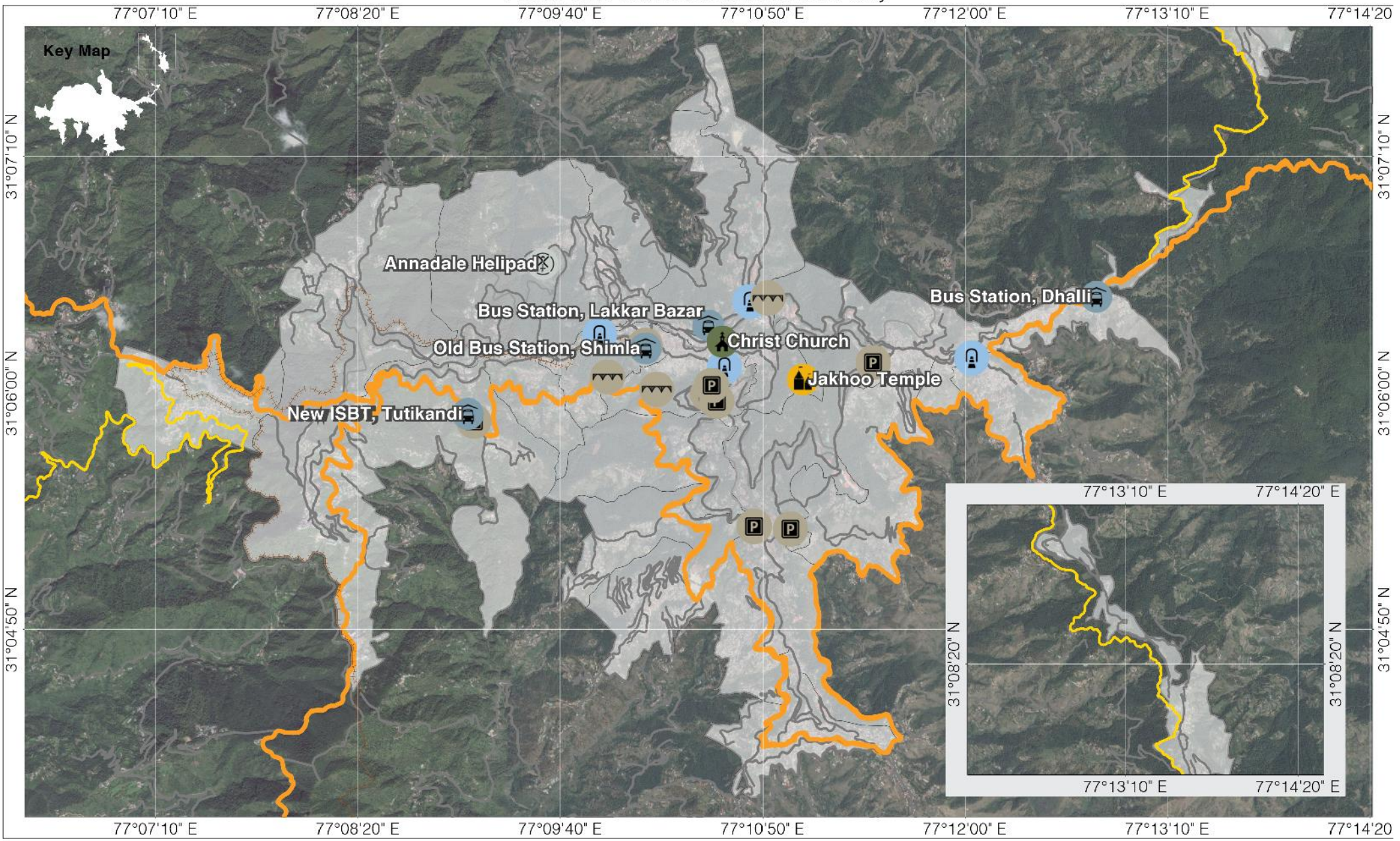
Page No	Name of the Map	Classes	Description
23	Building Vulnerability	Very High High Moderate Low Very Low	This is based on the Rapid Visual Survey method developed by FEMA and subsequently adapted by various Indian agencies. The higher the score, safer the building is, so Building Vulnerability is low. Lower the RVS score, the building is supposed to be weaker and more vulnerable.
24	Areas Which Are Inaccessible To Motorable Roads	Very Low Low Moderate High Very High	Distance of the households to the nearest motorable approach road is calculated. The buildings which are farther than 200m away from the approach road are marked as Very High Risk, as they cannot access the escape routes in case of emergency.
25	Limited Access To Fire Services	Very Low Low Moderate High Very High	Distance of the households from the nearest Fire station has been calculated here. The buildings which are farther than 4km are marked as Very High Risk and so on. This distance is the network distance considering moderate traffic conditions.
26	Time Taken By Nearest Fire Service To Respond	Very Low Low Moderate High Very High	Duration of travel of the households from the nearest Fire station has been calculated here. The buildings which take more than 20min are marked as Very High Risk and while buildings which take less than 5min are marked as Very Low risk and so on.
27	Limited Access To Emergency Services - Hospitals	Very Low Low Moderate High Very High	Duration of travel of the households from the nearest Govt. Hospital has been calculated. The buildings which take more than 4km are marked as Very High Risk and while buildings within 1km are marked as Very Low risk and so on.
28	Time Taken By Nearest Hospital To Respond	Very Low Low Moderate High Very High	Duration of travel of the households from the nearest Govt. Hospital has been calculated here. The buildings which take more than 20min are marked as Very High Risk and while buildings which take less than 5min are marked as Very Low risk and so on.

Legend Description

Page No	Name of the Map	Classes	Description
29	Water Supply Service Level Deficiency (Hot-Spots)	Very High High Moderate Low Very Low	Households where adults and kids are spending time to fetch water are classified as high risk areas, compared to households which have water supply connections at their own premises or who spend less time in collecting water. As the range of sources are very large, the households are also classified in more classes.
30	Sanitation Service Level Deficiency (Hot-Spots)	Very High High Moderate Low Very Low	Household which have connected toilets to running sewage systems are given better score compared to the ones which practice open defecation. The premise of the analysis is that the houses that are practicing open defecation are prone to more diseases compared to the ones which have safer toilets.
31	Percentage Population that will Require Special Attention During / Post Disaster	Very Low Low Moderate High Very High	The population which is highlighted under this category may change over a period of time. It is very dynamic population group. The health condition which may pose threat to the movement of the people, where people may need additional support are marked here. Some example of the cases are: differently abled people, people with temporary illness, lifestyle based diseases, etc.
32	Economic Vulnerability of Households	Very High High Moderate Low Very Low	Economic vulnerability is the ability of the households to withstand any shocks in earnings because of disruption in economic activities. The households which have good asset base, more number of people earning, good savings and no debts are given a higher score compared to the households contrast to it. The high vulnerability often means the household doesn't have access to sufficient financial resources.
33	Vulnerability to Fire Hazard Based On Household Level Preparedness	Very High High Moderate Low Very Low	How well the households/buildings are prepared for the fire hazard is mapped here. If the households have fire extinguishers, escape routes, sand buckets, etc., those houses/buildings are graded as lower risk buildings, compared to ones which do not have any preparedness (high risk)

A. Geophysical Settings

Road and Rail Network : Shimla City



Scale:
0 1 km

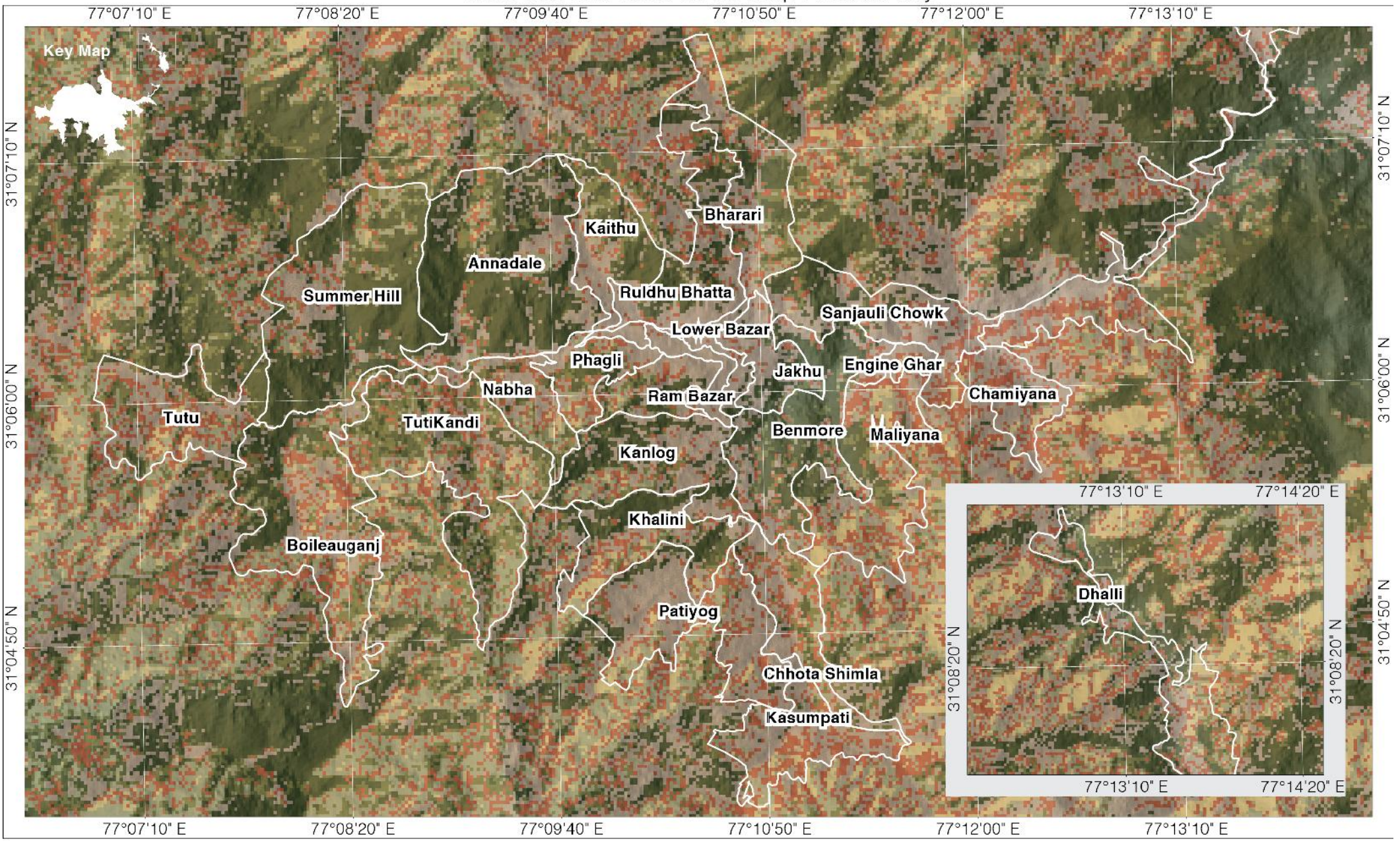
Datum: WGS 84
Projection: Mercator

Source:
Primary Survey By TARU (2015).
TARU Analysis (2015).

Background Images: Imagery ©2015 DigitalGlobe ©2015 Google.

Legend:
National Highway
State Highway
Other City Roads
Railway Line
Church
Temple
Bridge
Tunnel
Parking
Bus Station
Helipad
Muncipal Boundary
N

Land Use and Land Cover Map : Shimla City



Scale:
0 1 km

Datum: WGS 84
Projection: UTM 43 (N)

Source:
Land use and Land Cover classified from Landsat 8 data, Image Accuried on 23rd March 2015.

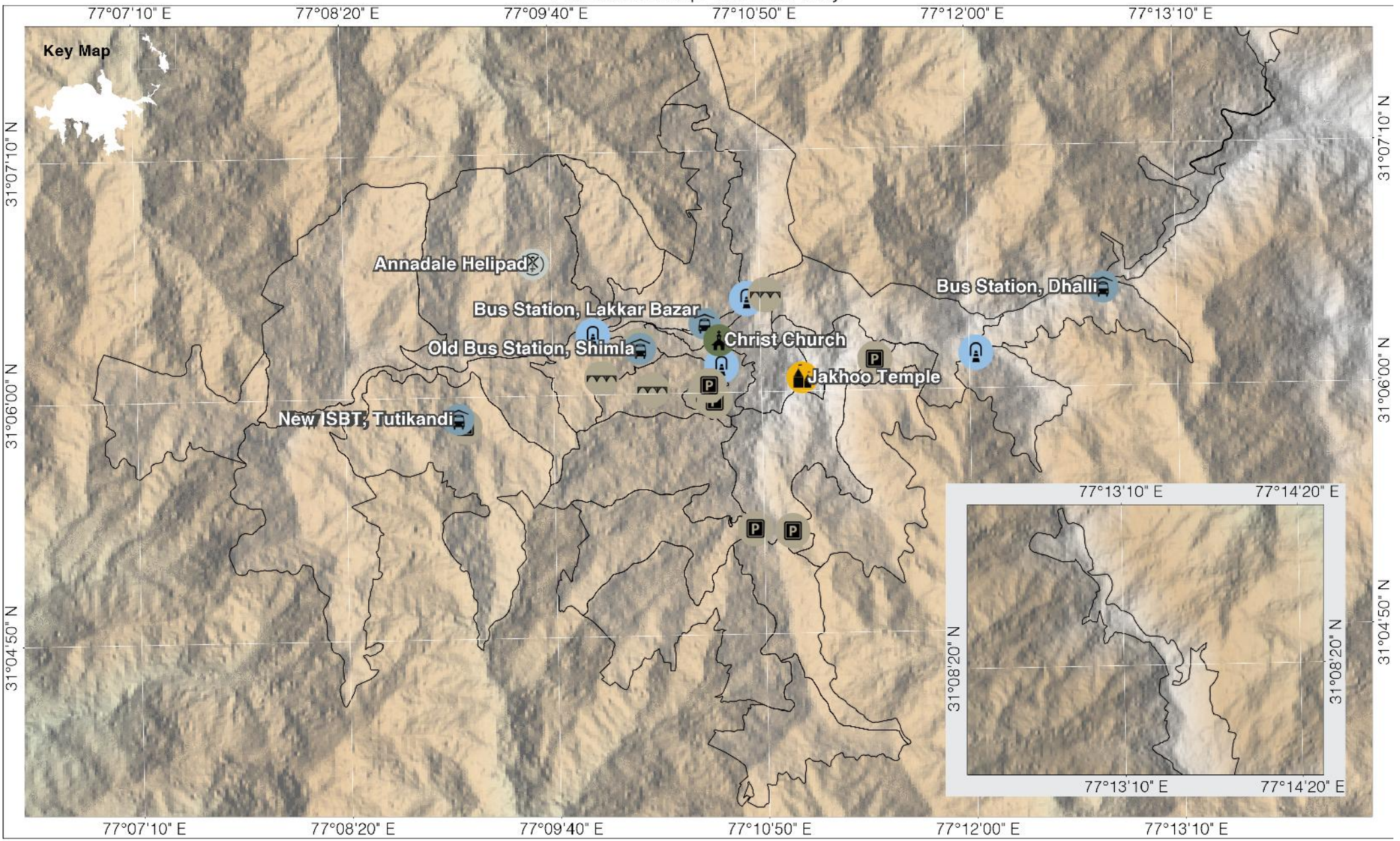
Primary Survey By TARU (2015).
TARU Analysis (2015).

Legend:
Ward Boundary

Land Use and Land Cover
Dense Forest
Forest
Grass
Built up area
Mixed
Barren Land

N

Elevation Map : Shimla City



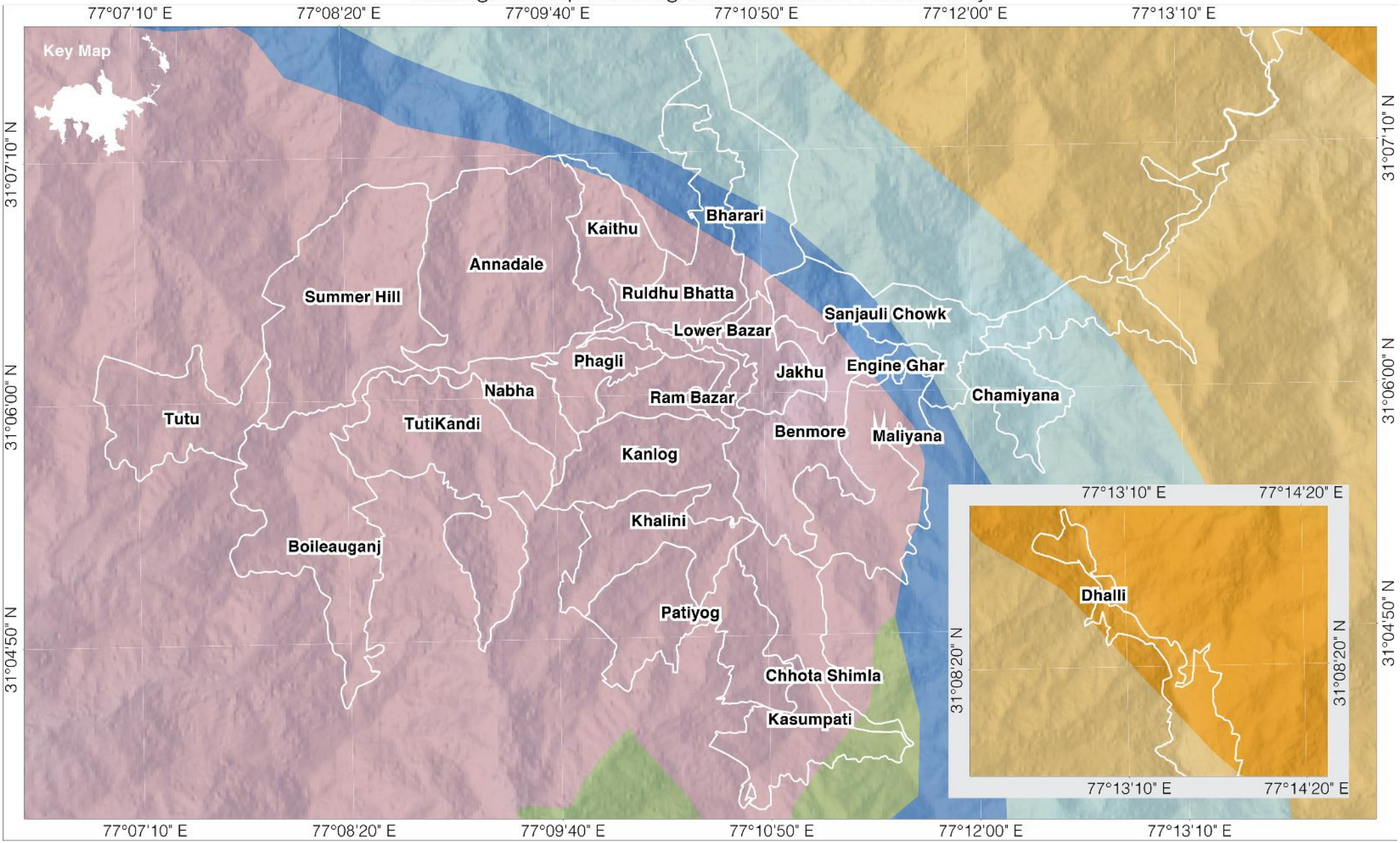
Scale:
0 1 km
Datum: WGS 84
Projection: UTM 43 (N)

Source:
Base Data:
Cartosat-1 Digital Elevation Model Version-3R1,
Resolution - 1 arc Sec (~ 32 m).
Primary Survey By TARU (2015).
TARU Analysis (2015).

Legend:
Elevation (in Meters)
800 2800

National Highway
State Highway
Other City Roads
Railway Line
Church
Temple
Bridge
Tunnel
Parking
Bus Station
Helipad
Ward Boundary
N

Geological Map Showing Soil Formations : Shimla City



Scale:
0 1 km

Datum: WGS 84
Projection: UTM 43 (N)

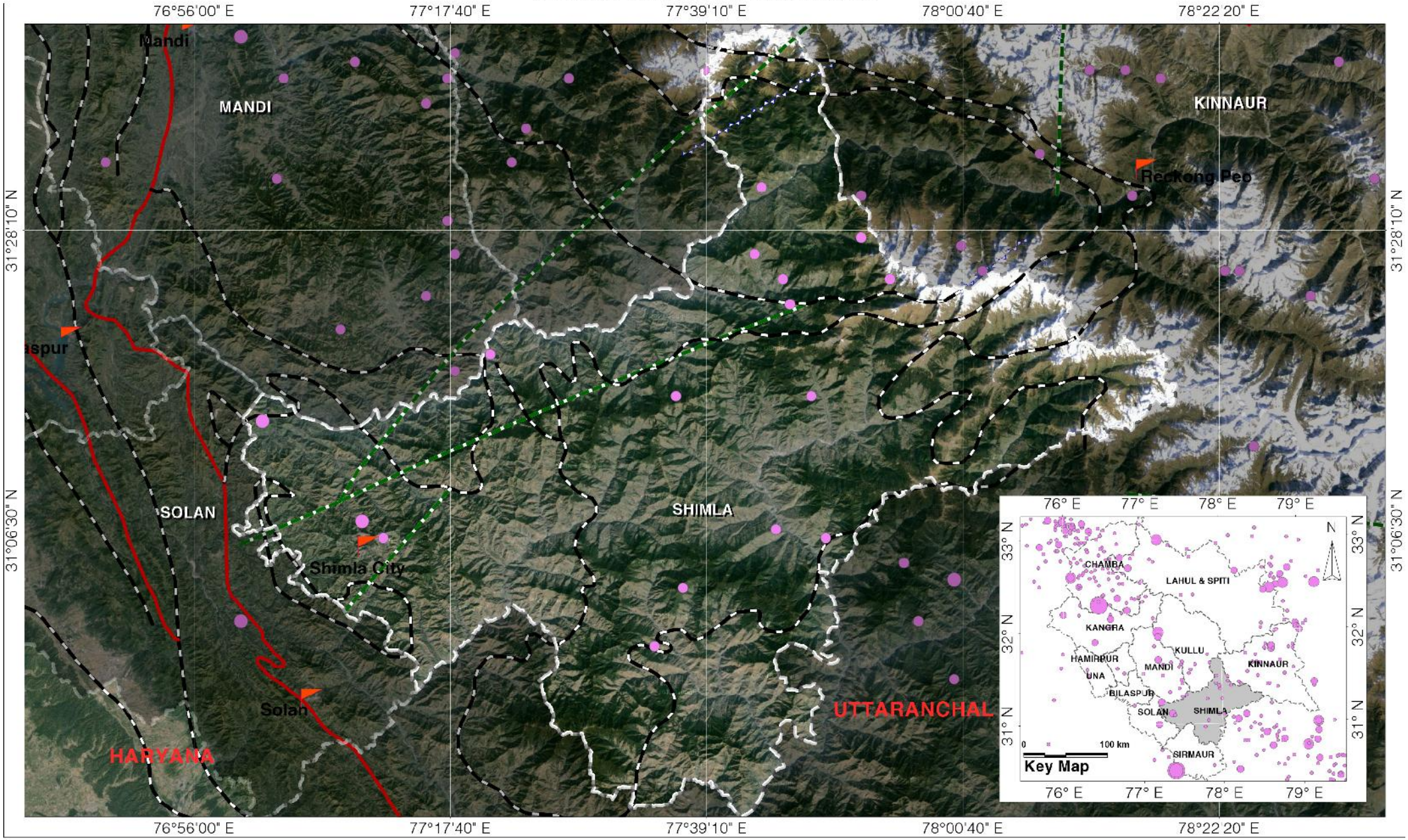
Source:
Base Data:
Above map created from Geological Quadrangle Map, Published by Geological Survey of India 1999.
TARU Analysis (2015).

Legend:
- Ward Boundary
- Carbonaceous, phyllite, slate,schist, quartzite, limestone, shale, dolomite, gneiss, amphibolite with garnet, kyanite and staurolite
- Tillitoids, shale, slate, quartzie, dolomite, limestone, pebbly mudstone(pebble bed)
- Shale, siltstone, greywacke, quartzite, sandstone, conglomerate, slate
- Shale, siltstone, quartzite, greywacke
- Quartzite, phyllite, slate, conglomerate, greywack limestone, dolomite and metavolcanics
- Limestone, shale, quartzite and sporadic conglomerate

N

B. Hazard

Geotectonic Map : Shimla District



Scale:
0 20 km

Datum: WGS 84
Projection: Mercator

Source:
Catalogue of events over 250 A.D. to 2009 A.D. compiled from 18 earthquake catalogue inc uding IMD, ISC & USGS. GSI Seismotectonic Atlas (2000), TARU Analysis (2015).

Background Images: Imagery ©2015 DigitalGlobe ©2015 Google.

Legend:

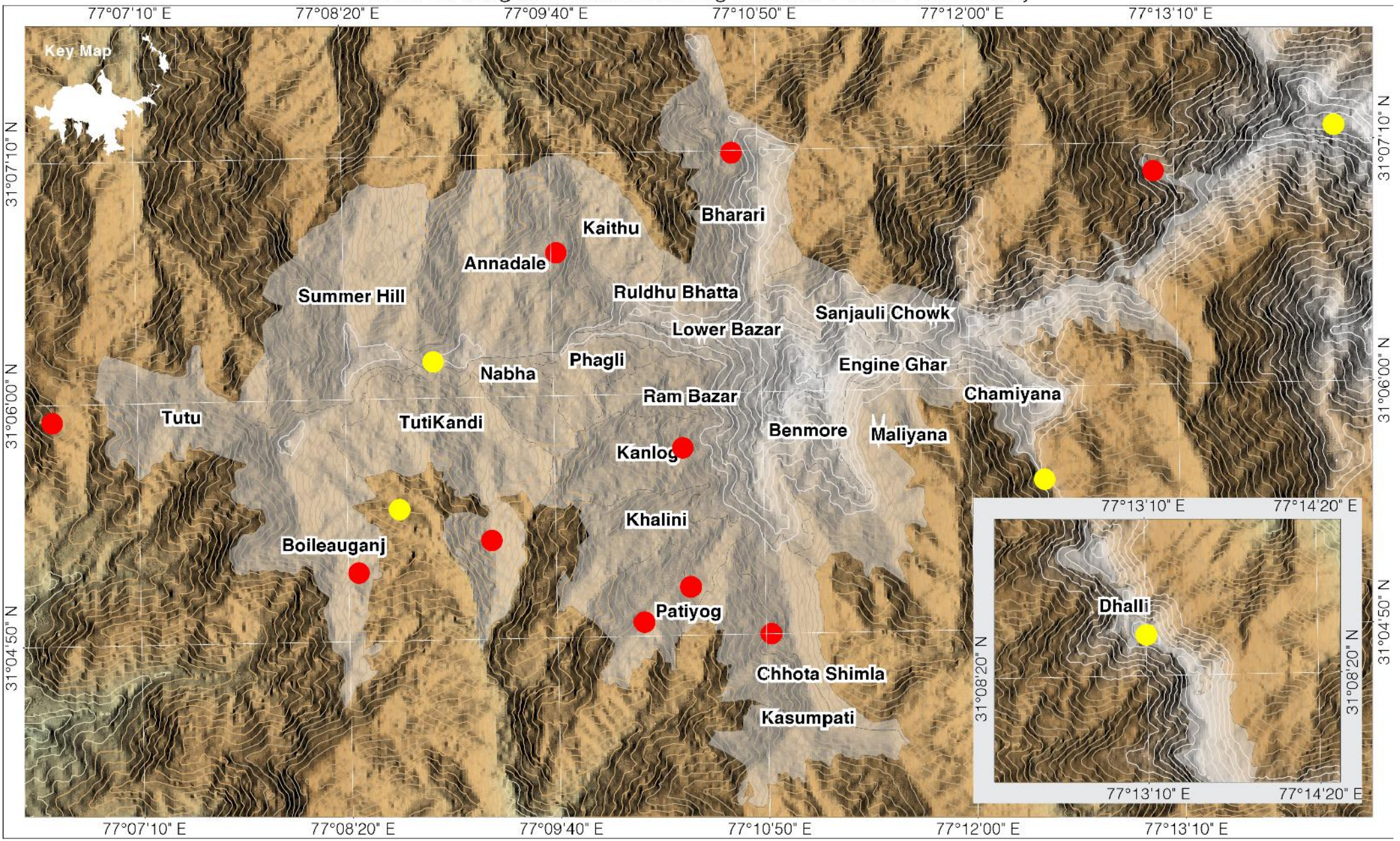
Earthquake Catalogue (Magnitude in Mw)
- 4 to 5
- 5 to 6
- 6 to 7
- 7 to 8
- > 8

District Boundary
District Headquaters

Structural Features
- Fault Involving Cover
- Fault Involving both basement and cover
- Lineament
- Neotectonic Fault

N

Vs 30 Investigation Location along with Soil Profile : Shimla City



Scale:
0 1 km

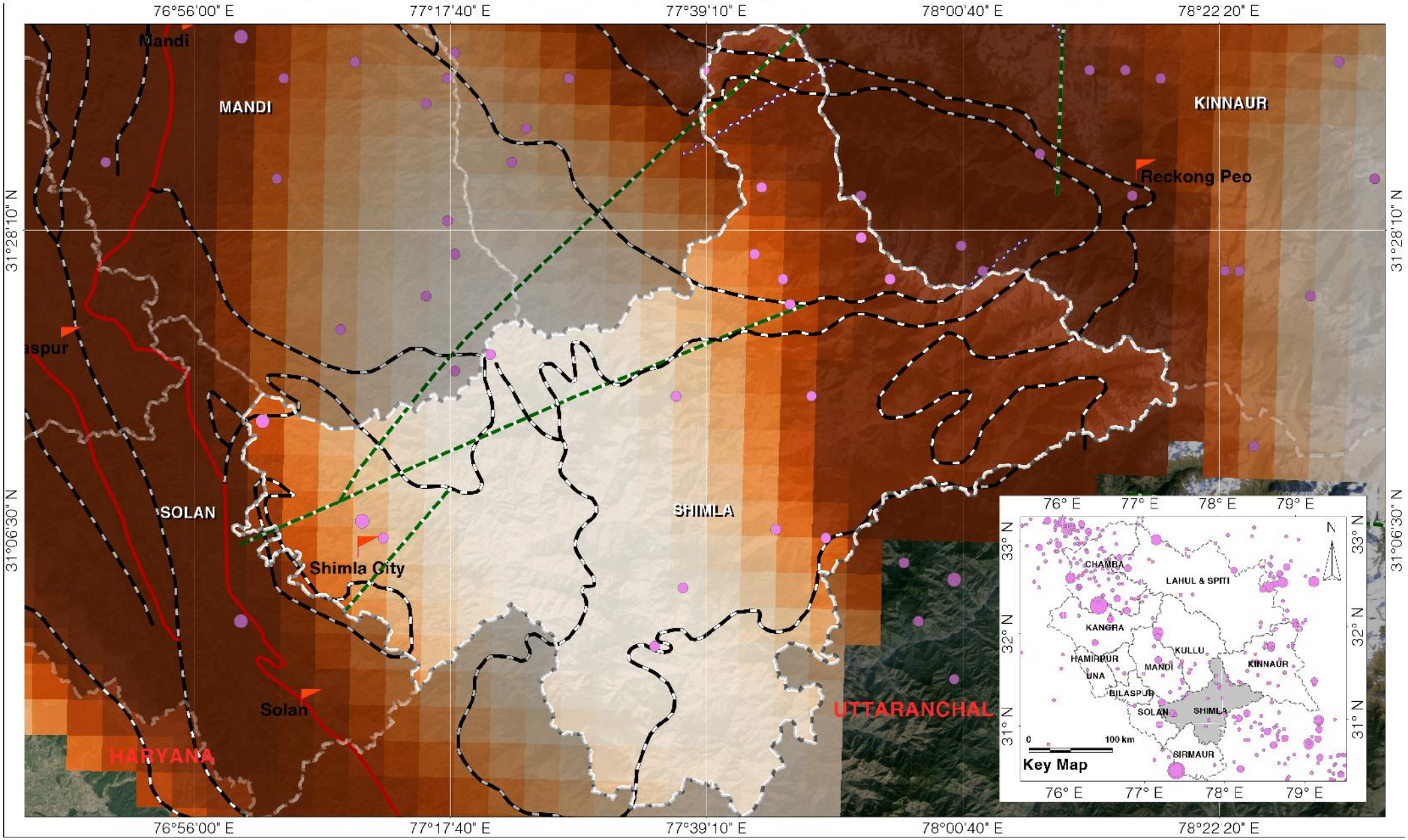
Datum: WGS 84
Projection: UTM 43(N)

Source:
Primary Survey By TARU (2015).
TARU Analysis (2014).

Background Image:
Cartosat-1 Digital Elevation Model Version-3R1, Resolution - 1 arc Sec (~ 32 m).

Legend:
Elevation (in Meters)
800 2800
Vs 30 Points
Medium
Soft
Ward Boundary
N

100 year Return Period Estimated Peak Ground Acceleration (PGA in g) : Shimla District



Scale:
0 20 km

Datum: WGS 84
Projection: Mercator

Source:
Catalogue of events over 250 A.D. to 2009 A.D. compiled, from 18 earthquake catalogue including IMD, ISC & USGS. GSI Seismotectonic Atlas (2000), TARU Analysis (2015).

Background Images: Imagery ©2015 DigitalGlobe ©2015 Google.

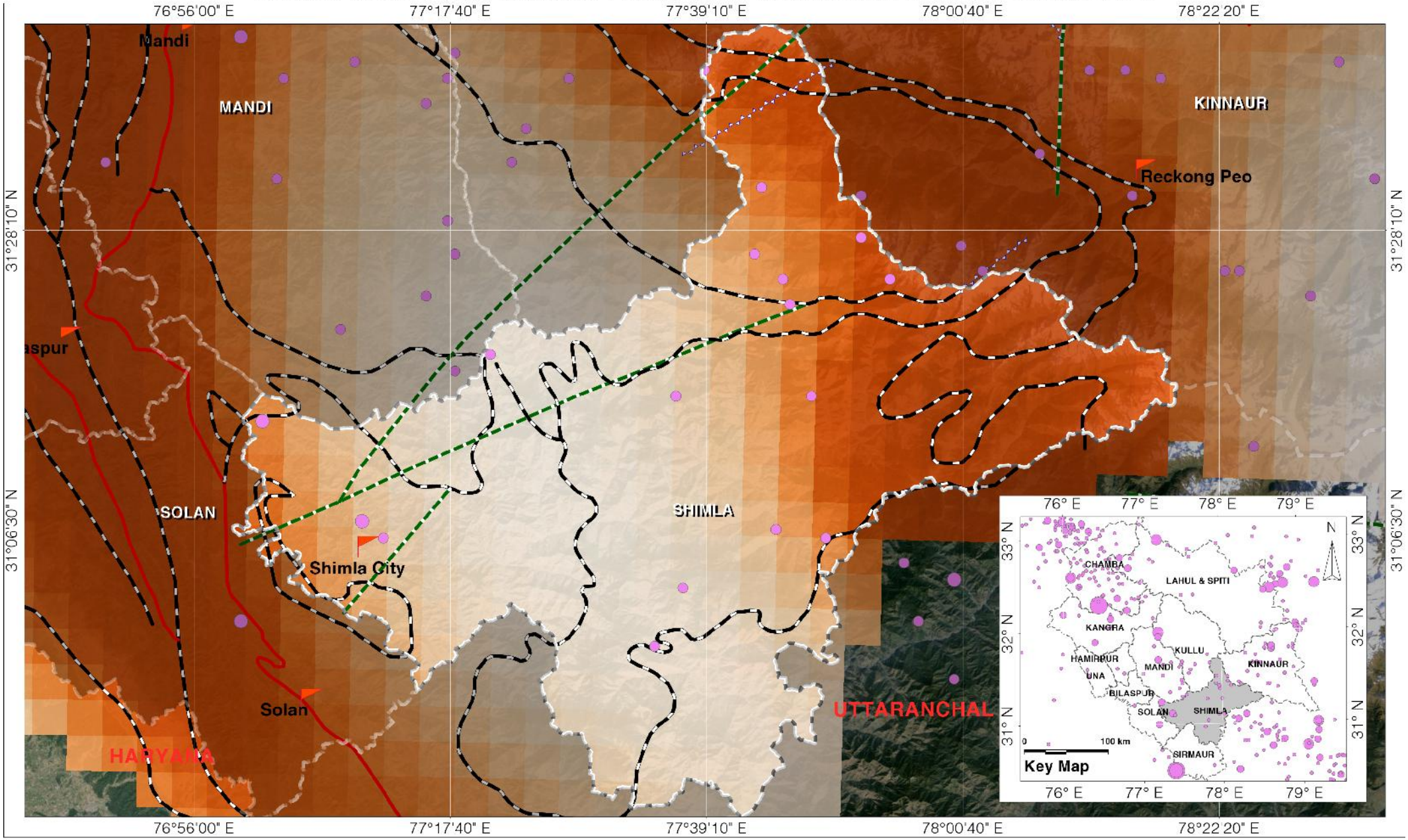
Legend:
District Headquaters
District Boundary
PGA (in g) 0.05 – 0.070

Earthquake Magnitude (Mw)
4 to 5
5 to 6
6 to 7
7 to 8
> 8

Structural Features
Fault Involving Cover
Fault Involving both basement and cover
Lineament
Neotectonic Fault

N

200 year Return Period Estimated Peak Ground Acceleration (PGA in g) : Shimla District



Scale:
0 20 km

Datum: WGS 84
Projection: Mercator

Source:
Catalogue of events over 250 A.D. to 2009 A.D. compiled, from 18 earthquake catalogue including IMD, ISC & USGS. GSI Seismotectonic Atlas (2000), TARU Analysis (2015).

Background Images: Imagery ©2015 DigitalGlobe ©2015 Google.

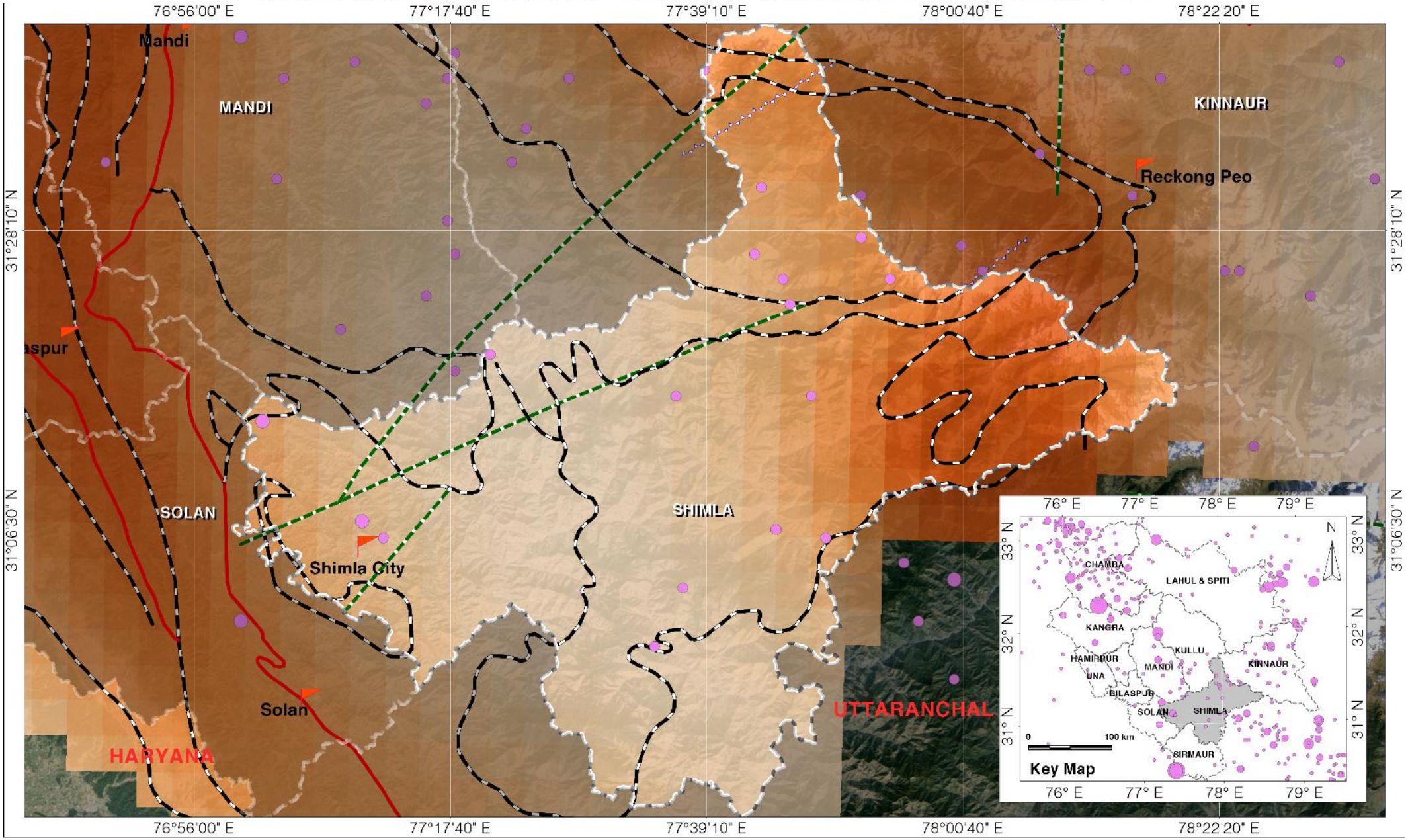
Legend:
District Headquaters
District Boundary
PGA (in g) 0.07 0.15

Earthquake Magnitude (Mw)
4 to 5
5 to 6
6 to 7
7 to 8
> 8

Structural Features
Fault Involving Cover
Fault Involving both basement and cover
Lineament
Neotectonic Fault

N

500 year Return Period Estimated Peak Ground Acceleration (PGA in g) : Shimla District



Scale:
0 20 km

Datum: WGS 84
Projection: Mercator

Source:
Catalogue of events over 250 A.D. to 2009 A.D. compiled, from 18 earthquake catalogue including IMD, ISC & USGS. GSI Seismotectonic Atlas (2000), TARU Analysis (2015).

Background Images: Imagery ©2015 DigitalGlobe ©2015 Google.

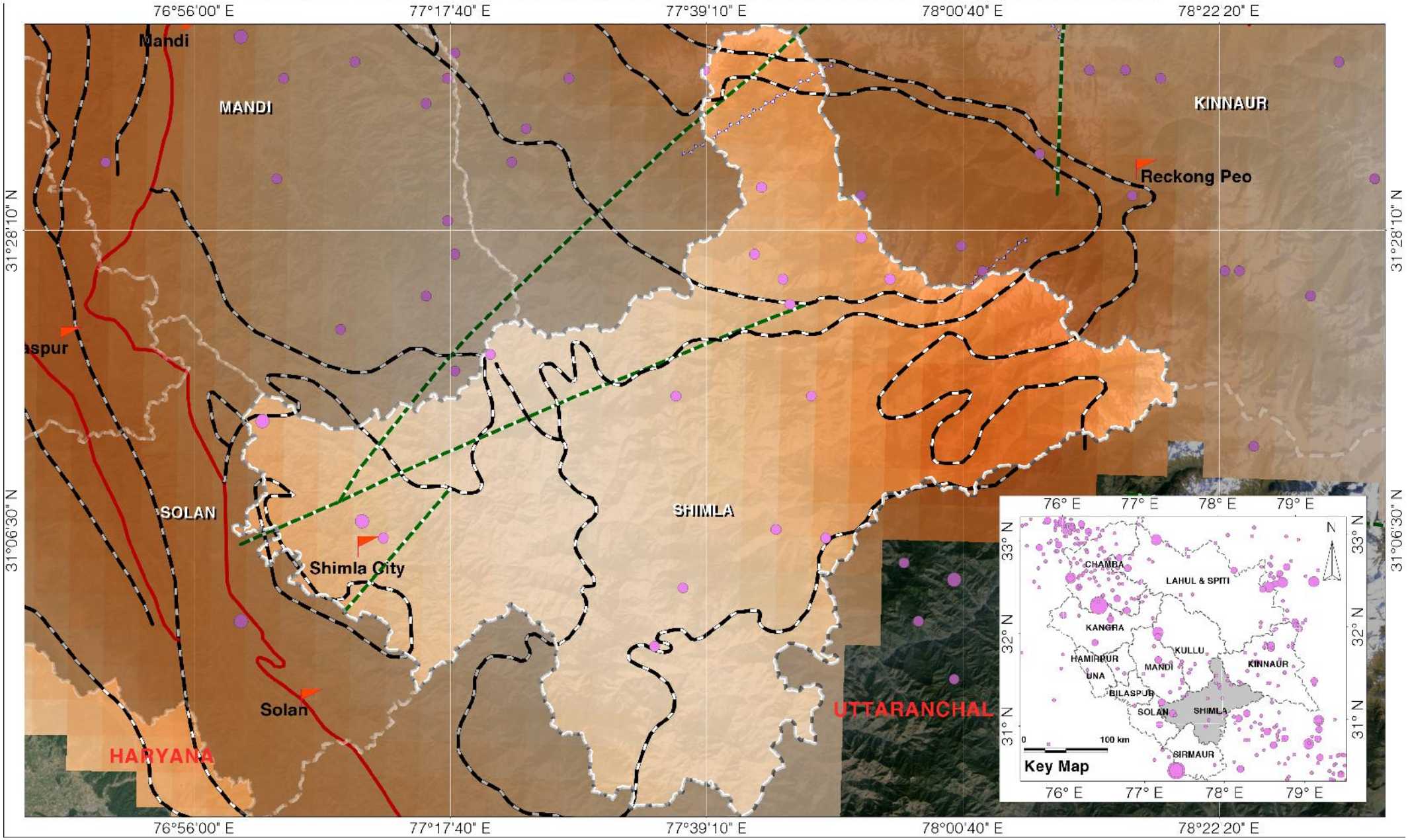
Legend:
District Headcuaters
District Boundary
PGA (in g) 0.1 0.20

Earthquake Magnitude (Mw)
4 to 5
5 to 6
6 to 7
7 to 8
> 8

Structural Features
Fault Involving Cover
Fault Involving both basement and cover
Lineament
Neotectonic Fault

N

2500 year Return Period Estimated Peak Ground Acceleration (PGA in g) : Shimla District



Scale:
0 20 km

Datum: WGS 84
Projection: Mercator

Source:
Catalogue of events over 250 A.D. to 2009 A.D. compiled, from 18 earthquake catalogue including IMD, ISC & USGS. GSI Seismotectonic Atlas (2000), TARU Analysis (2015).

Background Images: Imagery ©2015 DigitalGlobe ©2015 Google.

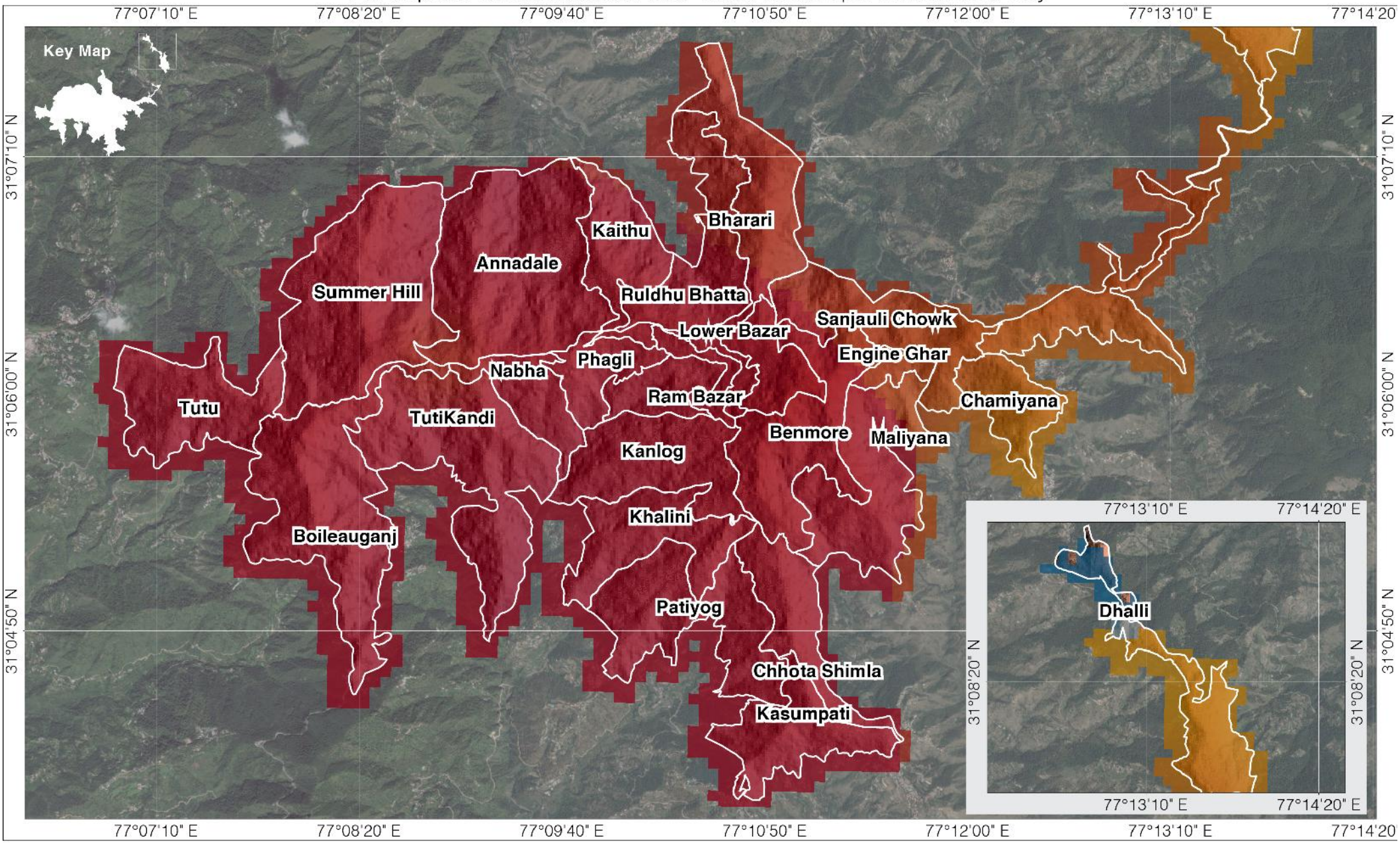
Legend:
- District Headquaters
- District Boundary
- PGA (in g) 0.2 – 0.45

Earthquake Magnitude (Mw)
- 4 to 5
- 5 to 6
- 6 to 7
- 7 to 8
- > 8

Structural Features
- Fault Involving Cover
- Fault Involving both basement and cover
- Lineament
- Neotectonic Fault

N

Earthquake Microzonation 2500 Years Return period : Shimla City



Scale:
0 1 km

Datum: WGS 84
Projection: Mercator

Source:
Geological Quadrangle Map 1999, Geological Survey of India.
Note: Peak Ground Acceleration (PGA) varies from 0.05 to 0.25 (g) (Very Low to Very High Risk).

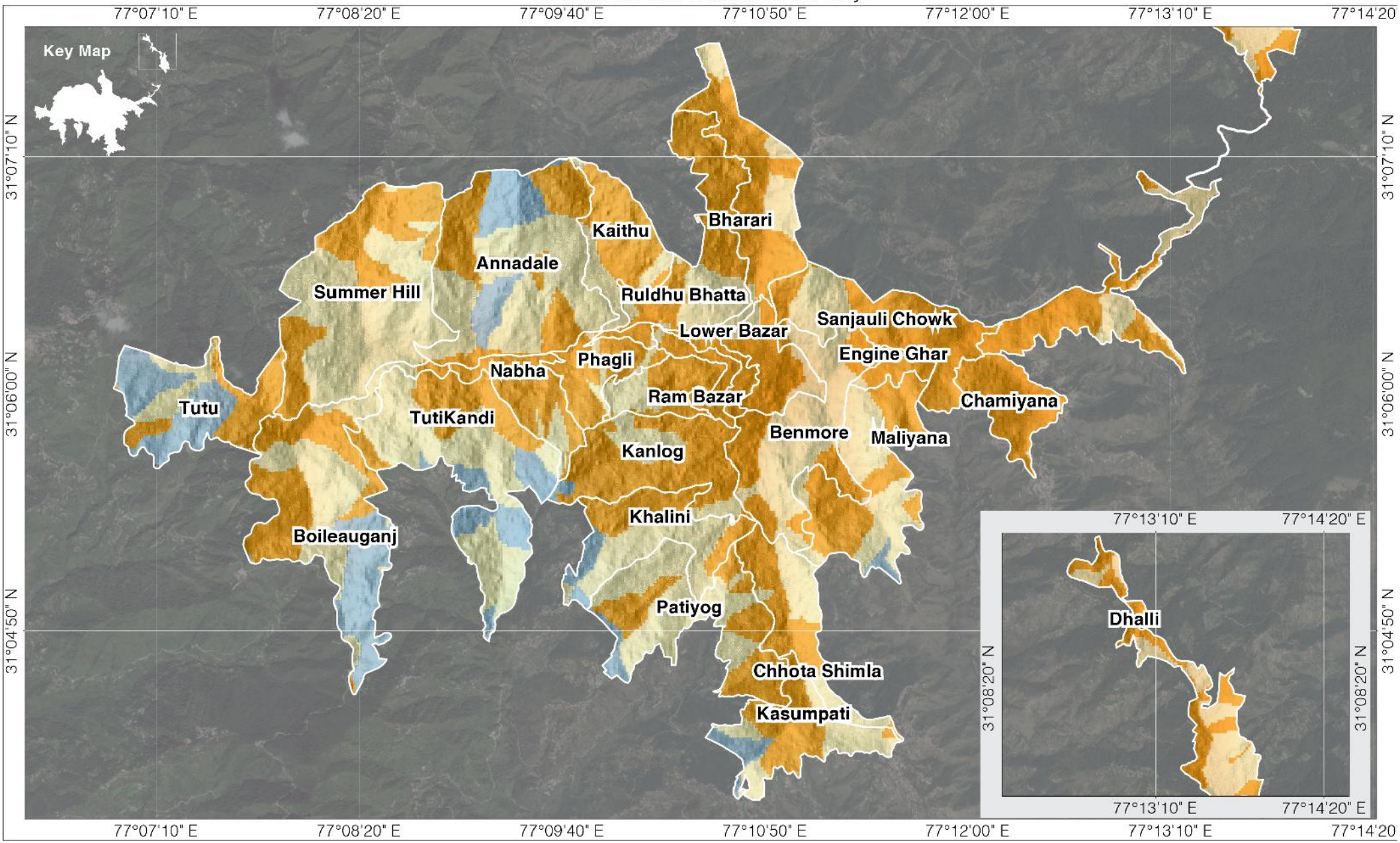
Primary Survey By TARU (2015).
TARU Analysis (2015).

Legend:
Ward Boundary

Peak Ground Acceleration
Very Low
Low
Moderate
High
Very High

N

Landslide Hazard : Shimla City



Scale:
0 1 km

Datum: WGS 84
Projection: Mercator

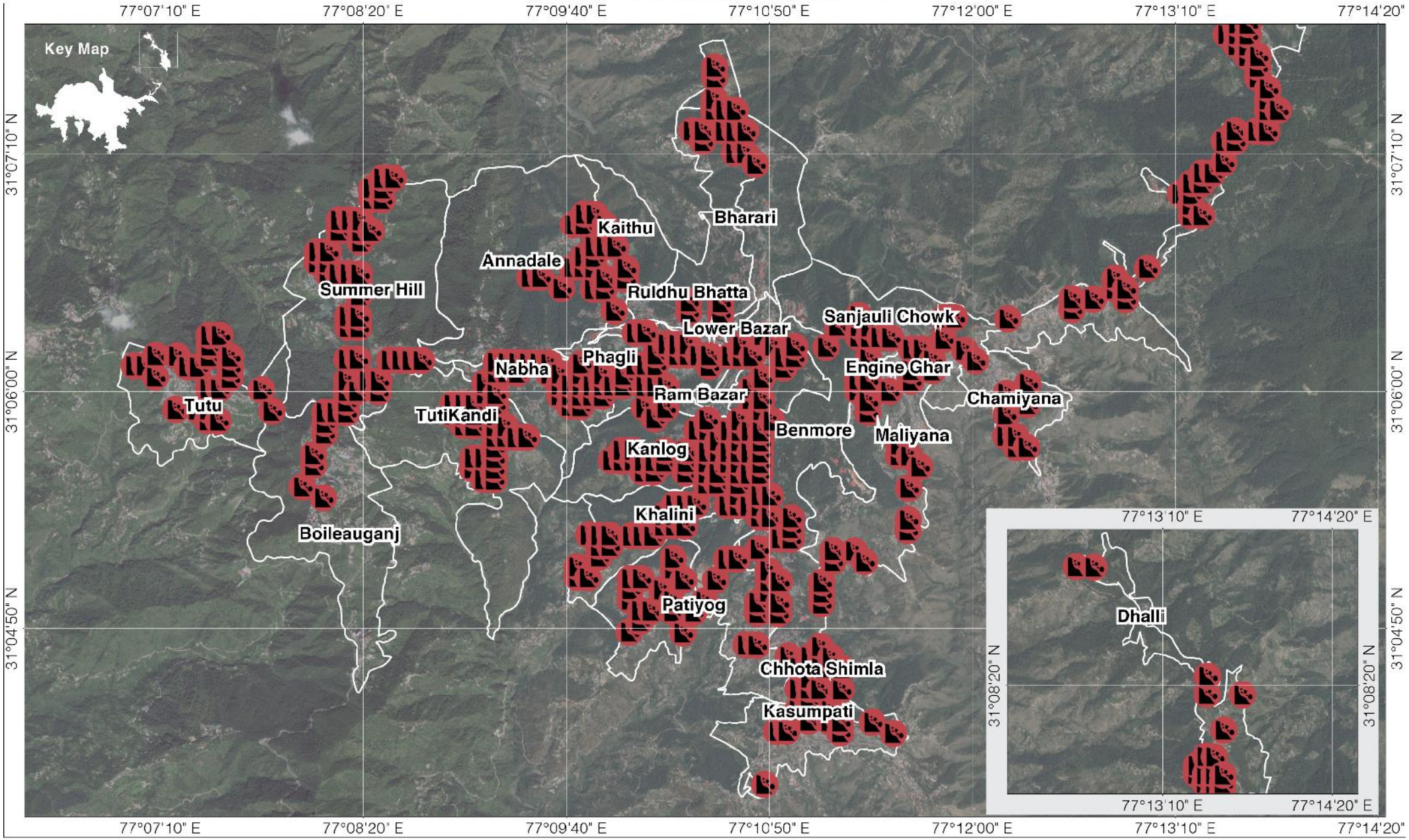
Source:
Landslide hazard is calculated as a combination of lithology, structure,slope morphometry,relative relief, LULC and hydrological conditions. The red shades show the area which is more prone to landslides.City of Shimla does not have any areas of high risk as well as low or very low areas.
TARU Analysis (2015). Background Images: Imagery ©2015 DigitalGlobe ©2015 Google.

Legend:
Ward Boundary

Landslide Hazard
Very Low
Low
Moderate
High
Very High

N

Landslide Susceptibility : Shimla City



Scale:
0 1 km

Datum: WGS 84
Projection: Mercator

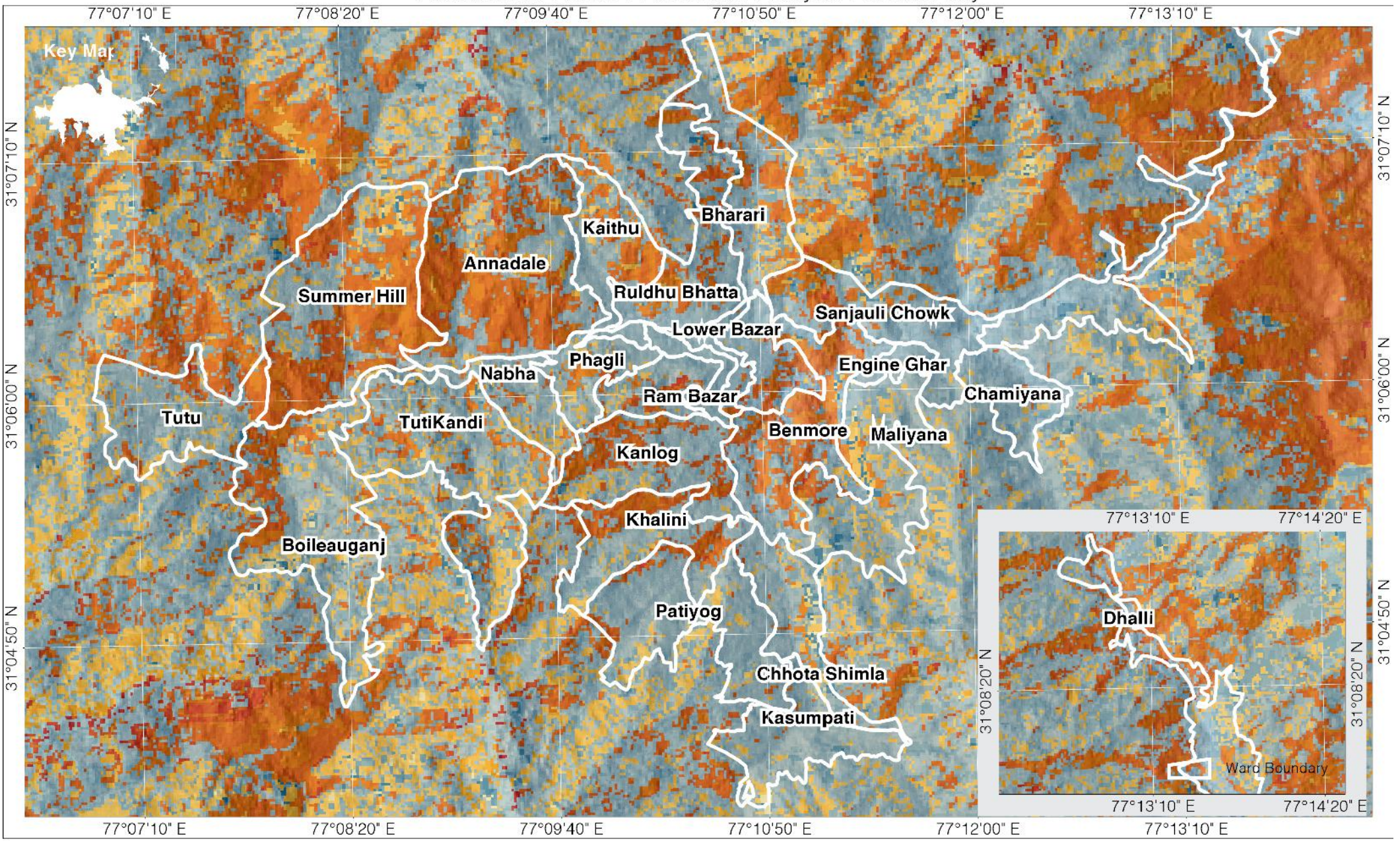
Source:
Primary Survey By TARU (2015).
TARU Analysis (2015).

Background Images: Imagery ©2015 DigitalGlobe ©2015 Google.

Legend:
Ward Boundary
Landslide Susceptibility

N

Probabilistic Forest Fire Hazard Analysis : Shimla City



Scale:
0 1 km
Datum: WGS 84
Projection: UTM 43(N)

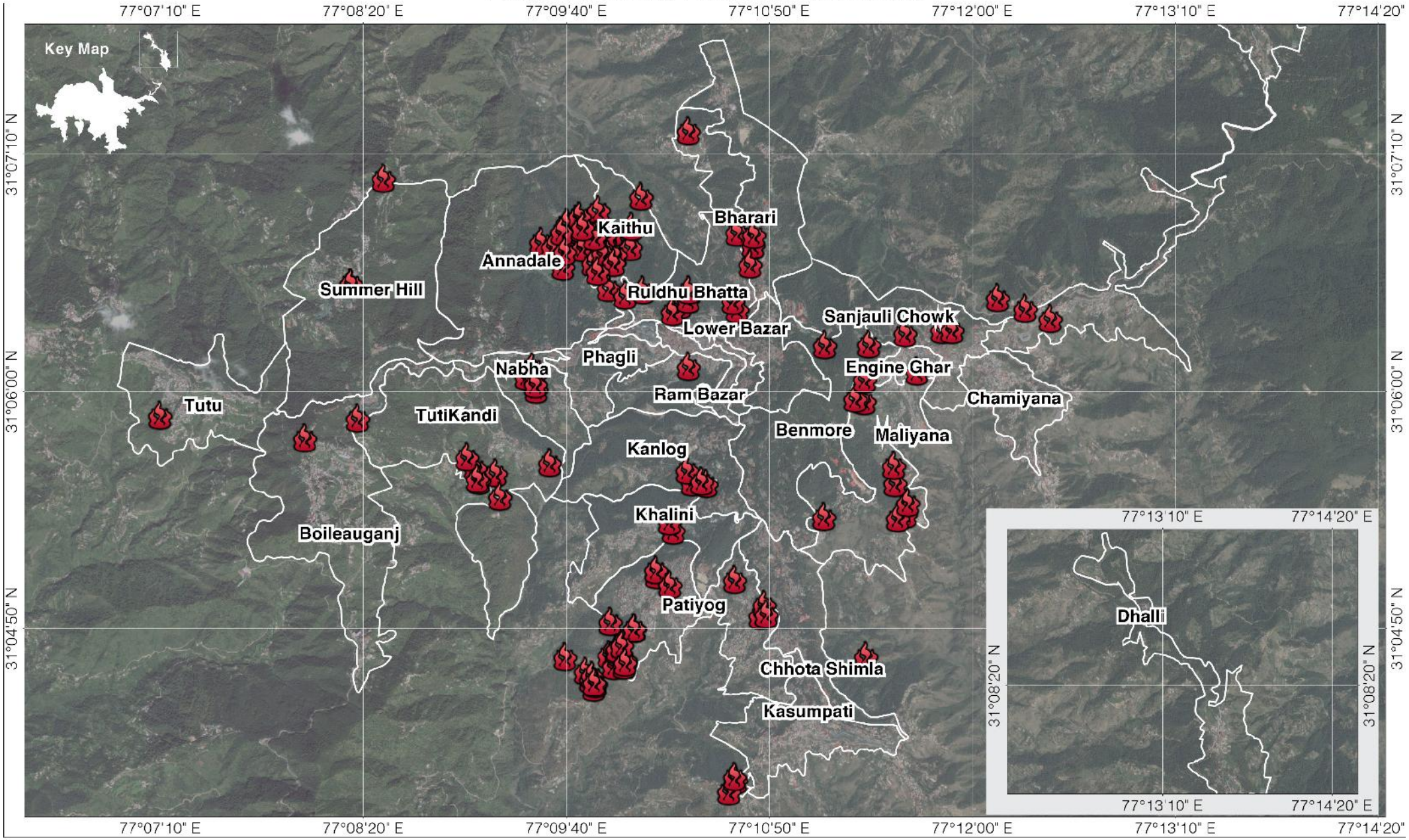
Source:
Cartosat-1 Digital Elevation Model Version-3R1, Resolution - 1 arc Sec (~ 32 m).
Land Use and Land Classification Extracted from Landsat 8 Sensors (OLI, TRIS), Image Accuried on 23rd March 2015.
Primary Survey By TARU (2015).
TARU Analysis (2015).

Legend:
Ward Boundary

Fire Risk Probability
Very Low
Low
Moderate
High
Very High

N

Forest Fire Hazard Perception : Shimla City



Scale:
0 1 km

Datum: WGS 84
Projection: Mercator

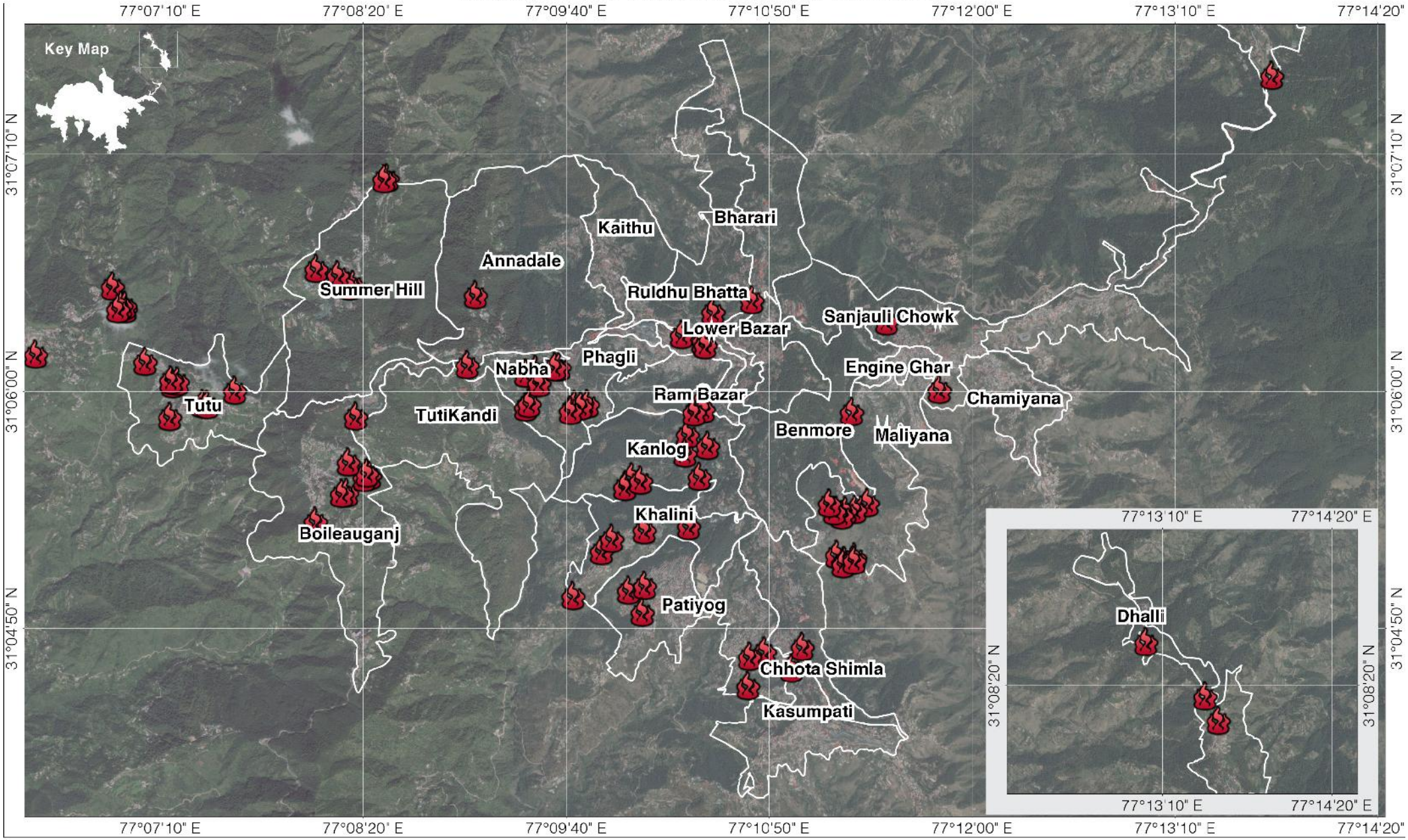
Source:
Primary Survey By TARU (2015).
TARU Analysis (2015).

Background Images: Imagery ©2015 DigitalGlobe ©2015 Google.

Legend:
Forest Fire Hazard Perception
Ward Boundary

N

Household Fire Incidence Catalog : Shimla City



Scale:
0 1 km

Datum: WGS 84
Projection: Mercator

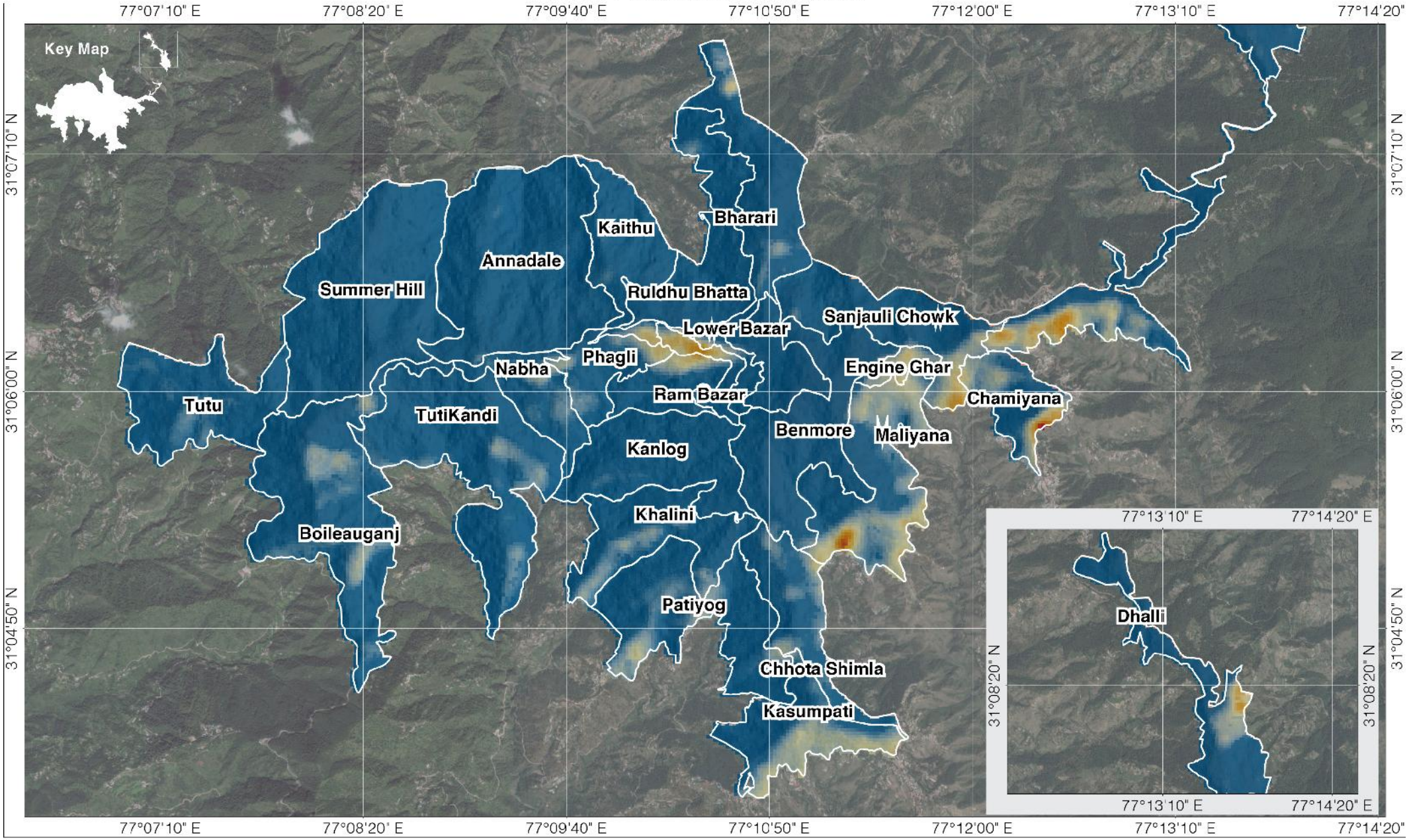
Source:
Primary Survey By TARU (2015).
TARU Analysis (2015).

Background Images: Imagery ©2015 DigitalGlobe ©2015 Google.

Legend:
Household Fire Incidence
Ward Boundary

N

Urban Heat Island : Shimla City



Scale:
0 1 km

Datum: WGS 84
Projection: Mercator

Source:
Land Surface temperature Extracted from Landsat 8 Sensors (OLI, TRIS), Image Accuried on 23rd March 2015.
TARU Analysis (2015).

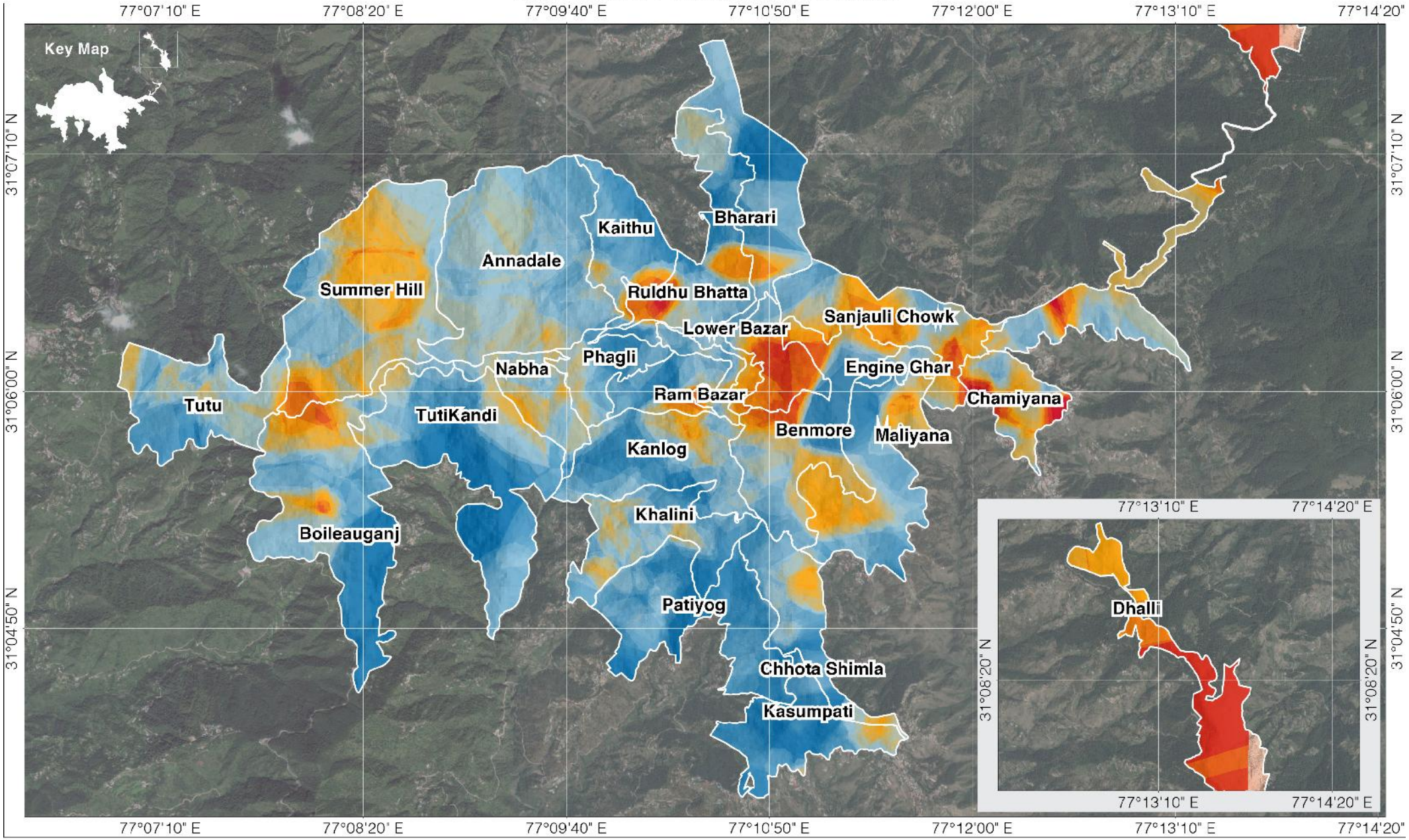
Background Images: Imagery ©2015 DigitalGlobe ©2015 Google.

Legend:
Ward Boundary

Urban Heat Variation
Very Low
Low
Moderate
High
Very High

N

Snow Hazard Perception : Shimla City



Scale:
0 1 km

Datum: WGS 84
Projection: Mercator

Source:
Primary Survey By TARU (2015).
TARU Analysis (2015).
Note: Map shows snow depth in inches and it's varies from 15 to 75 inch (Very Low to Very High)

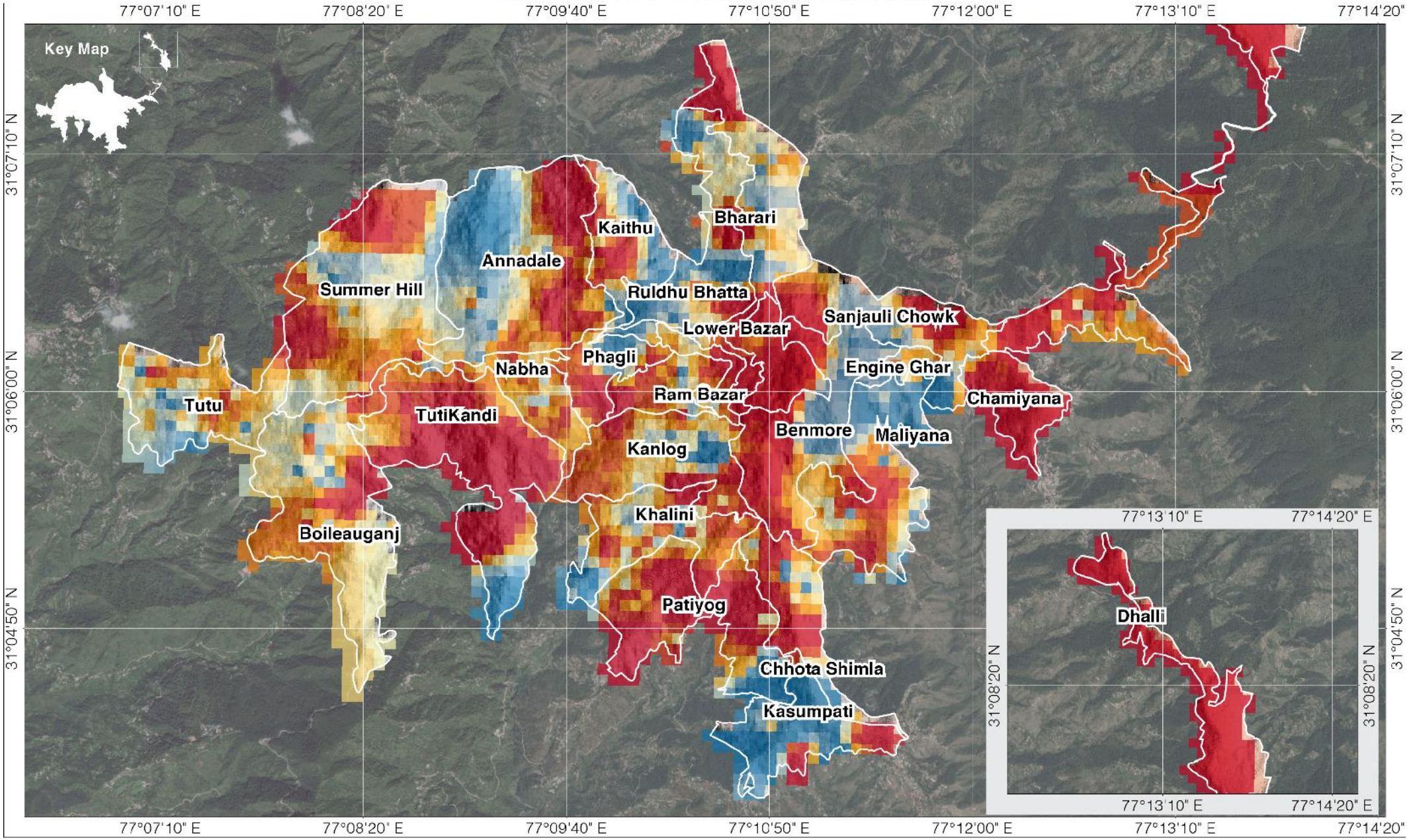
Background Images: Imagery ©2015 DigitalGlobe ©2015 Google.

Legend:
Ward Boundary

Snow Depth
Very Low
Low
Moderate
High
Very High

N

Hail Strom Hazard Perception : Shimla City



Scale:
0 1 km

Datum: WGS 84
Projection: Mercator

Source:
Primary Survey By TARU (2015).
TARU Analysis (2015).

Background Images: Imagery ©2015 DigitalGlobe ©2015 Google.

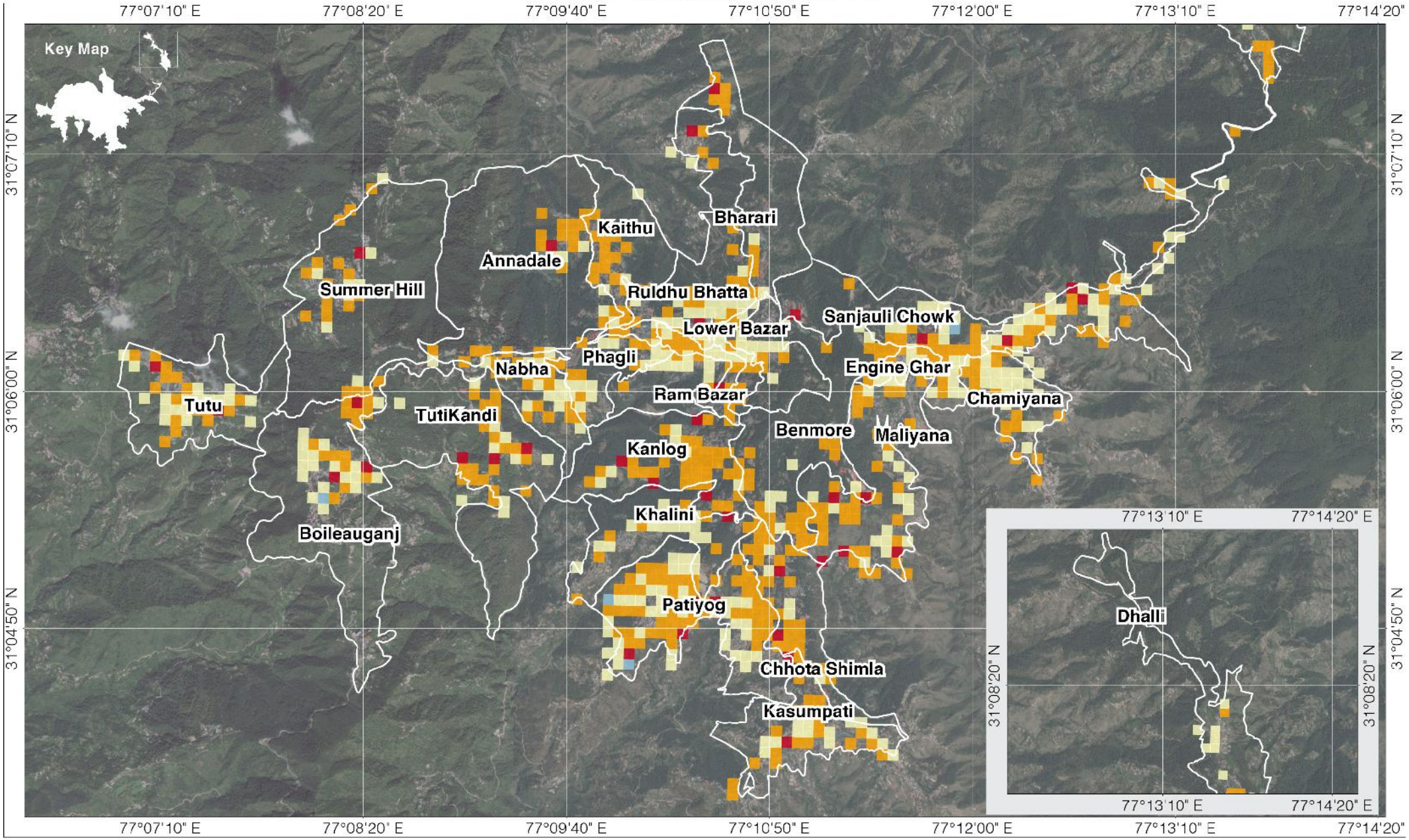
Legend:
Ward Boundary

Hail Strom Hazard Perception
Very Low
Low
Moderate
High
Very High

N

C. Vulnerability

Building Vulnerability : Shimla City



Scale:
0 1 km

Datum: WGS 84
Projection: Mercator

Source:
Primary Survey By TARU (2015).
TARU Analysis (2015).

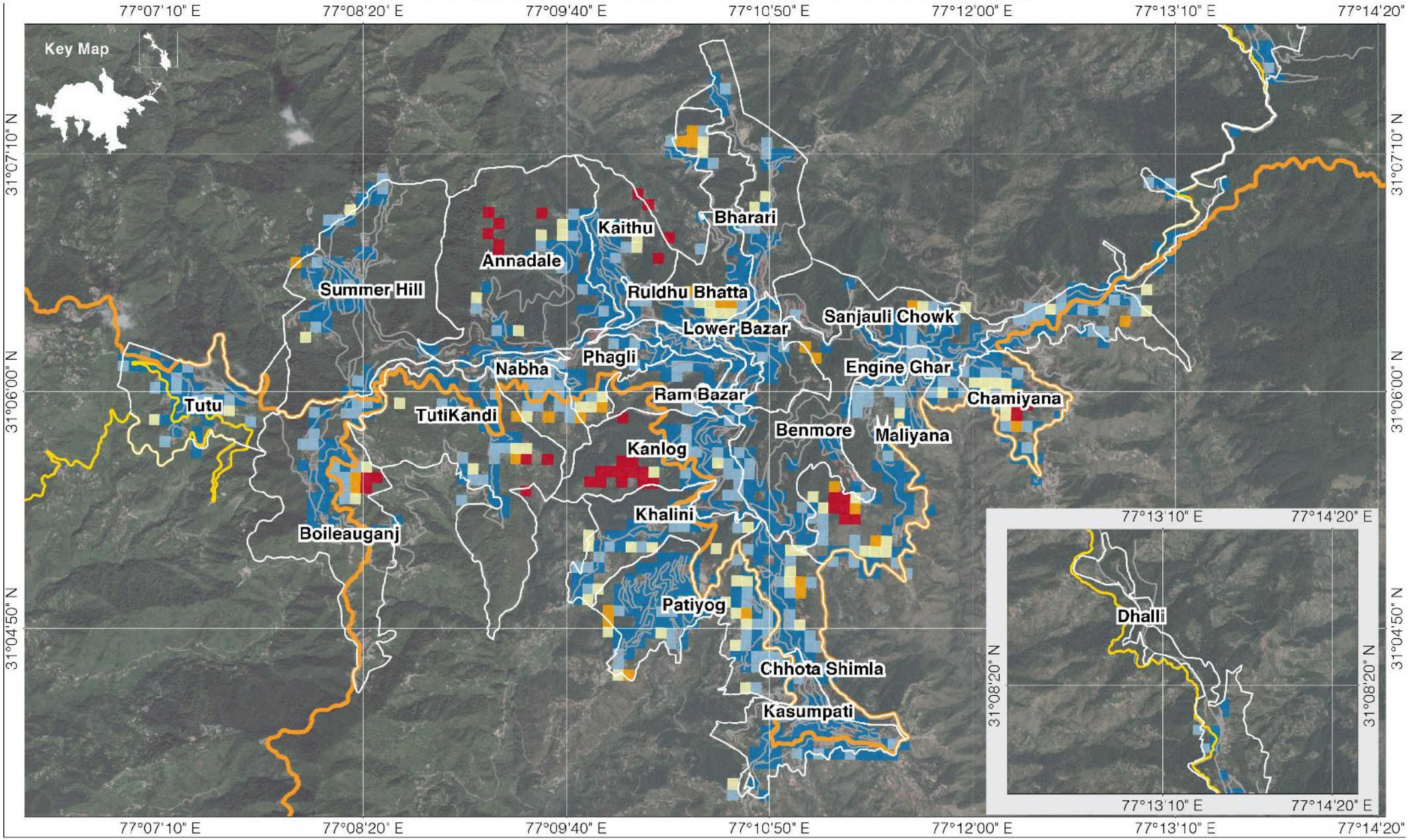
Background Images: Imagery ©2015 DigitalGlobe ©2015 Google.

Legend:
Ward Boundary

Building Vulnerability
Very Low
Low
Moderate
High
Very High

N

Areas Which Are Inaccessible To Motorable Roads : Shimla City



Scale:
0 1 km

Datum: WGS 84
Projection: Mercator

Source:
Primary Survey By TARU (2015).
TARU Analysis (2015).

Background Images: Imagery ©2015 DigitalGlobe ©2015 Google.

Legend:

Ward Boundary

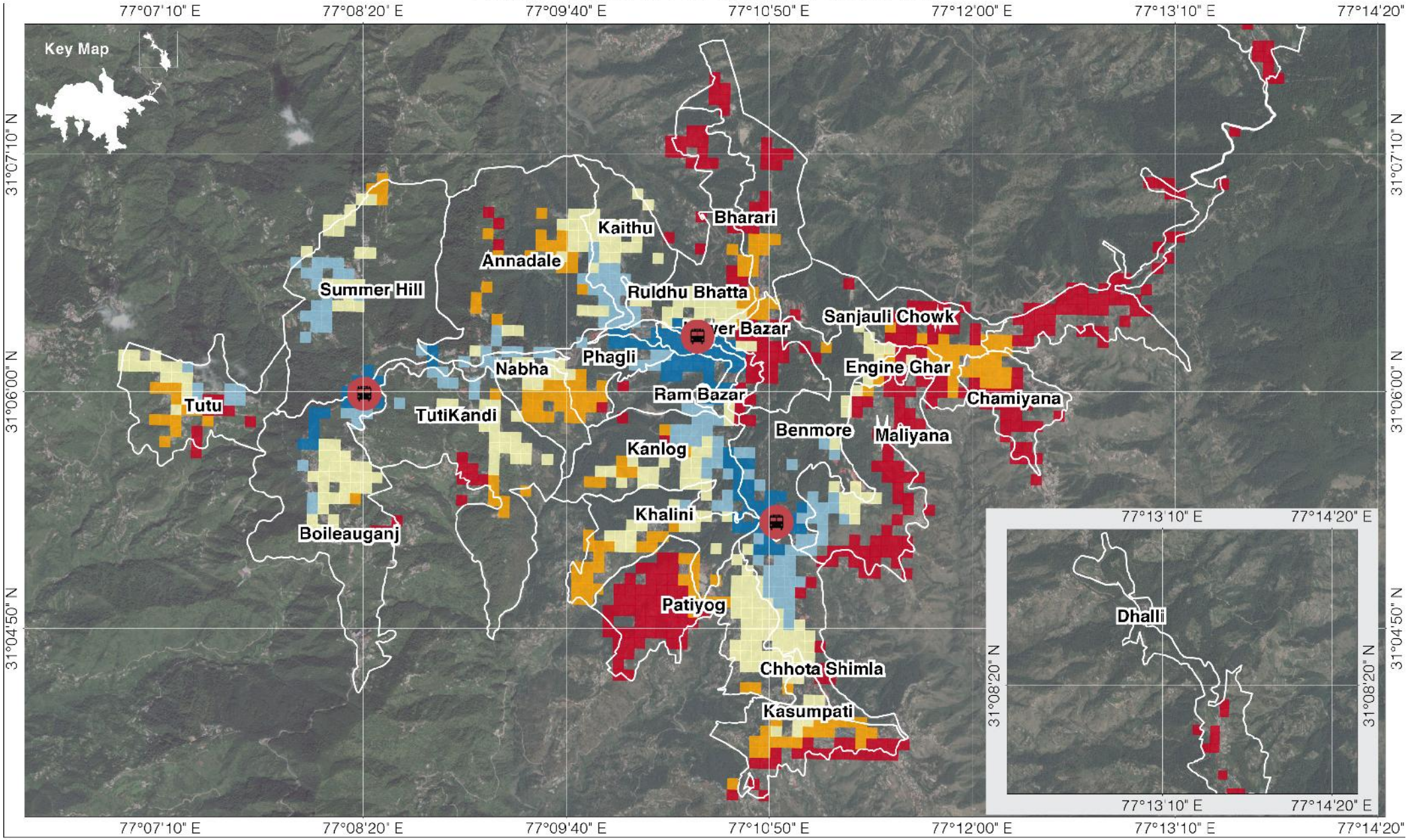
National Highway
State Highway
Other City Roads

Area inaccessible to motorable roads

Very Low
Low
Moderate
High
Very High

N

Limited Access To Fire Services : Shimla City



Scale:
0 1 km

Datum: WGS 84
Projection: Mercator

Source:

Primary Survey By TARU (2015) TARU Analysis (2015).
Note: Distance varies from Very Low (0 - 1 Km), Low (1 - 2 Km), Moderate (2 - 3 Km), High (3 -4 Km) to Very High (> 4 Km) *Kilometer (Km).

Background Images: Imagery ©2015 DigitalGlobe ©2015 Google.

Legend:

Ward Boundary

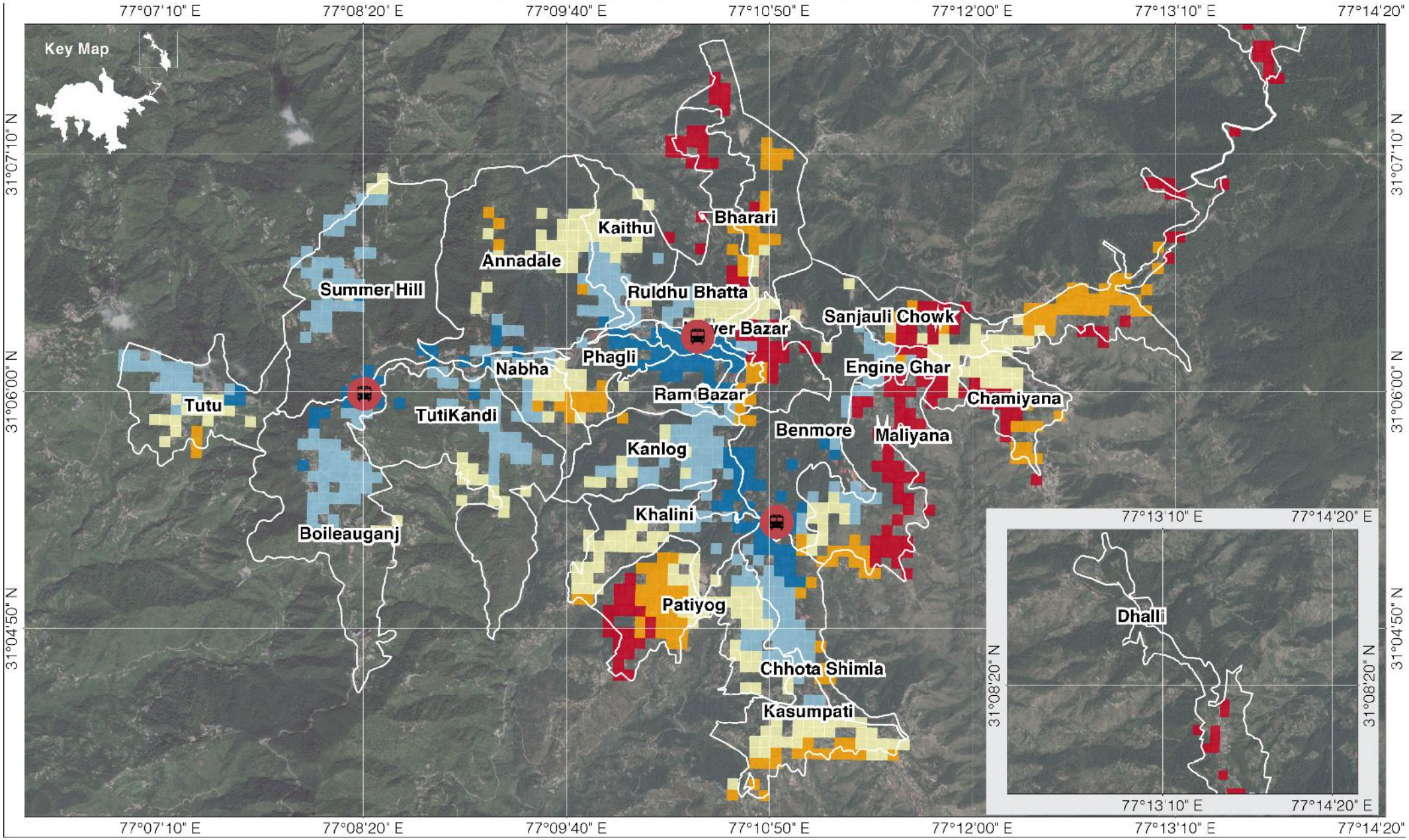
Fire Stations

Fire emergency services accessibility by distance

Very Low
Low
Moderate
High
Very High

N

Time Taken By Nearest Fire Service To Respond : Shimla City



Scale:
0 1 km
Datum: WGS 84
Projection: Mercator

Source:
Primary Survey By TARU (2015) TARU Analysis (2015).
Note: Duration varies from Very Low (0 - 5 min), Low (5 - 10 min), Moderate (10 - 15 min), High (15 - 20 min) to Very High (> 20 min) *Minutes (min).

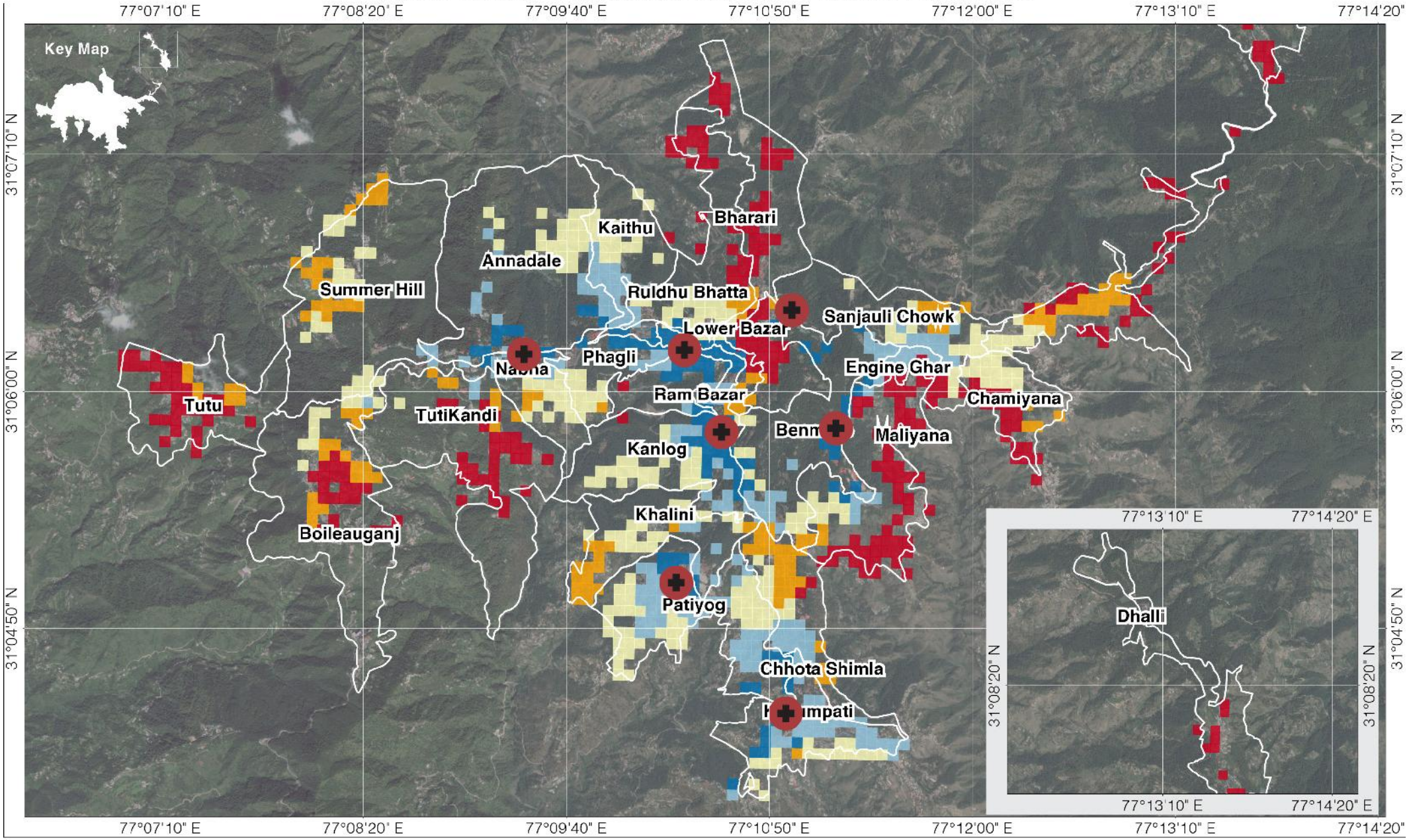
Background Images: Imagery ©2015 DigitalGlobe ©2015 Google.

Legend:
Ward Boundary
Fire Stations

Fire emergency services accessibility by duration
Very Low
Low
Moderate
High
Very High

N

Limited Access To Emergency Services - Hospitals : Shimla City



Scale:
0 1 km

Datum: WGS 84
Projection: Mercator

Source:
Primary Survey By TARU (2015) TARU Analysis (2015).
Note: Distance varies from Very Low (0 - 1 Km), Low (1 - 2 Km), Moderate (2 - 3 Km), High (3 - 4 Km) to Very High (> 4 Km) *Kilometer (Km).

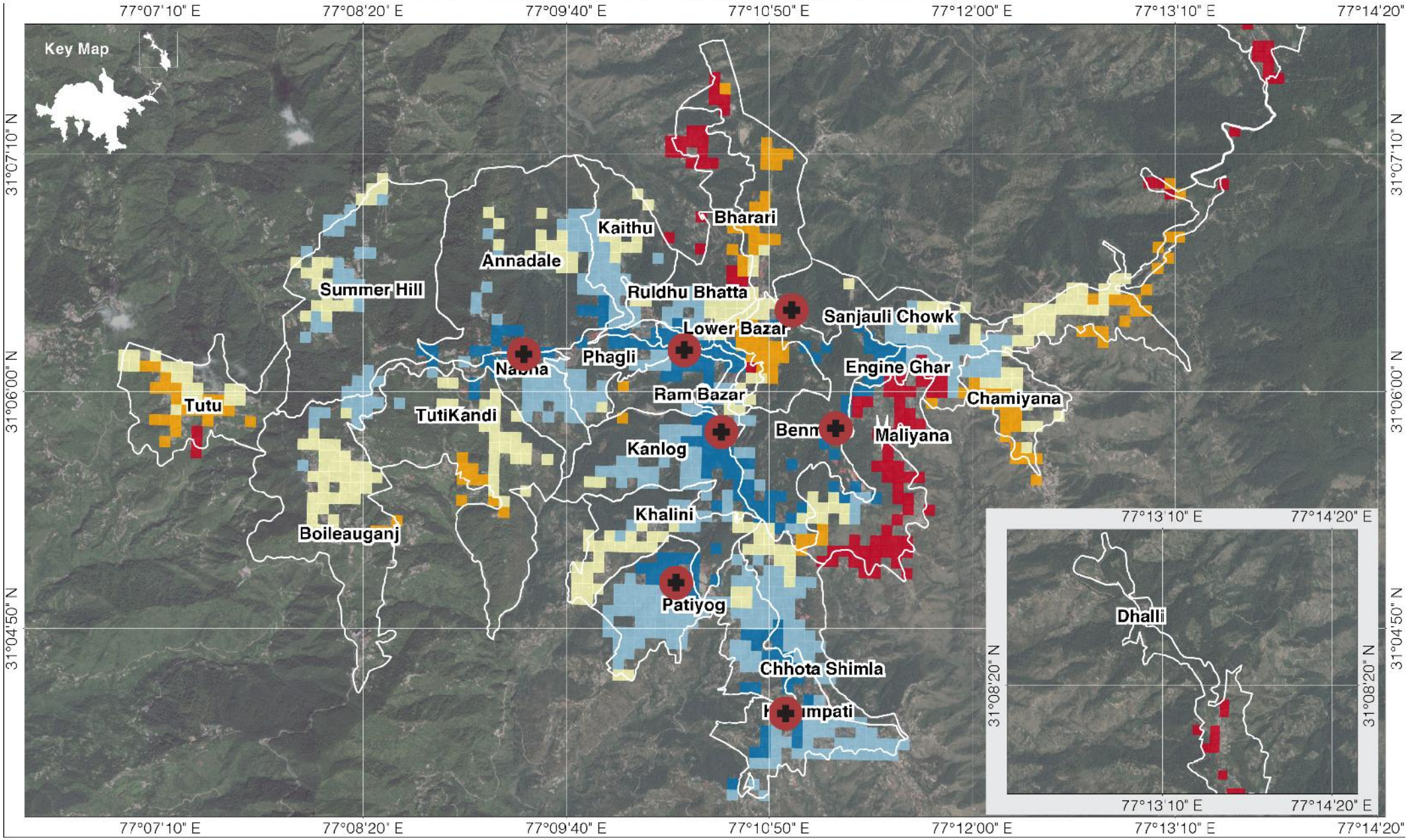
Background Images: Imagery ©2015 DigitalGlobe ©2015 Google.

Legend:
Ward Boundary
Hospitals

Medical emergency services accessibility by distance
Very Low
Low
Moderate
High
Very High

N

Time Taken By Nearest Hospital To Respond : Shimla City



Scale:
0 1 km

Datum: WGS 84
Projection: Mercator

Source:
Primary Survey By TARU (2015) TARU Analysis (2015).
Note: Duration varies from Very Low (0 - 5 min), Low (5 - 10 min), Moderate (10 - 15 min), High (15 - 20 min) to Very High (> 20 min) *Minutes (min).

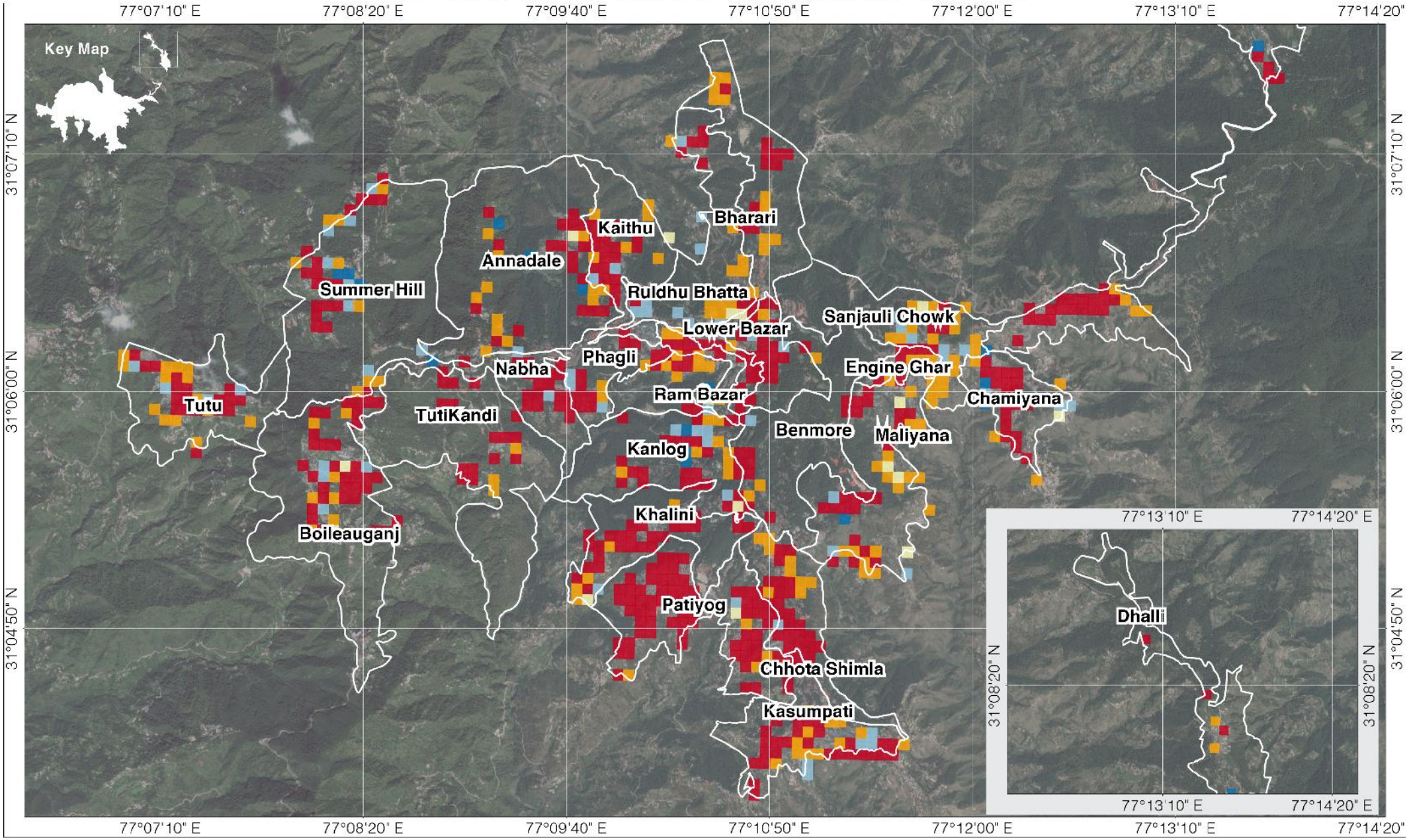
Background Images: Imagery ©2015 DigitalGlobe ©2015 Google.

Legend:
Ward Boundary
Hospitals

Medical emergency services accessibility by duration
Very Low
Low
Moderate
High
Very High

N

Water Supply Service Level Deficiency (Hot Spots) : Shimla City



Scale:
0 1 km

Datum: WGS 84
Projection: Mercator

Source:
Primary Survey By TARU (2015) TARU Analysis (2015).
Note:Water supply hot spots are calculated from primary survey at household level. Parameters considered were: sources of water supply, duration of supply, time taken to collect water, who within the family collects the water, availability of water storage within the house, if the storage is covered or not. The cumulative index is represented in this map.
Background Images: Imagery ©2015 DigitalGlobe ©2015 Google.

Legend:

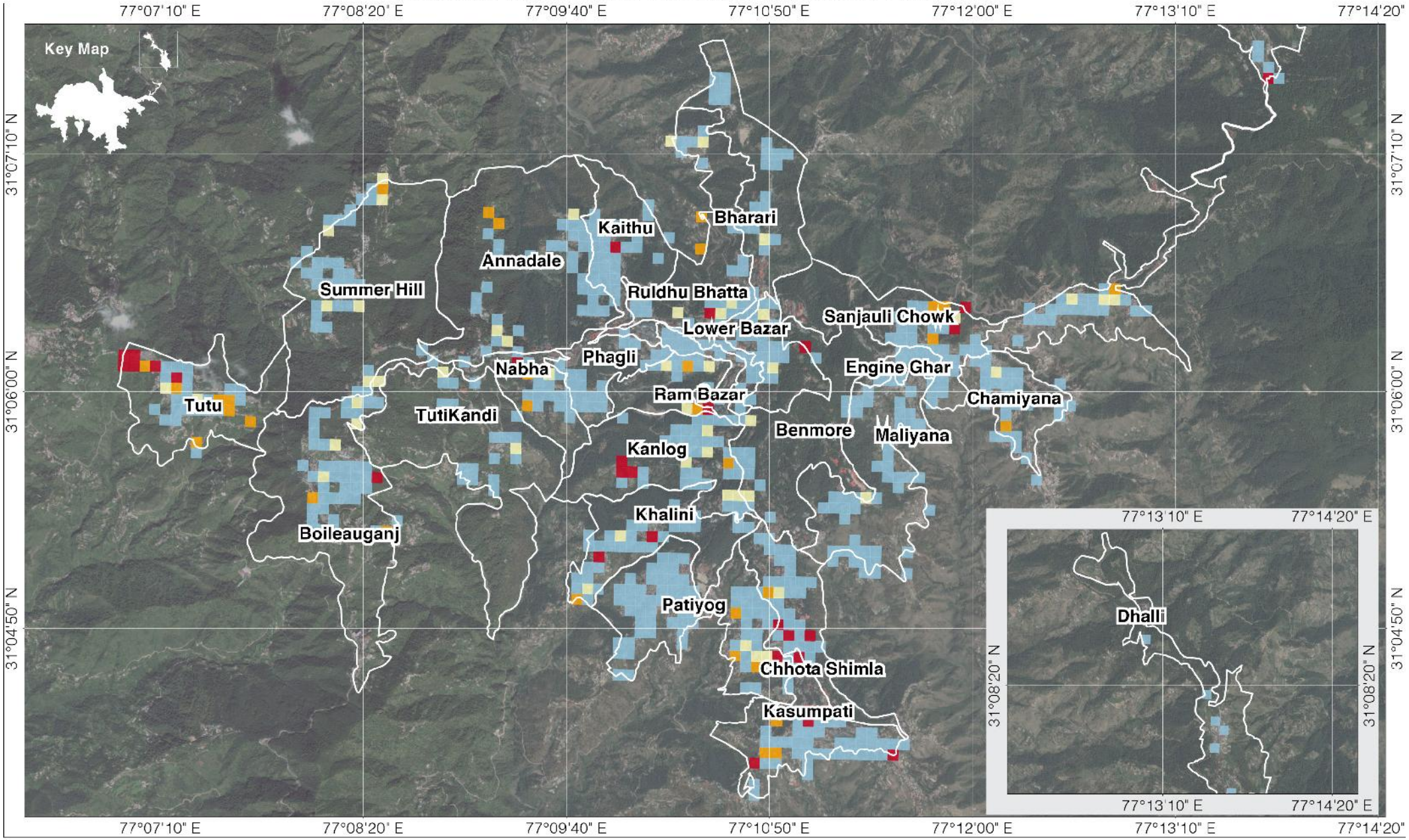
Ward Boundary

Water Supply Service Level Deficiency

Very Low	High
Low	Very High
Moderate	

N

Sanitation Service Level Deficiency (Hot-Spots) : Shimla City



Scale:
0 1 km

Datum: WGS 84
Projection: Mercator

Source:
Primary Survey By TARU (2015).
TARU Analysis (2015).

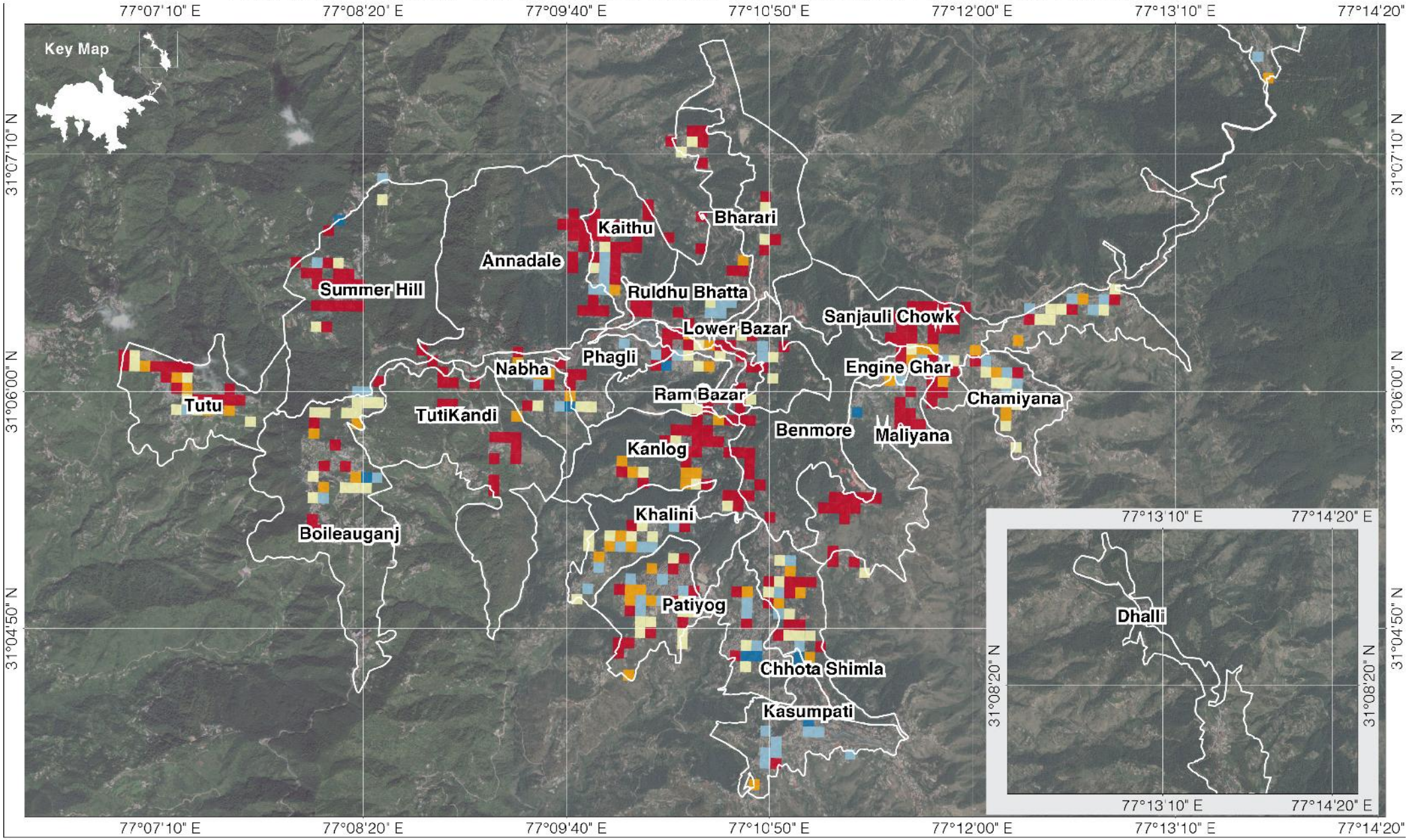
Background Images: Imagery ©2015 DigitalGlobe ©2015 Google.

Legend:
Ward Boundary

Sanitation Service Level Deficiency
Very Low
Low
Moderate
High
Very High

N

Percentage Population That Will Require Special Attention During / Post Disaster : Shimla City



Scale:
0 1 km

Datum: WGS 84
Projection: Mercator

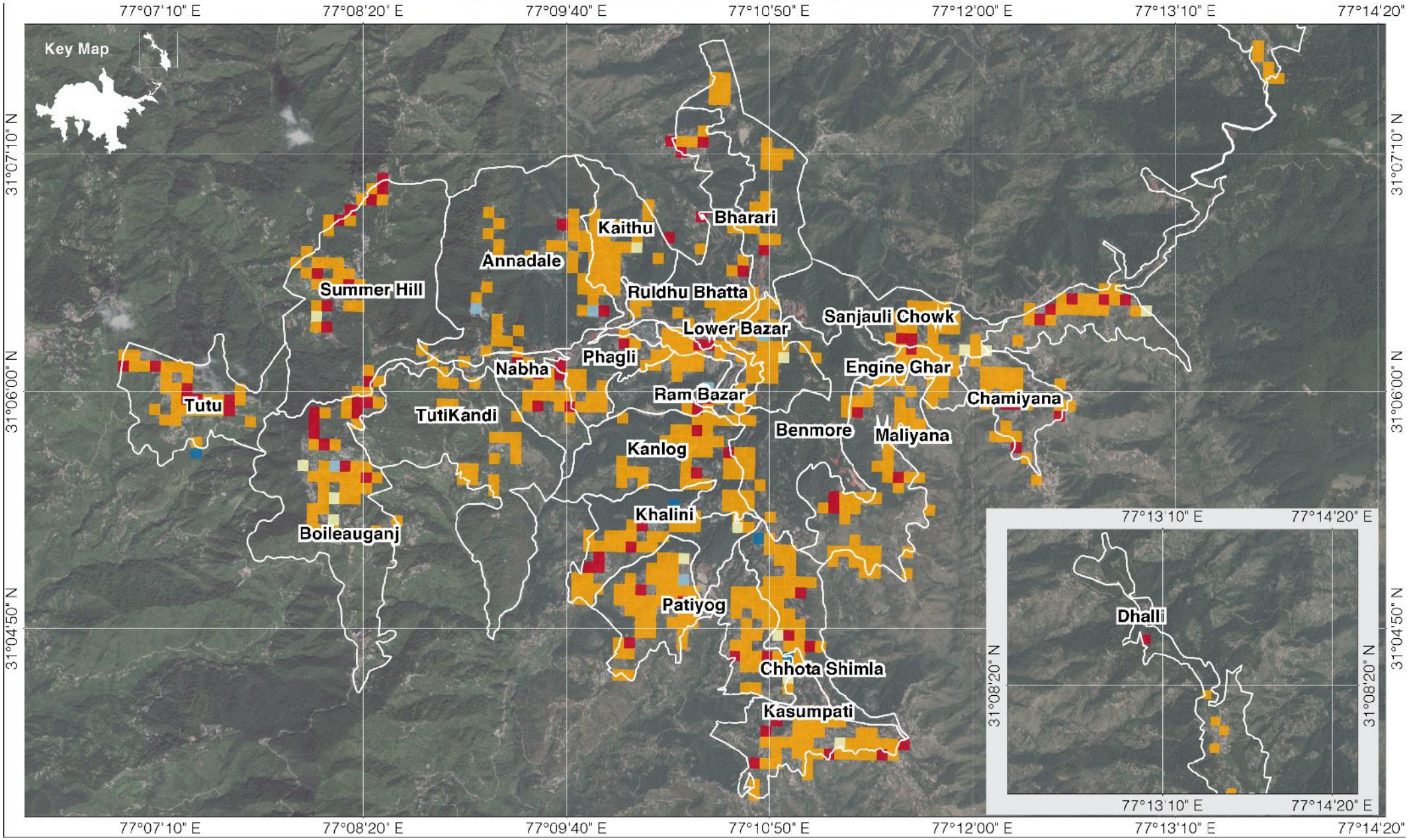
Source:
Primary Survey By TARU (2015).
TARU Analysis (2015).
Note: Map is based on household survey. Indicator used was people suffering from physical illness or disability from 0 to 100 percent (Very Low to Very High).
Background Images: Imagery ©2015 DigitalGlobe ©2015 Google.

Legend:
Ward Boundary

% Population Require Special Attention
Very Low
Low
Moderate
High
Very High

N

Economic Vulnerability Of Households : Shimla City



Scale:
0 1 km

Datum: WGS 84
Projection: Mercator

Source:
Primary Survey By TARU (2015).
TARU Analysis (2015).

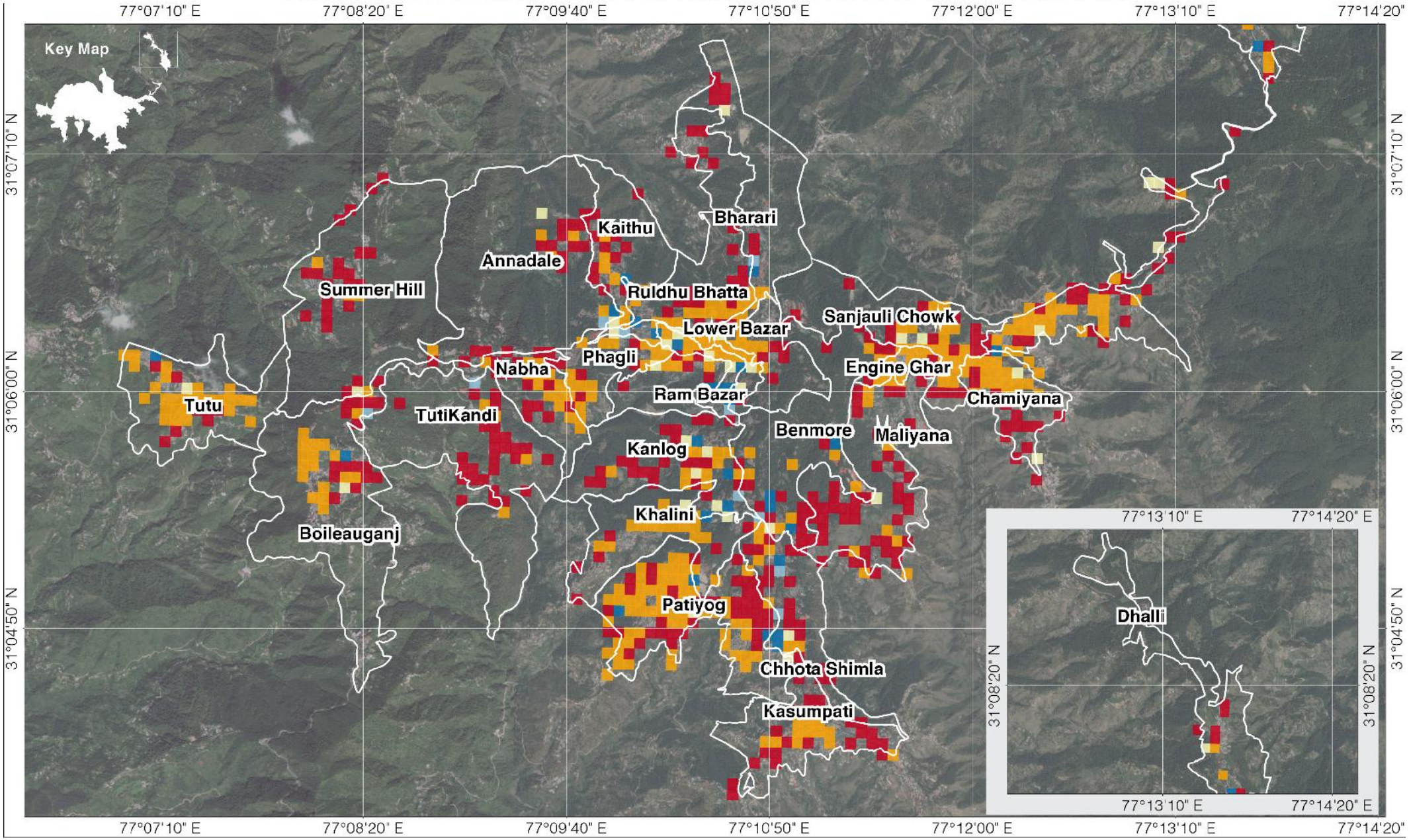
Background Images: Imagery ©2015 DigitalGlobe ©2015 Google.

Legend:
Ward Boundary

Economic Vulnerability
Very Low
Low
Moderate
High
Very High

N

Vulnerability To Fire Hazard Based On Household Level Preparedness : Shimla City



Scale:
0 1 km

Datum: WGS 84
Projection: Mercator

Source:
Primary Survey By TARU (2015).
TARU Analysis (2015).

Background Images: Imagery ©2015 DigitalGlobe ©2015 Google.

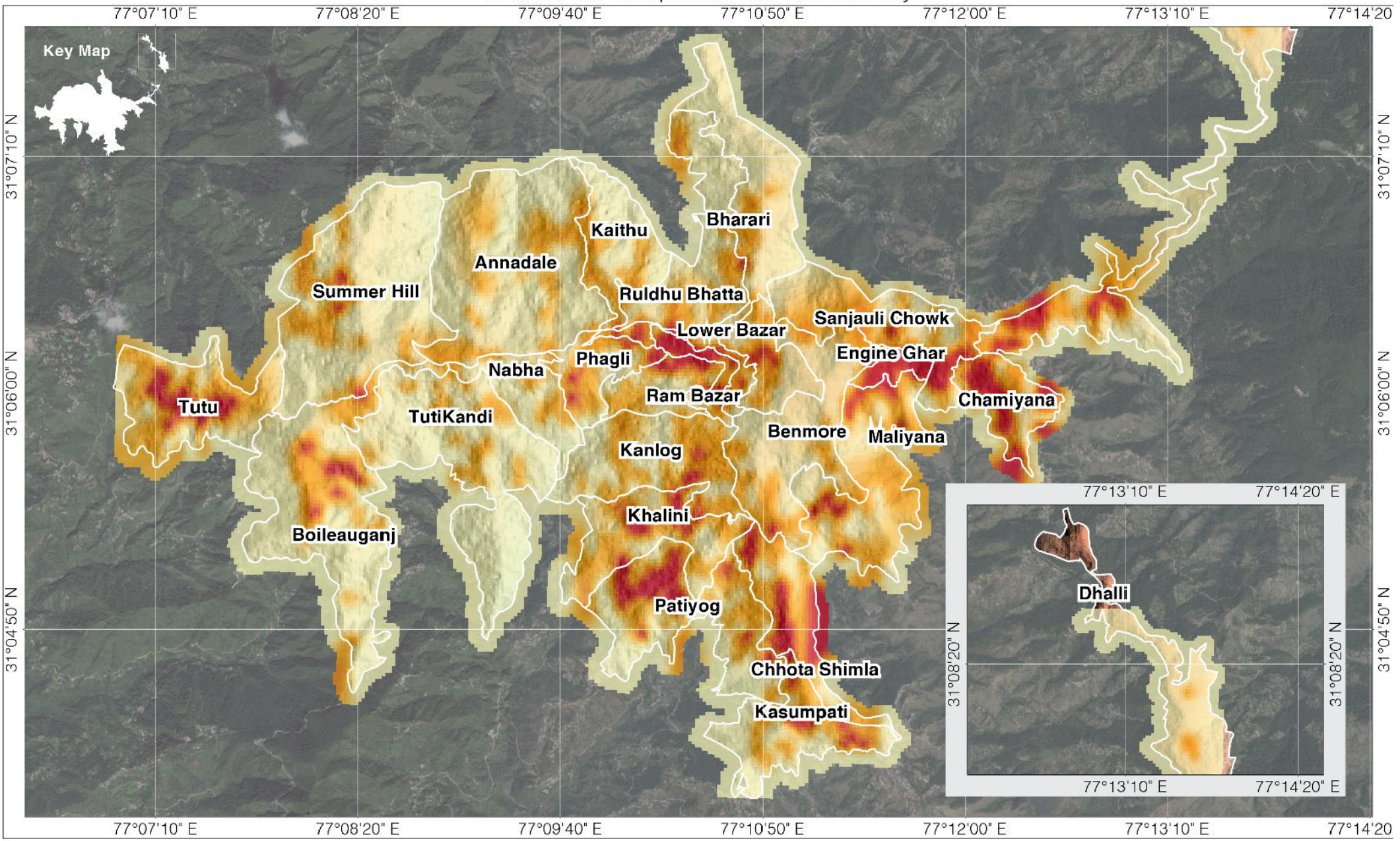
Legend:
Ward Boundary

Preparedness to Fight Fire Hazard
Very Low
Low
Moderate
High
Very High

N

D. Risk

Annualized Composite Risk : Shimla City



Scale:
0 1 km

Datum: WGS 84
Projection: Mercator

Source:
Primary Survey By TARU (2015), TARU Analysis (2015).
Note: The composite risk shown here is cumulative result of hazard and vulnerability calculated as a product of each of the hazards.

Background Images: Imagery ©2015 DigitalGlobe ©2015 Google.

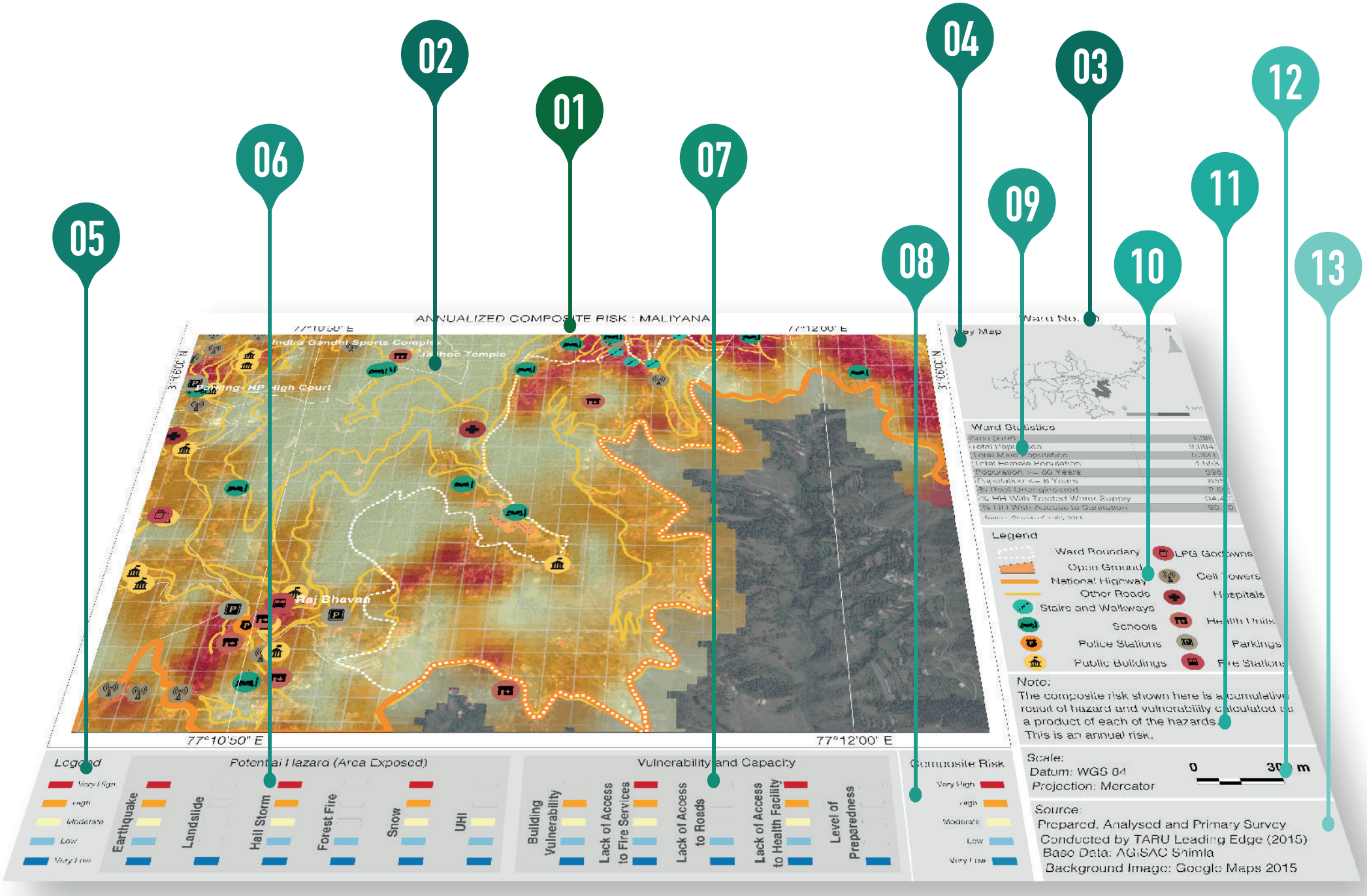
Legend:
Ward Boundary

Annualized Composite Risk
Very Low
Low
Moderate
High
Very High

N

2

Ward Level Maps


01
02
03
04
05
06
07
08
09
10
11
12
13
ANNUALIZED COMPOSITE RISK : MALIYANA
77°10'50" E
77°12'00" E
31°06'00" N
31°04'50" N
Indira Gandhi Sports Complex
Jakhoo Temple
Raj Bhavan
Ward No.
Key Map
Ward Statistics
Legend
Ward Boundary
Open Ground
National Highway
Other Roads
Stairs and Walkways
Schools
Police Stations
Public Buildings
LPG Godowns
Cell Towers
Hospitals
Health Units
Parkings
Fire Stations
Note:
The composite risk shown here is a cumulative result of hazard and vulnerability calculated as a product of each of the hazards.
This is an annual risk.
Scale:
Datum: WGS 84
Projection: Mercator
0
30 m
Source:
Prepared, Analysed and Primary Survey Conducted by TARU Leading Edge (2015)
Base Data: AGiSAC Shimla
Background Image: Google Maps 2015
Legend
Very High
High
Moderate
Low
Very Low
Potential Hazard (Area Exposed)
Earthquake
Landslide
Hail Storm
Forest Fire
Snow
UHI
Vulnerability and Capacity
Building Vulnerability
Lack of Access to Fire Services
Lack of Access to Roads
Lack of Access to Health Facility
Level of Preparedness
Composite Risk

How to read ward maps

01 Main Title of the Map

02 Main Map Area

03 Ward Number

04 Key Map

05 Legend

06 Hazard Exposure Levels Within this ward

07 Vulnerability Levels within this ward

08 Composite Risk

09 Ward Specific Statistics

10 Legend for Capacity and Other Indicators

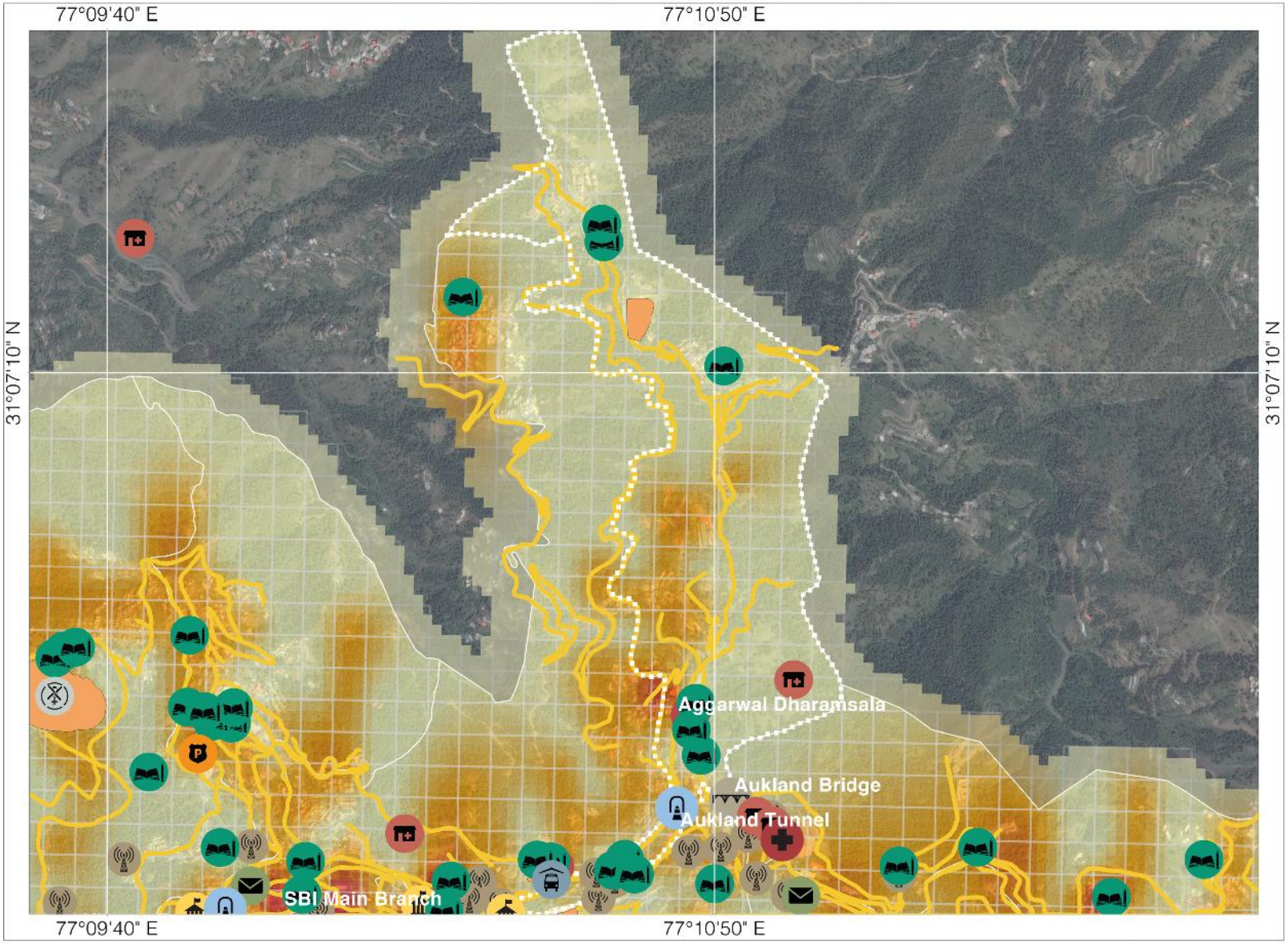
11 Notes about the main map

12 Scale and Projection system used

13 Sources of the information used

ANNUALIZED COMPOSITE RISK : BHARARI

Ward No. 1



Ward Statistics

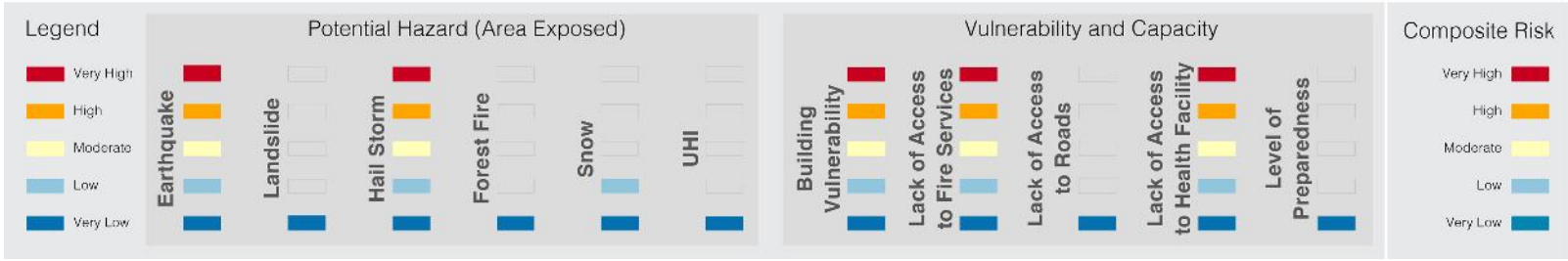
Area (km²)	1.11
Total Population	4,113
Total Male Population	2,174
Total Female Population	1,939
Population >= 60 Years	249
Population <= 6 Years	276
% Roof Unengineered	4.50
% HH With Treated Water Supply	94.10
% HH With Access to Sanitation	97.80

Source: Census of India, 2011

Legend

- Ward Boundary
- Open Ground
- Other Roads
- Schools
- Health Units
- Police Stations
- Post Offices
- Cell Towers
- Tunnels
- Hospitals
- Bridges
- Helipad
- Bus Stations

Note:
The composite risk shown here is a cumulative result of hazard and vulnerability calculated as a product of each of the hazards.
This is an annual risk.



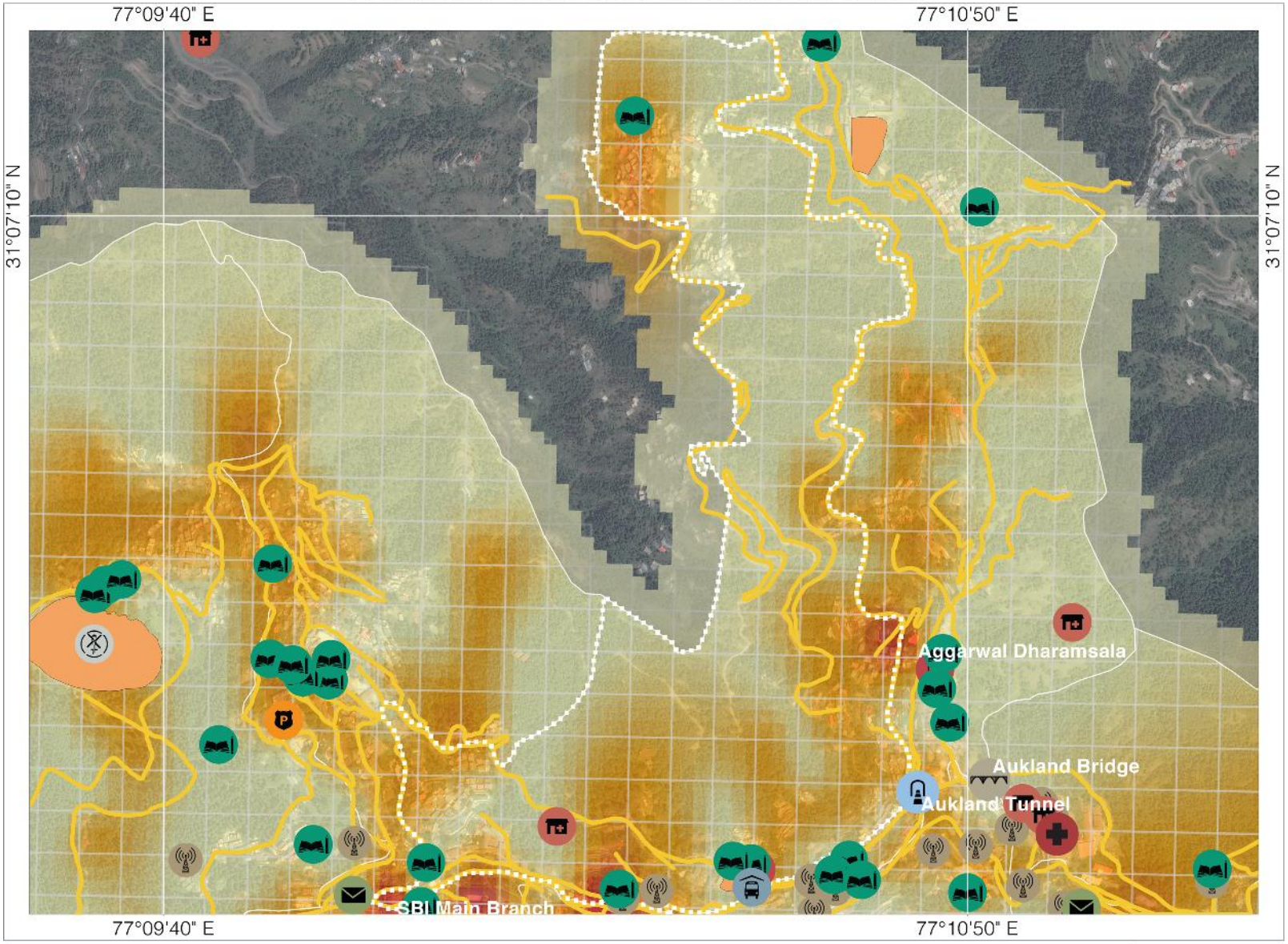
Scale:
Datum: WGS 84
Projection: Mercator

0 500 m

Source:
Prepared, Analysed and Primary Survey Conducted by TARU Leading Edge (2015)
Base Data: AGiSAC Shimla
Background Image: Google Maps 2015

ANNUALIZED COMPOSITE RISK : RULDHU BHATTA

Ward No. 2



Ward Statistics

Area (km²)	1.13
Total Population	6,839
Total Male Population	3,797
Total Female Population	3,042
Population >= 60 Years	414
Population <= 6 Years	563
% Roof Unengineered	13.90
% HH With Treated Water Supply	93
% HH With Access to Sanitation	85.20

Source: Census of India, 2011

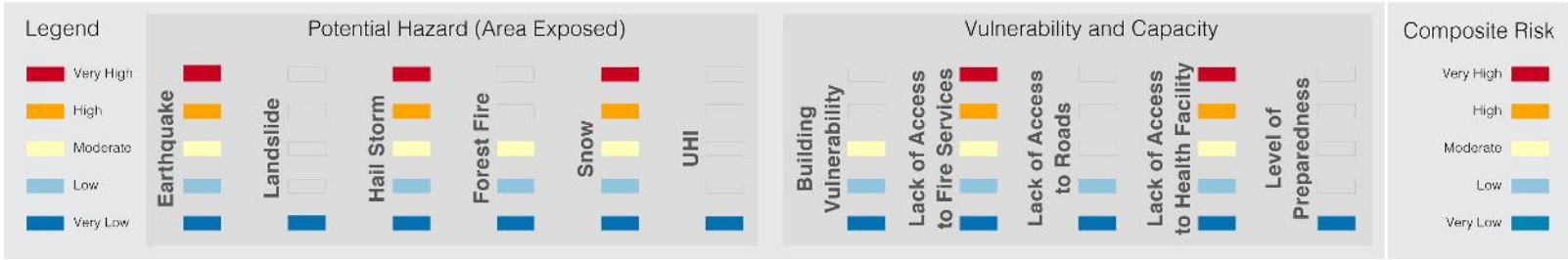
Legend

- Ward Boundary
- Open Ground
- Other Roads
- Schools
- Health Units
- Police Stations
- Post Offices
- Cell Towers
- Tunnels
- Hospitals
- Bridges
- Helipad
- Bus Stations

Note:
The composite risk shown here is a cumulative result of hazard and vulnerability calculated as a product of each of the hazards.
This is an annual risk.

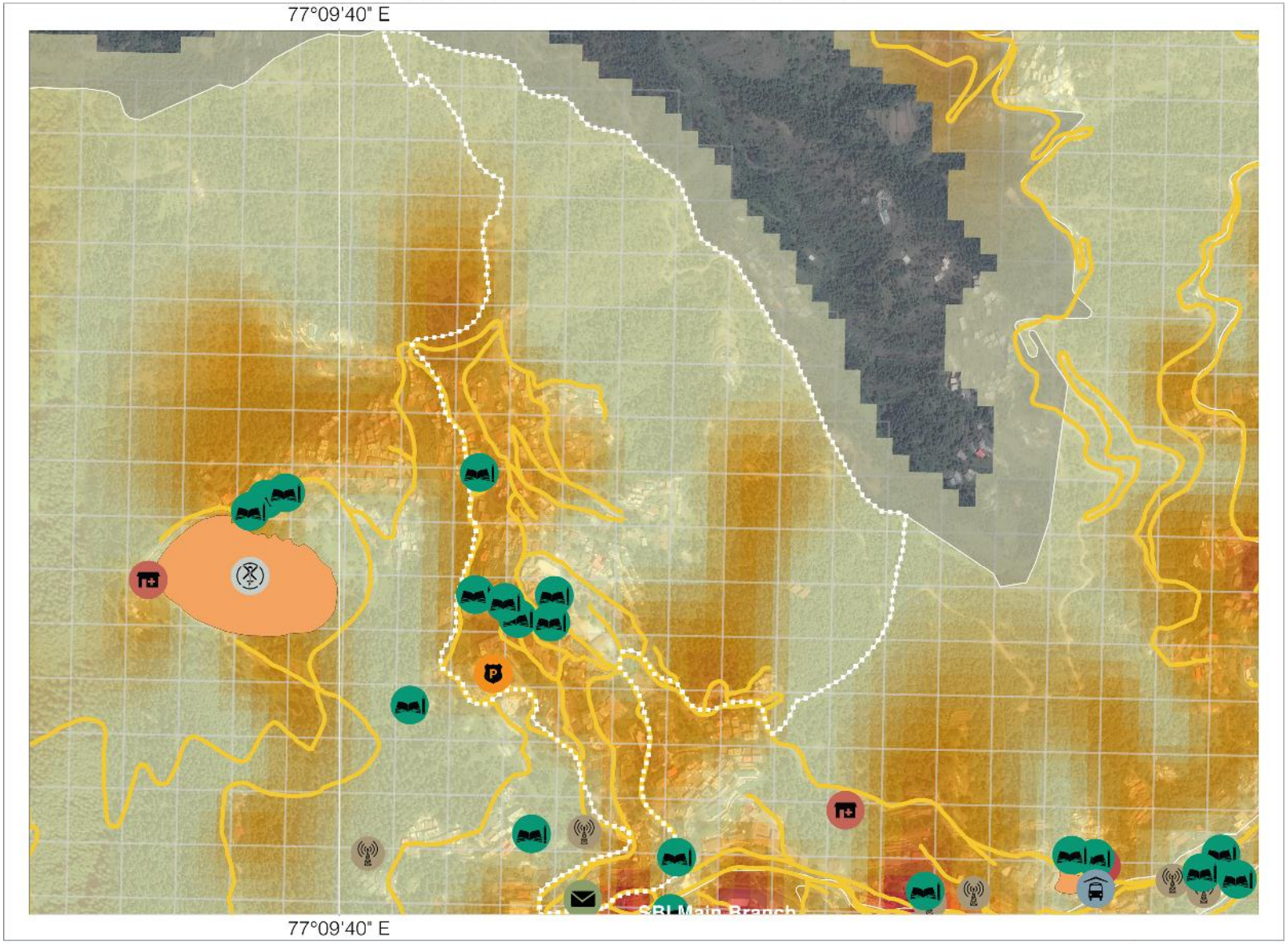
Scale:
Datum: WGS 84
Projection: Mercator
0 300 m

Source:
Prepared, Analysed and Primary Survey Conducted by TARU Leading Edge (2015)
Base Data: AGiSAC Shimla
Background Image: Google Maps 2015



ANNUALIZED COMPOSITE RISK : KAITHU

Ward No. 3



Key Map

Ward Statistics

Area (km²)	0.73
Total Population	4,298
Total Male Population	2,361
Total Female Population	1,937
Population >= 60 Years	260
Population <= 6 Years	277
% Roof Unengineered	24.10
% HH With Treated Water Supply	94.70
% HH With Access to Sanitation	88

Source: Census of India, 2011

Legend

- Ward Boundary
- Open Ground
- Other Roads
- Schools
- Health Units
- Police Stations
- Cell Towers
- Hospitals
- Helipad
- Bus Stations
- Post Offices

Note:
The composite risk shown here is a cumulative result of hazard and vulnerability calculated as a product of each of the hazards.
This is an annual risk.

Scale:
Datum: WGS 84
Projection: Mercator
0 300 m

Source:
Prepared, Analysed and Primary Survey Conducted by TARU Leading Edge (2015)
Base Data: AGiSAC Shimla
Background Image: Google Maps 2015

Legend

Very High
High
Moderate
Low
Very Low

Potential Hazard (Area Exposed)

Earthquake
Landslide
Hail Storm
Forest Fire
Snow
UHI

Vulnerability and Capacity

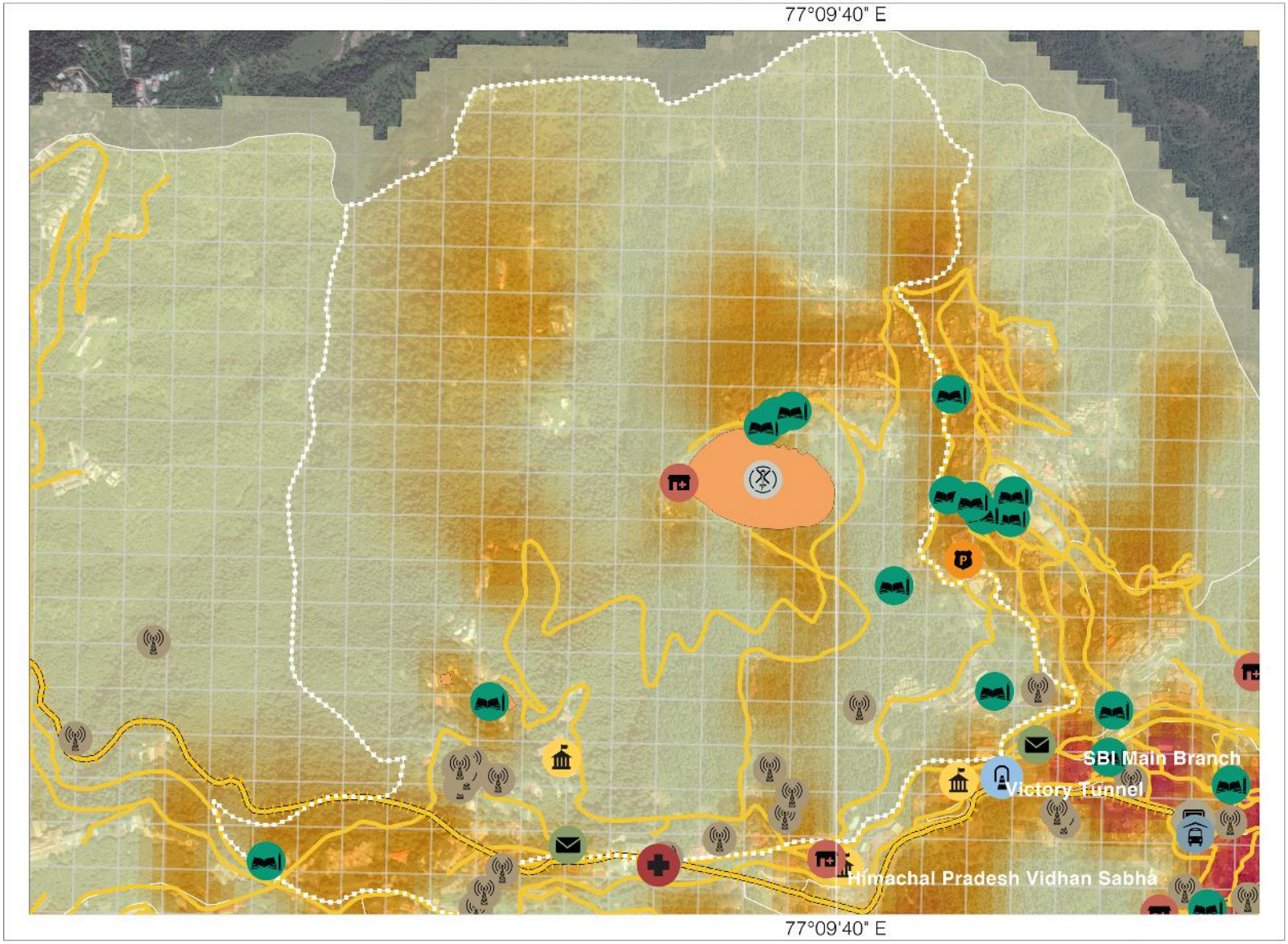
Building Vulnerability
Lack of Access to Fire Services
Lack of Access to Roads
Lack of Access to Health Facility
Level of Preparedness

Composite Risk

Very High
High
Moderate
Low
Very Low

ANNUALIZED COMPOSITE RISK : ANNADALE

Ward No. 4



Ward Statistics

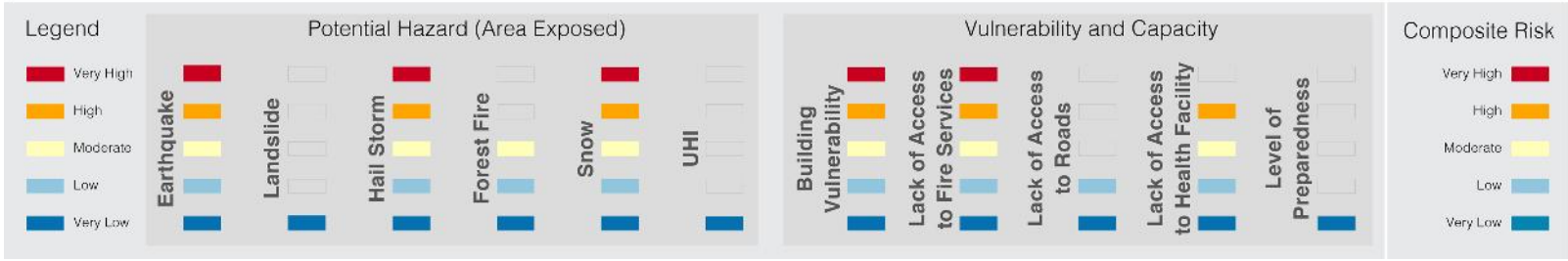
Area (km²)	2.46
Total Population	4,962
Total Male Population	2,682
Total Female Population	2,280
Population >= 60 Years	300
Population <= 6 Years	434
% Roof Unengineered	10.10
% HH With Treated Water Supply	92.60
% HH With Access to Sanitation	92.40

Source: Census of India, 2011

Legend

- Ward Boundary
- Open Ground
- Other Roads
- Railway Line
- Schools
- Health Units
- Police Stations
- Public Buildings
- Cell Towers
- Tunnels
- Hospitals
- Post Offices
- Helipad
- Bus Stations

Note:
The composite risk shown here is a cumulative result of hazard and vulnerability calculated as a product of each of the hazards.
This is an annual risk.



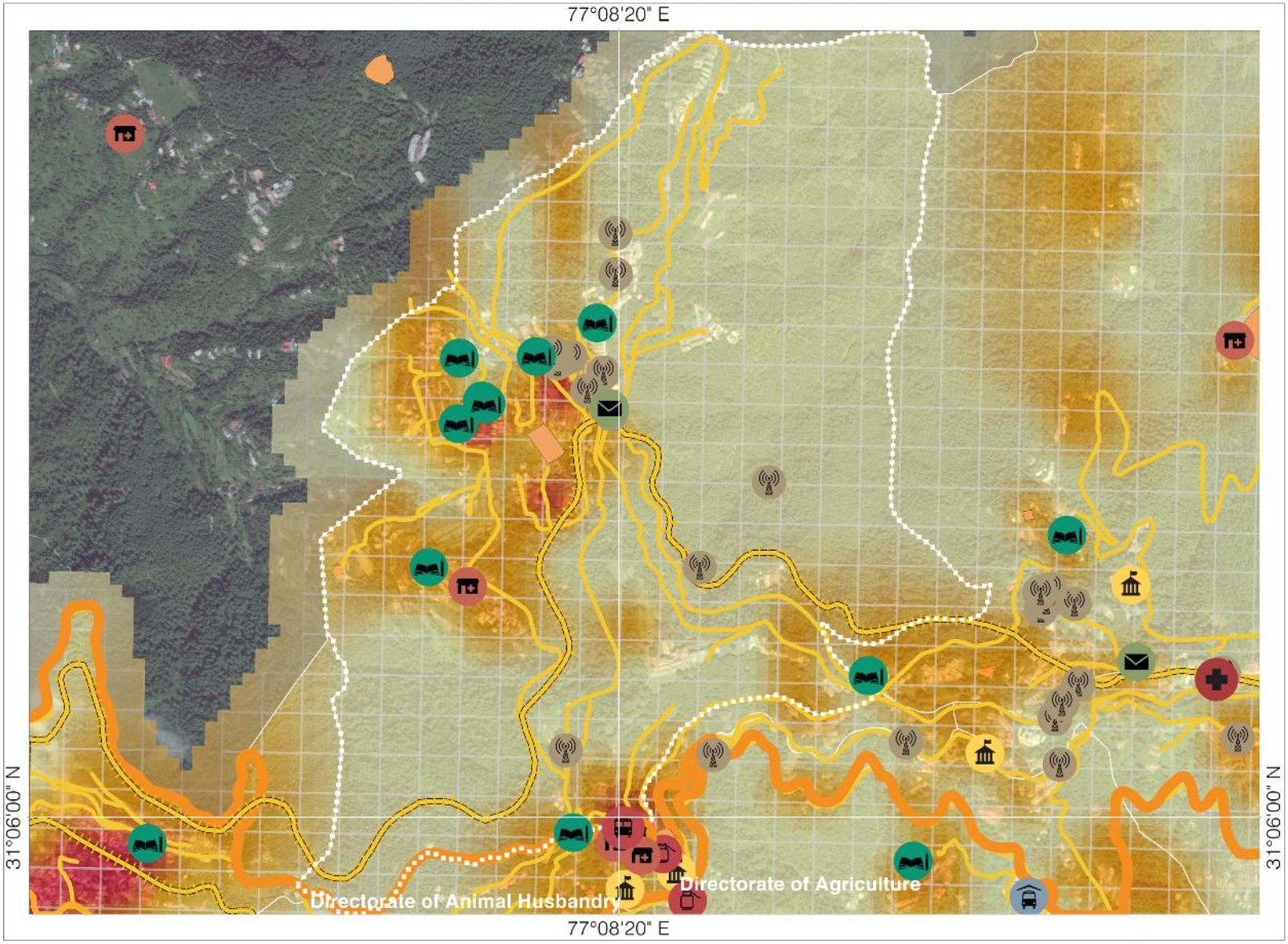
Scale:
Datum: WGS 84
Projection: Mercator

0 300 m

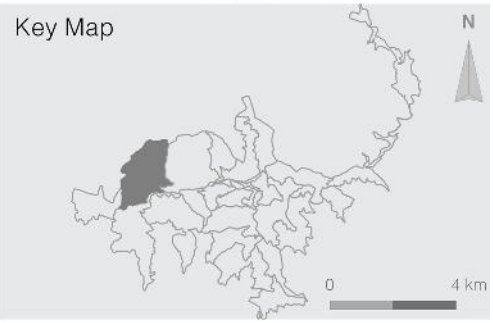
Source:
Prepared, Analysed and Primary Survey Conducted by TARU Leading Edge (2015)
Base Data: AGiSAC Shimla
Background Image: Google Maps 2015

ANNUALIZED COMPOSITE RISK : SUMMER HILL

Ward No. 5



Key Map



Ward Statistics

Area (km²)	2.38
Total Population	5,391
Total Male Population	2,478
Total Female Population	2,913
Population >= 60 Years	326
Population <= 6 Years	387
% Roof Unengineered	6.90
% HH With Treated Water Supply	99.50
% HH With Access to Sanitation	95.70

Source: Census of India, 2011

Legend

- Ward Boundary
- Open Ground
- National Highway
- Other Roads
- Railway Line
- Health Units
- Police Stations
- Public Buildings
- Schools
- Cell Towers
- LPG Godowns
- Hospitals
- Post Offices
- Helipad
- Bus Stations

Note:
The composite risk shown here is a cumulative result of hazard and vulnerability calculated as a product of each of the hazards.
This is an annual risk.

Scale:
Datum: WGS 84
Projection: Mercator

0 300 m

Source:
Prepared, Analysed and Primary Survey Conducted by TARU Leading Edge (2015)
Base Data: AGiSAC Shimla
Background Image: Google Maps 2015

Legend

Very High
High
Moderate
Low
Very Low

Potential Hazard (Area Exposed)

Earthquake
Landslide
Hail Storm
Forest Fire
Snow
UHI

Vulnerability and Capacity

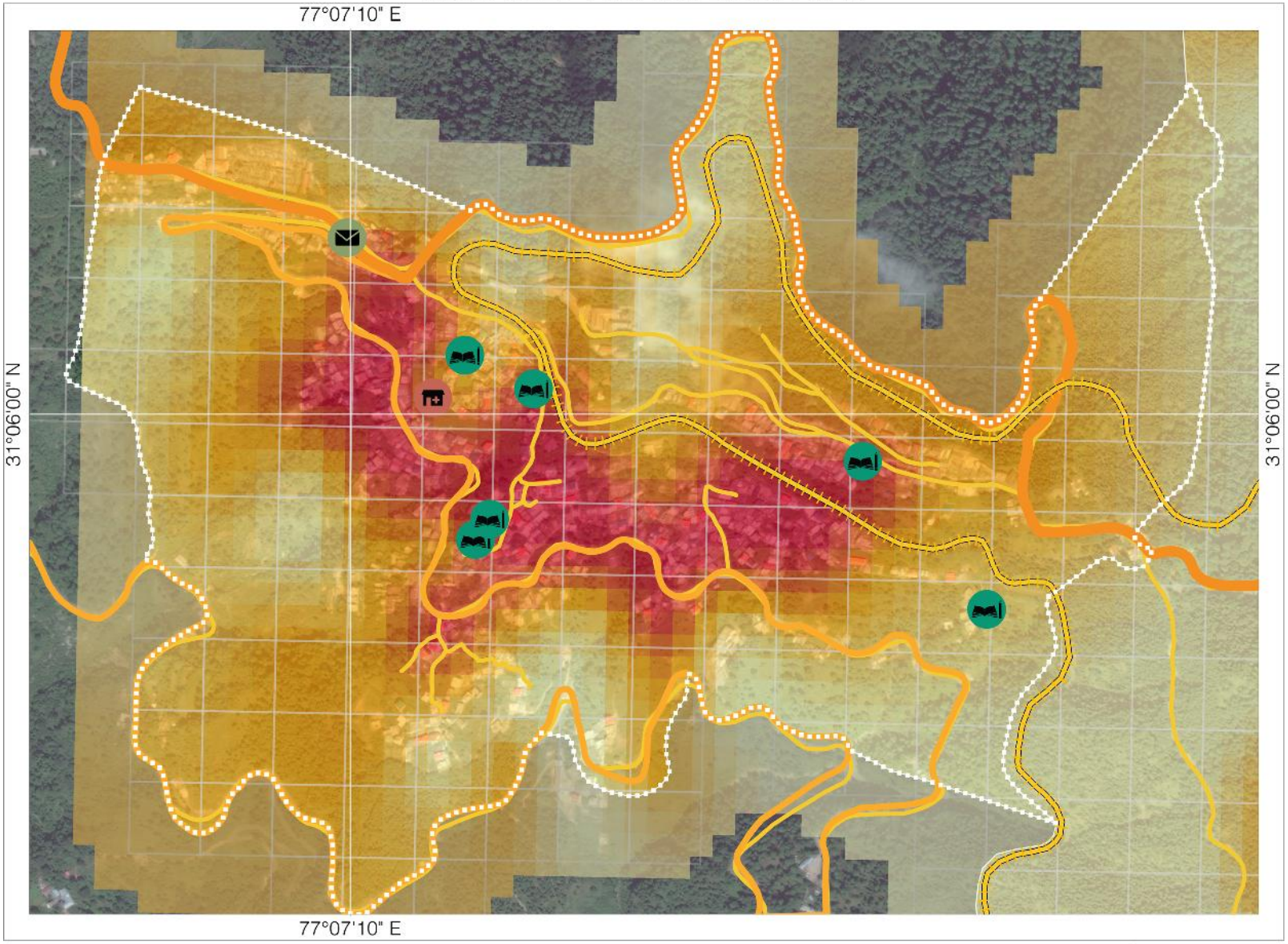
Building Vulnerability
Lack of Access to Fire Services
Lack of Access to Roads
Lack of Access to Health Facility
Level of Preparedness

Composite Risk

Very High
High
Moderate
Low
Very Low

ANNUALIZED COMPOSITE RISK : TUTU

Ward No. 6



Key Map

Ward Statistics

Area (km²)	1.13
Total Population	9,208
Total Male Population	5,118
Total Female Population	4,090
Population >= 60 Years	558
Population <= 6 Years	804
% Roof Unengineered	3.60
% HH With Treated Water Supply	97.20
% HH With Access to Sanitation	93.50

Source: Census of India, 2011

Legend

- Ward Boundary
- National Highway
- State Highway
- Other Roads
- Railway Line
- Schools
- Post Offices
- Health Units

Note:
The composite risk shown here is a cumulative result of hazard and vulnerability calculated as a product of each of the hazards.
This is an annual risk.

Scale:
Datum: WGS 84
Projection: Mercator
0 200 m

Source:
Prepared, Analysed and Primary Survey Conducted by TARU Leading Edge (2015)
Base Data: AGiSAC Shimla
Background Image: Google Maps 2015

Legend

Very High
High
Moderate
Low
Very Low

Potential Hazard (Area Exposed)

Earthquake
Landslide
Hail Storm
Forest Fire
Snow
UHI

Vulnerability and Capacity

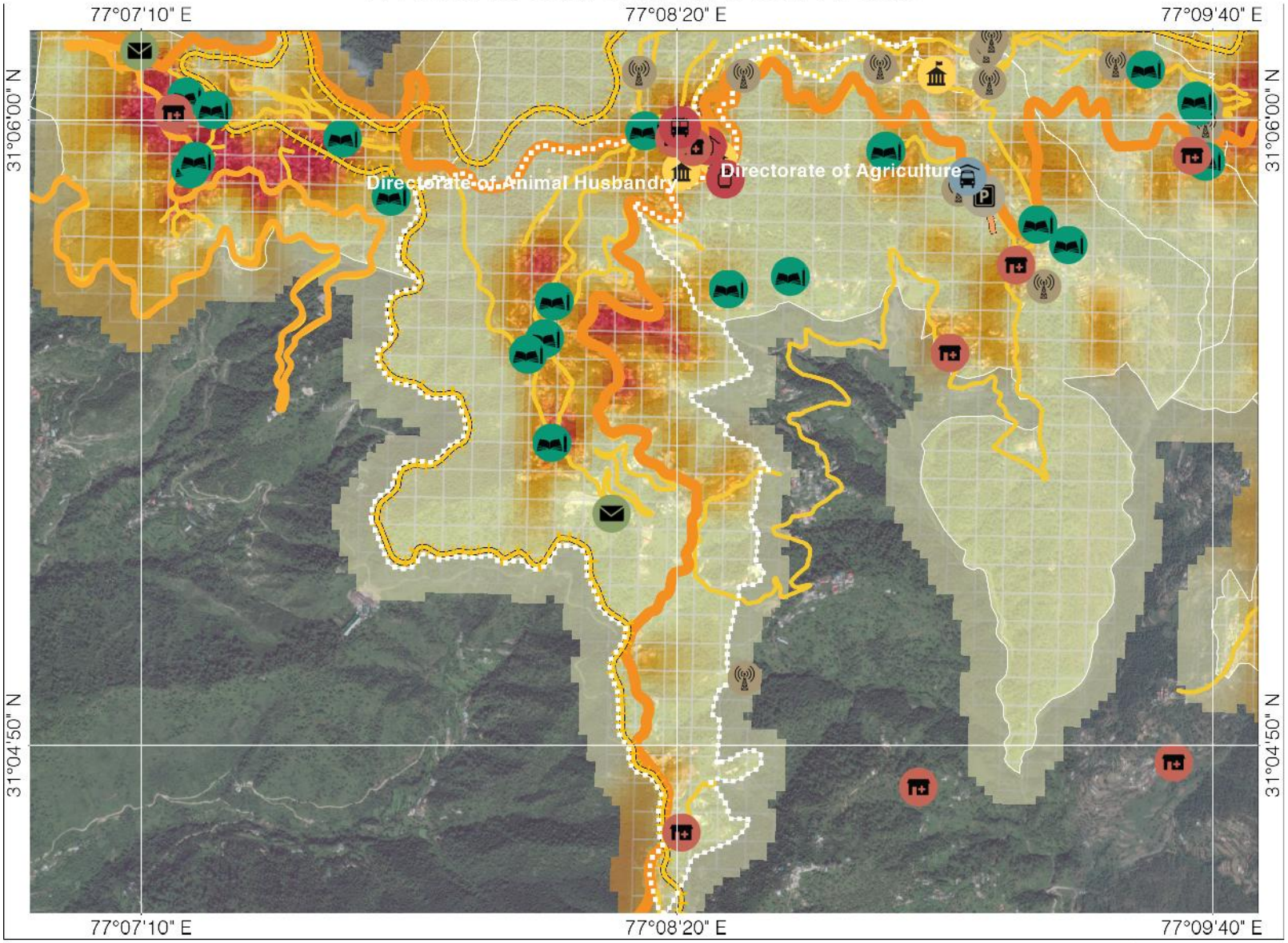
Building Vulnerability
Lack of Access to Fire Services
Lack of Access to Roads
Lack of Access to Health Facility
Level of Preparedness

Composite Risk

Very High
High
Moderate
Low
Very Low

ANNUALIZED COMPOSITE RISK : BOILEAUGANJ

Ward No. 7



Key Map

Ward Statistics

Area (km²)	2.09
Total Population	8,205
Total Male Population	4,543
Total Female Population	3,662
Population >= 60 Years	497
Population <= 6 Years	690
% Roof Unengineered	1.80
% HH With Treated Water Supply	97.40
% HH With Access to Sanitation	98.10

Source: Census of India, 2011

Legend

- Ward Boundary
- Open Ground
- National Highway
- State Highway
- Other Roads
- Railway Line
- Police Stations
- Public Buildings
- Schools
- Cell Towers
- LPG Godowns
- Health Units
- Post Offices
- Parkings
- Bus Stations

Note:
The composite risk shown here is a cumulative result of hazard and vulnerability calculated as a product of each of the hazards.
This is an annual risk.

Scale:
Datum: WGS 84
Projection: Mercator

0 500 m

Source:
Prepared, Analysed and Primary Survey Conducted by TARU Leading Edge (2015)
Base Data: AGiSAC Shimla
Background Image: Google Maps 2015

Legend

Very High
High
Moderate
Low
Very Low

Potential Hazard (Area Exposed)

Earthquake
Landslide
Hail Storm
Forest Fire
Snow
UHI

Vulnerability and Capacity

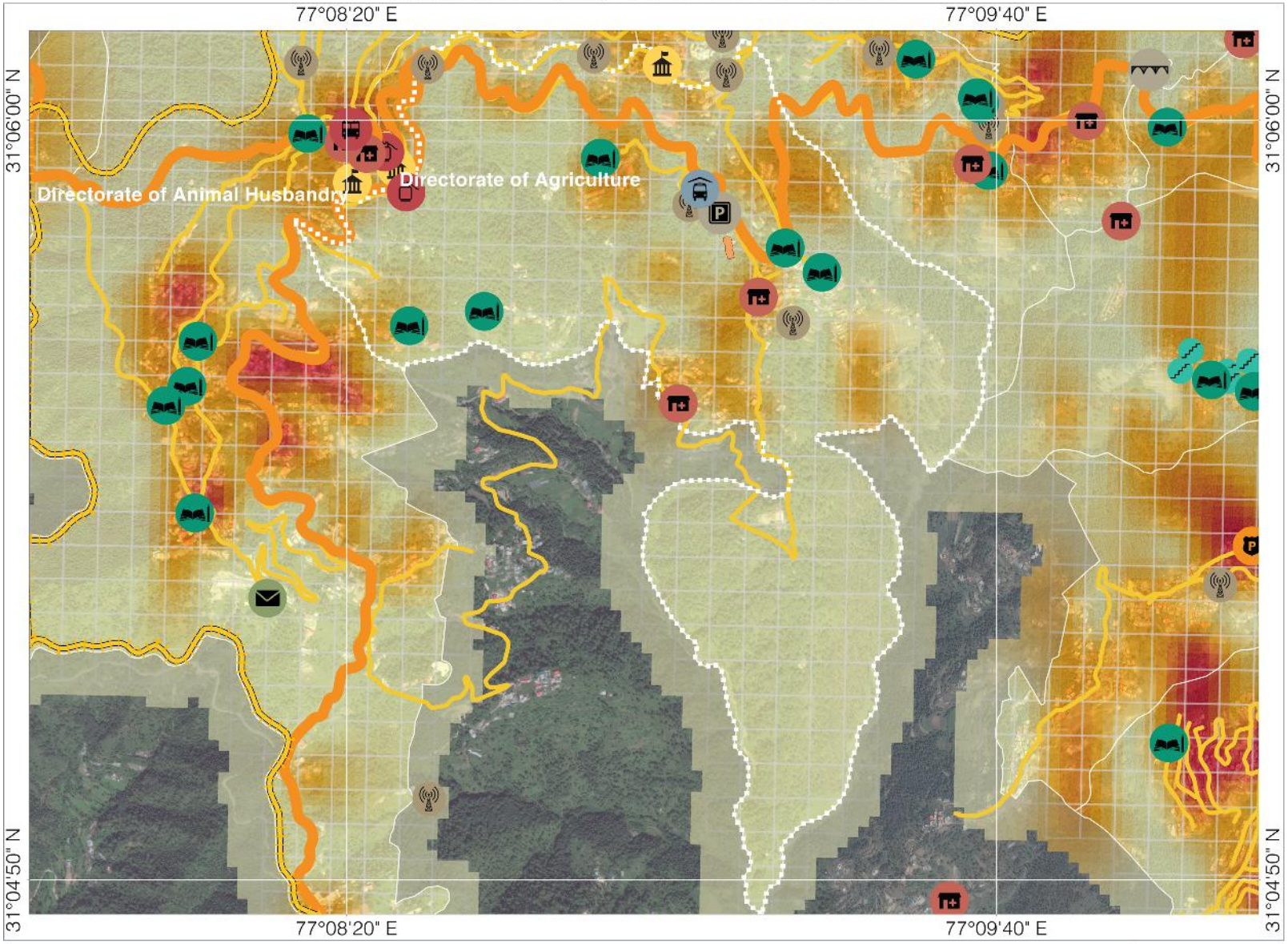
Building Vulnerability
Lack of Access to Fire Services
Lack of Access to Roads
Lack of Access to Health Facility
Level of Preparedness

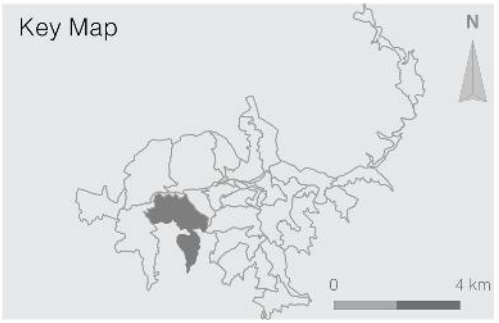
Composite Risk

Very High
High
Moderate
Low
Very Low

ANNUALIZED COMPOSITE RISK : TUTIKANDI

Ward No. 8





Ward Statistics

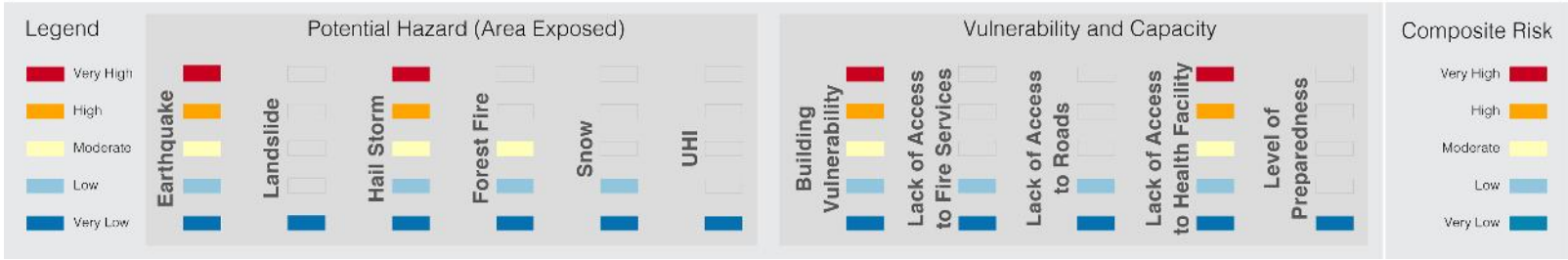
Area (km²)	2.06
Total Population	5,361
Total Male Population	3,068
Total Female Population	2,293
Population >= 60 Years	324
Population <= 6 Years	460
% Roof Unengineered	4.80
% HH With Treated Water Supply	87.30
% HH With Access to Sanitation	86.40

Source: Census of India, 2011

Legend

- Ward Boundary
- Open Ground
- National Highway
- Other Roads
- Railway Line
- Stairs and Walkways
- Police Stations
- Public Buildings
- Schools
- Bridges
- Cell Towers
- LPG Godowns
- Health Units
- Post Offices
- Parkings
- Bus Stations

Note:
The composite risk shown here is a cumulative result of hazard and vulnerability calculated as a product of each of the hazards.
This is an annual risk.



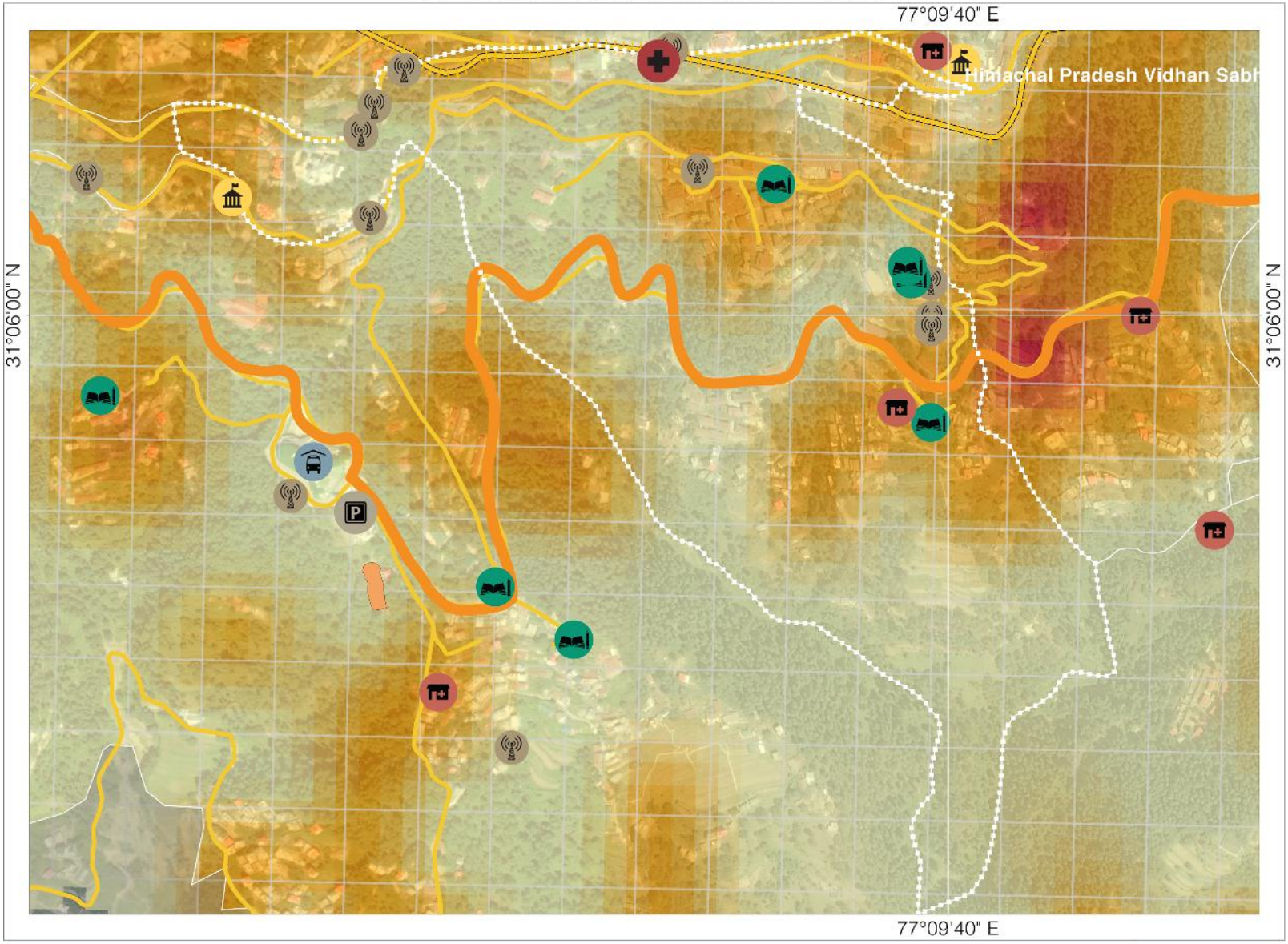
Scale:
Datum: WGS 84
Projection: Mercator

0 500 m

Source:
Prepared, Analysed and Primary Survey Conducted by TARU Leading Edge (2015)
Base Data: AGiSAC Shimla
Background Image: Google Maps 2015

ANNUALIZED COMPOSITE RISK : NABHA

Ward No. 9



Key Map

Ward Statistics

Area (km²)	0.56
Total Population	4,665
Total Male Population	2,510
Total Female Population	2,155
Population >= 60 Years	282
Population <= 6 Years	370
% Roof Unengineered	8
% HH With Treated Water Supply	96.70
% HH With Access to Sanitation	81.40

Source: Census of India, 2011

Legend

- Ward Boundary
- Open Ground
- National Highway
- Other Roads
- Railway Line
- Schools
- Public Buildings
- Cell Towers
- Health Units
- Hospitals
- Parkings
- Bus Stations

Note:
The composite risk shown here is a cumulative result of hazard and vulnerability calculated as a product of each of the hazards.
This is an annual risk.

Legend

Very High
High
Moderate
Low
Very Low

Potential Hazard (Area Exposed)

Earthquake
Landslide
Hail Storm
Forest Fire
Snow
UHI

Vulnerability and Capacity

Building Vulnerability
Lack of Access to Fire Services
Lack of Access to Roads
Lack of Access to Health Facility
Level of Preparedness

Composite Risk

Very High
High
Moderate
Low
Very Low

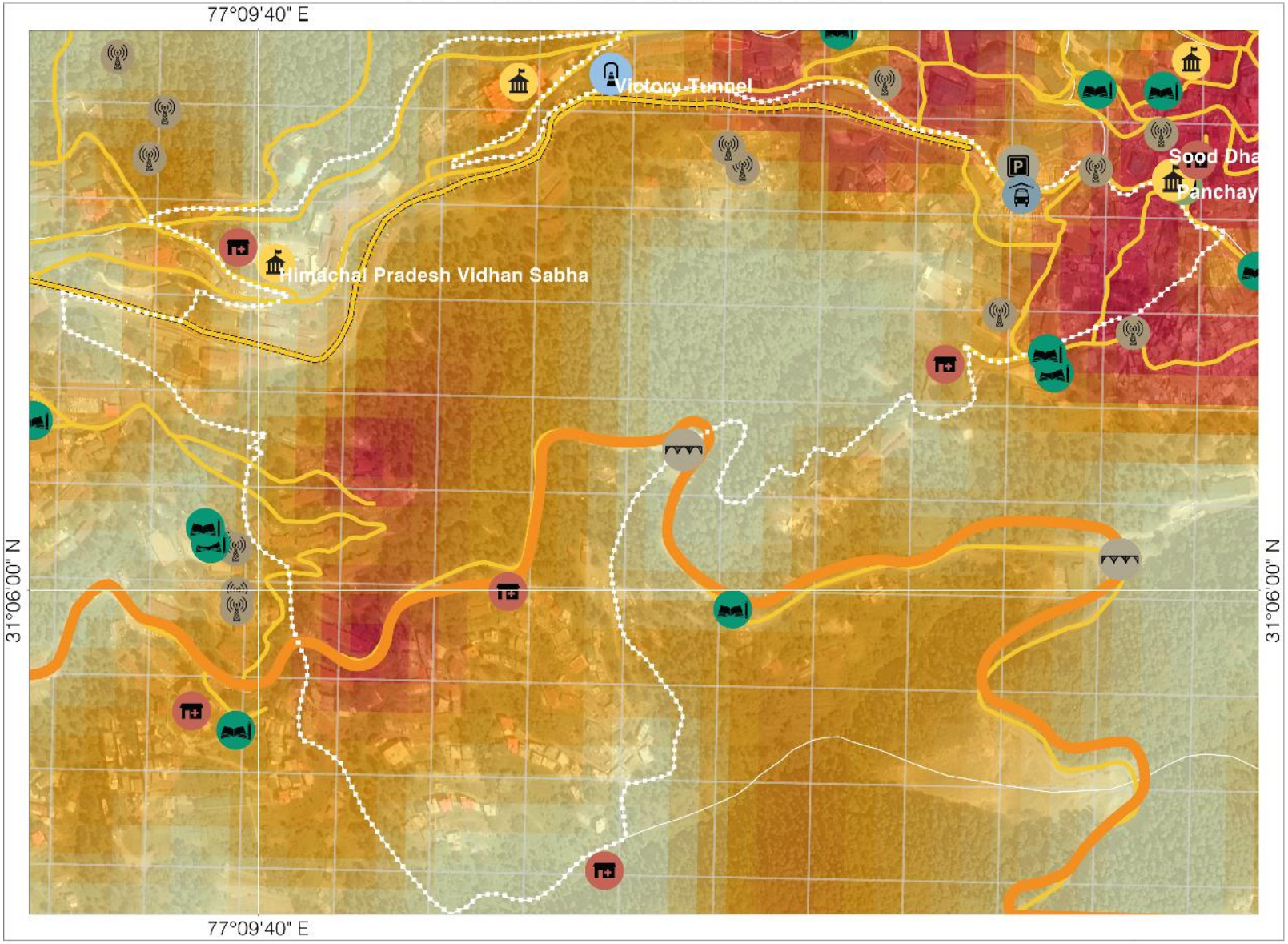
Scale:
Datum: WGS 84
Projection: Mercator

0 200 m

Source:
Prepared, Analysed and Primary Survey Conducted by TARU Leading Edge (2015)
Base Data: AGiSAC Shimla
Background Image: Google Maps 2015

ANNUALIZED COMPOSITE RISK : PHAGLI

Ward No. 10



Key Map

Ward Statistics

Area (km²)	0.49
Total Population	4,518
Total Male Population	2,622
Total Female Population	1,896
Population >= 60 Years	273
Population <= 6 Years	356
% Roof Unengineered	22.80
% HH With Treated Water Supply	93.40
% HH With Access to Sanitation	79.70

Source: Census of India, 2011

Legend

- Ward Boundary
- National Highway
- Other Roads
- Railway Line
- Schools
- Public Buildings
- Cell Towers
- Tunnels
- Bridges
- Parkings
- Bus Stations
- Health Units

Note:
The composite risk shown here is a cumulative result of hazard and vulnerability calculated as a product of each of the hazards.
This is an annual risk.

Scale:
Datum: WGS 84
Projection: Mercator

0 150 m

Source:
Prepared, Analysed and Primary Survey Conducted by TARU Leading Edge (2015)
Base Data: AGiSAC Shimla
Background Image: Google Maps 2015

Legend

Very High
High
Moderate
Low
Very Low

Potential Hazard (Area Exposed)

Earthquake
Landslide
Hail Storm
Forest Fire
Snow
UHI

Vulnerability and Capacity

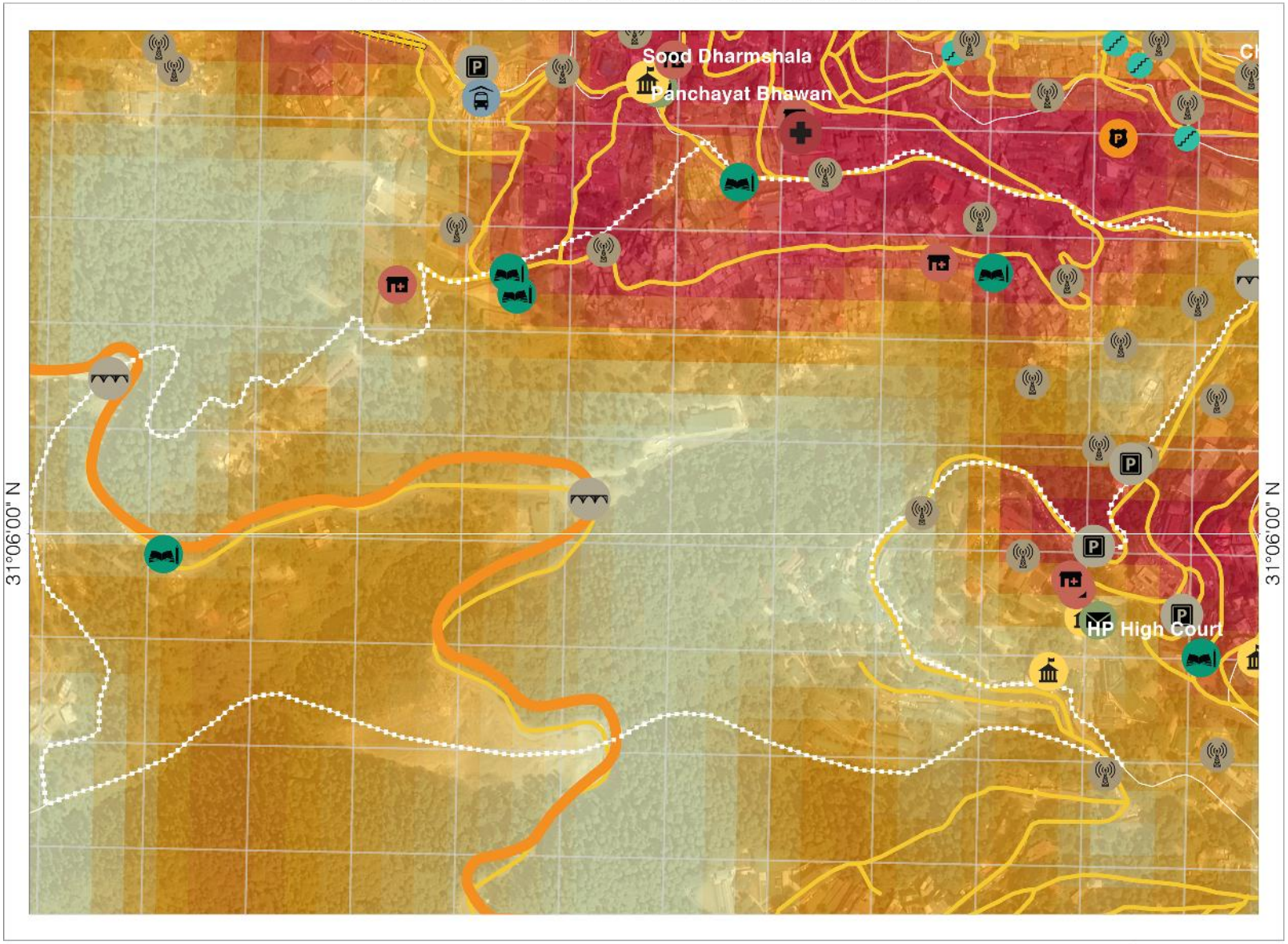
Building Vulnerability
Lack of Access to Fire Services
Lack of Access to Roads
Lack of Access to Health Facility
Level of Preparedness

Composite Risk

Very High
High
Moderate
Low
Very Low

ANNUALIZED COMPOSITE RISK : KRISHNA NAGAR

Ward No. 11



Key Map

Ward Statistics

Area (km²)	0.45
Total Population	7,190
Total Male Population	4,246
Total Female Population	2,944
Population >= 60 Years	435
Population <= 6 Years	675
% Roof Unengineered	6.20
% HH With Treated Water Supply	73.70
% HH With Access to Sanitation	69.40

Source: Census of India, 2011

Legend

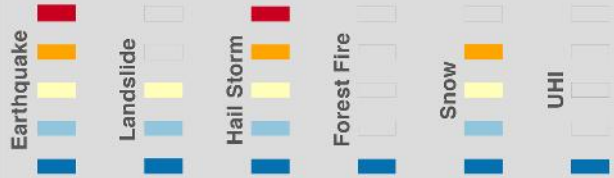
- Ward Boundary
- National Highway
- Other Roads
- Stairs and Walkways
- Schools
- Police Stations
- Public Buildings
- Bridges
- Cell Towers
- Hospitals
- Health Units
- Post Offices
- Parkings
- Bus Stations

Note:
The composite risk shown here is a cumulative result of hazard and vulnerability calculated as a product of each of the hazards.
This is an annual risk.

Legend

- Very High
- High
- Moderate
- Low
- Very Low

Potential Hazard (Area Exposed)



Vulnerability and Capacity

Composite Risk

- Very High
- High
- Moderate
- Low
- Very Low

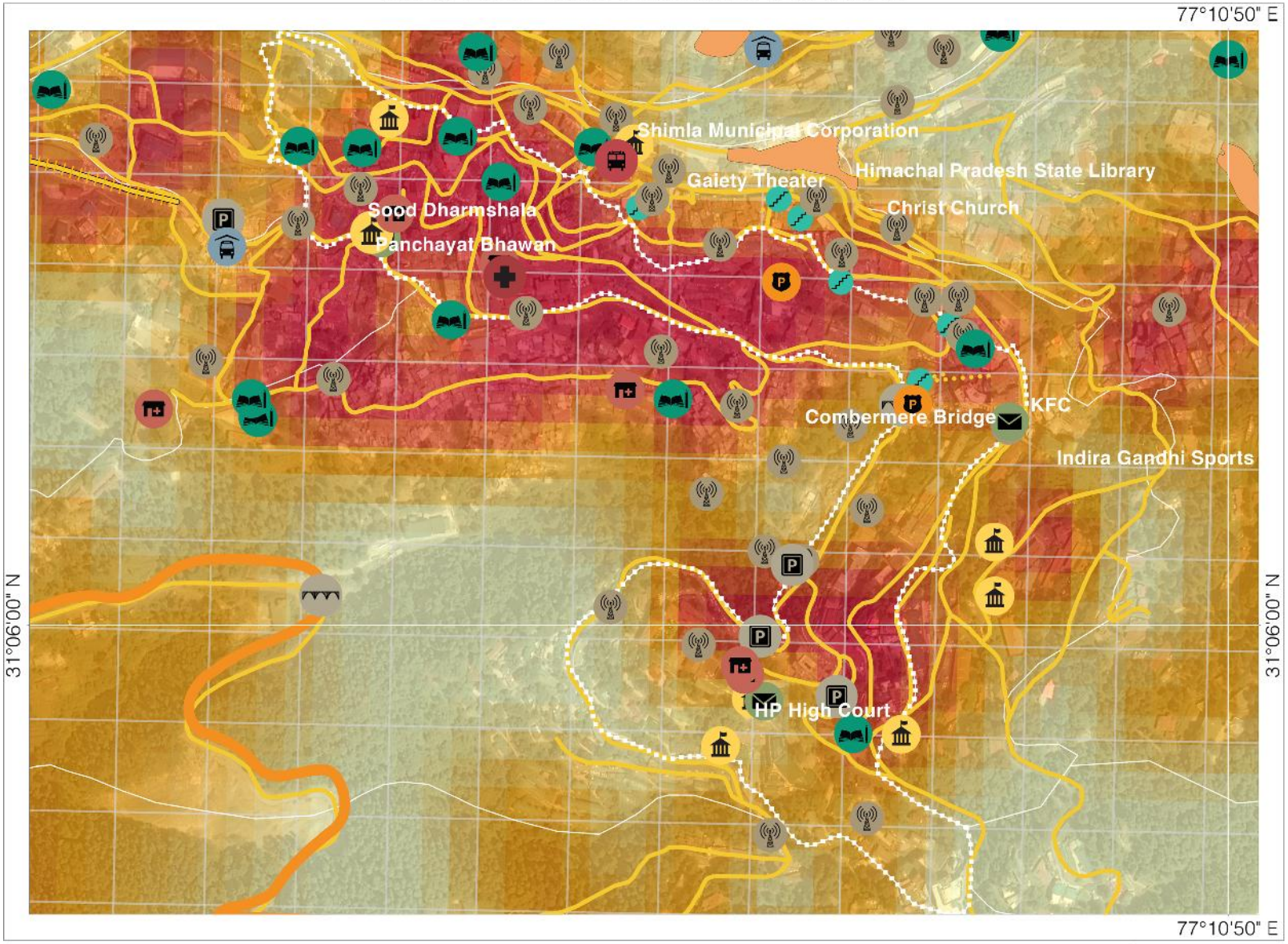
Scale:
Datum: WGS 84
Projection: Mercator

0 150 m

Source:
Prepared, Analysed and Primary Survey Conducted by TARU Leading Edge (2015)
Base Data: AGiSAC Shimla
Background Image: Google Maps 2015

ANNUALIZED COMPOSITE RISK : RAM BAZAR

Ward No. 12



Key Map

Ward Statistics

Area (km²)	0.22
Total Population	3,734
Total Male Population	2,199
Total Female Population	1,535
Population >= 60 Years	226
Population <= 6 Years	227
% Roof Unengineered	8.30
% HH With Treated Water Supply	97.30
% HH With Access to Sanitation	93.80

Source: Census of India, 2011

Legend

- Ward Boundary
- Open Ground
- National Highway
- Other Roads
- Railway Line
- Stairs and Walkways
- Schools
- Police Stations
- Public Buildings
- Bridges
- Cell Towers
- Hospitals
- Health Units
- Post Offices
- Parkings
- Bus Stations
- Fire Stations

Note:
The composite risk shown here is a cumulative result of hazard and vulnerability calculated as a product of each of the hazards.
This is an annual risk.

Legend

Very High
High
Moderate
Low
Very Low

Potential Hazard (Area Exposed)

Earthquake
Landslide
Hail Storm
Forest Fire
Snow
UHI

Vulnerability and Capacity

Building Vulnerability
Lack of Access to Fire Services
Lack of Access to Roads
Lack of Access to Health Facility
Level of Preparedness

Composite Risk

Very High
High
Moderate
Low
Very Low

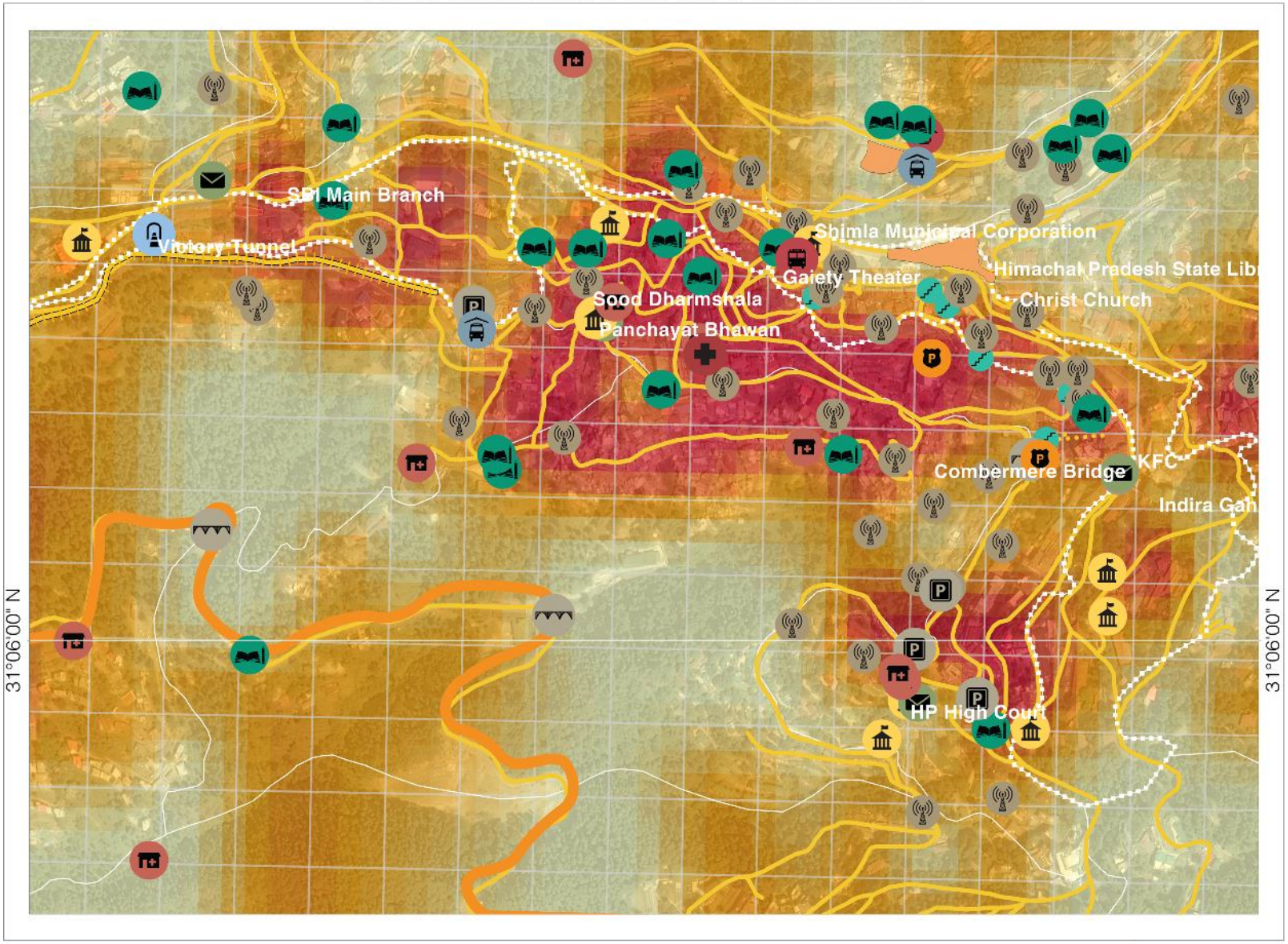
Scale:
Datum: WGS 84
Projection: Mercator

0 150 m

Source:
Prepared, Analysed and Primary Survey Conducted by TARU Leading Edge (2015)
Base Data: AGiSAC Shimla
Background Image: Google Maps 2015

ANNUALIZED COMPOSITE RISK : LOWER BAZAR

Ward No. 13



Key Map

Ward Statistics

Area (km²)	0.22
Total Population	3,936
Total Male Population	2,569
Total Female Population	1,367
Population >= 60 Years	238
Population <= 6 Years	188
% Roof Unengineered	11.30
% HH With Treated Water Supply	97.80
% HH With Access to Sanitation	93

Source: Census of India, 2011

Legend

- Ward Boundary
- Open Ground
- National Highway
- Other Roads
- Railway Line
- Stairs and Walkways
- Schools
- Police Stations
- Public Buildings
- Tunnels
- Bridges
- Cell Towers
- Hospitals
- Health Units
- Post Offices
- Parkings
- Bus Stations
- Fire Stations

Note:
The composite risk shown here is a cumulative result of hazard and vulnerability calculated as a product of each of the hazards.
This is an annual risk.

Legend

- Very High
- High
- Moderate
- Low
- Very Low

Potential Hazard (Area Exposed)

Earthquake, Landslide, Hail Storm, Forest Fire, Snow, UHI

Vulnerability and Capacity

Building Vulnerability, Lack of Access to Fire Services, Lack of Access to Roads, Lack of Access to Health Facility, Level of Preparedness

Composite Risk

- Very High
- High
- Moderate
- Low
- Very Low

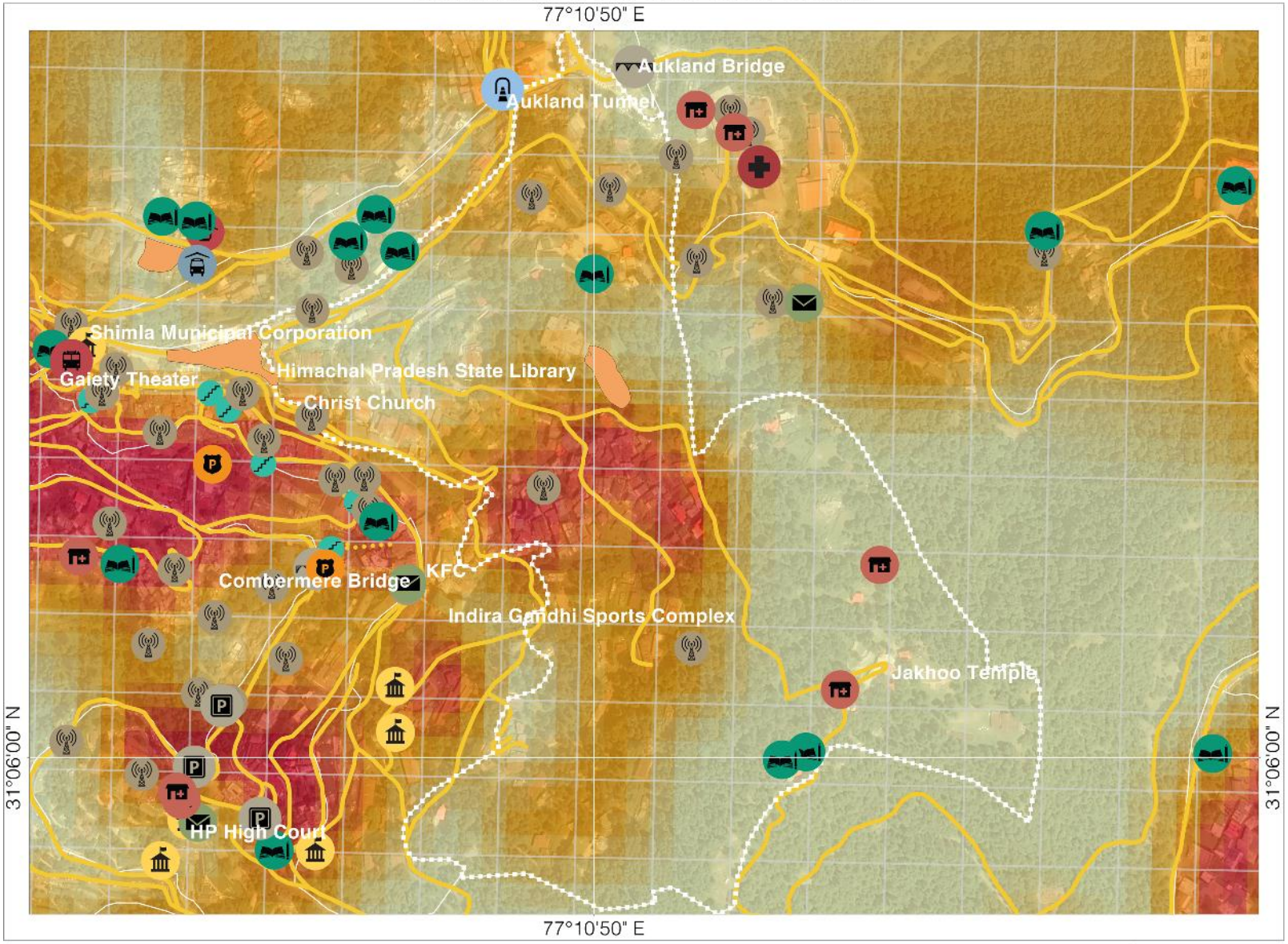
Scale:
Datum: WGS 84
Projection: Mercator

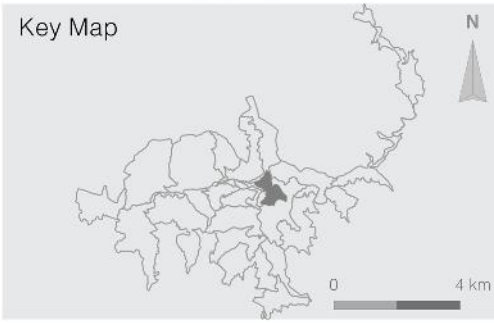
0 200 m

Source:
Prepared, Analysed and Primary Survey Conducted by TARU Leading Edge (2015)
Base Data: AGiSAC Shimla
Background Image: Google Maps 2015

ANNUALIZED COMPOSITE RISK : JAKHU

Ward No. 14





Ward Statistics

Area (km²)	0.5
Total Population	3,505
Total Male Population	1,856
Total Female Population	1,649
Population >= 60 Years	212
Population <= 6 Years	210
% Roof Unengineered	10.20
% HH With Treated Water Supply	96.90
% HH With Access to Sanitation	91.40

Source: Census of India, 2011

Legend

- Ward Boundary
- Open Ground
- Other Roads
- Tunnels
- Stairs and Walkways
- Schools
- Police Stations
- Public Buildings
- Bridges
- Cell Towers
- Hospitals
- Health Units
- Post Offices
- Parkings
- Bus Stations
- Fire Stations

Note:
The composite risk shown here is a cumulative result of hazard and vulnerability calculated as a product of each of the hazards.
This is an annual risk.

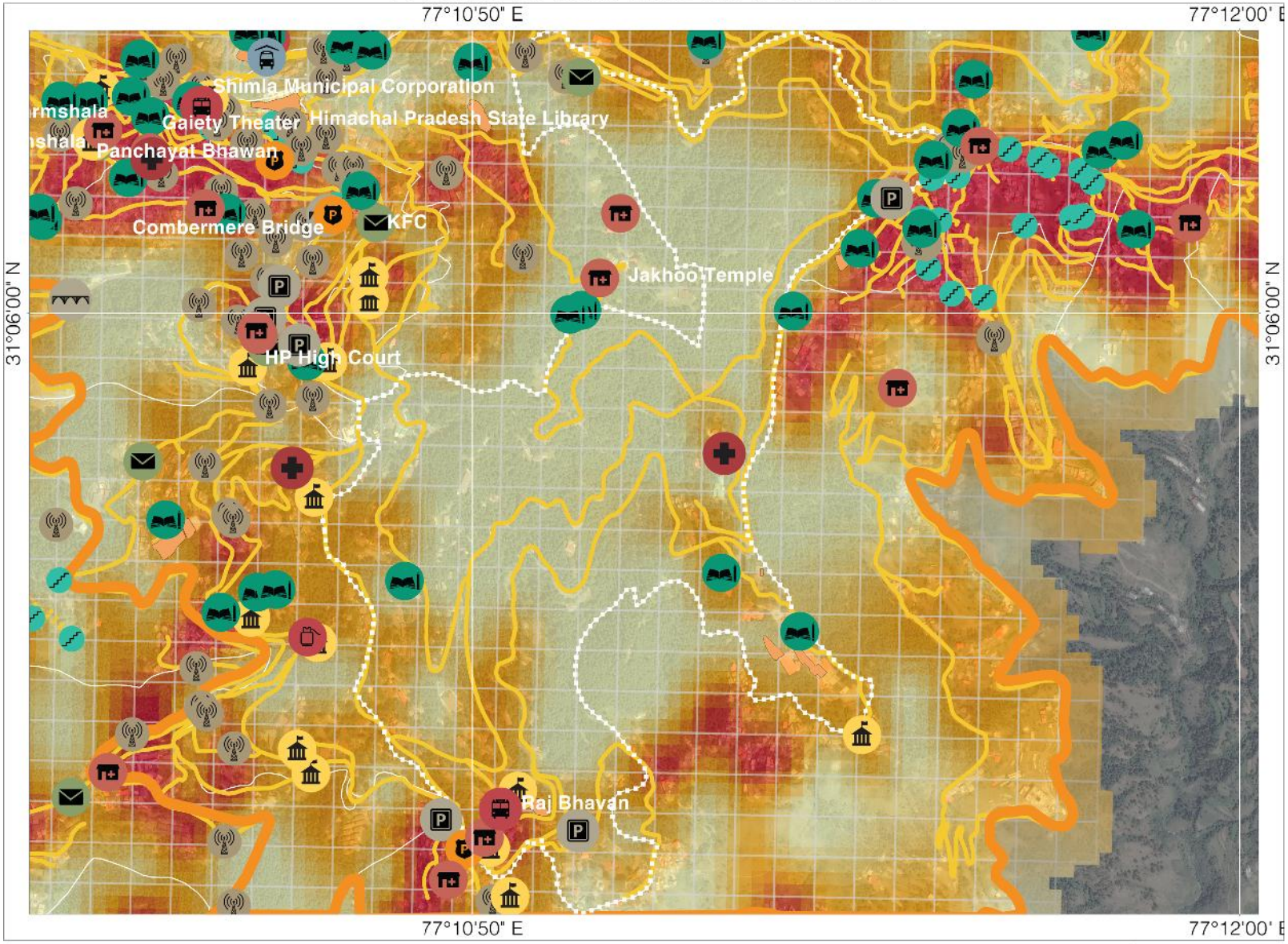
Scale:
Datum: WGS 84
Projection: Mercator

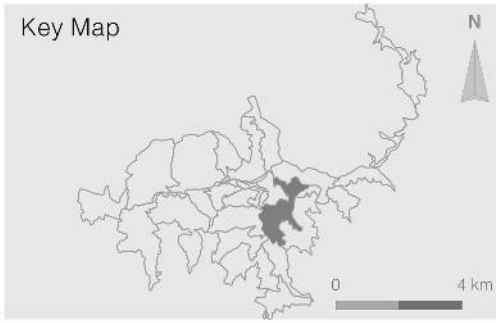
0 200 m

Source:
Prepared, Analysed and Primary Survey Conducted by TARU Leading Edge (2015)
Base Data: AGiSAC Shimla
Background Image: Google Maps 2015

ANNUALIZED COMPOSITE RISK : BENMORE

Ward No. 15





Ward Statistics

Area (km²)	1.43
Total Population	3,988
Total Male Population	1,983
Total Female Population	2,005
Population >= 60 Years	241
Population <= 6 Years	218
% Roof Unengineered	15.70
% HH With Treated Water Supply	99.10
% HH With Access to Sanitation	88.30

Source: Census of India, 2011

Legend

- Ward Boundary
- Open Ground
- National Highway
- Other Roads
- Stairs and Walkways
- Schools
- Police Stations
- Public Buildings
- LPG Godowns
- Bridges
- Cell Towers
- Hospitals
- Health Units
- Post Offices
- Parkings
- Bus Stations
- Fire Stations

Note:
The composite risk shown here is a cumulative result of hazard and vulnerability calculated as a product of each of the hazards.
This is an annual risk.

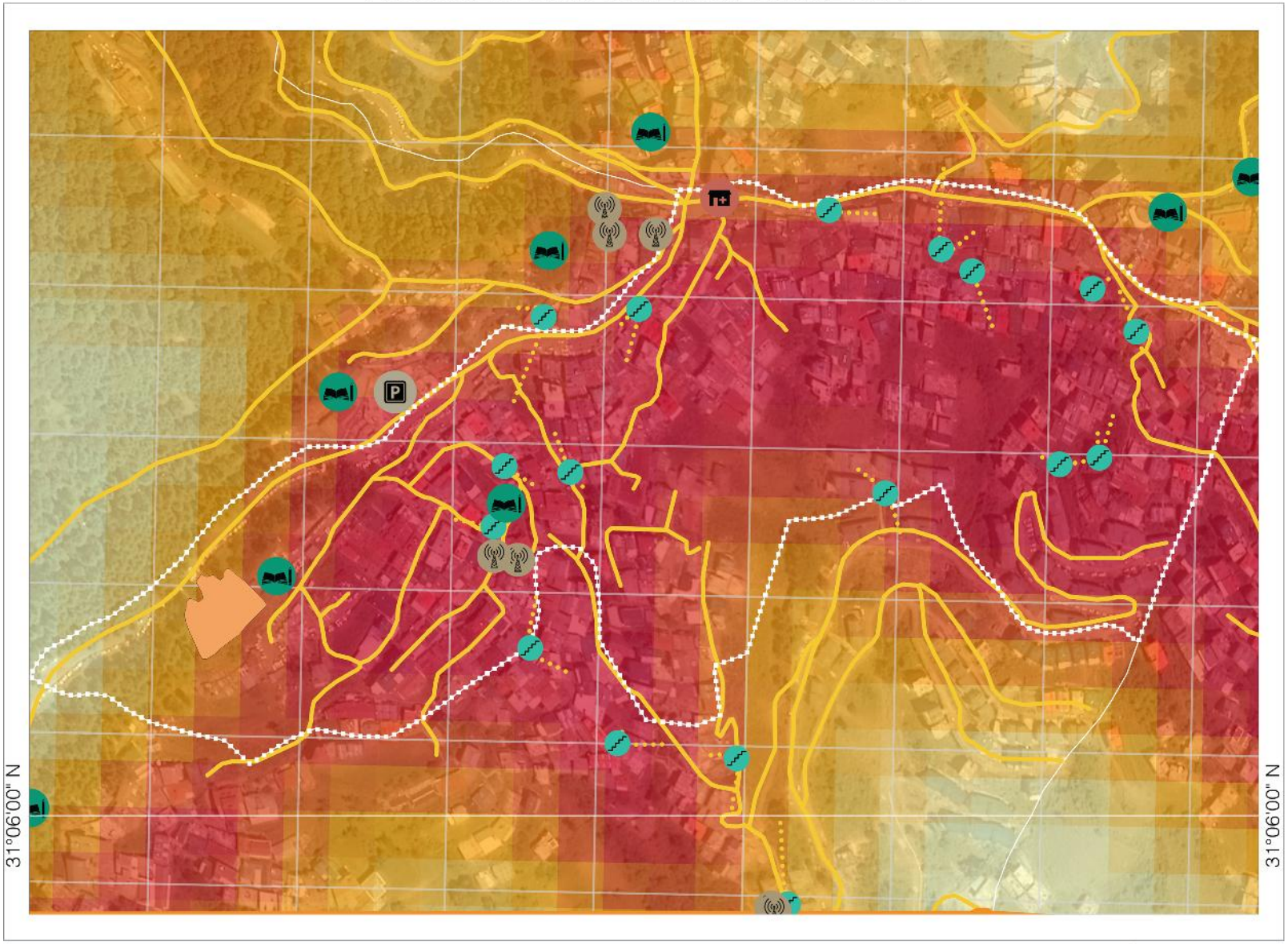
Scale:
Datum: WGS 84
Projection: Mercator

0 300 m

Source:
Prepared, Analysed and Primary Survey Conducted by TARU Leading Edge (2015)
Base Data: AGiSAC Shimla
Background Image: Google Maps 2015

ANNUALIZED COMPOSITE RISK : ENGINE GHAR

Ward No. 16



Key Map

Ward Statistics

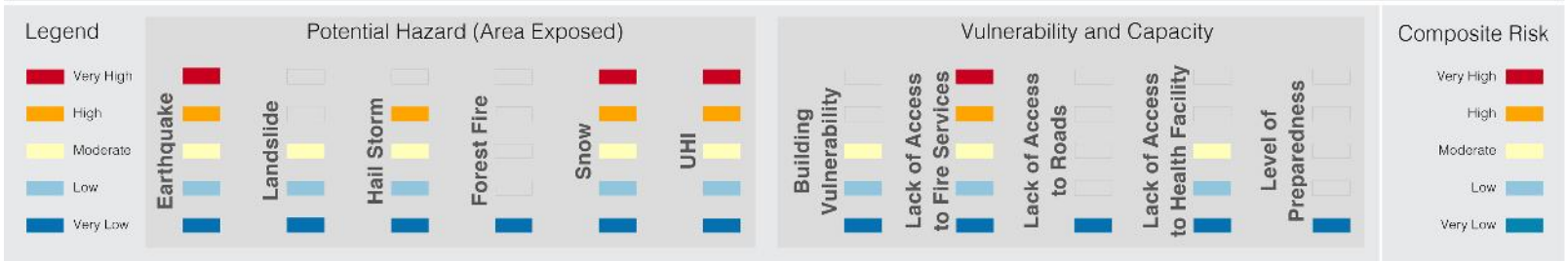
Area (km²)	0.16
Total Population	5,196
Total Male Population	2,724
Total Female Population	2,472
Population >= 60 Years	314
Population <= 6 Years	433
% Roof Unengineered	5.70
% HH With Treated Water Supply	99.50
% HH With Access to Sanitation	94.50

Source: Census of India, 2011

Legend

- Ward Boundary
- Open Ground
- Other Roads
- Schools
- Health Units
- Stairs and Walkways
- Cell Towers
- Parkings

Note:
The composite risk shown here is a cumulative result of hazard and vulnerability calculated as a product of each of the hazards.
This is an annual risk.



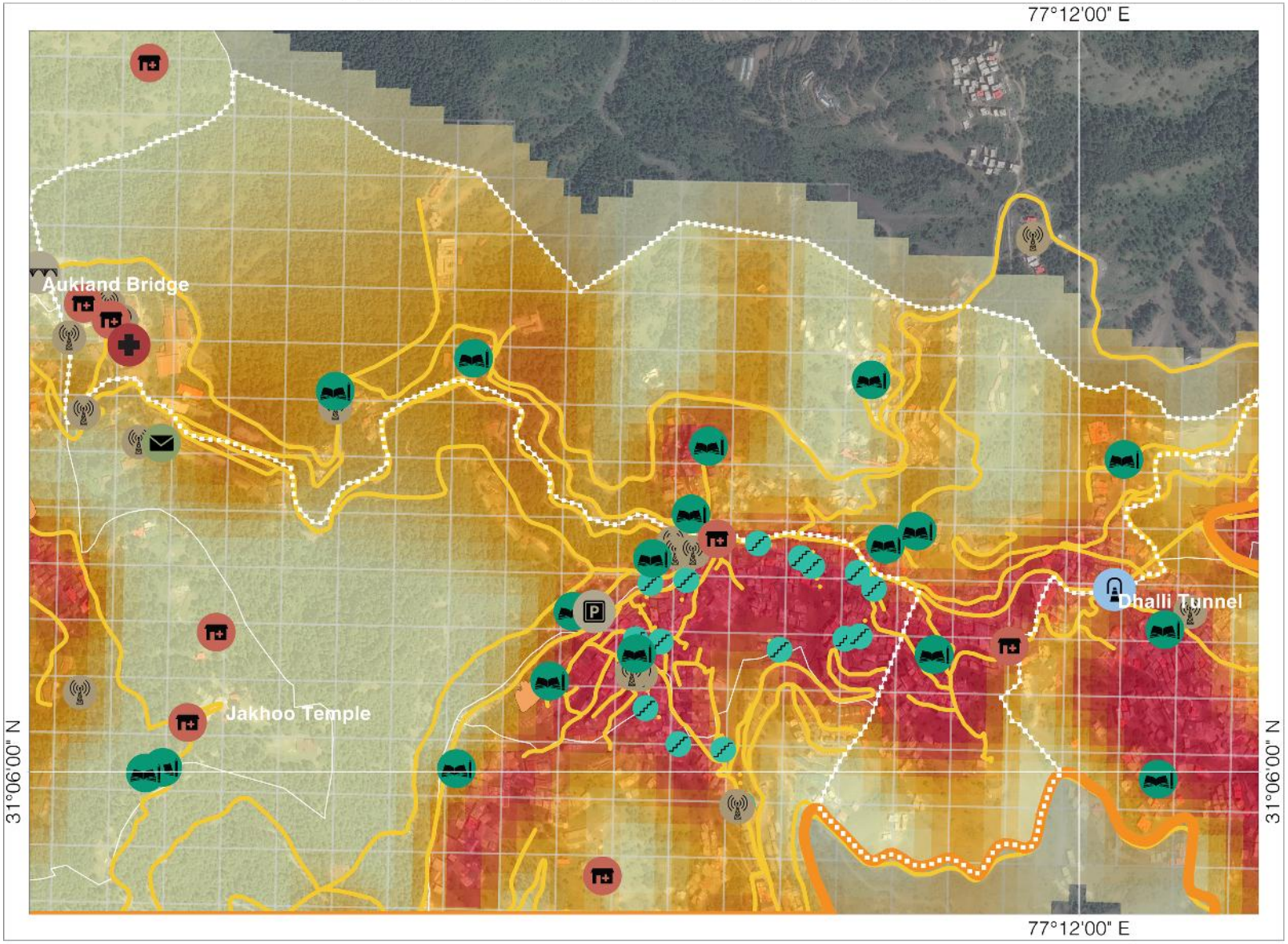
Scale:
Datum: WGS 84
Projection: Mercator

0 100 m

Source:
Prepared, Analysed and Primary Survey Conducted by TARU Leading Edge (2015)
Base Data: AGiSAC Shimla
Background Image: Google Maps 2015

ANNUALIZED COMPOSITE RISK : SANJAULI CHOWK

Ward No. 17



Key Map

Ward Statistics

Area (km²)	1.11
Total Population	6,526
Total Male Population	3,685
Total Female Population	2,841
Population >= 60 Years	395
Population <= 6 Years	535
% Roof Unengineered	6.80
% HH With Treated Water Supply	89.70
% HH With Access to Sanitation	77.50

Source: Census of India, 2011

Legend

- Ward Boundary
- Open Ground
- National Highway
- Other Roads
- Schools
- Bridges
- Stairs and Walkways
- Cell Towers
- Parkings
- Tunnels
- Health Units
- Hospitals
- Post Offices

Note:
The composite risk shown here is a cumulative result of hazard and vulnerability calculated as a product of each of the hazards.
This is an annual risk.

Legend

- Very High
- High
- Moderate
- Low
- Very Low

Potential Hazard (Area Exposed)

Earthquake | Landslide | Hail Storm | Forest Fire | Snow | UHI

Vulnerability and Capacity

Building Vulnerability | Lack of Access to Fire Services | Lack of Access to Roads | Lack of Access to Health Facility | Level of Preparedness

Composite Risk

- Very High
- High
- Moderate
- Low
- Very Low

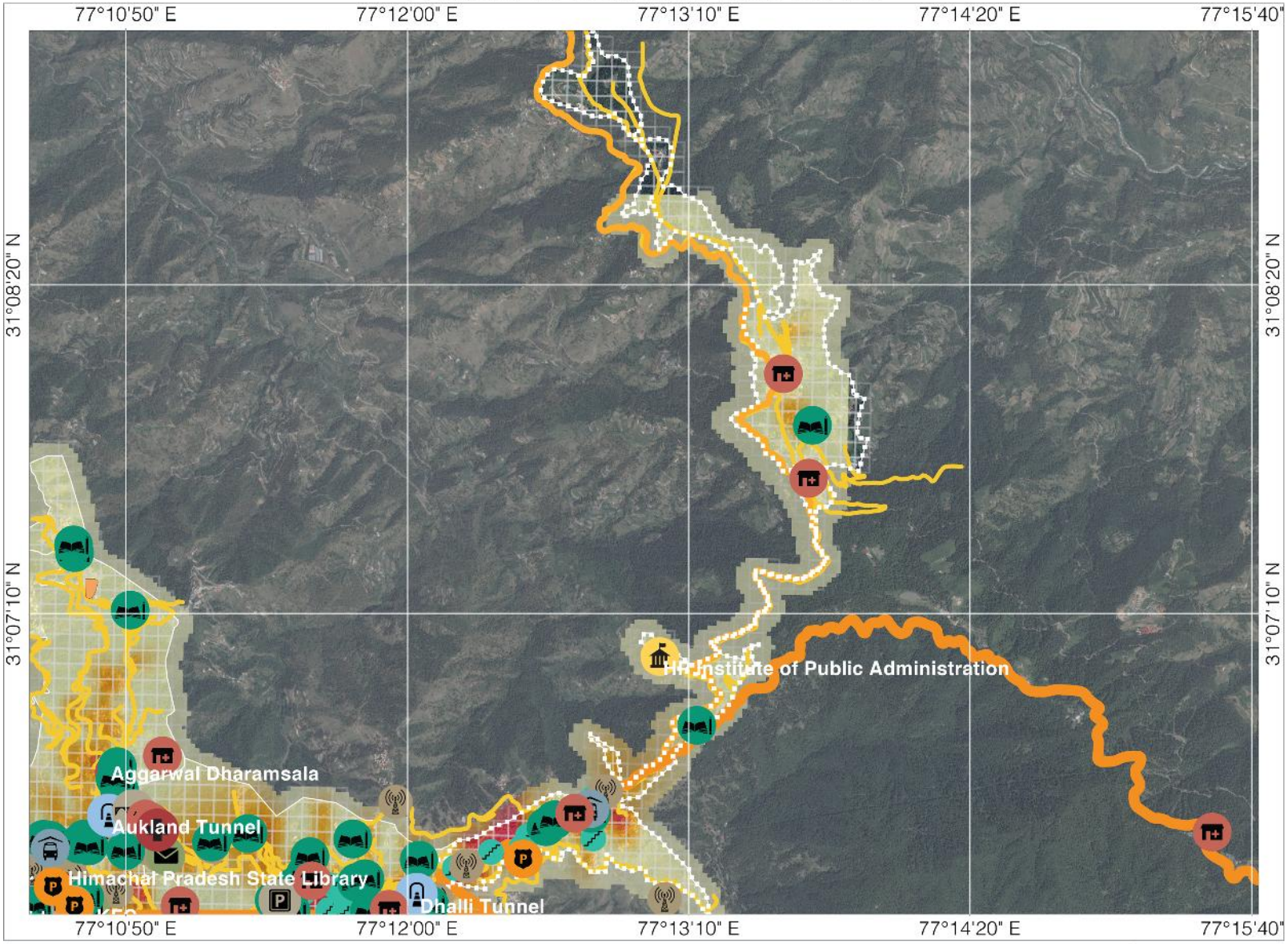
Scale:
Datum: WGS 84
Projection: Mercator

0 300 m

Source:
Prepared, Analysed and Primary Survey Conducted by TARU Leading Edge (2015)
Base Data: AGiSAC Shimla
Background Image: Google Maps 2015

ANNUALIZED COMPOSITE RISK : DHALLI

Ward No. 18



Ward Statistics

Area (km²)	2.17
Total Population	7,327
Total Male Population	3,952
Total Female Population	3,375
Population >= 60 Years	444
Population <= 6 Years	645
% Roof Unengineered	3.60
% HH With Treated Water Supply	92.90
% HH With Access to Sanitation	92.50

Source: Census of India, 2011

Legend

- Ward Boundary
- Open Ground
- National Highway
- Other Roads
- Stairs and Walkways
- Schools
- Police Stations
- Public Buildings
- Tunnels
- Cell Towers
- Hospitals
- Health Units
- Post Offices
- Parkings
- Bus Stations

Note:
The composite risk shown here is a cumulative result of hazard and vulnerability calculated as a product of each of the hazards.
This is an annual risk.

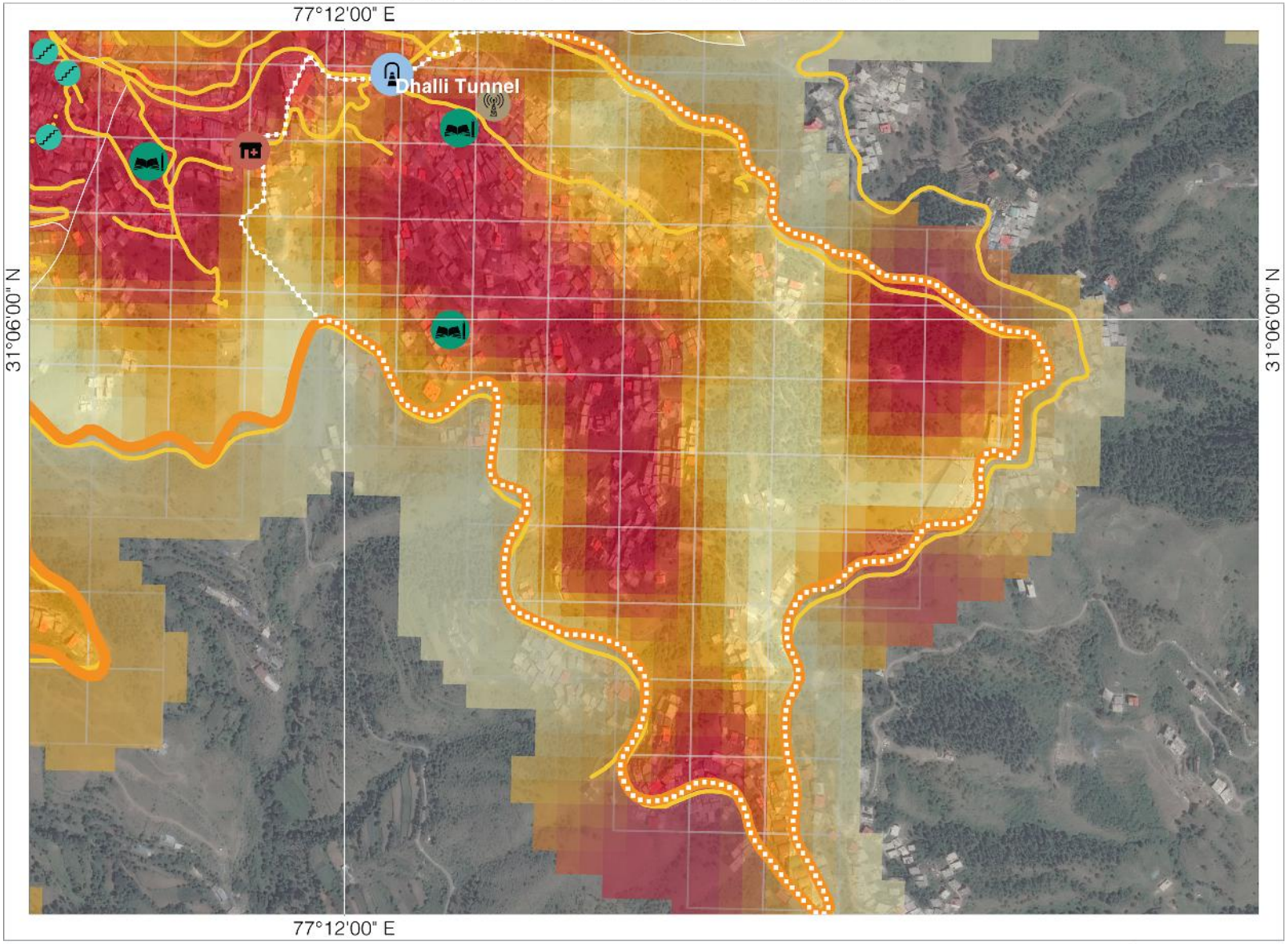
Scale:
Datum: WGS 84
Projection: Mercator

0 1 km

Source:
Prepared, Analysed and Primary Survey Conducted by TARU Leading Edge (2015)
Base Data: AGiSAC Shimla
Background Image: Google Maps 2015

ANNUALIZED COMPOSITE RISK : CHAMIYANA

Ward No. 19



Key Map

Ward Statistics

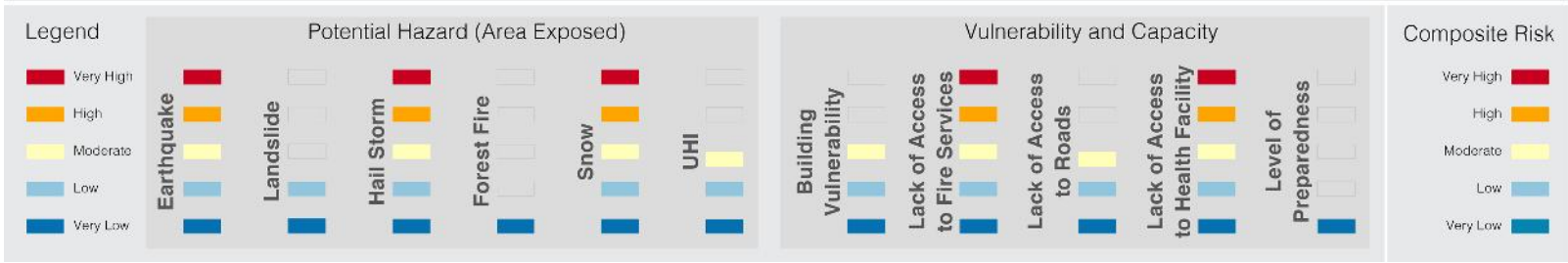
Area (km²)	0.55
Total Population	9,627
Total Male Population	5,098
Total Female Population	4,529
Population >= 60 Years	583
Population <= 6 Years	783
% Roof Unengineered	2.30
% HH With Treated Water Supply	97.30
% HH With Access to Sanitation	92.10

Source: Census of India, 2011

Legend

- Ward Boundary
- National Highway
- Other Roads
- Schools
- Health Units
- Stairs and Walkways
- Cell Towers
- Tunnels

Note:
The composite risk shown here is a cumulative result of hazard and vulnerability calculated as a product of each of the hazards.
This is an annual risk.



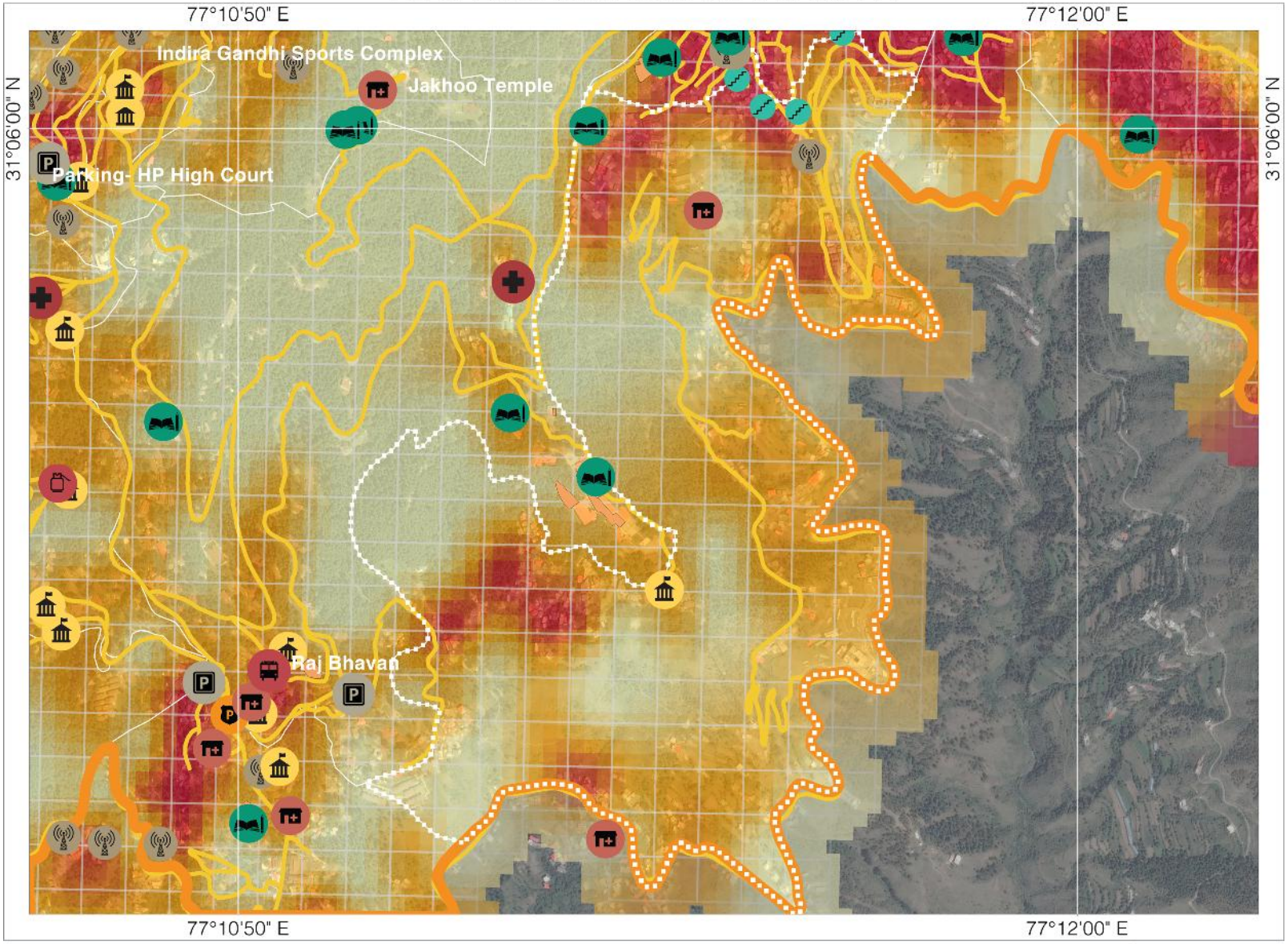
Scale:
Datum: WGS 84
Projection: Mercator

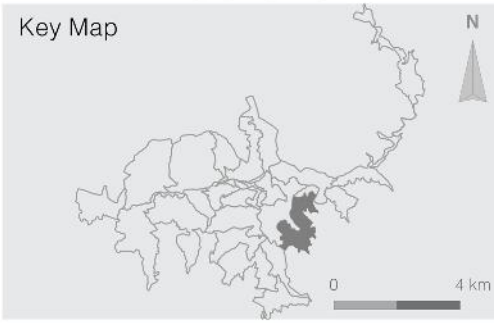
0 200 m

Source:
Prepared, Analysed and Primary Survey Conducted by TARU Leading Edge (2015)
Base Data: AGiSAC Shimla
Background Image: Google Maps 2015

ANNUALIZED COMPOSITE RISK : MALIYANA

Ward No. 20





Ward Statistics

Area (km²)	1.38
Total Population	9,884
Total Male Population	5,331
Total Female Population	4,553
Population >= 60 Years	598
Population <= 6 Years	855
% Roof Unengineered	2.80
% HH With Treated Water Supply	94.40
% HH With Access to Sanitation	90.40

Source: Census of India, 2011

Legend

- Ward Boundary
- Open Ground
- National Highway
- Other Roads
- Stairs and Walkways
- Schools
- Police Stations
- Public Buildings
- LPG Godowns
- Cell Towers
- Hospitals
- Health Units
- Parkings
- Fire Stations

Note:
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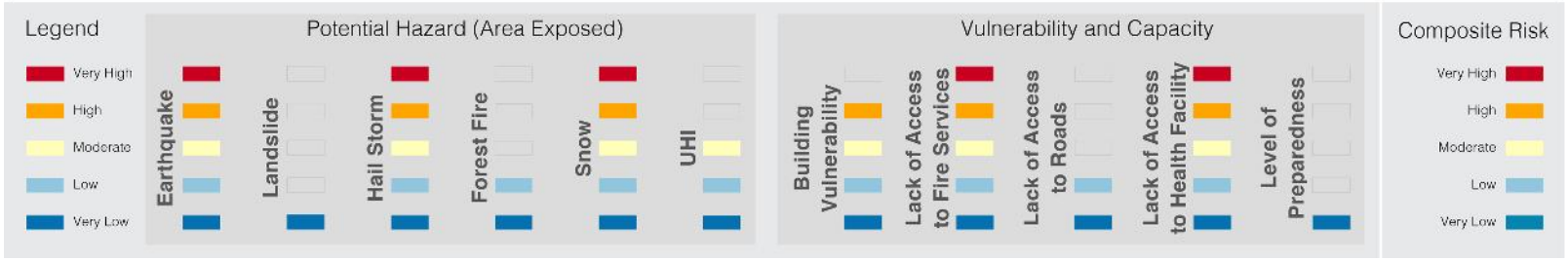
This is an annual risk.



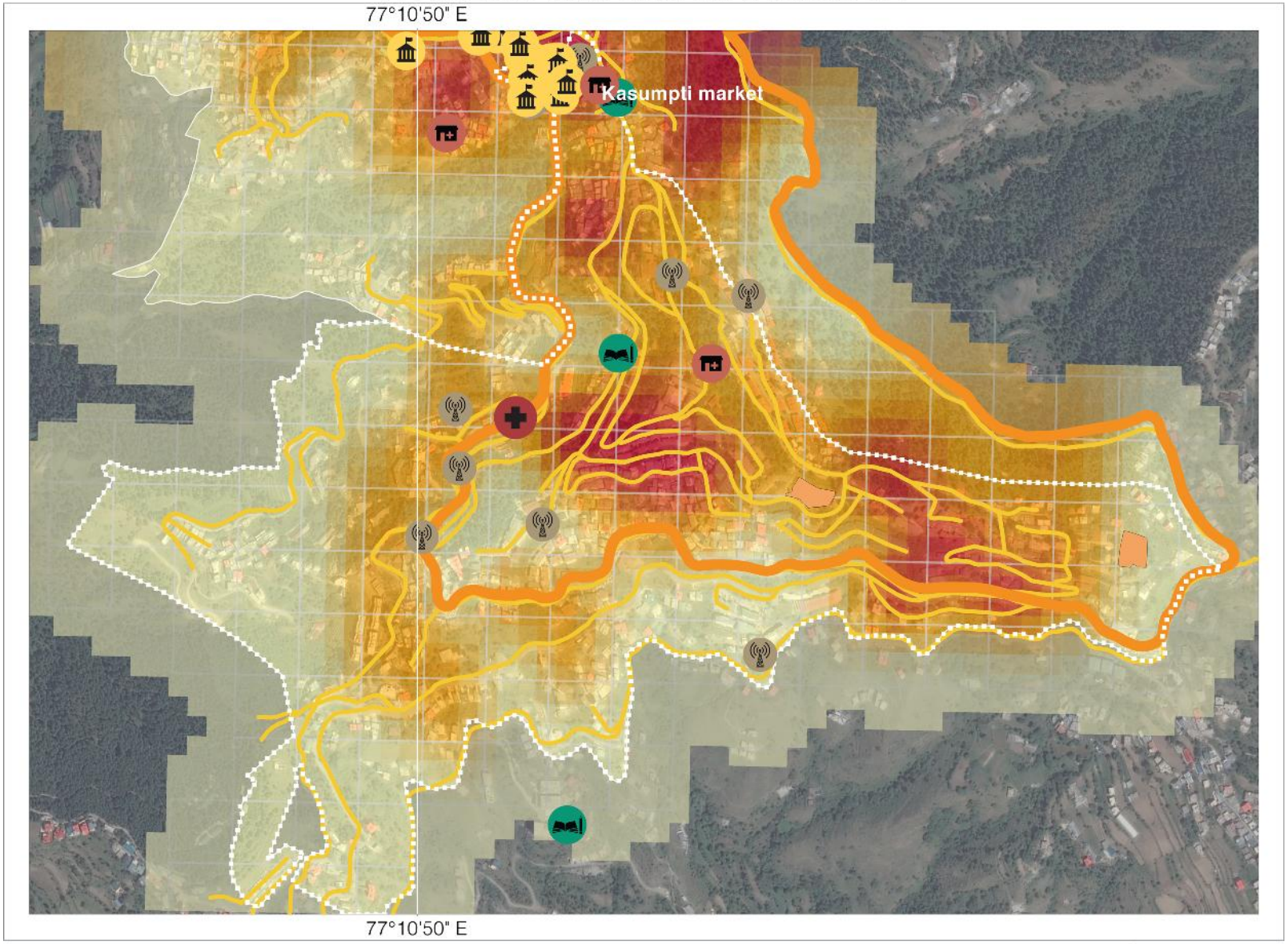
Scale:
Datum: WGS 84
Projection: Mercator

0 300 m

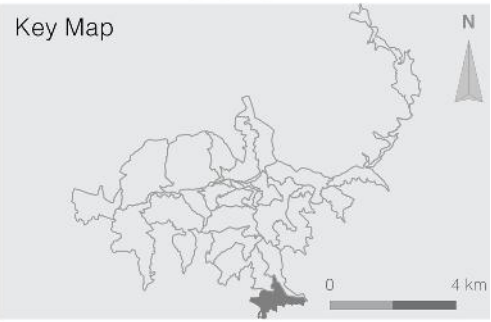
Source:
Prepared, Analysed and Primary Survey Conducted by TARU Leading Edge (2015)
Base Data: AGiSAC Shimla
Background Image: Google Maps 2015

ANNUALIZED COMPOSITE RISK : KASUMPATI

Ward No. 21



Key Map



Ward Statistics

Area (km²)	2.09
Total Population	8,205
Total Male Population	4,543
Total Female Population	3,662
Population >= 60 Years	497
Population <= 6 Years	690
% Roof Unengineered	1.80
% HH With Treated Water Supply	97.40
% HH With Access to Sanitation	98.10

Source: Census of India, 2011

Legend

- Ward Boundary
- Open Ground
- National Highway
- Other Roads
- Schools
- Public Buildings
- Cell Towers
- Hospitals
- Health Units

Note:
The composite risk shown here is a cumulative result of hazard and vulnerability calculated as a product of each of the hazards.
This is an annual risk.

Scale:
Datum: WGS 84
Projection: Mercator

0 200 m

Source:
Prepared, Analysed and Primary Survey Conducted by TARU Leading Edge (2015)
Base Data: AGiSAC Shimla
Background Image: Google Maps 2015

Legend

Very High
High
Moderate
Low
Very Low

Potential Hazard (Area Exposed)

Earthquake
Landslide
Hail Storm
Forest Fire
Snow
UHI

Vulnerability and Capacity

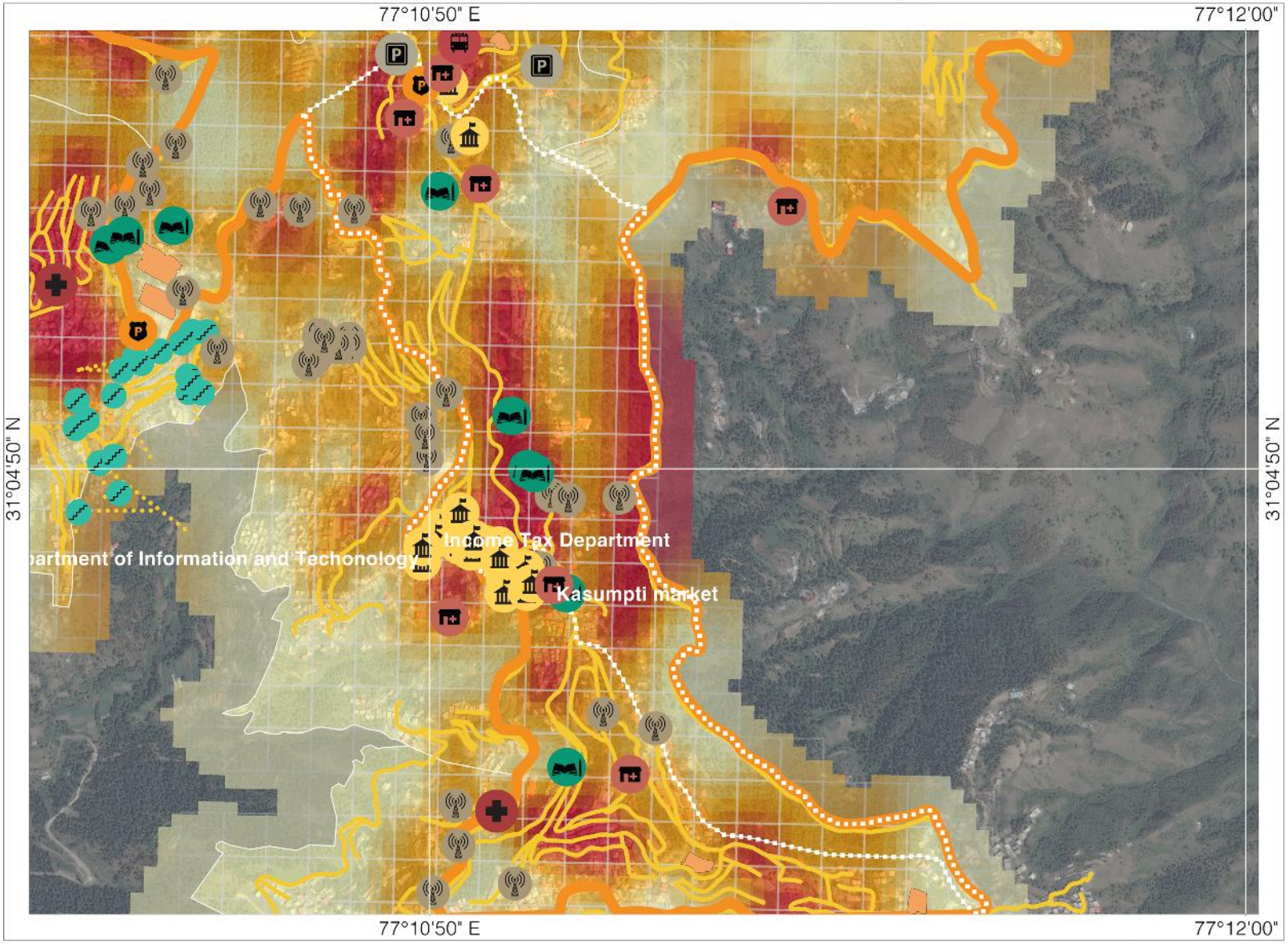
Building Vulnerability
Lack of Access to Fire Services
Lack of Access to Roads
Lack of Access to Health Facility
Level of Preparedness

Composite Risk

Very High
High
Moderate
Low
Very Low

ANNUALIZED COMPOSITE RISK : CHOTTA SHIMLA

Ward No. 22



Key Map

Ward Statistics

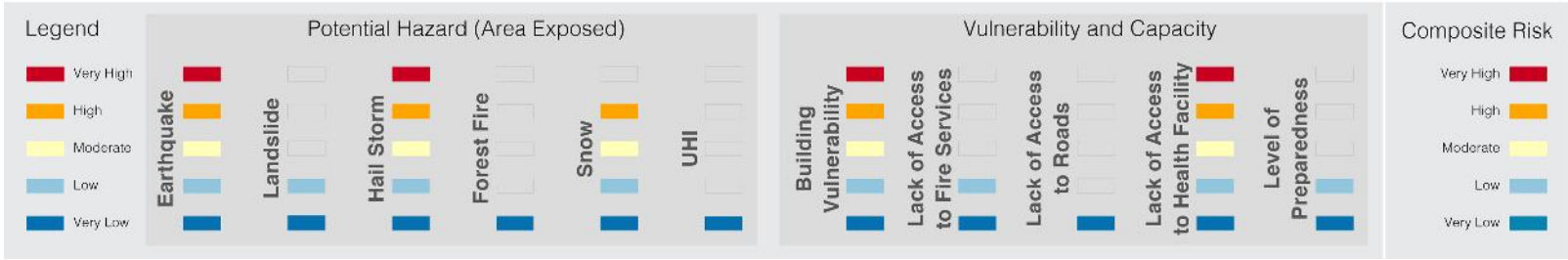
Area (km²)	0.77
Total Population	15,399
Total Male Population	8,424
Total Female Population	6,975
Population >= 60 Years	933
Population <= 6 Years	1,230
% Roof Unengineered	3.40
% HH With Treated Water Supply	90.40
% HH With Access to Sanitation	98.40

Source: Census of India, 2011

Legend

- Ward Boundary
- Open Ground
- National Highway
- Other Roads
- Schools
- Stairs and Walkways
- Public Buildings
- Cell Towers
- Health Units
- Hospitals
- Police Stations
- Fire Stations
- Parkings

Note:
The composite risk shown here is a cumulative result of hazard and vulnerability calculated as a product of each of the hazards.
This is an annual risk.



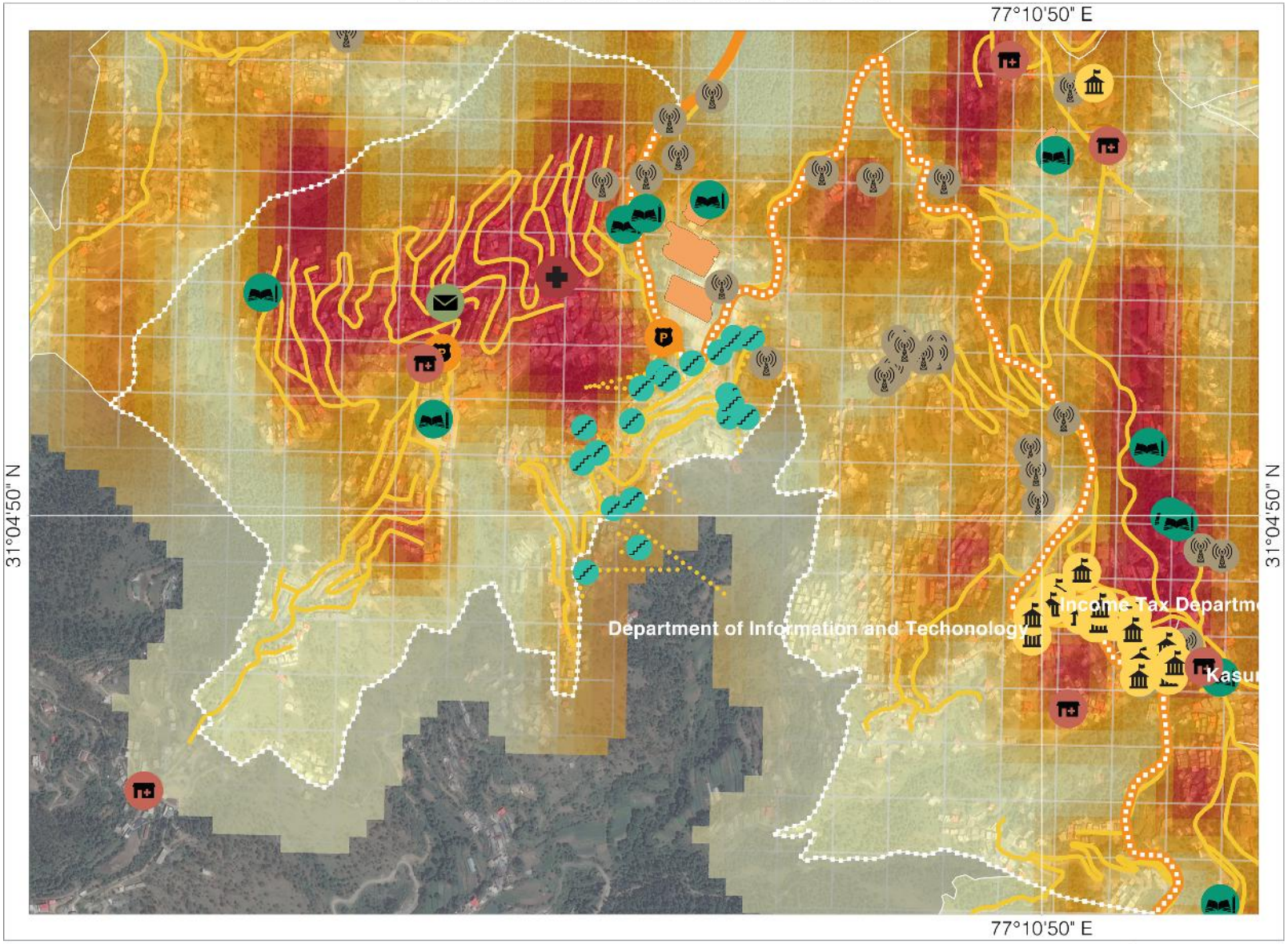
Scale:
Datum: WGS 84
Projection: Mercator

0 300 m

Source:
Prepared, Analysed and Primary Survey Conducted by TARU Leading Edge (2015)
Base Data: AGiSAC Shimla
Background Image: Google Maps 2015

ANNUALIZED COMPOSITE RISK : PATIYOG

Ward No. 23



Key Map

Ward Statistics

Area (km²)	1.46
Total Population	12,029
Total Male Population	6,572
Total Female Population	5,457
Population >= 60 Years	728
Population <= 6 Years	1,069
% Roof Unengineered	3.2
% HH With Treated Water Supply	93.20
% HH With Access to Sanitation	94.20

Source: Census of India, 2011

Legend

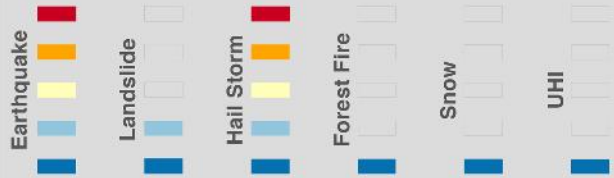
- Ward Boundary
- Open Ground
- National Highway
- Other Roads
- Schools
- Stairs and Walkways
- Public Buildings
- Cell Towers
- Health Units
- Hospitals
- Police Stations
- Post Offices

Note:
The composite risk shown here is a cumulative result of hazard and vulnerability calculated as a product of each of the hazards.
This is an annual risk.

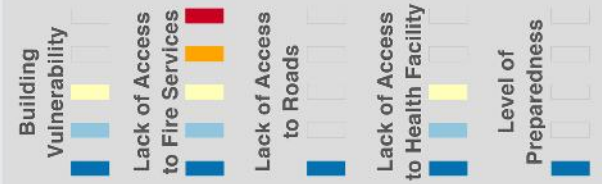
Legend

- Very High
- High
- Moderate
- Low
- Very Low

Potential Hazard (Area Exposed)



Vulnerability and Capacity



Composite Risk

- Very High
- High
- Moderate
- Low
- Very Low

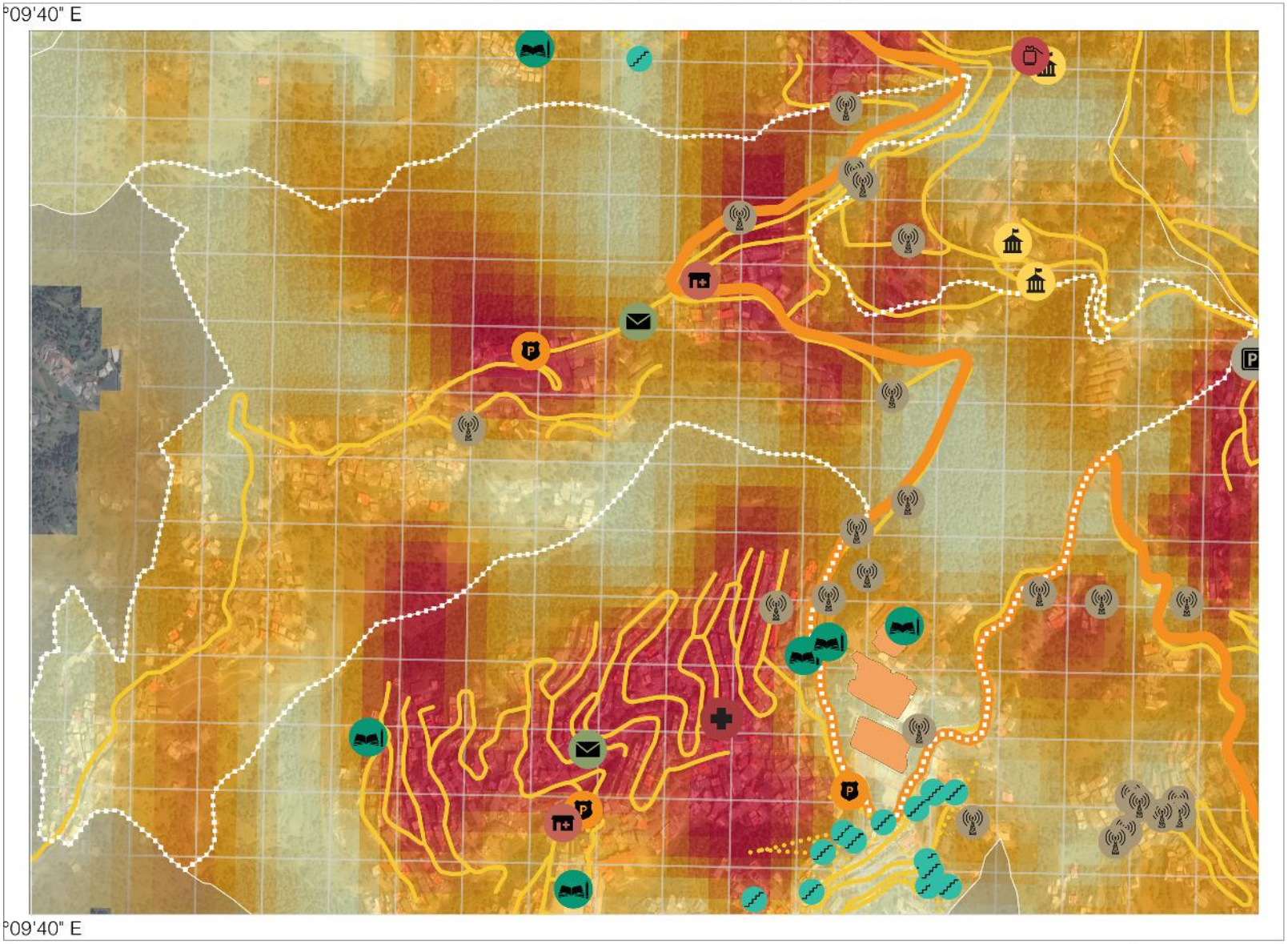
Scale:
Datum: WGS 84
Projection: Mercator

0 300 m

Source:
Prepared, Analysed and Primary Survey Conducted by TARU Leading Edge (2015)
Base Data: AGiSAC Shimla
Background Image: Google Maps 2015

ANNUALIZED COMPOSITE RISK : KHALINI

Ward No. 24



Key Map

Ward Statistics

Area (km²)	0.99
Total Population	8,456
Total Male Population	4,931
Total Female Population	3,525
Population >= 60 Years	512
Population <= 6 Years	671
% Roof Unengineered	3.90
% HH With Treated Water Supply	94.10
% HH With Access to Sanitation	93.20

Source: Census of India, 2011

Legend

- Ward Boundary
- Open Ground
- National Highway
- Other Roads
- Schools
- Stairs and Walkways
- Public Buildings
- LPG Godowns
- Cell Towers
- Health Units
- Hospitals
- Police Stations
- Post Offices
- Parkings

Note:
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This is an annual risk.

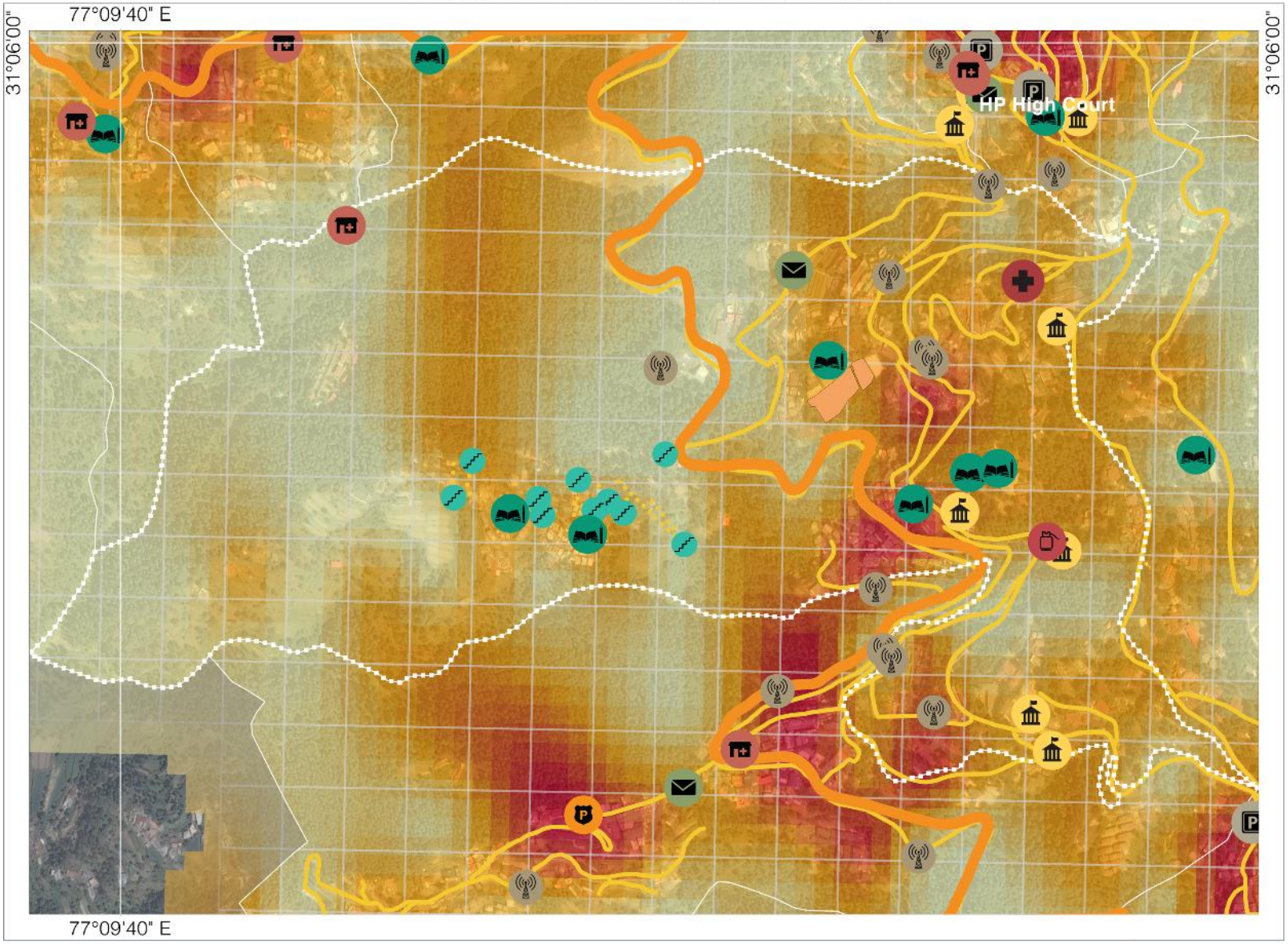
Scale:
Datum: WGS 84
Projection: Mercator

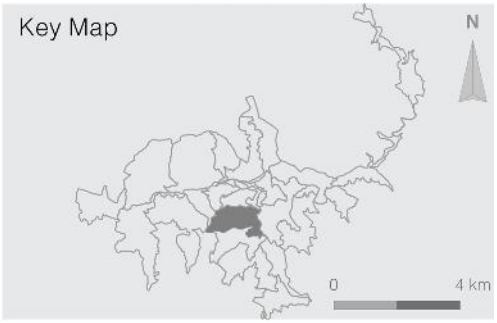
0 200 m

Source:
Prepared, Analysed and Primary Survey Conducted by TARU Leading Edge (2015)
Base Data: AGiSAC Shimla
Background Image: Google Maps 2015

ANNUALIZED COMPOSITE RISK : KANLOG

Ward No. 25





Ward Statistics

Area (km²)	1.20
Total Population	6,036
Total Male Population	3,137
Total Female Population	2,899
Population >= 60 Years	365
Population <= 6 Years	447
% Roof Unengineered	16.40
% HH With Treated Water Supply	88.40
% HH With Access to Sanitation	89

Source: Census of India, 2011

Legend

- Ward Boundary
- Open Ground
- National Highway
- Other Roads
- Schools
- Stairs and Walkways
- Public Buildings
- LPG Godowns
- Cell Towers
- Health Units
- Hospitals
- Police Stations
- Post Offices
- Parkings

Note:
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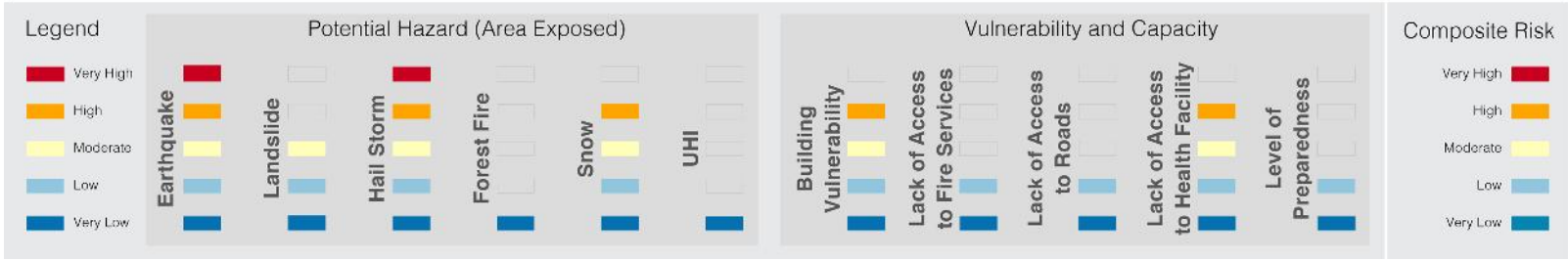

Scale:
Datum: WGS 84
Projection: Mercator

0 200 m

Source:
Prepared, Analysed and Primary Survey Conducted by TARU Leading Edge (2015)
Base Data: AGiSAC Shimla
Background Image: Google Maps 2015

May, 2016

Prepared By:
TARU Leading Edge Pvt. Ltd.
New Delhi & Ahmedabad, India