Nagaland State Disaster Management Plan

Nagaland State Disaster Management Authority

HOME DEPARTMENT
GOVERNMENT OF NAGALAND

With support from
NDMA & UNDP

CONTENTS

CHAPTER I

1. EXECUTIVE SUMMARY **1-3**

CHAPTER –II

2. OVERVIEW OF THE STATE **4-21**
2.1.1 Location
2.2 Socio – economic Division
2.3 Administrative Divisions.
2.4 Physiographic of Nagaland.
2.5 Geology of Nagaland.
2.6 Climate and Rainfall.
2.7 Drainage.
2.8 Demographic Profile & Literacy.
2.9 Demographic Profile of Nagaland.
2.10 State Education.
2.11 Health.
2.12 Forest.
2.13 Agriculture and Land Use Pattern.
2.14 Soils of Nagaland.
2.15 Industry.
2.16 Oil & Minerals.
2.17 Transportation.
2.18 Power.
2.19 Water Supply.
2.20 State Domestic Product.

CHAPTER III

3. HAZARD VUNERABILTY ANALYSIS OF THE STATE OF NAGALAND. **22-74**
3.1 Earthquake
3.1.1 Risk and Vulnerability Analysis.
3.1.2 Measures to be taken before, during and after an Earthquake.
3.2 Landslides
3.2.1 Hazard analysis.
3.2.2 Landslide Indicators.
3.2.3 Prevention and Mitigation Measures.
3.2.4 Structural Measures.
(i) Retaining wall, Embankments and Dams.
(ii) Bamboo/wooden Nail Reinforcements.
(iii) Water Control Methods.
(iv) Surface Water.
(v) Catch-water drain.
(vi) Cross drain.

(vii) Subsurface water.
(viii) Deep trench drain.
(ix) Topographic Treatment.

3.2.5. Biological Measures
3.2.6. Non-Structural Measures
3.2.7. Remote Sensing & GIS in Landslide Management
3.2.8. Generating Awareness
3.2.9. Recommendation
3.3. District wise Vulnerability Assessment
3.3.1. Dimapur
3.3.1.2. Vulnerability Analysis
3.3.2. Kiphire
3.3.2.1. Vulnerability Analysis
3.3.3. Kohima
3.3.3.1. Vulnerability Analysis
3.3.4. Longleng
3.3.4.1. Vulnerability Analysis
3.3.5. Mokokchung
3.3.5.1. Vulnerability Analysis
3.3.6. Mon
3.3.6.1. Vulnerability Analysis

3.3.7. Peren
3.3.7.1. Vulnerability Analysis.
3.3.8. Phek.
3.3.8.1. Vulnerability Analysis.
3.3.9. Tuensang
3.3.9.1. Vulnerability Analysis.
3.3.10. Wokha.
3.3.10.1. Vulnerability Analysis.
3.3.11. Zunheboto.
3.3.11.1. Vulnerability Analysis.

CHAPTER IV

4. STATE DISASTER MANAGEMENT FRAMEWORK 75-78
4.1. Principles of Disaster Management Plan.
4.2. Objectives of the Nagaland State Disaster Management Plan.
4.3 Disaster Management : An Approach
4.4. Disaster Response Plan.
4.5. The State Response Plan is based on the following Premises

CHAPTER V

5. INSTITUTIONAL MECHANISM TO RESPONSE TO DISASTER 79-90
5.1. State level.
5.1.1. Following shall be the sequence of action at the state level:
5.1.2. State Disaster Management Authority (SDMA)

5.1.3. State Executive Committee (SEC)
5.1.4. Role of other Department/Agencies
5.2. District Level
5.2.1. Following shall be the sequence of action at the District Level:
5.2.2. District Disaster Management Authority (DDMA)
5.3. First Response
5.4. First Information Report.
5.5. Daily Situation Report
5.6. Air dropping of Food in inaccessible areas
5.7. Rapid Damage Assessment
5.8. Immediate repair of infrastructure
5.9. Disposal of Dead bodies
5.10. Disposal of carcasses
5.11. Information and media management
5.12. Mechanism for International Assistance
5.13 Post – Operational Debriefing
5.14. Relief
5.15. Food & Nutrition
5.16. Water
5.17. Health
5.18 Medical Response
5.19. Mental Health Services
5.20. Clothing & Utensils
5.21. Shelter
5.22. Relief Camp
5.23. Sanitation and Hygiene
5.24. Provision of Intermediate Shelters
5.25. Management of Relief Supplies
5.26. Transparency of Relief

CHAPTER VI

6. STANDARD OPERATION PROCEDURE 91-117
6.1. Introduction
6.2. Objective of SOP
6.3. L Concept
6.4. Trigger Mechanism
6.5. At the Sub Divisional Level
6.6. At the District Level
6.7. At the State Level
6.8. SOP phases
6.8.1. Preparedness Phases
6.8.2. Early warning Phases
6.8.3. Response Phases
6.8.3.1. Where Early Signals are Available
6.8.3.2. Where Disaster Occurs without early warning
6.8.4. Relief Phases
6.8.5. Restoration Stage

CHAPTER VII

7. INCIDENT COMMAND SYSTEM **118-123**
7.1. Organizational Model
7.2. Setting up of a single Command Post
7.3. Unified Command
7.4. Incident Actions Plans
7.5. Standardization
7.6. Emergency Support Functions (ESFs)

CHAPTER VIII

8. APPROACH AND STRATEGY FOR IMPLEMENTATION: **124-126**

CHAPTER IX

9. CHECKLIST: DO's AND DON'TS **129-137**

CHAPTER X

10. PHOTO SECTION **138-140**

ANNEXURE

ANNEXURE 1 : SOP FOR BOMB EXPLOSION **127**
ANNEXURE 2 : SOP FOR DEALING WITH MAJOR LAW AND ORDER **128**

CHAPTER I

1.1. EXECUTIVE SUMMARY

The State of Nagaland, situated in the Northeast of India, comprises of hilly terrain bordered in parts of the west by low lying, alluvial tracts adjoining the State of Assam. Natural and Anthropogenic damages to the environment due to the adverse geologic and climatic conditions, rapid population growth and increased concentration of population in hazardous environments, and lack of adequate infrastructure has resulted in escalation and severity of natural disasters in the State.

Potential and real hazards identified by the State Government of Nagaland include natural (Earthquake, landslides, floods, fires, droughts etc) and manmade (forest fires, chemical and gas catastrophes etc) disasters. The State Government of Nagaland realizes the need to address the issue of disaster response and management at both the micro and macro level and hence, the adoption of a holistic approach in disaster management that ensures the involvement of the State machineries, District functionaries, NGOs, all concerned stakeholders right down to the traditional Village Councils at the level of the individual village units.

The Nagaland State Disaster Management Plan also takes into consideration National and State level policies and guidelines while making an effort to incorporate as far as possible, indigenous concepts, practices and wisdom that have been adopted for decades by the local tribes and communities of the State in their approach to ward off or in response to any disaster.

The State Government of Nagaland recognizes the need to adopt a proactive and sustainable approach to disaster management. Hence, the Nagaland State Disaster management Plan lays down specific guidelines and provisions to equip various entities at the State, District Block and Village level to respond and act effectively at any point of time during any disaster.

Disaster management involves a holistic approach to problem solving relating to any kind of disaster irrespective of its magnitude. The State Government of Nagaland realizes its

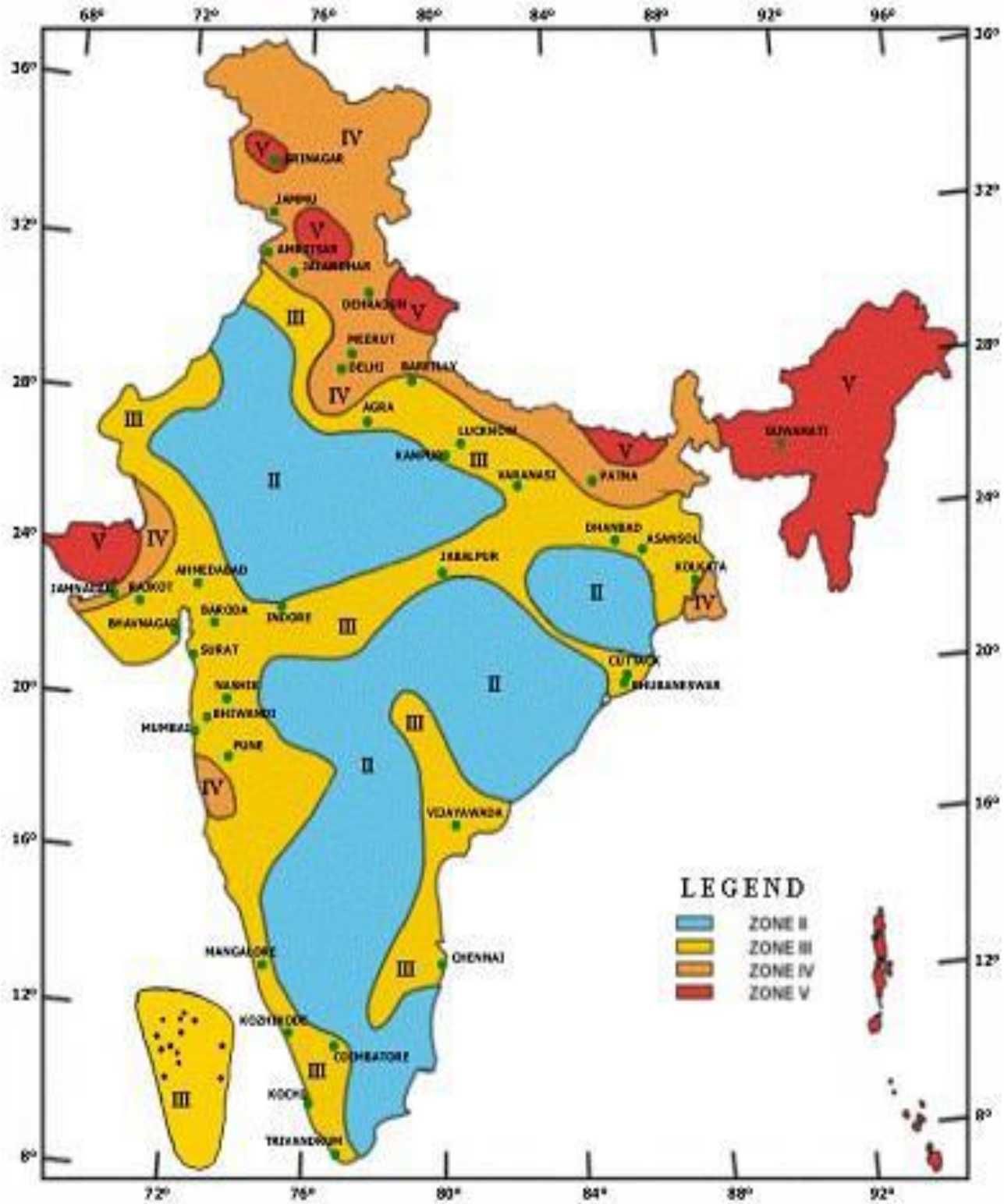
responsibility in initiating, adopting and implementing disaster management as an integral part of its State policy. At the same time it also recognizes the need to put people first and ensure the involved participation of people and communities, particularly in the context of Nagaland where the many Tribal communities have an inherent and inbuilt system of traditional ties and bonding. Hence importance is laid on community and peoples participation in the approach adopted by the State Government of Nagaland.

The Nagaland State Disaster Management Plan recognizes the need to rely on the usage of locally available resources (knowledge, personnel and material) to ensure a more efficient, cost effective and quicker response.

The political and administrative machinery will be made responsive while involving the active participation of Civic bodies, social organizations, institutions, community based organizations, Tribal Hohos and voluntary organizations. Participation and partnership at all levels of planning, capacity building, response activities, monitoring and rehabilitation will be encouraged.

The Disaster Management Act shall be enacted and each District shall develop its own Disaster Management Action Plan. Existing laws and regulations shall be reviewed with the objective of updating and incorporating suitable norms in line national and international principles and agreements.

Seismic Zoning Map of India



Bureau of Indian Standards

CHAPTER II

2. OVERVIEW OF THE STATE

2.1. Location:

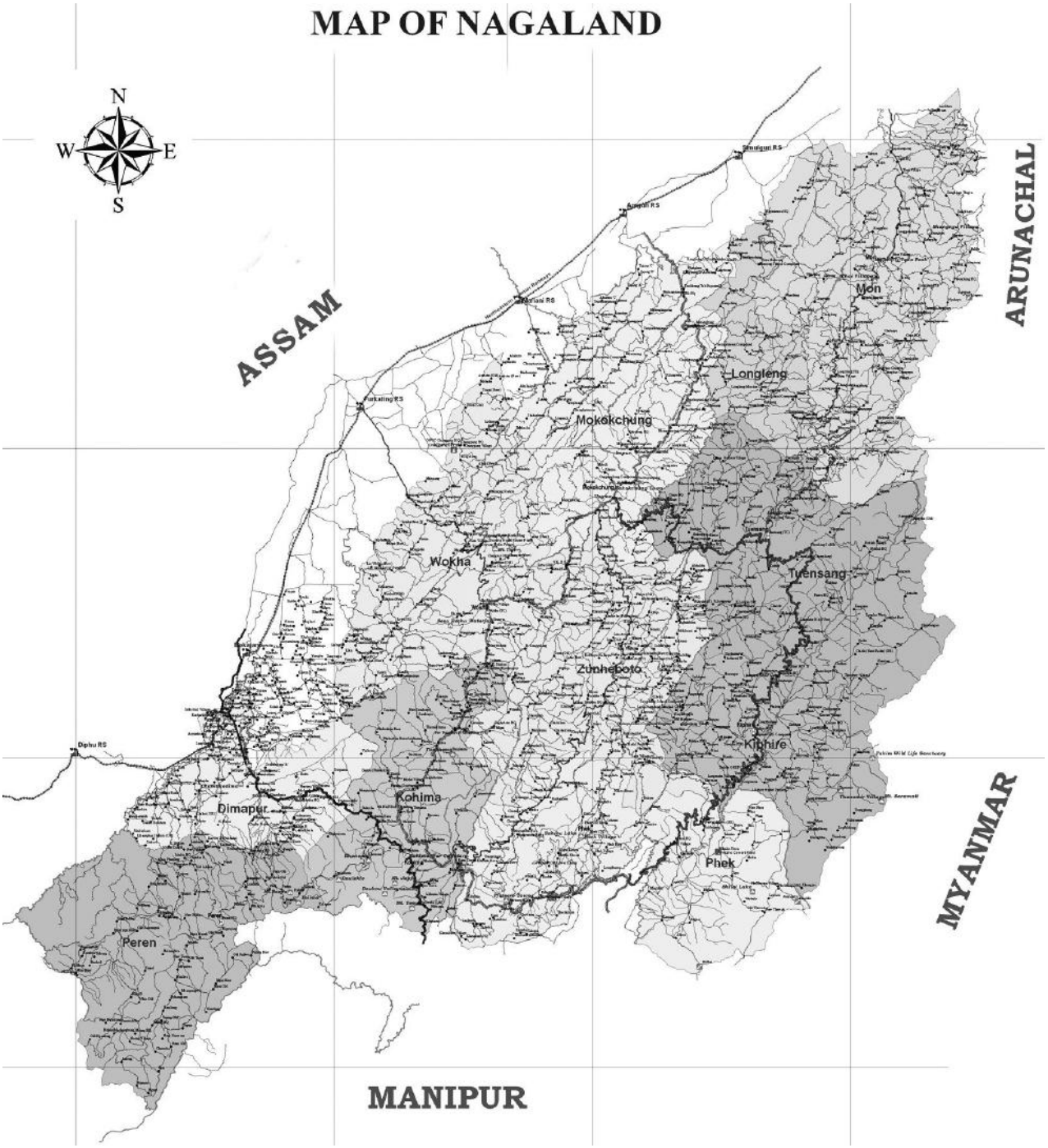
Nagaland, the smallest hilly state situated at the extreme northeastern end of India, lies between 25° 6' and 27° 4' latitude, North of Equator and between the Longitudinal line 93° 20’ E and 95° 15’E. The state shares its boundary with Assam on the West, Myanmar on the East, Arunachal Pradesh and parts of Assam on the North and Manipur on the South.

2.2. Socio-economic Profile:

Nagaland is noted for its rich incomparable traditional and cultural heritage, folklore, traditional handicrafts, exquisitely picturesque landscapes, flora & fauna, and historic monuments. The economy of the people is fully dependent on Agriculture. The state has inadequate socio-economic development because of relative isolation, the difficult terrain, inaccessibility to the rest of the world and continued insurgency. These factors handicap the State’s endeavors towards industrial and entrepreneurial development, private sector partnership in spearheading development initiatives and all round regional planning. Remoteness and inaccessibility are also the predominant cause for regional disparities in the State. An Index for Social and Economic Infrastructure by the Eleventh Finance Commission, during 1999, ranked Nagaland, with an index of 76.14, as the seventh most remote State in the country. Nevertheless, owing to its strategic location, the State has the potential to develop into an international trade centre in the East Asian region.

2.3. Administrative Divisions:

The state covers an area of 16,527 Sq. Km., which is approximately 0.5% of the total Indian land mass. Administratively, the State is divided into eleven Districts and the Districts are further divided into EAC Headquarters for effective administration. Nagaland has 11 (eleven) districts and 93 (ninety three) circles. Mokokchung town is not included in any of the circle and hence treated as a separate unit. All the district headquarters along with the state capital are shown at their respective locations in the map shown below.


MAP OF NAGALAND
N
W
E
S
ASSAM
ARUNACHAL
MYANMAR
MANIPUR
Mon
Longleng
Mokokchung
Wokha
Tuensang
Zunheboto
Kiphire
Kohima
Dimapur
Phek
Peren
Diphu RS

The details of the circles at district level are given hereunder:

Sl. No.	Districts	Circles
1.	**Mon**	Naginimora, Tizit, Hunta, Shangnyu, Mon Sadar, Wakching, Aboi, Longshen, Phomching, Chen, Longching, Mopong, Tobu, Monyakshu.
2.	**Tuensang**	Tamlu, Yongya, Longleng, Noksen, Chare, Longkhim, Tuensang Sadar, Noklak, Panso, Shamator, Tsurungtho, Chessore, Seyochung, Amahator, Kiphire Sadar, Thonoknyu, Kiusam, Sitimi, Longmatra, Pungro.
3.	**Mokokchung**	Longchem, Alongkima, Tuli, Changtongya, Chuchuyimlang, Kubolong, Mangkolemba, Ongpangkong.
4.	**Zunheboto**	V.K., Akuluto, Suruhoto, Asuto, Aghunato, Zunheboto Sadar, Atoizu, Pughoboto, Ghathashi, Satakha, Satoi.
5.	**Wokha**	Changpang, Aitepyong, Bhandari, Baghty, Sungro, Sanis, Lotsu, Ralan, Wozhuro, Wokha Sadar, Chukitong
6.	**Dimapur**	Niuland, Kuhoboto, Nihokhu, Dimapur Sadar, Chumukedima, Dhansiripar, Medziphema.
7.	**Kohima**	Tseminyu, Chiephobozou, Kezocha, Jakhama, Kohima Sadar, Sechu, Pedi (Ngwalwa), Jalukie, Athibung, Nsong, Tening, Peren.
8.	**Phek**	Sekruzu, Phek Sadar, Meluri, Phokhungri, Chozuba, Chetheba, Sakraba, Pfutsero, Khezhakeno, Chizami.
9.	**Longleng**	
10.	**Kiphire**	Siti,
11.	**Peren**	Jalukie, Hatipong,

Table 2.1: Circles at the District.

2.4. Physiographic of Nagaland:

Nagaland consists of a narrow strip of hilly country running North-east to South-west and facing the Assam plains to its North and North-west. The Barail range enters the state at the South- west corner and runs in a North-easterly direction almost up to Kohima. Near Kohima the Barail range merges with the mountain ranges which have extended to Manipur and the main range assumes a much more northerly trend. This range is considerably higher than the Barail, with peaks like Saramati (3826.15 m) and Mataung Kien (3420 m) at its extreme east. Between Mao and Kohima, there are several very high peaks including Japvo. North of Kohima the main range declines in height, and as far north as Mokokchung district, the Japukong range attains an average elevation of 750m. In general, 94% area falls under hilly

and rugged terrain and only 6% land is plain, especially those bordering Assam plains along western boundary of the state. The State has a rolling landscape with low hills covered with very dense vegetation.

2.5. Geology of Nagaland:

Facing the Himalayan ranges across the Brahmaputra valley and stretching NE- SW along the eastern margin of Northeast India, bordering Myanmar, there lies the Naga Hills. It represents the northern extension of the Indo- Burma Ranges (IBR) linking the Arunachal Himalaya to the north and Andaman-Nicobar Islands to the south. The N-S trending Patkai, Barail and associated ranges with their varied structural styles impart youthful geomorphology to the Naga Hills. The Cenozoic sedimentary cover in Nagaland accounts for nearly 95 percent of the area whereas the rest is being occupied by igneous and crystalline rocks of Mesozoic-Cenozoic age. These exhibit a general trend of NNE-SSW with moderate to steep dips towards NW and SE.

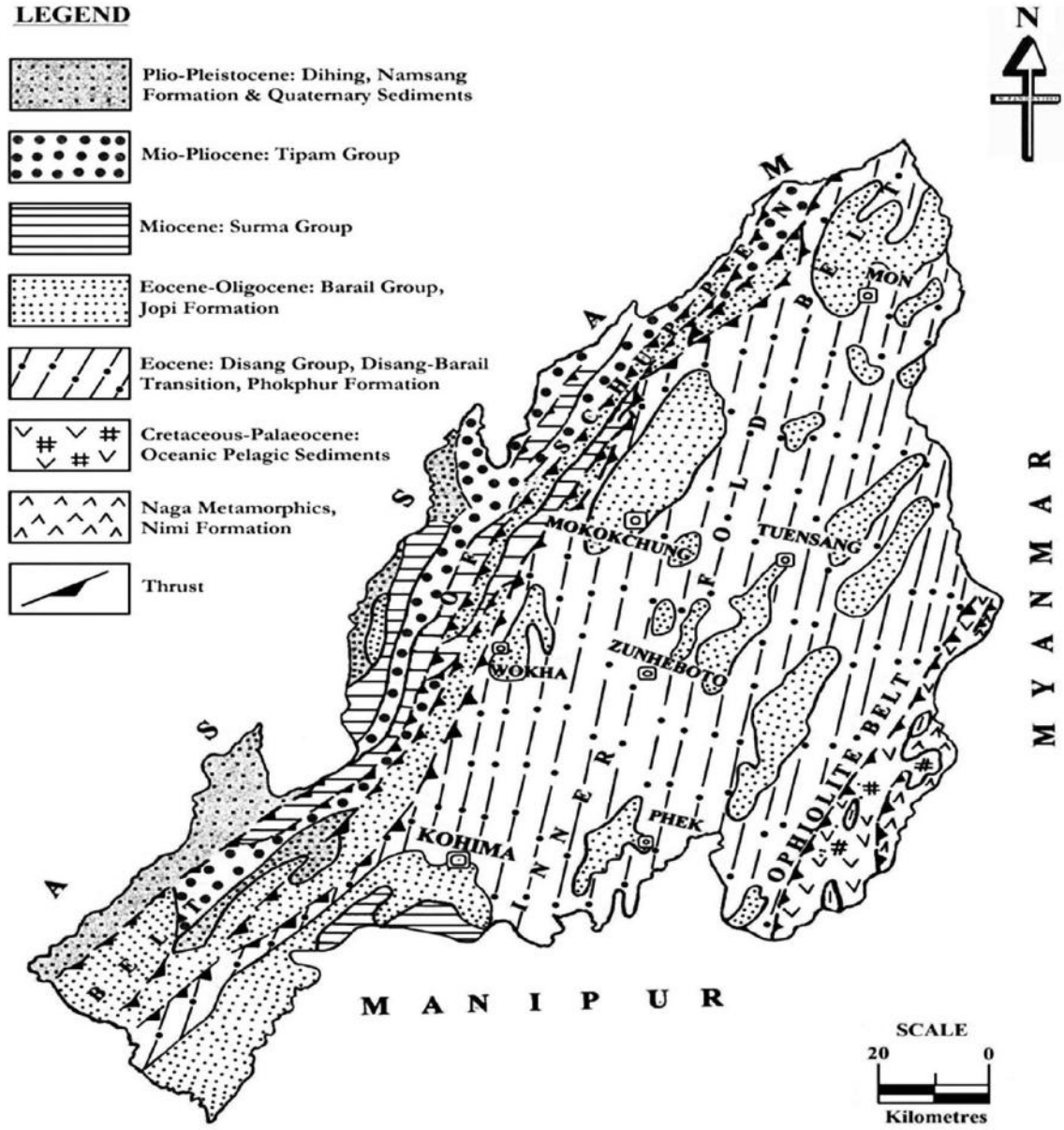
Based on the morphotectonic elements, the Naga Hills has been longitudinally divided, from west to east, into three distinct units, namely- the Schuppen Belt, the Inner Fold Belt and the Ophiolite Belt.

The Schuppen Belt has been defined as a narrow linear belt of imbricate thrust slices which follows the boundary of Assam valley alluvium for a distance of 350 Km. along the flank of Naga- Patkai hill ranges. It is postulated that this belt comprises of eight or possibly more overthrusts along which the Naga Hills have moved northwestwards relative to the Foreland spur. The total horizontal movement of all the thrusts together is estimated to be over 200 km. The Schuppen belt is delineated on the east by Halflong- Disang thrust and on the west by the Naga thrust which has an en-echelon disposition. Sediments ranging in age between Eocene-Oligocene and Plio-Pleistocene along with total absence of Disang rocks together characterize the Schuppen Belt.

The Inner Fold Belt occupies the central part of Naga Hills and extends up to Pangsu pass in Arunachal Pradesh. A large spread of Disang rocks with isolated covers of Barail as well as Disang- Barail Transition sequences characterizes the geological setting of this belt. The Palaeogene rocks have been folded into series of anticlines and synclines and are confined within two major tectonic zones viz. Haflong- Disang thrust to the west and the Ophiolite-

Disang thrust to the east. The Inner Fold Belt is occupied by two major synclinoria, namely the Kohima synclinorium to the south and Patkai synclinorium to the north, the Mokokchung and adjoining areas being the culmination point of the two. In Kohima synclinorium the younger Surma rocks are developed in its core.

The NE- SW trending Ophiolite belt of Naga Hills extends along the eastern margin of the Nagaland state for nearly 200 Km bordering Myanmar. It is characterized by dismembered tectonic slices of serpentinites, cumulates and volcanics. The associated pelagic sediments include mainly chert and limestones that are often interbedded with the volcanics. Cherts are usually bedded and contain radiolarians. The fossil assemblages from the limestone interbands have suggested an Upper Cretaceous to Lower Eocene age for the Ophiolites. These Ophiolite suit of rocks are unconformably overlain by an ophiolite derived volcaniclastic and open marine to paralic sedimentary cover which have been designated as Phokphur Formation.



Geological Map of Nagaland, Northeast India.

(Modified after Geological Survey of India, 1998)

2.6. Climate and Rainfall:

Climate of Nagaland is typical of a tropical country with heavy rain fall. The average rainfall of the area is about 2000mm to 2500mm. Rainfall is high during the monsoon from May to September/October; whereas during winter it is scanty. In summer the temperature ranges from 31◦c to 16◦c while during winter the same varies between 24◦c to 4◦c. Spring is warm and humid. On the whole the climatic condition of the state is cool and bracing. The characteristics of the climate can be summarized as follows:

Sl. No.	Months	Seasons
(a)	December to middle February	Coldest periods
(b)	Last part of February to March	Retreating summer with frequent dust wind and Moderate climate, pleasant.
(c)	April to October	Occasional dust wind with heavy rainfall.
(d)	October and November	Cold season starts gradually, pleasant because of the moderate nature of the climate.

Table 2.2: Characteristics of Climate in Nagaland

2.7. Drainage:

The main rivers that flow through the state are Dhansiri, Doyang, Dikhu, Tizu and Melak. There is no waterfall in Nagaland. The only natural lake well known is the Lacham lake located near Washello in Phek district. The Barail and Japvo range form the watershed of the state, but none of the streams are of considerable dimensions. Almost as far north as Mokokchung, the whole of the drainage of the north-western slope face of hills ultimately finds its way into Dhansiri River. Diphupani is an important tributary of Dhansiri. Doyang River originates near Mao and follows a north- northeasterly course and then flows north-west cutting across the main chain of hills till it joins its largest tributary, the Rongmapani. North of Doyang, the principal streams are Desai and Jhanzi, which ultimately flows into the Brahmaputra.

2.8. Demographic Profile & Literacy:

The official census 2011 of Nagaland has been conducted by Directorate of Census Operations in Nagaland. Enumeration of key persons including Chief Minister of Nagaland was also done by officials conducting population census.

As per details from Census 2011, Nagaland has population of 19.81 Lakh, a decrease from figure of 19.90 Lakh in 2001 census. Total population of Nagaland as per 2011 census is 1,980,602 of which male and female are 1,025,707 and 954,895 respectively. In 2001, total population was 1,990,036 in which males were 1,047,141 while females were 942,895. The total population growth in this decade was -0.47 percent while in previous decade it was

64.41 percent. The population of Nagaland forms 0.16 percent of India in 2011. In 2001, the figure was 0.19 percent.

Description	2011	2001
Approximate Population	**19.81 Lakh**	**19.90 Lakh**
Actual Population	**1,980,602**	**1,990,036**
Male	1,025,707	1,047,141
Female	954,895	942,895
Population Growth	**-0.47%**	**64.41%**
Percentage of total Population	0.16%	0.19%

Sex Ratio	**931**	**909**
Child Sex Ratio	944	926
Density/km2	**119**	**120**
Density/mi2	309	311
Area km2	**16,579**	**16,579**
Area mi2	6,401	6,401
Total Child Population (0-6 Age)	**285,981**	**289,678**
Male Population (0-6 Age)	147,111	147,524
Female Population (0-6 Age)	138,870	142,154
Literacy	**80.11 %**	**66.59 %**
Male Literacy	83.29 %	76.04 %
Female Literacy	76.69 %	56.87 %
Total Literate	**1,357,579**	**1,132,323**
Male Literate	731,796	640,201
Female Literate	625,783	492,122

Description	Rural	Urban
Population (%)	**71.03 %**	**28.97 %**

Total Population	**1,406,861**	**573,741**
Male Population	724,595	301,112
Female Population	682,266	272,629
Population Growth	**-14.59 %**	**67.38 %**
Sex Ratio	**942**	**905**
Child Sex Ratio (0-6)	932	979
Child Population (0-6)	**214,138**	**71,843**
Child Percentage (0-6)	15.22 %	12.52 %
Literates	**904,799**	**452,780**
Average Literacy	**75.86 %**	**90.21 %**
Male Literacy	79.49 %	92.11 %
Female Literacy	72.01 %	88.10 %

Literacy rate in Nagaland has seen upward trend and is 80.11 percent as per 2011 population census. Of that, male literacy stands at 83.29 percent while female literacy is at 76.69 percent. In 2001, literacy rate in Nagaland stood at 66.59 percent of which male and female were 76.04 percent and 56.87 percent literate respectively. In actual numbers, total literates in Nagaland stands at 1,357,579 of which males were 731,796 and females were 625,783. Total area of Nagaland is 16,579 sq. km. Density of Nagaland is 119 per sq km which is lower than national average 382 per sq km. In 2001, density of Nagaland was 120 per sq km, while nation average in 2001 was 324 per sq km.

Sex Ratio of Nagaland is 931 i.e. for each 1000 male, which is below national average of 940 as per census 2011. In 2001, the sex ratio of female was 909 per 1000 males in Nagaland.

2.10. State Education:

The State has 1311 numbers of Primary Schools, 121 Middle/ High Schools, 40 colleges, 02 Polytechnics, o5 Industrial Training Institutes and one Central University. The pass percentage in the matriculation examination is only 48.6 percent, whereas in higher secondary it is 76.5 percent. The dropout rates at class 10 and 12 levels are considerable.

2.11. Health:

The health facilities in Nagaland are inadequate to meet the requirements of the State. Nevertheless, the health profile of Nagaland has shown a positive swing in terms of expansion of primary health care system, the progressive increase in the number of trained health providers and the low infant mortality rate. Nagaland's crude birth rate is higher than the all India figures but the State's infant mortality rate is much lower. The vital statistics of every married woman producing four children during her productive phase has resulted in a total fertility rate of 3.77. The couple protection rate, i.e. use of contraceptives, is 30.3 percent. During 1980, the State had 204 health centers, including urban hospitals, rural hospitals, primary health centers and sub-centers with a total of 1367 beds and 156 doctors. By 1999–2000, the number of health centers increased to 425, with 1633 beds and 394 doctors. In 2002-2003, there were 13 Government hospitals & 422 dispensaries/ sub-centers with a total capacity of 2065 beds. The coverage was roughly 20 doctors and 30 hospitals/health centers per lakh population. The health professional to total population ratio was 1: 4000, against the recommended ratio of 1: 3500. Among the district headquarters, Kohima and Dimapur are equipped with better health facilities. In Kohima there are 21 Primary Health Centers including the Naga Hospital, Mental Hospital and T.B. Hospital (Khuzama). The Naga Hospital has Tele-Medicine Connectivity with the Apollo Hospital at Delhi where top physicians can be consulted for serious and complex cases. Apart from these, there are several privately managed well equipped Nursing Homes and Clinics. Besides urban areas, Dimapur covers the entire rural population in the district. The notable health establishments include Dimapur Civil Hospital under Medical Superintendent, NAP Hospital, Chumukedima Railway Hospital, Dimapur Military Hospital, Rangapahar and the 500 bedded Referral Hospital, Dimapur which has recently opened. In addition, there are numerous private Hospitals, Nursing Homes, Clinics and specialized Diagnostic Centers that offer medical facilities in the urban areas. The Urban Malaria Scheme under the aegis of the NMEP offers facilities to all the public and to OPD and in-patients at the Civil Hospital, Dimapur, for Parasitological examination & treatment.

2.12. Forests:

The presence of forests is crucial in maintaining the ecological stability of a given region as it provides protection against and reduces the adverse impact of natural calamities like droughts, floods and cyclones. Forestry activities also create substantial wage employment

opportunities and remain an important source of non-tax revenue for the State Government. The forest cover of the state is 13,345 sq. kms which is 80.49% of the total geographical area as compared to 19.4% at the national level. As such, forests represent the richest natural resource of the State. It has a wealth of herbal, medicinal and aromatic plants with tremendous economic potentials. The rich forest cover holds tremendous potential for bio-technological manipulations and also indicates strength for a sustainable timber industry, especially through tree cultivation. The forest cover of the State has degraded over the years due to rising population, encroachments, jhumming, increasing needs for fuel wood, timber and fodder.

Though Nagaland is a small state it has been endowed with a wide variety of forest types. This is mainly due to the fact that being in the tropics; Nagaland has land elevation ranging from a few hundred meters up to about four thousand meters. The various types of forest cover in the State are as follows:

- **Northern Tropical Wet Evergreen Forests:** These forests once covered the Namsa-Tizit area but now only a small vestige is found in the Zankam area. It is found only in Mon District. The dominant species in this type of forest are Hollong (Dipterocarpus macrocarpus), Makai (Shorea assamica), Nahor (Mesua ferae) etc

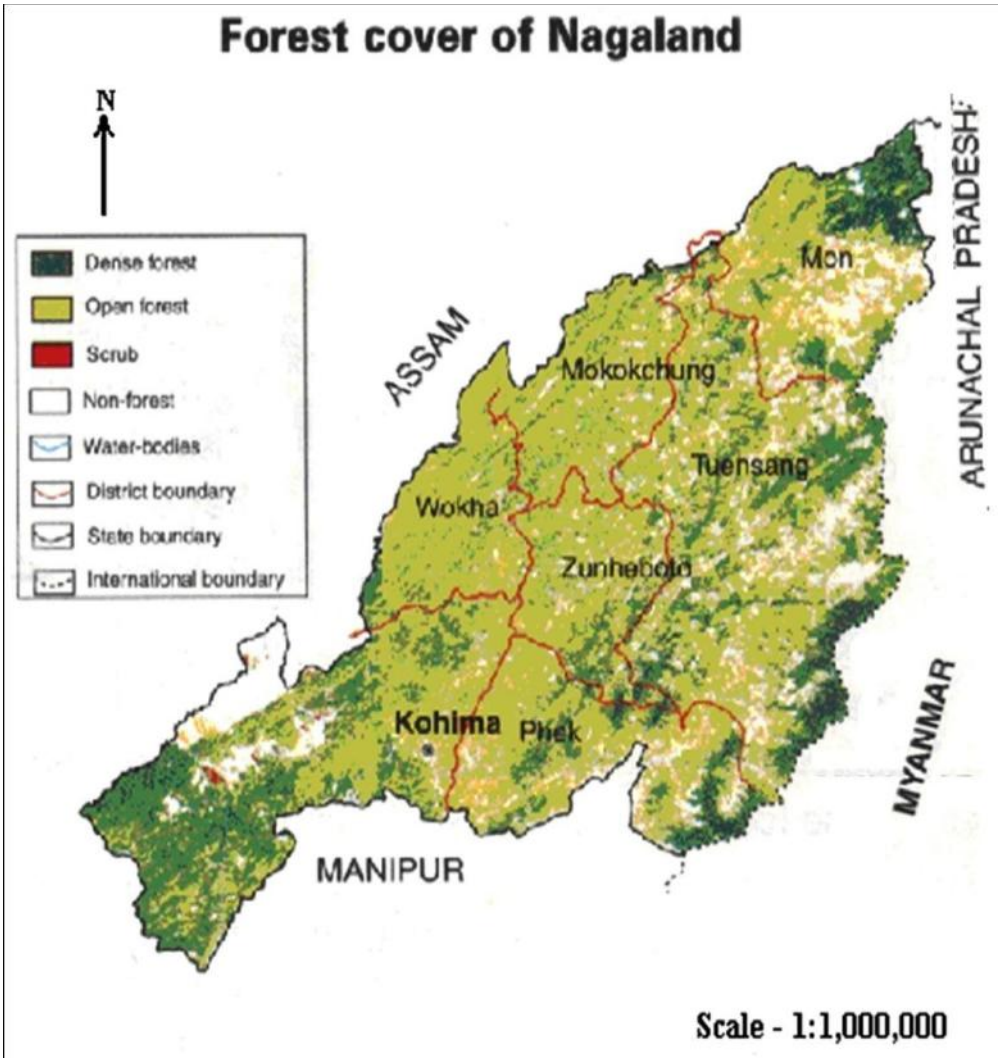
- **Northern Tropical Semi Evergreen Forests**: This type of forests is found in the foothills of Assam-Nagaland border in Mokokchung, Wokha and Kohima Districts. The Species that make up these forests are similar to those of the Northern Tropical Wet Evergreen Forests. The only difference is that in the former case the evergreen species dominate though there are deciduous species like Bhelu, Paroli, Jutuli etc, whereas in the present case, the number of evergreen species decreases and the deciduous species are dominant.

- **Northern Sub-tropical Broad Leaved Wet Hill Forests**: This type of forests is found in the hill areas below 1800m and above 500m in all the districts of Nagaland. The wet evergreen species are conspicuous by their absence and the dominant species are mostly semi-deciduous. Some of the important timber species in this type are - Koroi, Pomas, Sopas, Gamari, Gogra, Khokan, Hollok, Sam, Am, Badam, Betula etc.

- **Northern Sub-tropical Pine Forests:** This types of forests are found in hill elevation of 1000 meters to 1500 meters in parts of Phek and Tuensang Districts of Nagaland. Pine is the dominant species and is found mixed with Quercus, Schima, Prunus, Betula and Rhododendron.

- **Northern Mountain Wet- temperate Forests** This type of forests are found on the higher reaches of the tallest mountains in Nagaland above 2000 meters in - Japfu, Saramati, Satoi, Chentang ranges. The species are typically evergreen with Quercus, Michelia, Magnolia, Prunus, Schima, Alnus and Betula.

- **Temperate Forests:** this type of forests is found in peaks of the tallest mountains (above 2500 meters) like Saramati and Dzukou area. The species that dominate are Rhododendron, Patches of Juniperus coxie and Birch**.**



2.13. Agriculture and Land Use Pattern:

Agriculture has traditionally been and continues to be the mainstay of Naga life—the numerous festivals are centered on agriculture and have their roots in cultivation practices. Seventy-three percent of the people in Nagaland are engaged in agriculture. Rice is the staple food. It occupies about 70 percent of the total cultivated area and constitutes about 75 percent of the total food grain production in the State. Other crops include maize, linseed, potato, pulses, soya bean, sugarcane, jute, gram, cotton, castor, etc. However, like most of the world's tribal population, the production system in Nagaland has been close to proto-agriculture, which has enabled close links between nature and people from generation to generation. These linkages and traditional practices have been formalized through experiences and empirical observations, and interwoven with social, religious and traditional values. The impact of modern scientific practices has not been appreciable as most high external input technologies are not suitable for high altitudes and rain-fed conditions.

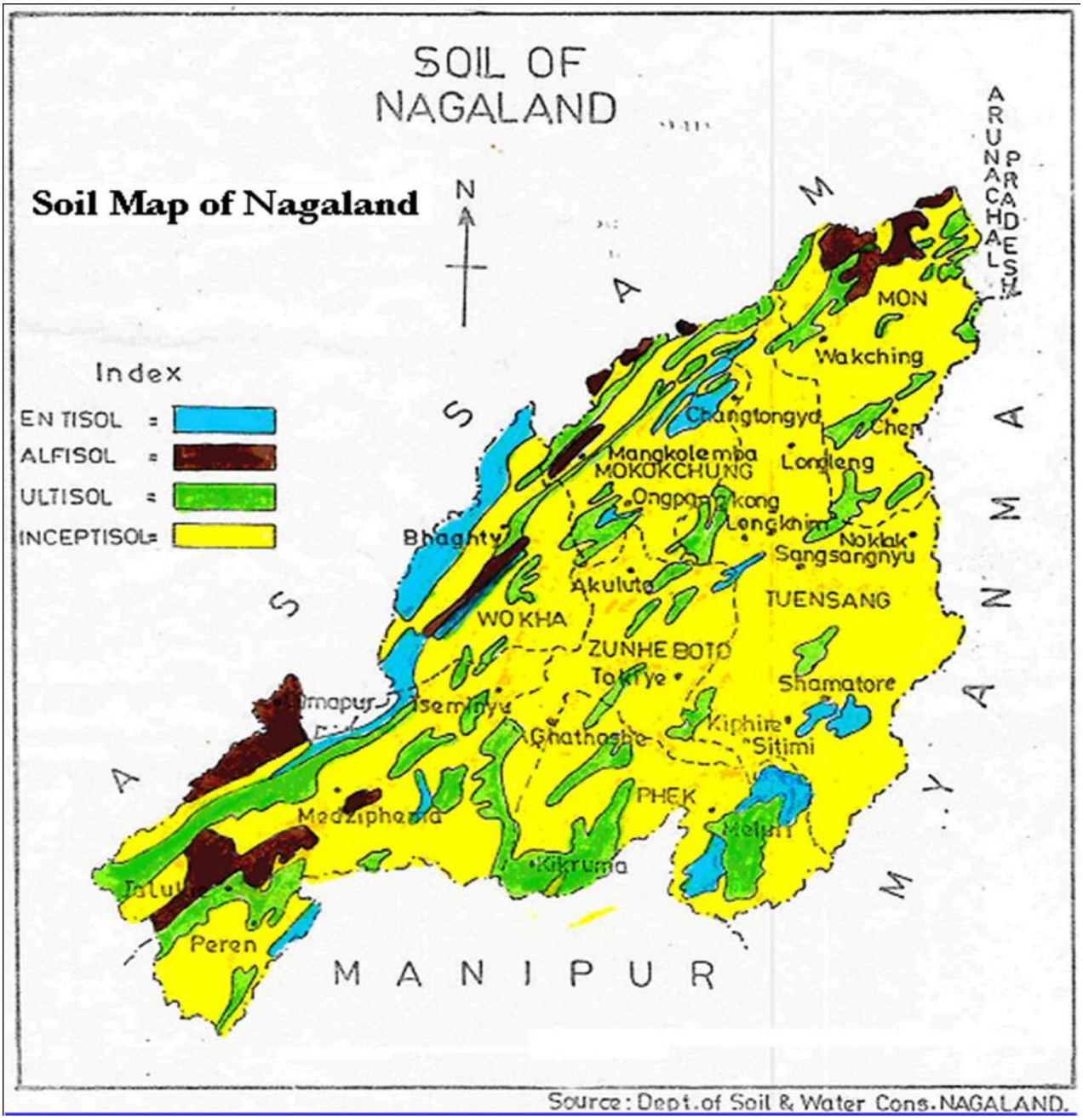
Major land use pattern in Nagaland continues to be shifting cultivation, known as Jhum. Though often considered primitive and unproductive, Jhum is a complex agricultural system that is well adapted under certain conditions and requires exhaustive comprehension of the environment to succeed. The major challenge for Nagaland is the issue of adapting its land use pattern and production systems to the increased population and changing lifestyles while ensuring biological and economical sustainability. Shifting cultivation covers over 73 percent of the total arable area of the State. It is mostly concentrated in the districts of Mokokchung, Tuensang, Wokha, Zunheboto and Mon. In other areas, terraced rice cultivation (TRC) or combined Jhum and TRC are practiced. During the last four decades, the food grain production in Nagaland has shown an upward trend from 62,000 metric tones in 1964–65 to 386,390 tones in 2001–02. The productivity increased from 700 kg per hectare to 1300 kg per hectare over the period. However, the State is not self-sufficient in production of food grains. Non-traditional crops such as wheat, barley, spices, rubber and sugarcane are also gaining popularity in recent years, promising to convert agriculture from subsistence farming to commercially viable activity. The land is extremely fertile and can produce the best quality of agro-based, horticulture and floriculture products through organic farming. Nagaland has a potential for becoming an organic State. Strategic initiatives in the fields of animal husbandry, fishery and sericulture could also result in generation of resources and overall development of the rural economy. The Land Use Pattern in Nagaland may be summarized as follows:

Sl. No.	Particulars	Area Coverage
1	Total Area	16,579 Sq. km
2	Forest Cover	13,345(80.49%)Sq. km
3	Forest Area	8,629 (52.04%) Sq. km
4	Area under Agriculture	3,89,120 Ha
A	Gross Sown Area	2,60,000 Ha
B	Net Sown Area	2,48,354 Ha
C	Area Sown More than Once	9,000 Ha
5	Area under Irrigation	
A	Irrigated Area	66,000Ha
B	Net Irrigated Area	62,000Ha
6	Area under Shifting Cultivation	190Sq km
7	No. of Cultivators	5,444 lakhs
8	No. of Agricultural Laborers'	0.338 lakhs
9	No. of Families Practicing Shifting Cultivation	1, 16,046

Table 2.4: Land Use Pattern in Nagaland

2.14. SOILS OF NAGALAND

The soils of Nagaland belong to 4 orders, 7 sub-orders, 10 great groups, 14 sub groups and 72 soil families. The 4 orders found in Nagaland are (i) Alfisols (ii) Entisols (iii) Inceptisols and (iv) Ultisols. Inceptisols dominate the soils of the State with 66% followed by Ultisols 23.8%, Entisols 7.3% and Alfisols 2.9% of the total 16.6 million Hectares of the State Geographical Area.



2.15. Industry

The industrial base of Nagaland is narrow. The majority of the industrial units/village industries are based on local forest products, agro-products and traditional handloom and cottage industries. The State has established six growth centers for industrial development. However, they have not been able to satisfactorily meet the objectives for which they were envisioned. Nagaland had only 73 industrial units including small scale industries, government emporiums, and district industrial centers and specialized farms in 1980. This increased to 1160 in 1999–2000. This includes 1064 small-scale units. The Paper Mill established at Tuli in Mokokchung District and Sugar Mill in Dimapur faced serious

difficulties. The Sugar Mill has since been closed down while efforts are on to revive the Paper Mill at Tuli.

2.16. Oil & Minerals

Coal, limestone, nickel, cobalt, chromium, magnetite, copper, and recently discovered petroleum and natural gas are the major minerals available in Nagaland. The State has huge caches of unutilized and unexploited limestone, marble, granite, petroleum and natural gas. Coal is found in Nazira, Borjan and Teru valley of Mon district. Limestone of grey to whitish grey color is found at Wazeho and Satuza in Phek district and at Nimi belt in Tuensang district. Ores of nickeliferrous chromite-magnetite occur in the ultra basic rocks at Pokhpur in Tuensang district. Nagaland is yet to fully explore its huge estimated reserves of natural oil. The hydrocarbons are found in the western parts of Nagaland, where connectivity is available in the foothills. The metallic and non-metallic minerals are located in the remote and backward eastern parts bordering Myanmar, ideal for export to the South East Asian region. If the available minerals are economically exploited, these would turn out to be a rich resource base and the mineral-related trade can contribute to the State economy. Unfortunately, though the potential exists, not much has been achieved so far due to funding and planning process constraints. In this connection, the proposed 'X Road' of the Government could provide good connectivity for exploiting the mineral wealth of the State and for trade and commerce both in the State and the country and with South East and East Asian countries.

2.17. Transportation

The rail network in Nagaland is nominal (13 km). The only airport in the State is at Dimapur. Surface transport is the main method of communication in this land-locked hilly State. This has resulted in the development of an impressive network of public and private sector road transport system. The road length of national highways is 365.38 km and of state roads is 1094 km. During 1996–97, the road density was 1107 per thousand sq. km as against the all India road density of 749 per thousand sq. km. However, road transport has been handicapped by inadequate development and poor maintenance of roads. All-weather roads linking the scattered villages are a prerequisite for development of potential areas. This holds true for agriculture, social, industrial, entrepreneurial and mineral development. A good many villages are still not covered by all weather roads and this remains a big hurdle for proper

socio-economic development while raising concerns of accessibility to education, primary health care and farmer's products to the market.

2.18. Power

Nagaland is not self-sufficient in power, the total power generation being only 29 MW (2001). The State purchases power from neighboring states to meet its requirement. The annual energy supply of 225 MU (2001) provides a very low per capita consumption, i.e. about 130 units per year only compared to an Indian average of 370 units. The current peak demand is estimated at about 75 MW but it is restricted to only 50 MW. The quality too is low, with frequent curtailment and interruption, transformer failures and low voltage. The bulk of the power in Nagaland is purchased from the North-Eastern Grid, which is expected to be power surplus, with large hydel projects coming on-stream in other states. The total existing installed State generation capacity is 29 MW, all based on hydropower. Current mean availability from this is about 90MU (2002 onwards). Under the central sector there is an operational 75 MW hydel plant, from which the State receives a share of 12 percent of the generated power. The 24 MW Likimro Hydro Electric Project has been commissioned and a few mini hydro- projects are under construction, which will add about 3 MW to the existing generation. A thermal power plant is planned to be set up at Dimapur within the next two years. Power generation, transmission and distribution are managed by the Nagaland Department of Power (DoP). The DoP's current financial situation is dire with a revenue collection of Rs. 19 crore against a power purchase bill of Rs. 36 crore (2001). The State suffers from high transmission and distribution (T&D) losses, estimated at 58 percent. Due to old and overloaded T&D infrastructure, technical losses form a significant fraction. In this regard, it may be mentioned that the State Power Department does not have the facility to undertake an audit of power transmission or distribution. Consequently, no detailed projection or analysis of segment-wise demand is available in the State. However, an investment projection of Rs. 4,500 crore (US$ 900 million) has been made to raise the generating capacity of the State to 450 MW, based on a notional per capita consumption target of 1,000 units.

2.19. Water Supply

Most of the Naga villages are located on hilltops, which makes supply of drinking water a challenging task. Therefore, water has to be normally supplied, through gravity, from a

source located at a higher altitude than the village. The number of villages having protected water supply sources in 1963 was only 59. Now, 1304 (fully covered–261, partially covered–1043) of the 1376 villages/habitations (approximately 95%) have been provided with drinking water supply. Under the ongoing water supply schemes, the remaining 72 villages/habitations will also be covered during 2004. Efforts are also being made to augment the water supply/distribution in the State, both in the rural and urban areas, to keep pace with the increasing requirement of water as the population grows. The objective is to achieve the recommended norm of 40 lpcd (liters per capita per day). Attempts are being made to involve the community in implementation and maintenance of the water supply schemes.

2.20. State Domestic Product

The net state domestic product (NSDP) of Nagaland has shown an increase from Rs. 10,547 lakhs in 1980 – 81 to Rs. 57,898 lakhs in 1990 – 91 (at constant 1980 – 81 prices) and Rs. 223,042 lakhs during 2000 – 01 (at constant 1993 – 94 prices). The per capita income in the State increased from Rs. 1361 during 1980 – 81 to Rs. 5520 during 1990 – 91. During 2000 – 01, per capita income was Rs. 11,473 (at constant 1993 – 94 prices) as against Rs.10, 306 for the country as a whole. As per the sample survey the per capita income of the State is Rs. 11,119, with Dimapur having the highest per capita income among the districts (Rs 16,837) and Mon having the least (Rs. 4,500). A look at the share of the various sectors in the NSDP during the last two decades shows that the share of the primary sector declined from 32.5 percent in 1980 – 81 to 31.01 percent in 2000 – 01. Among the primary sectors, agriculture formed the major component and its share declined from 28.65 percent to 27.48 percent during the above period. During the same period, the share of secondary sector rose from 14.13 percent to 15.18 percent. These figures show that Nagaland's economy has not witnessed many structural changes in the past two decades. The share of the tertiary sector has shown some fluctuations, i.e. it increased from 53.4 percent in 1980 – 81 to 58.14 percent in 1995 – 1996, and declined to 53.81 percent in 2000 – 01. Within the tertiary sector, transport, storage and communication formed a major share. Their share in the NSDP, which was 1.68 percent in 1980 – 81, increased to 18.14 percent in 1999 – 2000. Public administration and finance and real estate are the other important components in the tertiary sector.

CHAPTER III
HAZARD VULNERABILITY ANALYSIS OF THE STATE OF NAGALAND

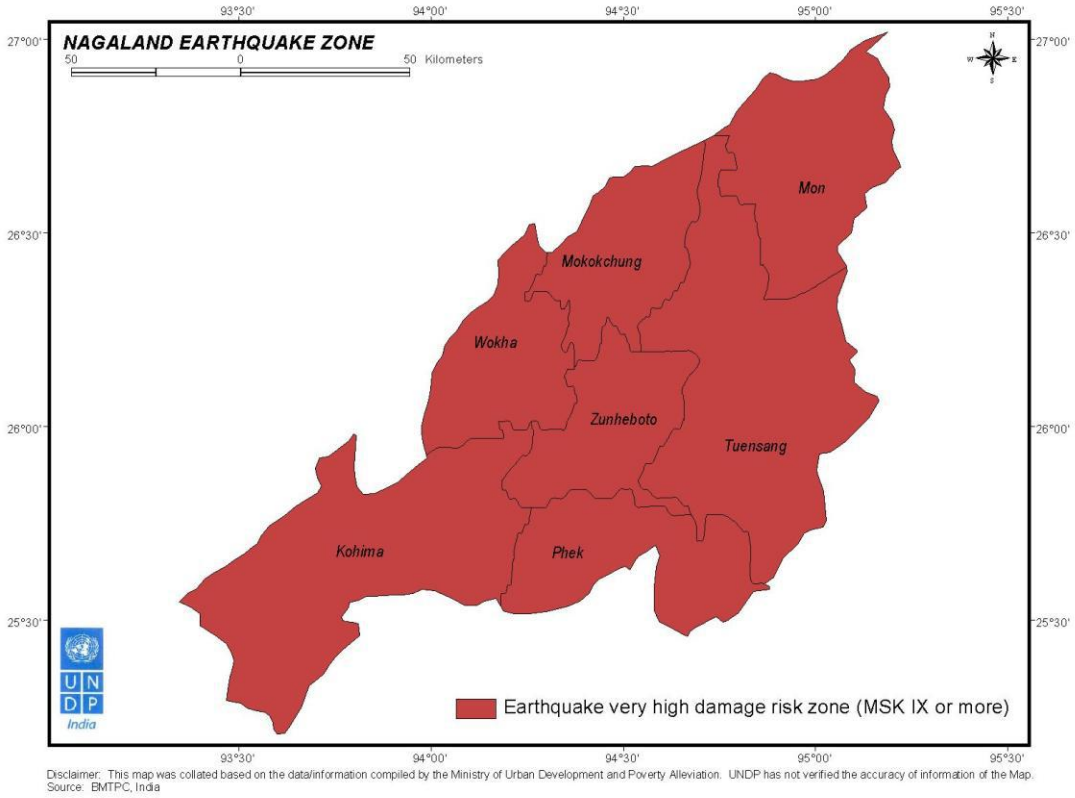
3.1. EARTHQUAKE:

Earthquakes are a real and potential danger to the State of Nagaland. The accepted and working definition of an earthquake is "a sudden and violent motion of the earth which lasts for a short time, within a very limited region". Earthquakes occur without any prior warning and are therefore unpredictable. The extent and impact of an earthquake depends on its magnitude, location and time of occurrence.

The North East of India (latitude 22-29º N and longitude 90-98º E) is one of the most seismically active regions in the World. The region is jawed between the two ranges (arcs), the Himalayan Range to the North and the Indo-Burmese (IBR) to the East. The Mishmi Hills occur at the junction between the Eastern Himalayas and the IBR. The northern part of the N-S trending sigmoid IBR has been named as the Naga Hills. The Naga Hills link the Eastern Himalayas (Arunachal Himalayas) to the North and the Andaman Nicobar Islands to the South. Belts of narrow tectonised but nearly continuous late Mesozoic-Eocene Ophiolite suite of rocks (igneous rocks) and associated sediments (cherts and lime stones) skirt along the northern margin of the Himalayan range and the Eastern margin of the IBR(the Naga Ophiolite) that owe their origin to the collision history of the Indian Plate with the Tibetan Plate (towards the north) and later with the Burmese Plate (towards the East) respectively, sometimes 30 million years ago, leading to the development of fold- thrust belts of the Himalayas and the IBR. It is the outcome of that plate convergence and collision which makes the NE Indian region one of the most seismically active areas of the world.

Nagaland is a multi hazard prone State in the North Eastern Region of India. It comes under the seismic zone IV/V and hence, falls under a very high damage risk zone. The general area is low-lying hills which are prone to landslides due to unstable rock materials, especially during the rainy season which lasts from May to September. Flash floods often occur due to deep depressions and local climatic conditions. The natural tectonic setting makes Nagaland prone to Earthquakes resulting in loss of life and material. A large number of moderate to large magnitude earthquakes have occurred within the State boundaries as

well as within a range of 100km around it. Altogether twelve major earthquakes have occurred in the region in the last 100 years of which the epicenter of the 1950 Great Earthquake was located only 7km towards north of Mon, a District Hq located about 200km north of the capital town of Kohima. It was the sixth largest earthquake of the 20th Century. The shock lasted 8 minutes causing 1,500 deaths, destruction of 2000 houses and other structures while rendering rail and road connectivity useless. The energy of the earthquake matched that of 100,000 atomic bombs and churned up nearly 10,000 sq miles of earth.



Disclaimer: This map was collated based on the data/information compiled by the Ministry of Urban Development and Poverty Alleviation. UNDP has not verified the accuracy of information of the Map.
Source: BMTPC, India

3.1.1. Risk and Vulnerability Analysis:

The State of Nagaland is bounded by Assam in the West, Myanmar on the East, Arunachal Pradesh and part of Assam on the North and Manipur in the South. The State is home to more than 16 major tribes and sub-tribes. The tribal communities more or less inhabit the State in clusters with each tribe inhabiting a particular area or district.

Amongst the thickly populated areas of the State, Dimapur, Mokokchung and Kohima have larger population. Dense population in isolated centers causes pressures and increases vulnerability. Development and growth of these urban centre have been carried out in an unplanned manner and has resulted in inaccessible colonies, narrow roads, illegal structures

and buildings which have not complied with building by-laws and regulations. The dangers of crowded dwellings, fragile building structures and inaccessibility to residential areas make these Districts and towns and their communities, extremely vulnerable in the event of an earthquake.

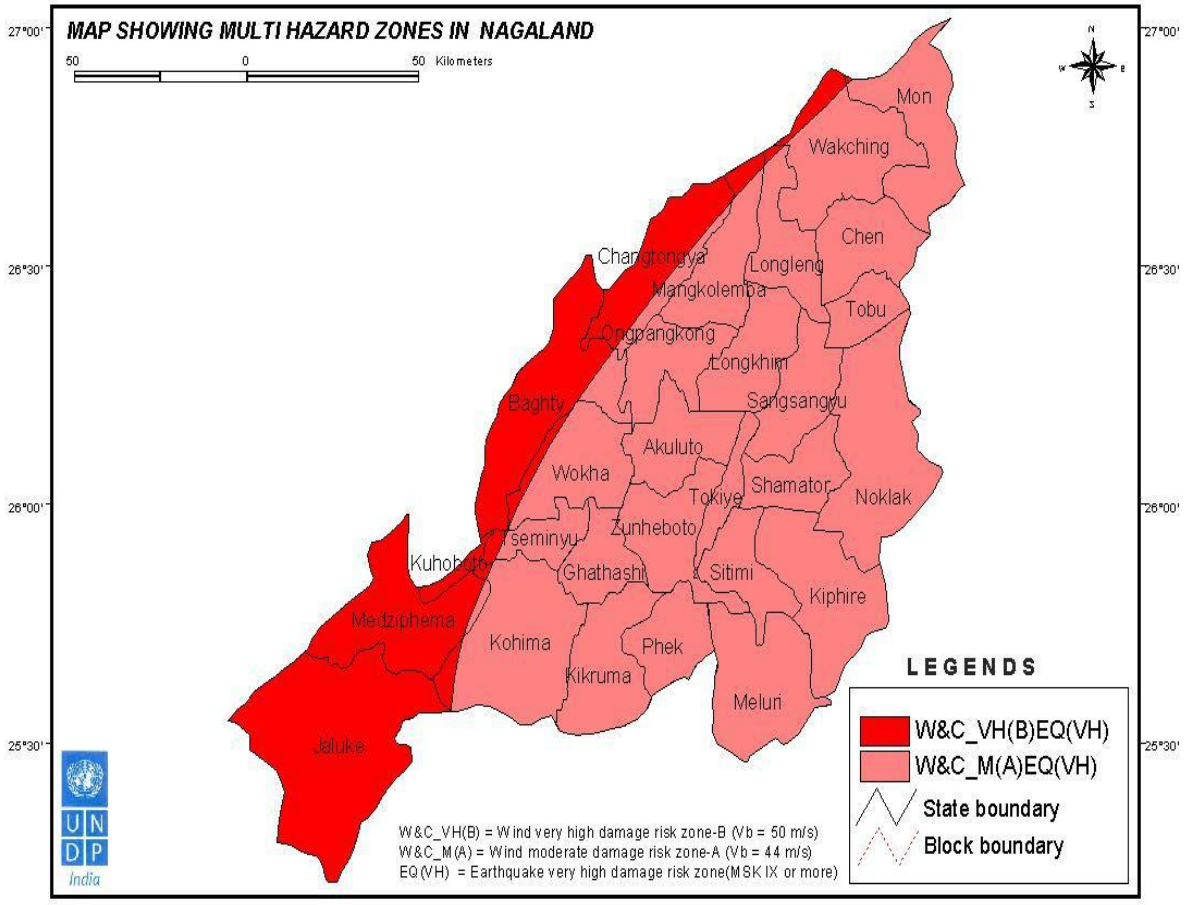
Nagaland is connected to the rest of the country by a lone airport and railhead, both at Dimapur and National Highway 39 and National Highway 37. The National Highways continue to remain an uncertain source of poor connectivity as it is beset with problems of landslides every monsoon. In the face of a disaster, accessibility to and within the State remains a mammoth logistic hurdle.

In the interior Districts, particularly in the Districts of Mon, Longleng, Kiphire, Tuensang, Wokha, Zunheboto and Peren, pockets of habitation spread across rural areas are rendered inaccessible by proper roads and communication facilities. This is compounded by problems of single road/bridge accessibility to certain areas. Longleng, Kiphire, Mon and Tuensang Districts are particularly vulnerable Districts in terms of communication and accessibility problems.

None of the infrastructures in the State, especially in the major towns meet the seismic provision. Slackness and non implementation of Building codes has led to the mushrooming of structurally weak buildings and houses which crowd commercial areas, particularly in Kohima and Dimapur town. Kutchha houses consisting of Category A (Clay and Stone walls) and Category B(Brick walls) account for 7.80% of the total number of houses in the State. These two categories of houses are vulnerable to receive severe damages including total collapse. The concrete and wooden frame houses placed in Category C account for 16.19% of the houses in Nagaland and withstand much greater damage with only a few collapses. The others consisting of thatch/metal sheet huts account for the majority of the housing in the State at 76.01%. These suffer very little damage in earthquakes and do not pose threat to life as Category A and B housing.

The Nagaland State Disaster Management Plan acknowledges the need to build a strong and detail data bank relating to types of housings, potential damage assessment to buildings and lifeline structures such as Highways, Bridges, water supply, waste water collection systems, electricity network, telecommunications, hospitals etc.

The Nagaland State Disaster Management Plan strongly envisages the development of Disaster management Plans at each District level incorporating details of men and material. This must also ensure the setting up of a digital database required to process all information required to perform a vulnerability analysis at each District level.



Disclaimer: This map was collated based on the data/information compiled by the Ministry of Urban Development and Poverty Alleviation, UNDP has not verified the accuracy of information of the Map. Source: BMTPC, India

3.1.2. Measures to be taken before, during and after an Earthquake:

All District Authorities shall take steps to inform and prepare individuals and communities in the event of an earthquake.

Before an earthquake:

- Preparing an emergency kit of food, water and supplies such as torchlight, radio, medicines, first aid kit, clothing and money.
- Identifying safe spots in the house/building where people can take shelter, such as desks, beds, tables etc.
- Identifying danger areas to avoid.

- Conducting mock drills.
- Learning first aid
- Securing heavy furniture, mirrors, pictures, hanging plants etc.
- Preparing necessary items for infants, children, disabled or the elderly.

During an earthquake:

- When in a high rise building, move against an interior wall if desks/tables are not in sight. if indoors, crouch under a table/desk/bed or stand in a corner.
- When outdoors move to an open are away from trees, buildings, walls and power lines.
- When driving, pull over to the side of the road and stop. Avoid power lines and stay inside the vehicle till the earthquake stops.
- If in a crowded area, do not rush to the door. Crouch and cover your head and neck with your hands and arms.
- If in a Stadium or theatre, stay in your seat , get below the level of the back of the seat, crouch and cover your head with your arm and hands.

After an earthquake:

- Check for gas and water leakages or broken electrical wires.
- Check for cracks and damages to buildings, walls and foundations.
- Do not use vehicles to keep roads clear for emergencies.
- Turn on radio for news/information or warnings.
- Be prepared for aftershocks.
- Evacuation should never be an automatic response. Prior to evacuation, a safe route and a shelter should first be identified.

3.2. LANDSLIDES:

Landslides are the down-slope movements of masses of rock debris or earth due to shear failure. Landslides may occur suddenly or through a prolonged period of time, with or without any apparent provocation. Landslides and other mass movements are common where the terrain is young, particularly in active mountain belts. Landslides are responsible for loss of life, damage to property, disruption of communication and transportation systems, and destruction of natural resources. There has been a sharp increase in the number of landslides worldwide during the twentieth century due to human interference. Expanding population,

urbanization and accompanying expansion of settlements over potentially hazardous areas, and wanton destruction of natural resources have rapidly modified the landscape on a massive scale thereby affecting the natural environment causing climate change. This has increased the intensity of rainfall, triggering countless landslides. Drastic climatic changes in recent years are evident in Nagaland. Temperatures have started rising abnormally while too much of rainfall is also noted. This has resulted in extensive areas being affected by landslides.

Much of the state is very hilly comprising of steep slopes and high relief. Nagaland is predominantly made up of shale's and sandstones in various combinations. Most of the rocks, particularly the shale's are sheared, fractured, crumpled, and weathered to various extents. They are normally saturated with water which leads to the building up of high pore-water pressure thereby causing the loss of shearing strength and collapse of the soil structure. Sandstones, particularly those of the Tipam Group in the Belt of Schuppen along the western fringe of the state are weak due to poor cementation and compaction. Repeated thrusting and faulting have further weakened the rocks. Such sandstone areas are known for rock falls and debris slides.

(Left) *Passengers stranded due to rock fall Near Tseminyu Town, NH-61* **(Right)** *Rock fall near Botsa, NH-61*

The 'Global Climate Change' due to global warming by the formation of green house gases in the atmosphere, is currently considered the most alarming development to scientists. The global warming effects will affect climate change globally according to the resource persons from 'National Institute of Disaster Management (NIDM), New Delhi', at the recently held training in the month of August 2010, on Climate Change, organized by A.T.I., Kohima.

According to the observations made, over the Eastern Himalayas in 1996 by Scientists (Kripalani et al), there is an increase in rainfall during the monsoon season. Nagaland, being in this part of the Himalayan Range, is also experiencing the increase in rainfall. The increase is not in the average total rainfall annually, but in the average intensity and quantum of discharge during the monsoon. This year there was an increase in rainfall quantum, in the month of July by 8.45% above normal, as per the hydrological records of the Directorate of Soil & Water Conservation, Government of Nagaland.

Nagaland in located geographically at the catchment level of the Eastern Himalayas, where the clouds from the Bay of Bengal condense and discharge their rainloads. And as opined by the scientists from NIDM, 'As a result of Global Warming, the clouds are heavier laden and resultantly contains heavier quantum of moisture to discharge'. Consequently, the heavier rains are apprehended to become a recurring phenomenon, on account of which, comprehensive salvage and preparedness strategies and policies, need be planned by the concerned authorities. The impacts of this Global Warming and Climate Change, has had effects all over Nagaland, in the form of widespread landslides. The highest casualty of the heavy rainfall this year, is reportedly the roads.

The NH-39 is snapped by a deep and wide landslide at the KMC dumping area. The once sinking zone has now become a valley, stretching from above the road to the river below in a stretch of about a kilometer. The NH-39, afflicted with numerous other landslides, is only a sample. There are reports that almost all the roads connecting the different areas of Nagaland are under peril. Most roads in Nagaland are cut across the mountain ranges, without culverts and proper drainages (nullah), making the roads carry the entire water flow from above, to accumulate or flow to a concentrated outlet stream, causing flush floods. Apart from flush floods, the scientists have made prediction on change in crop production patterns, as a fallout to climate change, even in Nagaland, in the years to come.

3.2.1. Hazard Analysis:

Nagaland has a population of 19,88,636 spread over an area of 16,579 sq kms with a population density of 120 per sq km. The State receives an average rainfall of 2500 mm. Nagaland comprises, for the most part a highly dissected, young and relatively immature mountainous terrain. This geodynamically sensitive region is characterized by intense tectonic activity which has caused large scale folding and faulting that has resulted in severe

shearing, fracturing, and crumpling of the rocks. About 90% of the state is hilly. This geologically unstable area experiences landslides and other mass movements which cause considerable damage every year. Such phenomena commonly occur towards middle to late monsoon and during heavy rains. They are the most common and widespread of the natural hazards in the State. Landslides occur mainly around settlements, in cultivated tracts, and along road sections. Slope stability is governed by geomorphological, geological, and hydro geological conditions. Any changes in these conditions due to human interference, precipitation, and geodynamic processes including seismicity can lead to slope failure.

Most landslides in Nagaland have been initiated during intense monsoon precipitation. Cloudbursts are very common phenomena in this region. Cloudbursts, as reported from other parts of the world are extremely heavy downpours that usually last for a few minutes. However, in Nagaland they are occasionally noted to continue for nearly two hours as had happened twice in the Pagalapahar area in August 2002. Such extended periods of cloudburst have caused large scale devastation. The stability of hill slopes is directly or indirectly influenced by land use practices and land cover because these factors control the rate of weathering and erosion of the underlying formations. Deforestation and creation of arable land allows considerable water to seep into the soil which causes soil erosion and mass movements. Large heavy trees on weak slopes can also cause instability.

In Nagaland, faulty land use practices such as jhum cultivation and heavy constructions are landslide initiators. Water stored in paddy fields induces instability because of great pore-water pressure generated on the soils due to retention of excess water for the paddy plants.

Another important factors causing landslides in Nagaland is faulty road construction methods. Landslides occur because road construction design and slope stabilization structures are very poor. Besides natural

Environmental factors, excavation for rocks and slope modification for agriculture have made many parts of our environment susceptible to mass wasting.

Nagaland is placed in Zone -V of the Seismic Zonation Map of India with an expected maximum magnitude greater than 8. Large seismic shocks, particularly towards late monsoon

and during storms or cloudbursts could trigger massive landslides in various parts of Nagaland.

Past disasters in Nagaland

Landslide is a major disaster that keeps affecting Nagaland specially in Monsoon, when heavy down pour is experienced all over Nagaland. It is a fact that properties worth lakhs and crores of rupees have been carried away by these Landslides. Some of the major Landslide Disasters that Nagaland has faced are:

- **August 2001**- Dimapur area experienced a cloud burst which lasted almost for one hour. This gave rise to so many landslides in that area, particularly the Paglapahar region which experienced the heavy down pour. In a stretch of just 4 kms on National Highway 39, seven major slides occurred which brought traffic to a standstill. In this incident 1 Tata Sumo was crushed where 3 people were killed and some injured.

Some of the houses damaged by the landslide at lower Chandmari area, Kohima town

- **August 2003** - the whole New Market colony in Kohima Town was affected by landslides. Many houses were razed to the ground, and many more were made unfit for habitation. The road was affected very badly, that for a year it had to be abandoned. Property worth lakhs were destroyed by this slide.
- **May 2005 -** The most tragic landslide that affected Nagaland in the recent past was the **May 26th 2005** Landslide that occurred in Mokochung Town. In this pre dawn landslide, 14 people were buried alive, so many more injured and damage to property was extensive.

- Wokha town was affected very badly by a landslide in **August 2006**. National Highway 61 was affected very badly. Extensive damage to property was reported.
- During **September 2006**, Zunheboto Town was affected by a Major landslide. This resulted in extensive damage to property.
- **October 17, 2007**- about 150 metres of National Highway 39 near Kiruphema went down almost 400 meters. This resulted in the complete blockade of the highway for 2 days.

3.2.2. Landslide Indicators:

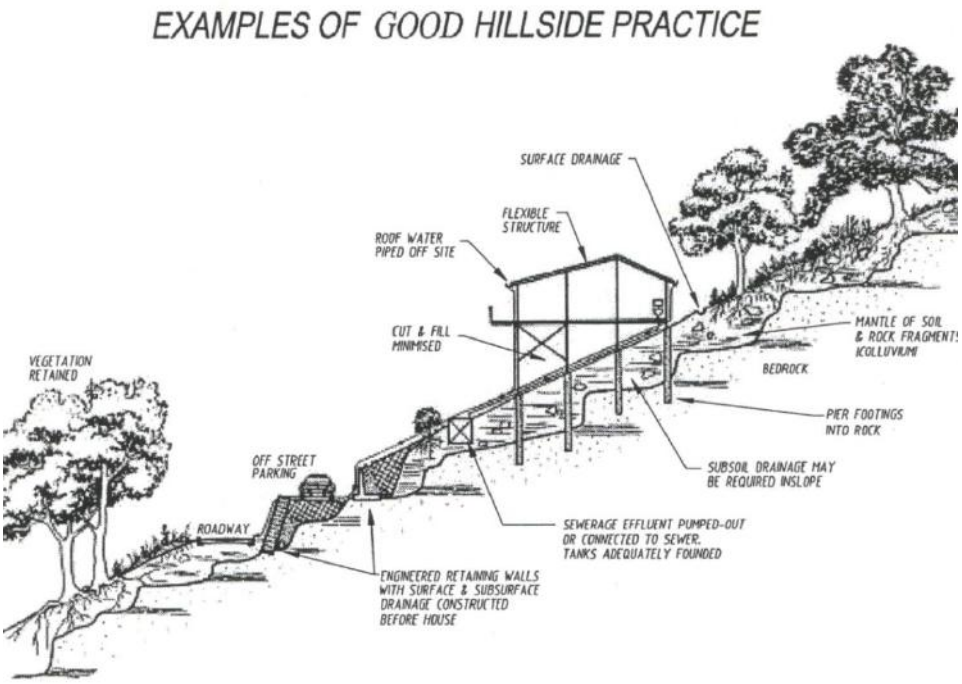
Certain telltale signs help the early detection of landslides. These signs may include curved tree trunks, tilted telephone poles, fences, and retaining walls, and cracked house foundations, sidewalks, driveways, and roads, broken pipelines and underground wiring, doors and windows that stick, etc.

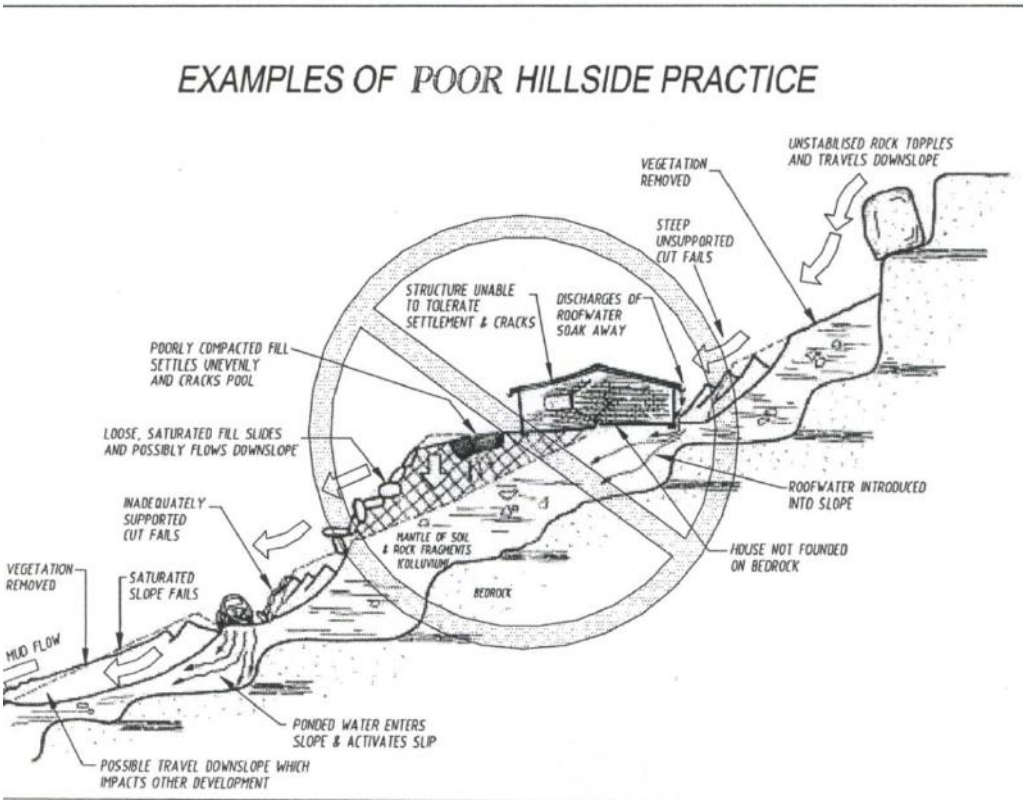
A major concern is that people continue to build houses in areas that are prone to landslides. As populations in urban areas increase many people are expanding businesses and others are looking for homes to live in. Therefore, more structures are built upon unconsolidated rocks which tend to reduce the stability of soils and eventually produce landslides. It has been observed that landslides begin with small movements of slope which remain unnoticed due to lack of proper monitoring. These movements get aggravated over a period of time and coupled with natural or man-made factors lead to slides of larger magnitude.

3.2.3. Prevention and Mitigation Measures:

Parts of Nagaland are highly disturbed and overused due to human activities. Hence, there is an urgent need to minimize the occurrences of landslide through proper management strategies. Landslides and other mass movements cannot be totally prevented but their frequency and severity can certainly be minimized through appropriate and timely biological, geological, and engineering measures. Landslide incidences can be controlled and damage minimized by proper surveys and mapping, sampling and testing of slope material, and design, analysis, and evaluation of slopes. Minimizing rock excavation and predicting the behavior of slopes for highways or townships should be the common objectives of geologists and engineers. Research should be directed to ensure that large initial investments justify the

resultant long-term savings toward maintenance and repair costs. Mass movements are of various types, each characterized by a certain type of material; the rate and nature of movements involved are peculiar to each. Hence, knowledge of the various types is necessary to understand their causes. Correct diagnosis of their causes is essential for appropriate preventive and/or mitigation measures.





3.2.4. Structural Measures:

Structural measures should include the feasibility of analysis of geologic, slope, and hydrologic conditions at the site to ensure the physical effectiveness of the remedial measures. Engineering methods for stabilizing of rock slopes such as sealing and bolting are not applicable to soil failures. Simple drainage solutions are often very effective for a wide range of soil and rock slides. The longevity of drainage treatments has been greatly improved by the use of geotextiles. Retaining walls, ground anchors, soil nails, etc. or combinations of these are commonly used to stabilize landslides. The promotion of vegetation on denuded slopes combined with structural elements like restraining structures is very effective for slope stabilization.

Retaining walls as remedial measure for landslides

i) Retaining Walls, Embankments, and Dams: Retaining walls are suitable for slip-out type of slides. Such structures should rest on bedrocks as far as practicable. However, such structures should be so designed as to not cause excessive overloading on the soil or weak bedrocks. Appropriately designed weep holes for smooth passage of water is very important. Provisions may also be required to siphon out excess groundwater to considerably increase the shear resistance of the soil.

There are different types of retaining walls such as cantilever, gravity, grip, buttress, etc. They may be composed of timber, concrete, rock, gabions (wired networks filled with rocks), etc. To increase their efficiency they must be anchored with tie rods to adjacent stable terrain. The selection of a particular type of restraining structure will depend on the nature and composition of the affected area.

Embankments should be erected upslope of slide zones to arrest movement. Material for these embankments such as boulders may be locally available. To prevent excessive erosion of river beds, particularly in the vicinity of slides, check dams are necessary.

ii) Bamboo / Wooden Nail Reinforcements: The stability of sliding slopes can be improved by piercing bamboo or wooden stakes into the soils to increase their internal friction and shearing strengths. Such measures are temporary and for short term benefits only. The stakes may vary from 10 to 15cms in diameter. They may be hammered at intervals of 1 to 1.5 meters. Horizontal bamboo runners (check dams) too may be nailed to the stakes. The function of the runners is to check the flow of debris downhill.

iii) Water Control Methods: Water action on soils is the prime reason for landslides so its control and removal are very important in the stabilization of slopes and shear zones. Landslides and other mass movements may be significantly reduced by improving drainage. There are a number of methods for improvement of surface and subsurface drainage conditions. The choice of any technique is governed by geomorphology, rainfall pattern, natural drainage, permeability of slope-forming material, vegetation, human activity, and sliding mechanism. Appropriate drainage facilities should be provided where slope material is susceptible to erosion, particularly under unfavorable groundwater conditions.

iv) Surface Water: It is very important to drain off all surface water. Water should be prevented from entering landslide zones and ancient slide deposits as far as possible. For successful control of drainage, affected areas should be reshaped to ensure proper surface runoff. Tension cracks and other permeable zones above the crests of slopes may be temporarily or permanently sealed by mortar, asphalt, etc. Polythene sheets spread over affected areas are excellent temporary measures. Concrete drains should be constructed

from top to bottom at regular intervals. Water outlets should be connected to nearby drains.

v) Catch-water drain: Properly lined, watertight surface drains in the form of catch-water drains should be constructed in slide zones. They should be interconnected to intercept and divert surface waters along hill slopes. Gradients should range from 1 in 20 to 1 in 25 to ensure that the velocity of water is not great enough to erode the drain. Water from catch-water drains should be trained into natural hillside stream channels.

vi) Cross drain: Where streams cut across roads properly designed cross drainage is necessary. Water from side drains also should be led into these cross drains and finally into natural stream channels. Such drains, if properly and adequately placed, will prevent water and debris from flooding roads.

vii) Subsurface water: Earth material should be dewatered at regular intervals to remove excess water from the subsurface to reduce the pore-water pressure below that which can cause slope failure. This may be achieved by siphoning out water. This considerably increases the shear resistance of soils. Subsurface water can also be effectively drained out of slide zones using semi-perforated pipes for dewatering.

viii) Deep trench drain: Subsurface drainage in the form of deep-trench drains is equally important. Such a trench may be of a definite size and filled with rounded gravel of varying sizes (50 and 60 mm) to help drain out water easily. Suitable geotextiles should be used to cover the gravel so as to prevent fine soil particles from entering the voids between gravel and thereby blocking water flow.

ix) Topographic Treatment: Terracing or benching is necessary for slope reduction and removal of dead load in unstable areas. In excavation for roads or buildings in weak soil areas it should be ensured that the cut walls have gentle slopes. Any overburden hanging toward the road or structure should be immediately removed. Where toe erosion is responsible for instability, stream courses may have to be diverted through box-cuts. This may involve cutting through thick layers of protruding rocks.

3.2.5. Biological Measures:

Biological measures can also be taken up to mitigate landslides:

1. Degraded and fallow land should be afforested with suitable species.
2. Perennial shrubs and trees need to be planted on landslide prone slopes, the roots of which will act as anchors to prevent mass movement. Among the trees that are recommended are poplar, alder, willows such as Salix tetrasperma and Salix ichnostachya Lindl, birch, oak, acacia, and certain species of eucalyptus. However, pruning may be necessary to prevent trees like eucalyptus and alder from growing too tall. Peuraria hirsute, a legume with deep roots, is found to give good results.
3. Empty spaces may be covered with grass to minimize water percolation and prevent surface erosion. Grasses are light and good soil binders. Their roots form matted structures that do not allow too much of water to penetrate the surface. Lantana shrubs and kikui grass are also good soil binders.
4. Some areas such as subsidence zones need to be relieved of banana plants which are responsible for storing and holding large amounts of water.
5. Very large and heavy trees in weak rock and unstable soil areas need to be removed as their weights can cause mass wasting.

3.2.6. Non-Structural Measures:

The primary objectives of Landslide Management Programs should include the generation of a database, zonation of landslide prone areas for risk assessment, monitoring of selected high risk zones, and development of suitable control measures and models. Landslide database should be generated by starting programs for Landslide Hazard Zonation (LHZ) and Landslide Incidences mapping. Paleoslide zones should be identified and thoroughly mapped. Regulating and monitoring constructions and other activities in and around high hazard zones are very important.

Landslide mitigation programs can be taken up only when the expected frequency, character, and magnitude of mass movements in an area are known. For any developmental scheme in hilly areas, planning without advance information about details of the terrain as well as about known and potential slide areas would be disastrous. Hence, to take quick and safe mitigation measures and plan future strategies, identification of landslide-prone areas and Landslide Incidences and LHZ mapping are necessary. LHZ mapping implies the classification of zones into varying degrees of proneness to landslides. LHZ maps can play a

significant role in minimizing loss to life and property and give a boost to development. LHZ maps are necessary for vulnerability mapping. Inventory maps are primary requirements for any landslide hazard mitigation and management programs. LHZ maps can assist Planners in selecting favorable sites for developmental schemes such as buildings, road construction, etc. Even if hazardous areas cannot be avoided altogether, their recognition at the initial stages of planning may help in the adoption of suitable precautionary measures. Highly susceptible areas should be considered for short or long term remedial or control measures.

3.2.7. Remote Sensing & GIS in Landslide Management:

GIS (Geographic Information System) provides an effective tool for efficient storage and manipulation of remotely sensed and other spatial and non-spatial data. This can be used to facilitate measurement, mapping, monitoring and modeling of a variety of data types. GIS can improve the quality and power of analysis of landslide hazard assessments, guide developmental activities and assist Planners in the selection of mitigation measures and in the implementation of emergency preparedness and response action.

The State Government of Nagaland must initiate steps to:

a) Create a Center for Remote Sensing & GIS in collaboration with the Department of Science & Technology and/or the Department of Space. This Center should be properly equipped with relevant Satellite Data that should be periodically updated. Appropriate RS software and GIS packages are prerequisites for such a program and which can be easily obtained. Such material should also be made available to the Scientific Community for landslide and related research. Specialists in RS & GIS should be appointed to man the Center.

b) Appoint a few specialized Geologists immediately to map out the towns, highways, and important areas. The same geologists will also take care of monitoring instability in their respective areas, preferably districts, besides generating a database for Landslides and other Natural Hazards. These professionals will also coordinate with the Geological Survey of India to provide remedial / mitigation measures for all forms of instability through conduct of geotechnical investigations, etc.

LHZ mapping of all landslide-prone towns of Nagaland should be initiated without delay. From data generated vulnerability mapping should be conducted for risk assessment.

Land Use Planning: Proper land use planning is a must. Building bye-laws and Land Use Regulations that are already in place should be updated and strictly implemented. The bye-laws should be revised from time to time and model bye-laws adopted. The Master Plans of the major towns should also be reviewed, regenerated, and strictly implemented. Mandatory clearance from authorized agencies should be ensured before any construction. Severe punishment should be meted out for violation of rules or negligence of duty.

Detailed geotechnical investigations aimed at analyzing shearing strengths of various clay and soil deposits are very important. Determination of Safety Factor for such deposits should be made mandatory before execution of any developmental projects. Laws should be enforced to regulate or prevent construction in weak areas and ensure that any type of construction or developmental activities in high hazard areas be cleared only after appropriate remedial measures are in place.

In the high hazard areas both environmental and human aspects should be managed as to achieve an ecological balance with land use activities. Buffer zones should to be created around landslides and no activity permitted within such areas. Real-time monitoring of active landslides in high risk areas may be taken up. Warning systems for such areas during earthquakes, unusual rainfall, etc. should be developed. Environmental Impact Assessment is a must prior to the execution of any developmental activity.

3.2.8. Generating Awareness:

Awareness generation is the most important aspect in any management program. Awareness should be created about landslide vulnerability and risk, and risk reduction measures through sensitization workshops and seminars. The public should be made aware of areas that are unstable such as old landslides, landfills, etc. and should be educated on tell-tale signs of landslide hazards to ensure personal safety. Mass awareness campaign on landslide disasters with audio-visual media is a must for all areas. Consumers should be advised to obtain slope-stability evaluation from the concerned agencies or accredited private practitioners before making land purchases. Insurance of property is an area where awareness of the public is necessary. Awareness should also be imparted on potential geological hazards and public should be encouraged to consult Engineers and Geologists with relevant experience for advice or information on potentially hazardous locations.

Small courses on Disaster Management with special reference to earthquakes and landslides should be incorporated in the syllabi of schools and colleges. Mock drills should be carried out in schools.

3.2.9. Recommendations:

a) Ensure that all villages are connected with landline and mobile facilities.
b) Effective Alarm systems should be identified in case of disaster. Such systems may be helpful to sleeping populations during a disastrous event. Church bells are most effective as all villages have a church. A separate Ring Code, designed specifically for disasters, may be assigned for church bells.
c) The Log Drums could be revived as backup to support church bells for emergencies in the event of destruction of bell towers.
d) Drainage systems should be properly planned and taken care of.
e) Legal/Community action should be initiated against persons responsible for blocking and/or choking drains.
f) Water is a scarce commodity in most parts of the state. Preventing the disposal of waste into stream channels can help increase the amount of usable water. This should also include the prevention of construction of latrines, pig sty, etc. on stream channels and diversion of waste waters and septic tank wastes into the channels.
g) As Highways are important lifelines, the District Administration should ensure that landowners' do not interfere with emergency needs such as widening of roads, side cuttings, etc. thereby allowing the agencies concerned to keep the roads open to traffic. The administration should play a proactive role in immediately negotiating and acquiring land using all possible means in affected areas.
h) Acknowledging that a major part of the State is unstable and that many segments of the Highway are extremely weak, it should be ensured that Goods Carriers plying on the various highways do not exceed the recommended weight. For the purpose Weigh Bridges should be set up at the foothills, just before entry into the hilly terrain to check and detain vehicles that are overloaded.
i) Signboards cautioning drivers to be wary of "Falling Rocks", "Toppling Hillsides", etc. should be placed at strategic points such as Paglapahar Area, Dimapur District, Lalmati area, Kohima District and at various sensitive areas along NH-39.
j) Excavation for rocks along highways should be discouraged. Such activities destroy road surfaces besides causing debris slides during the monsoon.

k) Methods of road construction including realignment in high hazard zones should be improved. Activities that result in the undercutting of steep banks should be avoided, or taken up with appropriate measures.

Each Hazard should be viewed separately and its nature understood. This should lead to the generation of scientifically designed Hazard Zonation and Risk Maps from which Risk Assessment is made. Such data are indispensable for Preparedness and Prevention and/or Mitigation Planning.

3.3. DISTRICT WISE VULNERABILITY ASSESSMENT:

3.3.1. DIMAPUR:

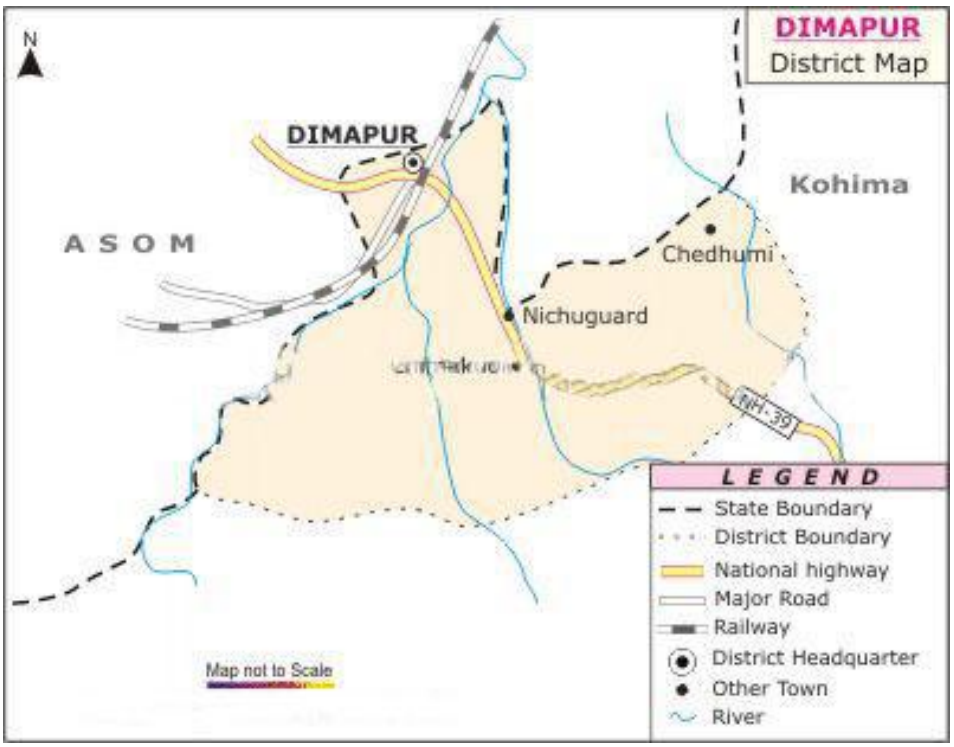
Dimapur District was created as the eighth district of Nagaland in December, 1997 out of Kohima District. The District draws its name from the Kachari dialect; 'DI'- meaning river, 'MA' meaning great or big and 'PUR'- meaning city, together connoting 'the city near the great river'. That the Kachari kingdom flourished in dimapur in the days of old is evident from the existence of the Kachari Rajbari Fort ruins, housing the ancient stone monoliths, and the many excavated tanks dug by the royalty known even today as the Rajukhuri, Padampukhuri, Bamunpukhuri, Jorupkhuri etc. to name a few. History and legends trace their civilization to the epic age of exile, married the Kachari princess Hidimbapur, which would throw light on the gradual corruption of the original name to its present 'Dimapur' the gateway of Nagaland and Manipur. The infrastructure developed is unequal throughout the state, having the only airport in Nagaland, an important railhead, besides the National Highway 29 – which connects it to Kohima, Imphal and Moreh on the Myanmar border – which runs through Dimapur. Dimapur town is distinct in its character where all the different communities have congregation into a mini India. Although the notified town area of dimapur has remained the same, the neighboring villages/settlements have expanded considerably over the years merging with the town boundary to form a continuous urban/semi urban area extending across the length of more than 13 sq.kms.

Dimapur District, the commercial hub of Nagaland is home to a population of 308,382 in an area of 927 sq kms; the population density is 333 per sq km. A good portion of this district is very hilly while a small part bordering Assam comprises a flat alluvial tract.

Dimapur town is situated on the flat to gently undulating alluvial tract. The Naga Thrust runs through part of the hilly section, being mainly confined to the Paglapahar region. This is an area of severe crustal deformation. Due to tectonic activity the rocks have been weakened to a great extent. The area receives abundant rainfall during the monsoon. Cloudbursts are common phenomena in this part of the region. The district is hence, prone to two major hazards including floods and landslides..

Geography

The district is bounded by Kohima district on the south and east, Karbi Anglong district of Assam on the West, the Karbi Anglong and stretch of Golaghat District of Assam, in the west and the north.



Map of Dimapur district

A large area of the District is in the plains with an average elevation of 260 m above sea level excepting the Medziphema sub-division and a few villages of Niuland sub-division, which are located in the foothills. The total area of Dimapur is 927 km^2 (Source-Deptt. of Land Record & Survey). The district is bounded by Kohima District on the south and east; the Karbi Anglong and the DAB (Disputed Area Belt) stretch of Golaghat District of Assam, in the west and the north 25° 54’ 45” N Latitude 93° 44’ 30” E Longitude.

Rainfall

Average annual rainfall is 1594.7mm.

Major Rivers

Dhansiri River and Chathe River.

Climate

Dimapur Climate is hot and humid in the plains during summer, reaching a maximum of 36 °C, (July - August) with humidity up to 93% (July - August) while the winter months are cool and pleasant with minimum of 7°C (Jan - Feb). The average annual rainfall is 1504.7 mm

Divisions

Administratively, The government of Nagaland, for administrative purpose has established four sub-divisions; Nuiland and Medziphima with Additional Deputy Commissioner as the administrative head and Kuhuboto and Dhansririphar sub-divisions headed by Sub-divisional Officer. Also the district administrative headquarter is currently located at Dimapur, headed by the Deputy Commissioner. The new administrative complex that would also house the Deputy Commissioner Office is under construction at Chumukedima(about 20 km from Dimapur town).

The Following officers are responsible for the running of district administration:

1) The Deputy Commissioner (DC) at Dimapur heads the District.
2) Additional Deputy Commissioner (ADC) Headquarters at Niuland
3) Sub-Divisional Officer SDO (C) Headquarters at Medziphema, Kuhuboto and Dhansiripar.
4) Extra Assistant Commissioner (EAC) Headquarters at Nihokhu, Chumukedima and Aqhunaqa.

Demographics

According to the 2011 census Dimapur district has a population of 379,769,[1] roughly equal to the nation of Maldives.[2] This gives it a ranking of 563rd in India (out of a total of 640).[1] Its population growth rate over the decade 2001-2011 was 0 %.[1] Dimapur has a sex ratio of 916 females for every 1000 males,[1] and a literacy rate of 85.44 %.[1]

The District has a heterogeneous population with the majority comprising Naga tribes from all over Nagaland.

Flora and fauna

In 1986 Dimapur district became home to the Rangapahar Wildlife Sanctuary, which has an area of 4.7 km^2 (1.8 sq mi).[

3.3.1.2. Vulnerability Analysis

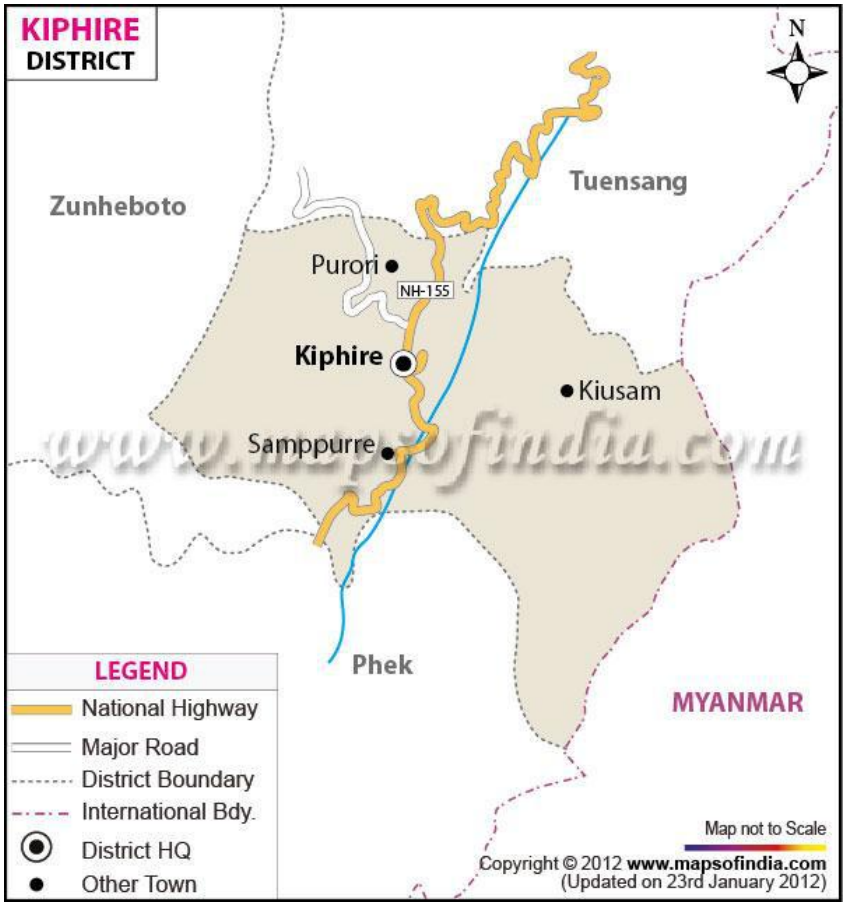
In Dimapur town the artificial drainage system is very poor. It is for this reason that floods are annual recurring problems in some of the low lying colonies. With adverse global climatic changes taking place this could become a more serious problem in the near future with greater areas being inundated. This could also lead to loss of lives if appropriate measures are not taken. However, loss of property in the form of homes and business establishments may rise to unprecedented levels.

Destructive landslides have been recorded in the hilly section of the district. However, most landslides are confined to the NH 39 and along the Chathe River. Disruption of traffic is likely in the event of too much of rainfall during any given year or during extended cloudbursts. This can also cause the burying of vehicles and humans by hill slope debris. Water pipelines are prone to damage in this section.

Nagarjan Area, Dimapur, Nagaland on 23/04/2008

3.3.2. KIPHIRE:

This district situated on the eastern fringe of Nagaland bordering Myanmar with Phek on its south and Tuensang on its north is part of a very hilly terrain. The district covers an area of 1137 Sq kms and is located in the remote coners of Nagaland. The administrative headquarters was established in1952 within Tuensang District under North Eastern Agency (NEFA) and later upgraded to a full fledged district on 24th January 2004. The district is bounded on the East by international boundary with Myanmar (Burma) on the west by Zunheboto district, on the North by Tuensang District and Phek District on the South.



The district lies at an altitude of 869.42 mts above the sea level and interestingly crusted between two lofty mountains i.e the Saramati, the highest peak in Nagaland and Jinkhu in the West. The district is inhabited by some naga tribes namely Sangtam, Yimchunger, Sumi Tribe. English and nagamese are the commonly spoken language besides their own tribal dialects. The soci-economic advancement of the district in this past few years is encouraging and praise worthy although a lot need to be done to bring all round development.

Kiphere at a glance

SL. NO	PARTICULARS	DETAILS
1	Geographical Area	1137 Sq Kms
2	Total Population	74,033.00 (2011 Census)
3	No. of Households	1,28,59.00
4	Sex Ratio	961:1000.00
5	Population Density	66%
6	Literacy Rate	71.1% Male: 76.54% Female: 65.44%
7	Administrative HQs	- Kiphire (District HQ) - ADC HQ, Seyochung. - ADC HQ, Pungro. - EAC Amahator. - EAC Longmatra. - EAC Sitimi. - EAC Kiusam. - EAC Khongsa.
8	Rivers	- Zungki. - Thsingaki. - Mitriki. - Likimro.

History of Disaster.

Kiphire District has not yet recorded any major disaster so far apart from minor natural calamities. Landslides are not uncommon along villages roads especially in interior area like Kiusam under Pungro sub-division especially during the rainy season. And the instances of fire destroying homestead in human settlement areas mainly due to unattended sources of fire and faulty electrical connection resulting in short circuiting and setting fires. Kiphire district falling under the seismic zone v is vulnerable to high intensity earthquakes and in the event of such occurrence the district machinery will be crippled if precautionary measures are not adopted to reduce or negate the disastrous effect.

Three major fire incidents occurred in Kiphire town within a span of few months during 2011. The cause of the fore is believed to be caused by short circuit, setting in one of the house which then spread to the neighboring houses. Shortage of water and non-availability of fire tenders in the district caused the panic to the public. However, with timely intervention of the AR personnel including the district administration, Kiphire town Sangtam students union (KTSSU) and Kiphire police prevented the situation from becoming worse.

Multitude landslides also occurred along the village road connecting Kiusam EAC HQ via Pungro during July 2011. Due to the non-availability of adequate specialized machineries in the district to clear the area, it was completely cut-off from the rest of the district for Five MONTHS which caused untold suffering to the villages as the road was the only link to other parts of the District.

Sl. No.	Types of Hazard	Jan - march				April – June				July – Sept				Oct – Dec			
		H	C	A	I	H	C	A	I	H	C	A	I	H	C	A	I
1	Earthquakes	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
2	Landslides					√	√	√	√	√	√	√	√				
3	High Winds					√	√	√	√								
4	Forest Fires	√	√	√	√	√	√	√	√								

H - Human, C – Crop, A – Animals, I – Infrastructures.

Some of the major Landslides:

Sl. No	**Location**	**Potential impact**
1	Mission compound (Kiphire town)	Road and agricultural areas
2	G.A rest house (kiphire town)	Residential areas
3	Near District hospital (kiphire town)	Road, Residential areas and agricultural areas
4	Jail road (kiphie town)	Road and agricultural areas
5	Pungro road via Tethezu	Sinking areas
6	Thangthure village	Road and agricultural area
7	Amahator road via Pungro	Road and agricultural area
8	Kiusam roas via Pungro	Road and agricultural area
9	Khongsa road via Pungro	Road and agricultural area
10	NH – 155	Road and agricultural area

3.3.2.1. Vulnerability Analysis:

Due to the major structural disturbance and weak lithology, portions of the district are prone to landslides. The highway which is the lifeline of the northern eastern areas of the state may be affected by land sliding. Disruption of traffic is likely in the event of too much of rainfall and severe cloudbursts during the monsoon. The small towns and villages situated on the Disang Group of rocks and in the Ophiolite Belt such as those placed in the moderate to high hazard zones are vulnerable.

Disaster at a large scale has not yet occurred in the district but an occasional level it has faced problems due to landslides, Forest fire and High speed winds and the risk is compounded by the absence of trained Fire Service in the District.

3.3.3. KOHIMA:

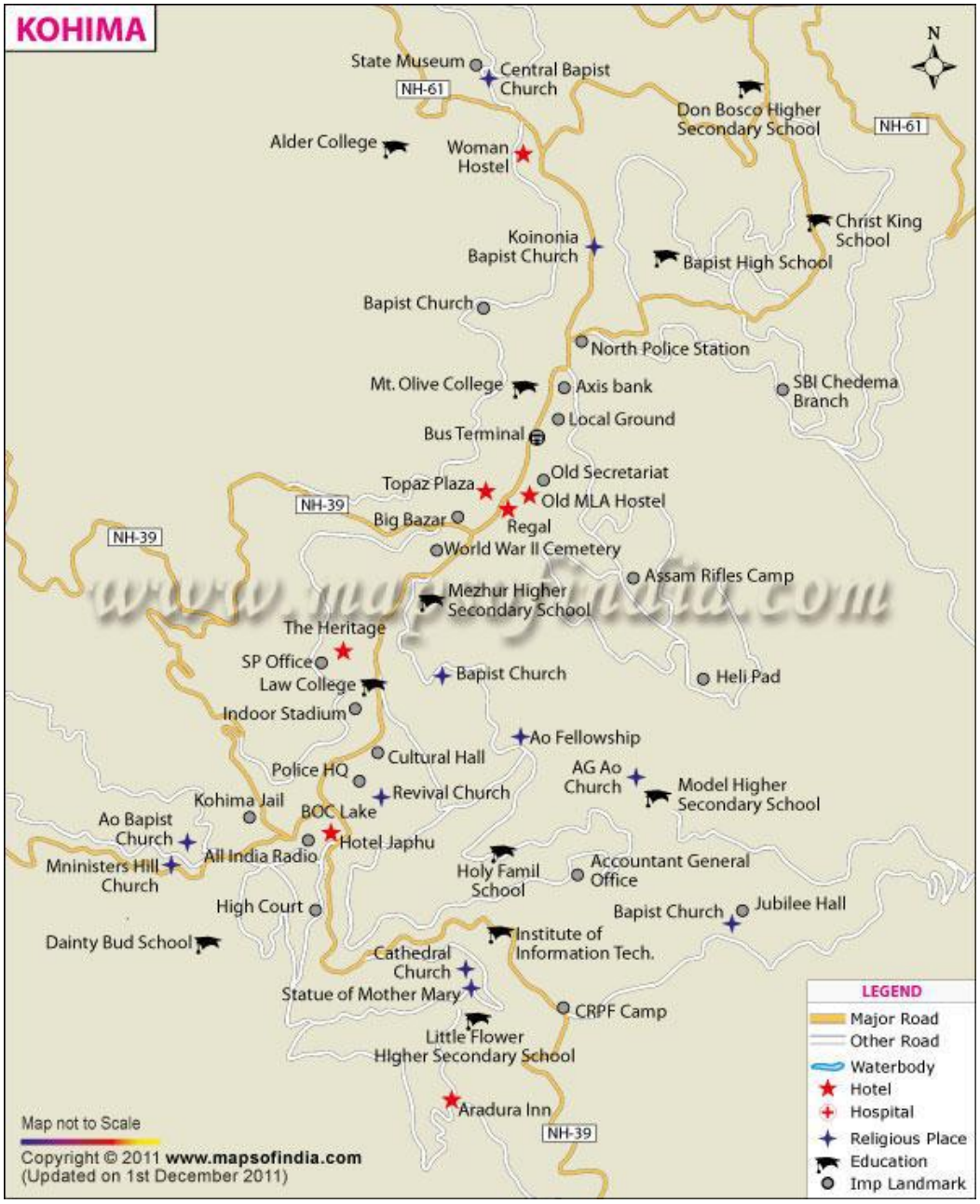
Kohima, is a hilly district of India's North Eastern State of Nagaland, sharing its borders with Assam State and Dimapur District in the West, Phek District in the East, Manipur State and Peren District in the South and Wokha District in the North. One of the oldest among the eleven districts of the state, Kohima is the first seat of modern administration as the Headquarters of Naga Hills District (then under Assam) with the appointment of G.H. Damant as Political Officer in 1879. When Nagaland became a full fledged state on 1st December, 1963, Kohima was christened as the capital of the state. Since then, parts of Kohima district have been carved out thrice - the first in 1973 when Phek District was created, then in 1998 Dimapur was carved out and declared as a separate district and it was in 2004 for the third time that Kohima district once again gave birth to one of the youngest districts in the state called Peren District.

The name Kohima is so called because the Britishers could not pronounce its original name "KEWHIRA" which is the name of the village where Kohima town is located. Kohima village, also called 'Bara Basti' which is the second largest village in Asia forms the North-Eastern part of Kohima Urban area today.

Demographics:

As of 2011 Census, Kohima district has a population of 270,063 . Males constitute 140,118 of the population and females 129,945. Kohima has an average literacy rate of 85.58%,

higher than the national average of 74.04 %: male literacy is 89.28 % and female literacy is 81.56 %. In Kohima, 36,157 of the population is under 6 years of age.



The People:

The main *indigenous inhabitants* of Kohima District are the Angami Nagas and the Rengma Nagas. But Kohima being the capital city, it is a cosmopolitan city with a pot pouri of all the tribes of Nagaland as well as mainland India residing here.

Climate:

Kohima features a more moderate version of a ***humid subtropical climate.*** Kohima has a pleasant and moderate climate - not too cold in winters and pleasant summers. December and

January are the coldest months when frost occurs and in the higher altitudes, snowfall occurs occasionally. During peak summer months from July-August, temperature ranges an average of 80-90 Fahrenheit. Heavy rainfall occurs during summer.

Topography:

Kohima is located at 25º40'N 94º07'E 25.67ºN 94.12ºE. It has an average elevation of 1261 metres (4137 feet).Kohima town is located on the top of a high ridge and the town serpentines all along the top of the surrounding mountain ranges as is typical of most Naga settlements.

Kohima, lying at an average altitude of 1444 m above msl is the capital of Nagaland. Most of this district lies on the Disang Group of rocks. A number of Barail outliers are noted forming the high peaks in the district. This terrain represents part of the Intermediate Hills of Nagaland. The southern portion of this terrain is part of the Kohima Synclinorium. To the west lies part of the

3.3.3.1. Vulnerability Analysis:

The rocks of this district are severely deformed due to the tectonic processes. The area receives abundant rainfall and cloudbursts are common phenomena here. Numerous landslides have been recorded in this hilly terrain. Probably the worst affected is Kohima Town itself. Portions of the NH 39 running through the Disang Group of rocks are also badly affected. The NH 61 is also affected at a number of places. Disruption of traffic is commonplace along these highways during the monsoon. Besides danger to human lives and that of livestock, business establishments and other economic activities too are highly vulnerable, especially at and near Kohima town and along the highways.

3.3.4. LONGLENG:

Longleng district lies between Mon in the north and Mokokchung in the south. Tuensang lies towards the east of this district. This district is mostly hilly with a narrow flat tract along the northwest. A good portion of the district comprises very steep hills with deep gorges. Longleng district is prone to landslides. The Longleng District in Nagaland covers an area of 885 Square Kilometers.

Geography

Carved out of Tuensang District, **Longleng** is tenth district of Nagaland. It is bordered by Mon District in the north, Mokokchung District in the west and Tuensang District in the south. The district's headquarter is Longleng, which is at an altitude of about 1,066 m above sea level. Tamlu and Longleng are the major towns in the district. Its main river is Dikhu.

Demographics

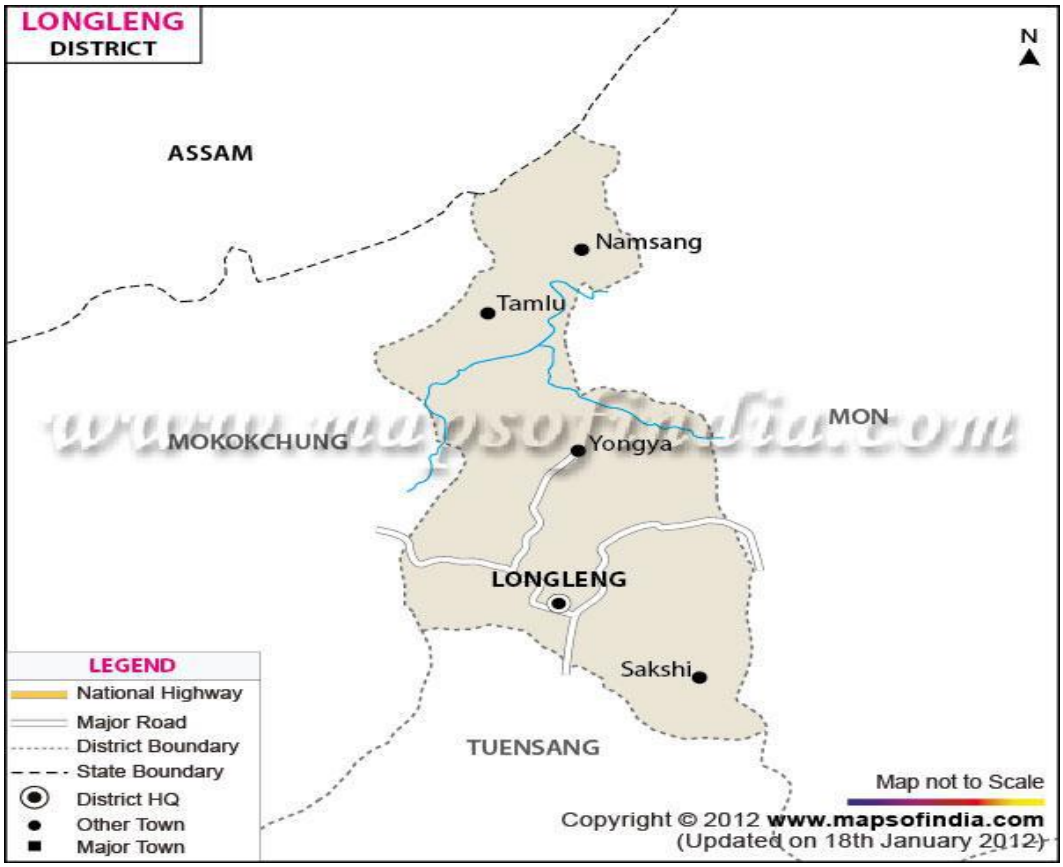
According to the 2011 census Longleng district has a population of 50,593 ,[2] roughly equal to the nation of Saint Kitts and Nevis.[3] This gives it a ranking of 632nd in India (out of a total of 640).[2] Longleng has a sex ratio of 903 females for every 1000 males,[2] and a literacy rate of 73.1 %.[2]

River **:** Dikhu

Latitude of Longleng city **:** 26 degrees, 26.0 minutes North

Longitude of Longleng city **:** 94 degrees, 53.0 minutes East

Town in Longleng District : Tamlu, Longleng



3.3.4.1. Vulnerability analysis:

The NE-SW trending Belt of Schuppen traverses the northern part of this district. Other faults and thrusts are also noted north of Longleng town. For the most part the district is situated on

the Disang Group of rocks which are composed of abundant shales with thin beds of sandstones and siltstones. Outliers of the Barail are noted along hilltops. The shales are badly affected by the numerous faults and thrusts cutting through the region. This has resulted in the general weakening of the rocks. Such areas are prone to land sliding.

3.3.5. MOKOKCHUNG:

The district Mokokchung is bounded by the state of Assam and Longleng to its north, Tuensang and Longleng to its east, Zunheboto to its south and Wokha and Assam to its west, and lies between 93.53 and 94.53 Degrees Longitude and 25.56 Degrees Latitude. It the Home of the Ao Naga Tribe, which covers an Area of 1,615. Sq kms.

The Physiography of the district shows Six distinct hill ranges. The ranges are more or less parallel to each other in the North-east or South-west direction. Between the ranges, there are gorges through which flow the hill stream. There are only two small valleys namely, the Changki and Tuli, and both of them are on the western side of the district adjoining the plains of Sibsagar district of Assam. The entire district of Mokokchung is conveniently sub-divided into ranges they are:

- **TZURANGKONG RANGE -** These are actually pimples of hillocks thrown at random adjoining the plains of Assam mostly along the valley of Dissai and Jhanzi rivers just before they flow into the plains of Assam. These hillocks are densely covered with bamboos and the climate of the entire range is warm.

- **JAPUKONG RANGE** - It is the outermost Range stretching from North-east to South-west lying to the interior south of Tzurangkong Range.

- **CHANGKIKONG RANGE -** This is a parallel Range east of Japukong Range. Changki village was said to be founded by a man named Changki, and so the Range too was named after him as Changkikong.

- **ASETKONG RANGE** - It is a Central Range running from east to west but compared to the other ranges, it is the shortest one. This range lies between Melak and Menung rivers, and therefore, it resembles an island. Hence the name Asetkong (Aset means Island)

- **LANGPANGKONG RANGE** - It is the easternmost range skirting along the course of Dikhu river. The river forms a natural boundary line of Mokokchung with Tuensang and Mon districts. This range is spread like a bed and so the name has been aptly given to this range. (Langpang means bed).

- **ONGPANGKONG RANGE** - It is the southernmost range forming an irregular boundary of the Ao area with that of the Lothas and Semas to the south and with the Sangtams to the east. It is called Ongpangkong as the land is higher and cooler than the other ranges. (Ongpang means higher)

MAJOR RIVERS

MELAK, DIKHU, TSURANG.

Land use in Mokokchung district

CATEGORY	AREA IN HACTRES
TOTAL LAND	1,61,500 HAC
FOREST DEPTT PURCHASED LAND	4,966 HAC
UNDER AGRICULTURE	18,039 HAC
AREA OCCUPIED BY VILLAGES AND TOWNS	1,050 HAC
UNDER HORTICULTURE	812 HAC
AREA UNDER DIFFERENT DEVELOPMENT DEPARTMENTS	38,607 HAC
DEGRADED LAND	98,262 HAC

Highways:

- Major highways passing through Mokokchung.
- NH 61 (Kohima-Wokha-Mokokchung-Changtongya-Tuli-Amguri)
- NH 155 (Pfutsero-Kiphire-Tuensang-Mokokchung)
- Mokokchung-Mariani Highway
- Mokokchung-Lumami-Zunheboto-Kohima Highway
- Mokokchung-Chare
- Mokokchung- Noksen

Demography:

According to the 2011 census Mokokchung district has a population of 193,171,[1] roughly equal to the nation of Samoa.[2] This gives it a ranking of 591st in India (out of a total of 640).[1]Mokokchung has a sex ratio of 927 females for every 1000 males,[1] and a literacy rate of 92.68 %.[1]

Christianity is the predominant religion with 95% of its population being Baptist. The district was the first to embrace Christianity in the later part of the 19th century and continues to be the Main Baptist belt of India. Impur, the centre of Ao Baptist Arogo Mungdang (ABAM), i.e. Ao Baptist Churches Convention, and the largest convention affiliated with the Nagaland Baptist Churches Convention, is located at the heart of the district.

Education

District's literacy rate of 84.6% (2001 census) is the highest in the state and one of the highest in the entire country. The district has been declared a fully literate district in 2007, to become Nagaland's first 100 percent literate district. With 1004 females for every 1000 males, it has the 7th healthiest sex ratio needed among the 538 districts of India in the 0-6 age group population (2001 census).

Satellite towns (sub urban areas) of Mokokchung

Dimapur and Mokokchung are the only towns in Nagaland with a significant sub urban population. Mokokchung is the hub of Mokokchung Metropolitan Area, a term which refers to the continuous settlements from Alichen in the south, through Mokokchung town up to Amenyong and Khensa in the North West; and from Mokokchung town through Fazl Ali College up to DEF colony in the North East.

The trend of sub urbanization in Mokokchung (which had started in Western countries in the sixties) started in the eighties with the mushrooming of satellite towns like Yimyu and Marepkong. Today, the urban settlement has spilled outside the historical boundary of Mokokchung town. This trend has speeded up (since the late nineties) so much so that the erstwhile satellite town of Yimyu boomed and spread towards Mokokchung and became conjoined with it. Today it has become a ward of Mokokchung. As a result of this **flight to the suburbs**, population growth in Mokokchung town (the area under the municipality comprising the fifteen wards) has slowed down while the satellite towns are booming.

Besides, the following villages have been engulfed by the spiralling urban spread of Mokokchung and have acquired urban characteristics. In fact, though not part of the municipality, they have become very much a part of Mokokchung and are confused by many tourists as being localities of the town.

- Chuchuyimpang
- Mokokchung Village
- Khensa
- Ungma

People are now living miles away from the main town in smaller suburbs as well as villages, who drive to work daily to the main town. This phenomenon is in sharp contrast to other towns in Nagaland like Kohima, Wokha and Zunheboto where an overwhelming majority of the population tend to be concentrated in the main town

3.3.5.1. Vulnerability Analysis:

Portions of the plains of the district such as at Tuli have been flooded. This was considered unusual. The problem lay in the indiscriminate dumping of wastes in the stream channels which had too much of water from abundant rainfall. With drastic changes in climate patterns this problem may be aggravated and inundation may become a regular feature if human interference in the environment is not checked. Floods could lead to loss of lives and property in the near future.

The Belt of Schuppen runs through part of western portion of the district. In this area of severe crustal deformation the rocks have been weakened to a great extent. Destructive landslides have been recorded in the hills. The recent disaster at Mokokchung Town (2005) in which 14 lives were lost should be an eye opener. Many other colonies in this town and surrounding villages and towns of the district are highly vulnerable to landslides. The NH 61 which passes through the district also is affected at a few places. Too much of rainfall could aggravate the situation and cause road blocks. A cursory glimpse of the topography and geologic setup of the district indicates that in the event of a major earthquake the destruction due to landslides could be unprecedented.

Disasters that occurred at Mokokchung.

Landslide at Tzudikong Town, Mokokchung District

Landslide at Tzudikong Town, Mokokchung District

Soil erosion caused by Milak river at NH-61

Tzudikong Town, Mokokchung, Nagaland

Tzudikong Town, Mokokchung, Nagaland.

3.3.6. MON:

Mon district, situated in the Northeastern part of the State of Nagaland was brought under the civil administration in 1948. The Konyak Nagas with a population of 2,59,604 in an area of 1786 sq kms; the population density is 145 per sq km. A good portion of this district is very hilly while a small part bordering Assam comprises a plain. The initial provisional data released by census India 2011, shows that density of Mon district for 2011 is 140 people per sq. km

In 2011, Mon had population of 250,671 of which male and female were 132,062 and 118,609 respectively. In 2001 census, Mon had a population of 0 of which males were 0 and remaining 0 were females. Mon District population constituted 12.66 percent of total Maharashtra population. In 2001 census, this figure for Mon District was at 0.00 percent of Maharashtra population. Average literacy rate of Mon in 2011 were 56.60 compared to 41.83 of 2001. If things are looked out at gender wise, male and female literacy were 60.38 and 52.39 respectively. For 2001 census, same figures stood at 46.56 and 36.35 in Mon District. Total literate in Mon District were 119,496 of which male and female were 67,170 and 52,326 respectively. In 2001, Mon District had 0 in its district.

Description	2011	2001
Actual Population	**250,671**	**0**
Male	132,062	0
Female	118,609	0
Population Growth	**-3.83%**	**0.00%**
Area Sq. Km	1,786	1,786
Density/km2	**140**	**0**
Proportion to Nagaland Population	12.66%	0.00%

Topography

The District can be divided into two regions topographically.

a) The upper region comprising Longching, Chen, Mopong and Tobu area
b) The lower region comprises Mon, Tizit and Naginimora areas.

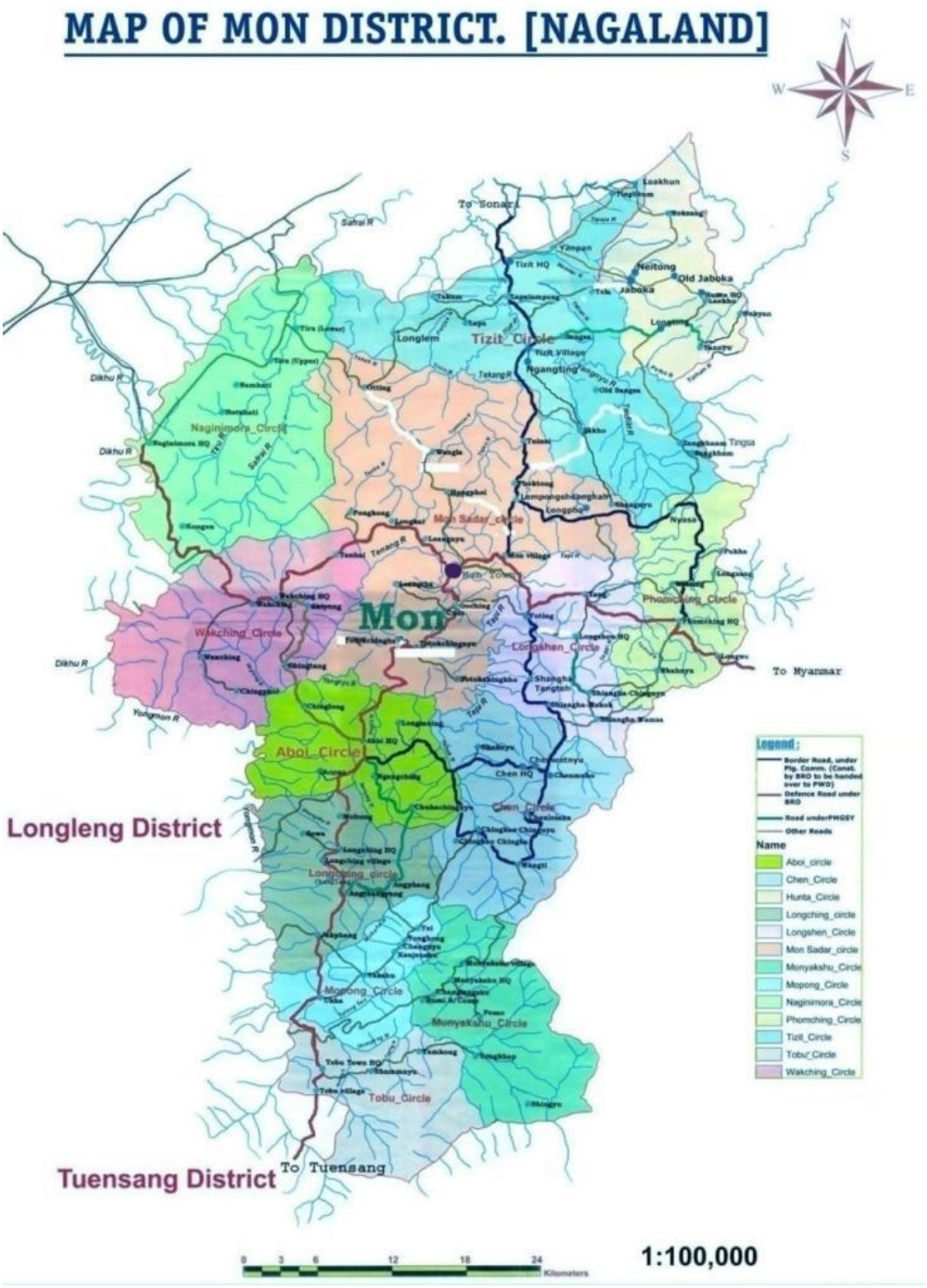
Climate

The Mon district has a fairly moderate climate. Days are warm and nights are cool. Rainy season sets in the month of May and lasts till October. From November to April, the District has dry

weather relatively cool and days are bright and sunny.The average rainfall is between 2000mm and 3000mm mainly between April and October.

Transport and Communication Networks

The Nagaland State Transport is operating bus services from Mon to Dimapur, Sonari, Tobu , Wanching and Moynakshu. Helicopter service has been started from Dimapur to Mon on a weekly basis.Besides these private individuals are also operating Taxi as well as bus services from Mon to other Districts as well as within the District.



10.12 Vulnerability Analysis: Some small inhabited pockets bordering Assam could be affected by floods if any disturbance to the natural environment takes place.Townships and villages situated at and near the high hazard zones are vulnerable to landslides. The Belt of Schuppen runs through part of the hilly section. Where these structures run through the Disang sediments the areas are generally weak. Mon town itself has been in the news in 2007 due to landslides affecting some colonies. Other areas in the region too could be affected by landslides.

	Vulnerable areas against each hazard				
	Cyclone	**Flood**	**Earthquake**	**Fire**	**Landslide**
Infrastructures	Whole District	Naginimora and Tizit	Whole District	Whole District	Mon-Namtola Road, Mon-Naginimora road, Mon-Tobu road
Road Network	Whole District	Naginimora and Tizit	Whole District	Whole District	Mon-Namtola Road, Mon-Naginimora road, Mon-Tobu road
Water Supply	Whole District	Naginimora and Tizit	Whole District	Whole District	Mon-Namtola Road, Mon-Naginimora road, Mon-Tobu road
Hospital	Whole District	Naginimora and Tizit	Whole District	Whole District	Mon-Namtola Road, Mon-Naginimora road, Mon-Tobu road
Food Stocks & Supplies	Whole District	Naginimora and Tizit	Whole District	Whole District	Mon-Namtola Road, Mon-Naginimora road, Mon-Tobu road
Communication	Whole District	Naginimora and Tizit	Whole District	Whole District	Mon-Namtola Road, Mon-

					Naginimora road, Mon-Tobu road
Bridges	Whole District	Naginimora and Tizit	Whole District	Whole District	Mon-Namtola Road, Mon-Naginimora road, Mon-Tobu road

TYPES OF DISASTER: (Experienced in the District)

1. **Earthquakes**:-The whole of Nagaland lies in Zone V which is the highest classification zone of the earthquake.
2. **Landslides**: - Landslides are very frequent in Mon District due to its geological land formation and topography.
3. **Fire**: - Fire occurs frequently in the area due to various reasons such as forest fire (usually spread during the Jhum (cultivation), accidental fire from the households, etc.
4. **Floods**: - Floods usually occurs in the low land area like river banks where most of the cultivation is being carried out.
5. **Hailstorm**: - The cultivation is also hugely effected by hailstorms during the monsoon season.
6. **Accident**- Many casualties from road/railway has also been recorded

3.3.7. PEREN:

Peren District is a strip of mountainous territory having fertile foothill valley plains in North-West and North-East. It occupies the elongated South-Western end of Nagaland State. Peren District is located between longitude 93°E - 94°E and latitude 25° N-26°N of the Equator. From State Capital = 139 K.M. via Kukidolong, from Airport = 71 K.M. from Railhead Dimapur = 77 K.M. Peren District has a total area of 2300sq k.m. Peren District is one of the fertile districts in Nagaland. The altitude of the District varies from 800 mts. to 2500 mts. above the sea level. Mt. Paona, the highest mountain peak in the district is 2500 mts. high and Peren Town, the Headquarter is 1445.40 mts. above sea level.

PHYSIOGRAPHY: Peren District is a strip of mountainous territory having fertile foothill valley plains in North-West and North-East. It occupies the elongated South-Western end of Nagaland.

LOCATION: It is located between longitude 93°E - 94°E and latitude 25° N-26°N of the Equator.

Distance to Peren Hq from: State Capital = 139 K.M. via Kukidolong, Airport = 71 K.M., Railhead, Dimapur = 77 K.M.

AREA: Peren District has a total area of 2300sq k.m.

LANGUAGES: Zeme, Liangmai, Kuki, Rongmai, English, Tenyidie, Nagamese and Hindi.

BOUNDARY: Peren District is bounded by 2 (two) States and 2 (two) Districts. On the East and South it shares Nagaland's Inter-State boundary with Manipur; on the west also it shares Nagaland's Inter-State boundary with Assam; and on the North and North-East it is bounded by two Districts of Nagaland – Dimapur and Kohima, respectively.

ALTITUDE : The altitude of the District varies from 800 mts. to 2500 mts. above the sea level. Mt. Paona, the highest mountain peak in the district is 2500 mts. high and Peren Town, the Headquarter is 1445.40 mts. above sea level.

RIVERS : The principle rivers and important rivulets that flows through Peren District includes Tepuiki, Mbeiki (Barak), Ntanki, Mungleu, Tesanki, Nguiki, Nkwareu, Techauki, Ngungreu,Tahaiki and Duilumreu (Tributary of Tepuiki).

POPULATION: The population of Peren District is entirely tribal. The original inhabitants of Peren District are people who originated from Nkuilwangdi, presently in Senapati District of Manipur. As per 2001 Census, the total population is 96,825 of which 50,001 are Male and 46,823 Female. Circle wise break up of population is : Peren Sadar = 12,882, Ngwalwa Circle = 08,771, Jalukie Circle = 22,006, Ahthibung Circle = 13,481, Nsong Circle 07,441, and Tening Circle = 31,243.

LITERACY RATE: The Literacy rate of the District as per 2001 Census is 54%, of which 32% are Male and 22% are Female.

CLIMATE - Peren District enjoys Monsoon type of climate with the rest of the country. Owing to the elevation of the area and rich vegetation, Peren District enjoys salubrious climate - of temperate type. Winters are cold but pleasant and Summers are warm and tolerable.

TEMPERATURE - The mean annual temperature in the hill sector ranges from 18° C to 26° C (Approximately) and in the valley sector, from 18°C to 35°C (Approximately). The mean December and January temperature in the hill sector ranges from 2° - 4°C to 10°C to 15°C (Approximately) and in the valley sector from 10°C to 20°C (approximately). Frost occurs at selected places in the hill sector during December and January.

PRECIPITATION - Precipitation Occurs mainly in the form of rainfall, of which time of occurrence cannot be predicted. Anytime a sudden build-up of dark rain clouds may occur causing heavy downpour, which may last as brief as few minutes, or may last for hours together, or even days together. Hailstone occurs also during February to April at selected places. The mean annual rainfall ranges from 1500mm to 3000 mm with an one average of about 2000 mm, approximately. The number of rainy days ranges from 95 - 108 days, mostly during the month of July to September, while the time number of months with rainfall less than 50mm is for 3 to 5 months - December to April. Peren District receives the Bay of Bengal Monsoon.

SOIL TYPE - The soil type in the District is reddish-yellow type topped by a varying depth of black soil rich in humus. Whereas sandy soil occurs in Jalukie, Ahthibung and Tening Circles. Most of the hill sectors are endowed with clay soil.

ROCK TYPE - Metamorphic Rocks, particularly quartzite is the most commonly found rock in the District. Besides, sand stones are abundantly found in Tening Circle.

PARAMETERS	UNIT	PERIOD	DESCRIPTIONS
Geographical Area	Sq. Km.	2004	2300
Population	Lac	2001	96825
Literacy Rate	%	2001	54
Sex Ratio	No. of Female Per 1000 Male	2001	936
Population Density	Per Sq. Km.	2001	42
Sub Division	Number		3
Community Blocks	Number		3
Township	Number		2
Ward	Number		18
Villages	Number	2009	104
Village Council	Number		79
Electrified Villages & Hutments	Number	2009	104

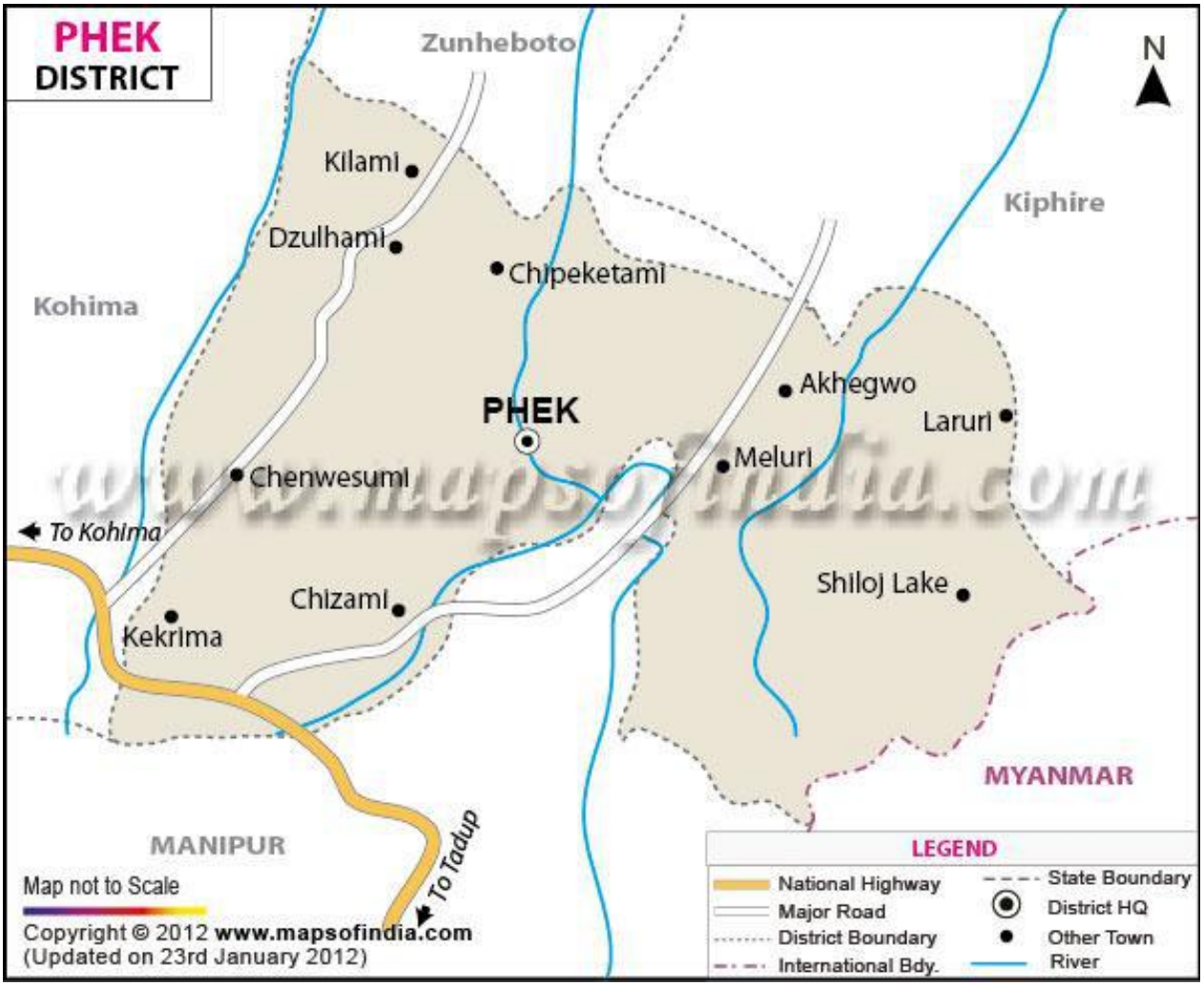
3.3.7.1. Vulnerability Analysis:

The middle and southeastern parts of the district are very hilly. The Naga Thrust belt passes through this area. The area is basically made up of the Disang sediments which have been rendered weak due to the structural disturbances. Hence, habitations in such areas are vulnerable to landslides.

3.3.8. PHEK:

Carved out of the district of Kohima on 21st December, 1973, **Phek** is one of the districts of Nagaland situated in the south eastern fringe of the state. The district is bound on the east by the international border that separates India from the country of Myanmar. The district derives it name from the term "Phekrekedze" which refers to the watch tower.

The district of Phek is bound by state of Manipur in the south, Kohima District in the west, districts of Zunheboto and Tuensang in the North and Myanmar in the east. Phek covers a total area of 2026 square kilometers. The population of the district according to the Census of 2011 stood at 1,63,294 with a population density of 81 per square kilometer. The district is inhabited by two main tribes of Nagaland, Pochurys and Chakhesangs. The people of the state communicate in the Tenyidie and Nagamese languages. The topographical features of Phek shows that the district is drained by the waters of the Rivers Sedzu, Tizu and Lanye. The district also has three large lakes called the Chida, Shillo and Dzudu. Enveloped in wooded hill slopes, the district is rich in the presence of flora and fauna. The economy of Phek district is predominantly agrarian, which is the chief occupation of the people of the district. 80.84 percent of the people practice terrace cultivation. Salt making, wood, bamboo carving and weaving are other means of livelihood of the people of the Phek district.



The district witnesses distinct seasonal changes with the winter being bitterly cold and the summer moderately warm. The monsoons arrive, in the district in the last week of May and lasts till the end of September. The district of Phek retains the cultural heritage of the land that is reflected in the cultural extravaganzas of Phek.

This hilly district borders Myanmar on the east, Kohima on the west, Kiphire on the north, and Manipur state in the south. The district is made up dominantly of the Disang Group of rocks. The younger Barails occur as outliers forming the peaks of high hills in this terrain. Towards the east the ophiolite suite of rocks is encountered. The shales are found to be metamorphosed towards the east.

Forest and forest Produces in Phek

Out of 202600 hectares of total land area of Phek District, forests occupy an area of approximately 56593.36 ha. Forests continue to acquire increasing importance for their role

in meeting the human material needs and also for their ecological and environmental services. Therefore, sustainable use of forest resources with strong conservation approaches is the key elements for current forestry management practices. The Forestry Sector has been one of the main source of providing livelihood and revenue, however, of late, the forest has been badly affected by several factors namely, rapid increase in population, insufficient infrastructure, diversion of forest area for developmental activities, inadequate public awareness about the forest functions and its administrations, etc.

Forest types in Phek, Nagaland:

1.1.Northern sub-tropical pine forest (9/C2): These types of forest are found in hills with elevation of 1000m to 1500m in parts of Phek and Tuensang district. Pine is the dominant species and is found mixed with QUERCUS, Schima, Prunus, Betula and Rhododendron.

1.2.Northern Mountain Wet –Temperate Forest (11B): These types of forest are found on the higher reaches of the tallest mountains (above 2500m) like Saramati and Dzukou area. The species that dominate are Rhododendron, Oaks, Birch and Juniperus sp.

1.3.Alpine Forest (15): Alpine vegetation is found at high altitude in ridges of Saramati range, which remains covered with snow for major part of the year from October to April. Species of Rhododendron, Albies, and Juniperus are found in sub alpine area.8.1 Types of forest

3.3.8.1. Vulnerability Analysis:

The district is cut across by the Laniye Thrust near Meluri. Other thrusts and faults trending in a NE-SW direction are also noted. The relief in the area is very high. Landslides and other mass movements are common in the Disang dominated parts of the district. Portions of the Ophiolite Belt is also susceptible to mass wasting.

3.3.9. <u>TUENSANG</u>:

The district is named after the town of the same name Tuensang, and the town is named after the village of that which is situated close by the town. It is surrounded on the north by Mon district, on the east by the nation Myanmar, on the south by Zunheboto and Phek district of

Nagaland and on the west by Mokokchung district. The latitude of the district is 25º 6`and 27º 4` North and Longitude is 93º 20` and 95º 15` East. The district is situated at an altitude of 1,371.60 meters above sea level; the total area is 4228 sq. km. The main tribes of this district are Changs, Sangtams, Khiamniungans, and Yimchunger. Tuensang is the districts headquarter.

It lies at an altitude of 897.64 sq. km. meters above sea level. It has four sub-divisions; Noklak, Shamatore, Longkhim. The total population of the district is 414801. The density of population is 98 persons per sq. km. and the sex ratio are 913 females per 1000 males.

Literacy rate is 51.30 % of the population, and the literacy rate of male to female is 55.97%: 46.12 %. Tuensang was a part of North East Frontier Agency till December 1957, when it was separated from it and joined with Naga Hills to form Naga Hills Tuensang Area in short. Tuensang is the biggest of the eleven districts in Nagaland. The district is oblong in shape and stretches north south.

3.3.9.1. Vulnerability Analysis:

The major part of the district is made up of the Disang Group of sediments. The rest of the area comprises the more stable Barail rocks. These rocks are traversed by a number of fault planes and thrust sheets. Where the faults cut across the Disang the rocks have been rendered weak and prone to mass wasting.

3.3.10. Wokha:

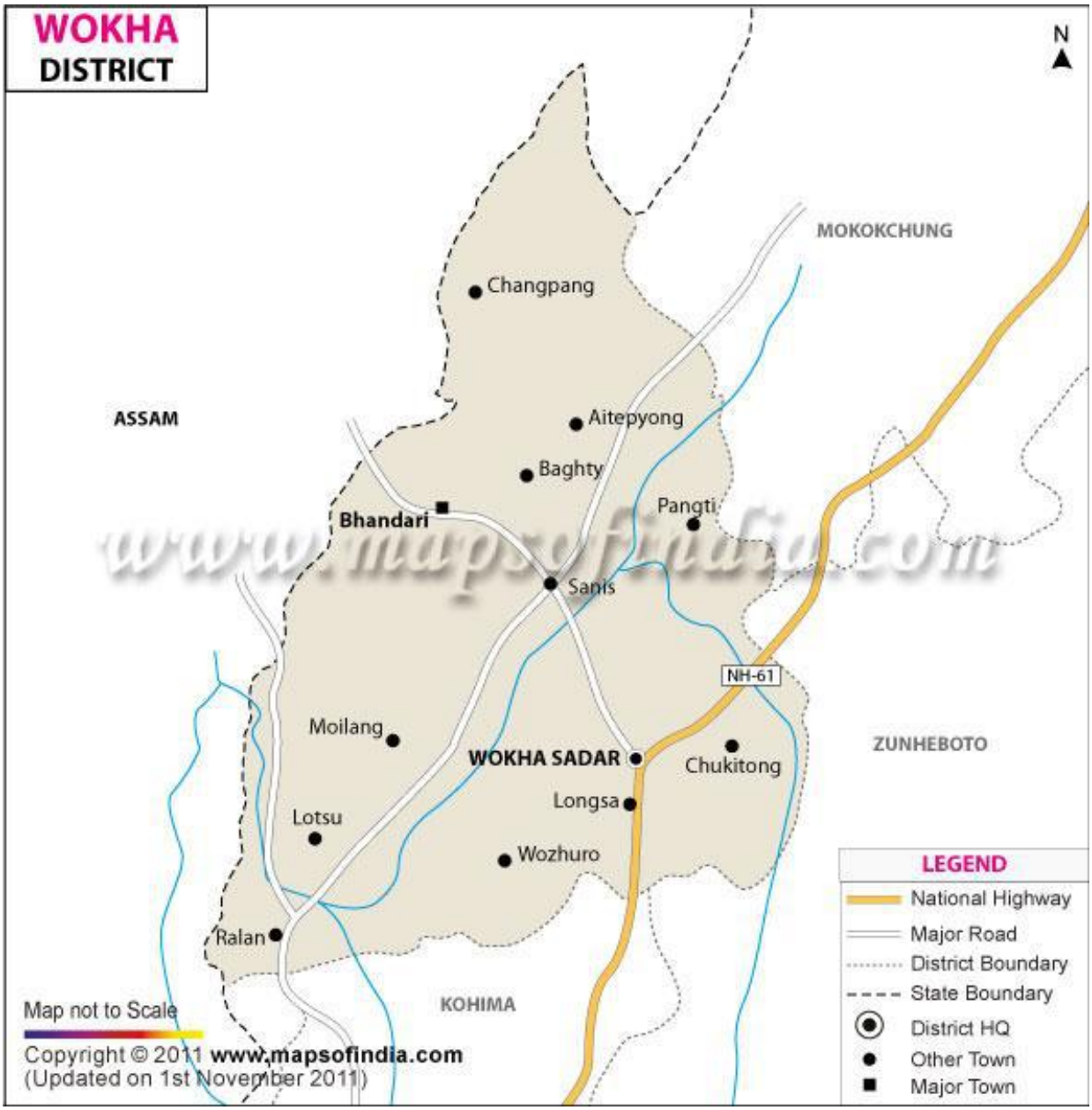
Wokha district, the home of the Lothas has a population of 1,61,098 in an area of 1628 sq kms; the population density is 99 per sq km. The major portion of this district is very hilly while a small part bordering Assam comprises a flat alluvial tract.

Year of formation	1973
Area	1,682 sq. km
Altitude	1,313.69 metres
Latitude	26.1° N
Longitude	94.27° E
Population (2011)	1, 66,239
Males	83,620
Females	77,478
Population density	51 per sq. km
Sex Ratio	969 females per 1000 males
No. of Blocks	05
Average rainfall	2000 mm. to 2500 mm.
Temperature	Max.: 32°C; Min.: 2°C

Geography

Geographical are of Wokha district is 1, 682 square km. Wokha district is bounded by

Mokokchung district in the North side, Kohima district in the South side, Zunheboto district in the East side and the State of Assam in the west side. It is situated in the mid-western part of the Nagaland State, adjacent to the Sibsagar plains of the Assam State.



Latitude of Wokha Town : 26.1°N **Longitude of Wokha city :** 94.27°E

Administrative Centers:-

a. Wokha : District HQ.
b. Bhandari : ADC.
c. Ralan : SDO.
d. Sanis :SDO

e. Merapani : Border Magistrate.

f. Chuktiong : EAC.

g. Lotsu : EAC.

h. Wozhuro : EAC.

i. Changpang : EAC.

j. Aitepyong : EAC.

k. Sungro : EAC.

l. Baghty : EAC.

History of disaster.

Disaster	Year	Remark
Earthquake (8.7R.S)	1950	NA
Earthquake (6.6.R.S)	1988	NA
Bus Accident	2007	NA
Landslide & Flash Flood(Nzhu River)	Almost every year	Destruction of houses and terrace Fields
Drought	1979	Damage of crops
Bus Blast (Dim to wka)	2000	4 died and 20 injured
Tuensang Bus Accident (Satsuphen Area)	2004	Above 15 person died
Bus Accident (kma-wka)	2006	9 person died
Fire incident (Tsumang Colony)	2007	House gutted & property damaged
Fire incident (Tsumang Colony)	1998	House gutted & property damage
Fire incident (Tsumang Colony)	2000	House gutted & property damage
Fire incident (DIS Office)	1994	House gutted & property damage
Forest Fire (Mt. Tiyi, wokha)	2005	Environmental damages society unrest
Forest Fire (Mt. Tiyi, wokha)	2006	Environmental damages society unrest
Boat Capsize (Doyang)	2004	4 people died
Landslide, New Bhandri Town	1960's	NA
Landslide, Sanis Baghty Road	1970'S	NA
Landslide, Mentsu, Wokha town	1970's	NA
Landslide, Wokha – Mkg Road Wokha village	1974	NA
Landslide, Lotsu Hq	1980's	Na
Landslide, Wokha – merapani Road, Sanis	1984	NA
Landslide, Wokha – merapani road, Baghty	1984	NA
Landslide, DHEP, Doyang	1989	NA
Landslide, Enongchu, Yikhum	1994	NA
Landslide, Wka-Mkg road,Tsungiki area	1996	NA

Landslide, mahanato area, Wokha	1997	NA
Landslide, Longtsangchu area, yikhum	1998	NA
Landslide, New Riphyim area	1999	NA
Landslide, CMHS area, Wka	2002	NA
Landslide, (Project colony)	2007	House damaged
Land fall accident, Akok	2008	5 people died

Hazards :

1. Cracking of earth caused by Doyang River/Dam near Riphyim village: In Riphyim area, it has been reported that there are cracks/sinking in certain patches due to constriction of the dam at Doyang which is causing environmental degradation.
2. Forest Fire: Forest fire is not uncommon in the district as major population of the district engaged in agriculture are practicing Jhum cultivation . However some unintentional or natural forest fires are also seen during dry season i.e. march - may.
3. Landslide: Wokha district being geologically fragile, it is a prone hily place. Occurrence of landslide could be observed almost every year during the rainy season of the calendar.
4. Vehicle Accident: the connectivity, condition, space and geographical terrains of the road pose much vulnerable for motor collision and falling below the roads.
5. Flood: Flood is not common for the entire district but can be make out at the low lying areas of Assam border.
6. Poor Umping Area: Industrial related waste are not available in the district, however systematic dumping of domestic waste products is to be improved viewing drainage blockage and other related health related hazards that it could have etc.
7. Flash Flood: Flash flood is very common in the district during the rainy season due to its hilly terrains. It is also commono at the river bank like Nhu, Doyang, etc.
8. Oil Leakage and natural gas in Chamgpang Area: these chemical related hazards at champang areas pose not only for the environment degradation but also stands dangerous for health, soil and water condition in the area have became poor for usage.
9. Sinking Area Wokha to Chukitong Road: as mentioned above about the geological instability of the locating district, sinking in major portion at patches can be observed. Best example for health being Wokha – Chukitong road, Wokha Village area.
10. Damage of Crops by Pest/animal: One very interesting character of thr Nagas are that some insects like grasshopper are consumable, but crop damage is done by other

inconsumable insects and pests . animal related crop damage is also common especially by elephants.

3.3.10.1. Vulnerability Analysis:

The Naga, Sanis - Chungliyimsen, and Disang Thrusts cut across this district. A number of faults have also weakened the rocks. The rocks of the area belong predominantly to the Disang Group and to a lesser extent the Barail Group. Where these structures have cut across the Disang, the areas are prone to slope failure in the presence of abundant water which is available from the high rainfall the district receives. Some prospect of underlying vulnerabilities and their factors of the district are listed below:

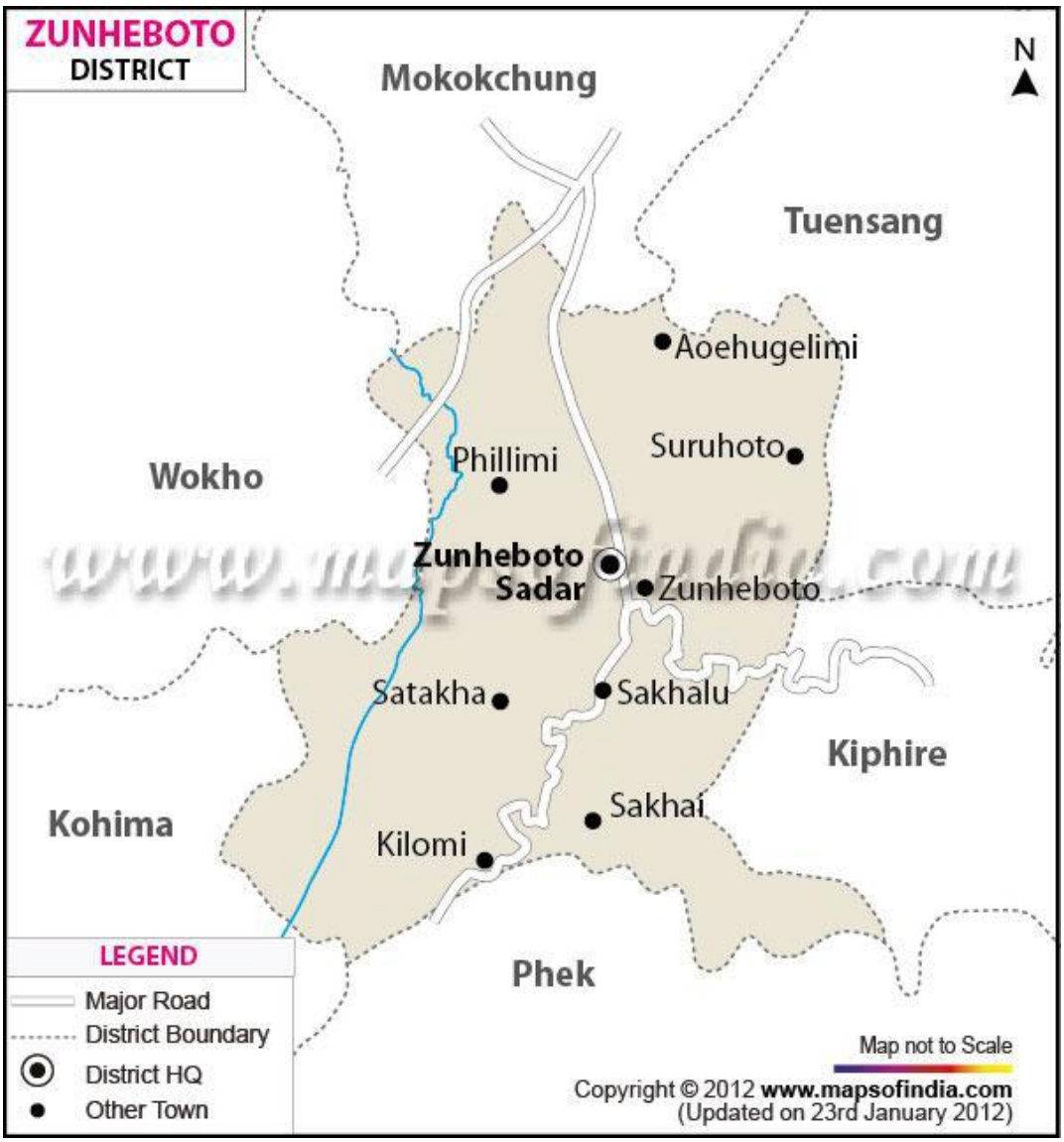
1. Untrained Officials or Unskilled Resources.
2. Forest, Shrub and grass are amble for fire incident during Dry season.
3. Entire north east or the state is prone to earthquake zone-v which is a high risk zone, so is the Wokha District.
4. Storms at western part which are of rural settlers are prone to damage of thatch houses and agricultural crops.
5. Any out break of epidemics could be major due to its poor developmental coping mechanism.
6. Majority of the population, both Urban and Rural due to lack of awareness as well as interest among the people.
7. Wokha to Merapani road condition being in bad shape is vulnerable for road accident.
8. Disable, old aged, children and pregnant or lactating women population being signification are vulnerable.
9. Oil split for fire incident, environmental degradation and other health hazards.
10. Natural gas leak for health hazards and environmental degradation.
11. 75-90% of the building are poorly constructed.
12. Geological unstable location that caused landslide problem during rainy season.

3.3.11. ZUNHEBOTO:

It is located 150 km away from the state capital Kohima and the total area of the district is 1255 sq. km. (2001 census). Incidentally it is located in the middle of the state. Zunheboto is the district headquarters that lies at an altitude of 1874.22 meters above sea level. It also has six sub-divisions- Akuloto, Satakha, Atoizu, Aghunato,Suruhuto and Pughoboto. The total

population of the district is 154909. The density of population is 123 persons per sq. km. And the sex ratio is 981 females per 1000 males (2011 census). Literacy rate is 86.26 % of the population.

Zunheboto district 150 Km away from the state capital and is bounded by Mokokchung on the North, Tuensang district on the East, Phek district on the South and Wokha on the West. Zunheboto, with total area of 1300 Sq Km. Like most of the districts of Nagaland, is situated on the Hills with its mountain ranges spread northeast to Southwest. The district is hilly. The hill varies from 1000 to 2500 meters and the average height of the district is 1800 meters. Most of the people live between 1500 and 2500 meters altitude. There are several ranges and they are more or less parallel and have gone from northeast to southwest. Between the ranges there are glens and gorges through which flow the hill streams.



TOPOGRAPHY:

There are high hills spread over many areas of the district. The hills vary from 1000 to 2500 metres and most people live between1500 - 2000 metres altitude. The Altitude of the district HQ. (ZBTO) is 1874.22 mtrs. above sea level. (Most of the population reside in rural areas. Zunheboto Town is the only designated urban area of the district.)

CLIMATE & RAINFALL:

Owing to the high altitude, this district enjoys a monsoon climate almost throughout the year. Winters are very cold but summers moderately warm. December and January form the coldest part of the season and at times the temperature comes down to10Celsius. The highest summer temperature is 220 Celsius. The average rainfall is about 200 cm. It falls for nine months in a year, heaviest contribution being in July and August.

SOIL:

Almost all the soils of the Zunheboto district belongs to the following classes/orders.There are alluvial soil, Forest soil(organic) pertaining to moolisol, non-laterised soil and soils of high altitudes belonging to order spodosals.

RIVERS:

There are three important rivers in the district, viz, Tizu river originating in Tuensang district flows down towards south crossing at the centre of Zunheboto district and join Chindwin. Doyang river originating in Japfu passes through west part of the district and joins Dhansiri in Assam. Tsutha river, originating in North East of Zunheboto drains eastern part of the district and joins Tizu below Nihoshe village, where a Mini Hydel Power project is located. Most of the area under terrace cultivation on Tizu, Tsutha and Mela a tributary of Tizu river.

3.3.11.1. Vulnerability Analysis:

Large scale deforestation due to logging and for cultivation has left extensive tracts bare. A number of faults trending NE-SW cut across the district. The Disang and Barail Groups of rocks are noted here. The Disangs have been rendered weak due to the faults. The rocks are sheared and crumpled to very large extents resulting in general weakening of the slopes. Hence, many road sections and inhabited areas are vulnerable to landslides.

CHAPTER IV
STATE DISASTER MANAGEMENT FRAMEWORK

4.1. PRINCIPLES OF DISASTER MANAGEMENT PLAN

Disaster Management involves a holistic approach to problem solving relating to any kind. The plan also recognizes the need to rely on and usage of locally available resources (knowledge, personnel and material) to ensure a more efficient, low cost and quicker response to any disaster situation. These have been taken into consideration while framing the Disaster Management Plan of the State of Nagaland;

Effective management of disaster involves bringing together agencies, organizations, individuals and their resources in working with the communities at a time of crisis. Any effective strategy for Disaster Management in Nagaland must recognize the strength of the traditional ties of the Community and rely on the involvement of the community through traditional representative bodies such as the Councils and Tribal Hohos.

Information is key to appropriate planning and implementation and hence emphasis will be laid on accessibility to such information. The plan recognizes the need to build repositories of information at the macro as well as micro level of administration to ensure effective networking at different levels of management as well as to ensure effective sharing and sourcing of material and skills in the aftermath of a disaster.

The Plan must ensure the usage of available local resources. Key to this principle is the understanding that local resources (Personnel, material and knowledge) are more accessible and cost effective.

The Disaster Management Plan must ensure District wise preparation in order to take into consideration the variations within the 12 districts of the State. Each District is required to plan on the basis of the disasters that are more prone to that District and accordingly structure its Disaster Management Plan around available resources and skills.

The Disaster Management Plan must have inbuilt flexibility in order to effectively address emergency situations. It is important to recognize that planning is a continuous process which must be updated and improvised.

4.2. OBJECTIVES OF THE NAGALAND STATE DISASTER MANAGEMENT PLAN

The objectives of the Nagaland State Disaster Management Plan are as follows;

- To identify and assess the vulnerability of the State to various natural and manmade disasters.
- To develop appropriate Disaster prevention and mitigation strategies.
- To develop policies and guidelines that will clarify the role of stakeholders.
- To strengthen the capacities of organizations and agencies, Government and voluntary, as well as the community to act and respond in the event of any disaster.
- To develop a well structured MIS that will form the basis of any response to a Disaster situation.
- To incorporate, promote and adopt indigenous systems of knowledge and skills in disaster prevention and mitigation strategies.
- To develop a knowledge source in order to create awareness and disseminate information about disasters.
- To incorporate capacity building and skills as an essential part of the State Disaster Management approach.
- To ensure sufficient investment of funds and resources for sustainability and effectiveness of the plan.
- To facilitate community participation in the planning and implementation process of the plan.
- To strengthen the Disaster Management policy and efforts with appropriate legislative and legal sanctions.

4.3. DISASTER MANAGEMENT: AN APPROACH

Disaster refers to a catastrophe, mishap or calamity caused by natural or man-made factors which is beyond the coping capacity of the community so affected. Disaster Management is an approach that involves the entire process of planning, organizing, implementing, coordinating and monitoring for ensuring;

- Preventive measures for any disaster
- Mitigation measures to reduce the severity of any disaster or its impact
- Capacity building measures
- Effective and timely Response action
- Evacuation, Rescue and Relief Responses
- Rehabilitation
- Reconstruction.

Therefore, a Disaster management Cycle can be generally accepted as having six elements comprising of:

- Pre-Disaster
- Preventive measures
- Mitigation
- Preparedness Post-Disaster-
- Rescue and Relief
- Rehabilitation
- Reconstruction

4.4. DISASTER RESPONSE PLAN:

The State Response Plan is a general guideline to enable key officials, agencies, Departments and assisting organizations to organize an initial response to a disaster situation and also specify their responsibilities during any emergency.

The response Plan represents an all-hazards approach that encompasses a multitude of possible disasters or crisis that could range from natural disasters to acts of terrorism that the State of Nagaland may face.

The plan includes:

- Specific procedures to respond to, mitigate and recover from any crisis.
- Defining the chain of command in any emergency
- Communication plan that will facilitate accurate and up-to-date information that is shared between the Government organizations, voluntary agencies and the community.
- Defining roles and responsibilities for those assigned to respond to any situation.

4.5. THE STATE RESPONSE PLAN IS BASED ON THE FOLLOWING PREMISES:

More delegation of power to the lower level of governance so that Village Councils (in the case of Village) and Wards (in the case of Town areas) are the unit of planning, coordination and management.

Devolution of financial power to the lower level functionaries for management of emergencies and inbuilt flexibility to increase the ceiling of expenses likely to occur in times of emergencies that are of a more serious nature and such that communications with the District and State Headquarters are rendered impossible.

Emphasis shall be laid on capacity building of local personnel in search and rescue, evacuation, First Aid, emergency relief and shelter Management and equipping them with necessary equipments and other resources with the view of progressively minimizing external dependence during emergencies.

Minimizing overlapping roles of officers, volunteers and agencies and ensuring a unified command for effective coordination and networking of efforts.

CHAPTER V

INSTITUTIONAL MECHANISM TO RESPONSE TO DISASTER

In our federal system of governance, in the aftermath of a disaster, the primary responsibility for undertaking the rescue, relief and rehabilitation measures rests with the concerned State Governments. The role of the Central Government is supportive, in terms of physical and financial resources and complementary in sectors such as transport, early warning systems, etc.

The Disaster Management Act 2005, lays down a three tier institutional structure for disaster management at the national, state and district levels in the form of NDMA, SDMA and DDMA. National Policy on Disaster Management (NPDM) has further specified the roles and responsibilities of various organizations for disaster response.

5.1. STATE LEVEL

It will be the primary responsibility of the State Government to respond to natural disasters and provide relief to the affected people. Section 22(2) (G) of the Disaster Management Act stipulates that the SEC under the State Chief Secretary shall 'coordinate response in the event of any threatening disaster situation or disaster'. SEC shall give directions to any Department of the State Government or any other authority or body in the State regarding actions to be taken in response to any disaster.

Home Department, Nagaland State Disaster Management Authority (DM) and Relief and Rehabilitation (RR) shall be the nodal department for disaster management and Home Commissioner shall implement the decisions of the SEC pertaining to State level Response to natural disasters.

Disaster response being a multi-agency function, other Departments of the State Governments will provide emergency support in their relevant domains at the State/District levels.

5.1.1 Following shall be the sequence of action at the State level: SEOC shall discharge the following functions:

1. On receipt of information either from NEOC/DEOC or from Early Warning Agencies or any other reliable sources, State Emergency Operation Centre, shall be activated fully as per laid down protocol.
2. SEOC shall issue alerts/warning to all designated authorities at the State level and Districts including for Public Information to AIR/Doordarshan/Press.
3. SEOC shall send First Information Report to NEOC, MHA and thereafter Daily Situation Report till situation normalizes.
4. SEOC shall collect all relevant information and appraise the status to the designated decision making authorities.
5. It shall arrange Meetings of SEC
6. It shall activate ESFs of State if the situation so warrants

5.1.2 State Disaster Management Authority (SDMA)

1. Meeting of the SDMA shall be convened on the direction of Chief Minister
2. SDMA will take stock of the situation.
3. SDMA shall give necessary directions to SEC, Deptt. Of Disaster Management and other Departments/agencies of the State Government and concerned DDMAs.
4. SDMA shall decide on Inter-State assistance and cooperation.

5.1.3 State Executive Committee (SEC)

1. Home Commissioner/Secretary (NSDMA) shall convene the meeting of SEC
2. SEC shall assess the situation and give directions to the concerned Departments/agencies of the State Govt. and DDMAs concerned regarding measures to be taken by them in response to any specific threatening disaster situation or disaster.
3. SEC shall coordinate response of various agencies
4. SEC shall requisition NDRF or Armed Forces if the situation so demands.
5. SEC may depute a team of Officials to visit the affected Districts for on the spot assessment of the situation and supervise the response & relief measures.
6. SEC shall mobilize resources and dispatch them to concerned Districts.
7. SEC shall monitor and review the situation on a regular basis
8. SEC shall keep the NEC and NDMA informed of the situation.
9. SEC shall constantly evaluate their own capabilities to handle that situation and project the anticipated requirements for the central resources well in time.

10. SEC shall deploy State level Incident Command Team on the request of the DDMA as and when required.
11. In the event of calamity of severe nature, the SEC will consider appointment of Senior Officers, delegate powers and assign specific areas for timely and effective, efficient management of disasters.
12. SEC will also take necessary steps to pool the resources for better management of crisis situation. This includes the pooling of food grains funds and other resources available in the districts under various Government schemes. However, these resources will be reimbursed to the respective schemes/Departments once the situation becomes normal.

5.1.4 Role of Other Departments/Agencies

1. On activation of State ESF Plan, the concerned Department/Agency shall depute the designated officials to SEOC for coordination of response measures.
2. Departments/Agencies shall coordinate with their National counterparts and mobilize central assistances, such as specialized manpower, equipments, materials etc. to meet immediate needs in their respective sectors.
3. Departments/Agencies shall provide resources both in terms of men and material for assistance to the DDMAs.

5.2 DISTRICT LEVEL

Section 30(2) (xvi) of the Disaster Management Act stipulates that the DDMA under the chair of the Collector or District Magistrate or Deputy Commissioner, as the case may be and the co-chair of the elected representative of the local authority, shall 'coordinate response to any threatening disaster situation or disaster'. The Collector/District Magistrate/Deputy Commissioner, as the head of administration at the district, shall be the focal point in the command and control for disaster response at the district level, in accordance with the policies/guidelines/instructions from the national and state levels. Depending on the nature of disaster and response he will be the Incident Commander himself or delegate the responsibility to some other officer.

All the Departments/Agencies of the State Governments in the District/City involved in response and relief will work in accordance with the directions of the Incident Commander.

The lower administrative units of Districts viz; Subdivisions under the administrative control of a Sub-divisional Magistrate/Officer and Blocks and under the administrative control of the Block Development Officers will coordinate the functioning of the various departments in their respective jurisdiction.

The Incident Command Teams at Subdivision and Block levels under SDO/SDM or BDO as the case be will be responsible for all response and relief works.

5.2.1 Following shall be the sequence of action at the District level: DEOC shall discharge the following functions:

1. On receipt of information either from NEOC/SEOC or from Early Warning agencies or field functionaries from Sub-divisions, Blocks, VDB or any other reliable sources, District Emergency Operation Centre shall be activated fully as per laid down protocol.
2. DEOC shall issue alerts/warning to all designated authorities at the District level.
3. DEOC shall send First Information Report to SEOC and NEOC, MHA and thereafter Daily Situation Report till situation normalizes.
4. DEOC shall collect all relevant information and appraise the status to the designated decision making authorities.
5. DEOC shall maintain all records and documents related to the response
6. It shall activate ESFs of District if the situation so warrants

5.2.2 District Disaster Management Authority (DDMA)

1. DDMA shall assess the situation and give directions to the concerned Line Departments/Agencies at the District level regarding measures to be taken by them in response to any specific threatening disaster situation or disaster.
2. DDMA shall take such other action as may be necessary for coordinated response to natural disasters. These may include the following:
    a. Assessing situations based on reports received from various sources and giving directions to different agencies for immediate response, relief and restoration of critical infrastructure
    b. Reviewing the resources and capacities of different agencies to deal with the situations and giving directions for pooling available manpower, equipments and resources available with different agencies for speedy and effective response

c. Requisitioning assistance from SDRF/NDRF/ Armed Forces/ other specialized agencies, if necessary
d. Coordinating with civil society and Non-Governmental Organizations for supplementing the efforts of government agencies
e. Monitoring and reviewing the situations on a regular basis.

5.3 First Response

In disasters where there are no early warning signals available, the community members will be the first responder. However, immediate support and assistance shall be available from other important first responders like the police, State Disaster Response Force (SDRFs), Fire and Medical Services. Other important responders will be the Civil Defence, Home Guards and youth organizations such as NCC, NSS and NYKS drawn from local units.

5.4 First Information Report

DEOC shall send First Information Report immediately to SEOC, NEOC and all designated authorities/agencies. FIR shall invariably give an account of the severity of the disaster, damage & loss caused, locally available capacities, priority. The FIR shall briefly summarize,

a) Severity of the disaster
b) Actions being taken locally
c) Local coping capacities (including locally available resources)
d) Immediate priorities for external relief required and approximate quantities for the same
e) Best logistic means for delivering relief
f) Forecast of possible future developments including new risks.
g) The First Information Report on occurrence of natural calamity shall be sent to SEOC, NEOC and MHA, Government of India within maximum 24 hours of occurrence of calamity.

5.5 Daily Situation Report

A standardized form for reporting of situation report on daily basis has been prepared for the District, State and National levels. This format will be used uniformly for all the States. The State Governments shall submit situation report to the MHA on six hourly basis during first three days thereafter daily till the situation come to normal.

5.6 Air dropping of food in inaccessible areas

Airdropping of food and essential commodities shall be undertaken in the inaccessible areas. The State Governments/ district authorities will liaise with Air Force Authorities and the NEC, Ministry of Home Affairs, Government of India for requisitioning the helicopters.

The agencies for preparing food packets for airdropping and items as well quantity to be included in the food packets will be communicated by the district administration in advance.

5.7 Rapid Damage Assessment

Rescue & relief operations shall be based on ground assessment of damage and losses. Preliminary assessment shall be carried out immediately within 24 hours for planning the response. Teams shall be constituted of officials drawn from various sectors to make assessment on the basis of on the spot visits, aerial surveys and information collected from primary and secondary sources.

5.8 Immediate repair of infrastructure

The Departments/Agencies of the State Governments responsible for various infrastructural facilities such as electricity, drinking water, telecommunication etc shall repair the damage caused by the disaster and will take immediate steps to restore damaged essential services so that rescue & relief operations are conducted smoothly.

5.9 Disposal of dead bodies

The State Government/District authorities shall earmark authorities responsible for disposal of bodies in event of mass causalities. The process of identification and handing over to next of kin shall be followed. Mass burial/disposal of bodies shall be done as a last resort. Local religious & cultural practices shall be honored while disposing dead bodies.

5.10 Disposal of carcasses

The State Government/District authorities shall earmark authorities responsible for disposal of carcasses in event of mass destruction. The process to be followed for mass disposal of carcasses shall be decided by Department of Animal Husbandry.

5.11 Information and Media Management

During disaster situations, the dissemination of accurate information through electronic and print media is very important. Regular press briefings shall be made by District Magistrate/Collector or his authorized representative at pre-designated time as a single source of information from Government.

5.12 MECHANISM FOR INTERNATIONAL ASSISTANCE:

Where an agency/Department requires resources beyond its own capacity to satisfactorily respond to a disaster situation, it will request for assistance as appropriate;

- If at the local level, from the EAC/SDO (Civil).
- If resources at the District are insufficient, then the request will have to be made to the State Disaster Management Committee.
- Thereafter, if resources at the State Level are insufficient to meet the Disaster situation, the State Executive Committee shall, through the State Government shall seek assistance from the Central Government and International Aid agencies/ Organizations.

5.12. POST – OPERATIONAL DEBRIEFING:

The Block, Municipal or District emergency response co – ordinator is responsible for convening a debriefing conference as soon as practicable after cessation of response activities. In so far as is possible, all agencies that are involved in the response activities will be represented with a view to assess the adequacy of the response and to recommend any changes to the relevant plan(s).

5.13. RELIEF:

In the aftermath of disasters the affected people must be looked after for their safety, security and the well being and provided food, water, shelter, clothing, medical care etc. so as to ensure that the affected people live with dignity. State Governments shall be responsible for providing prompt and adequate relief assistance to the victims of disasters. The minimum standards of relief shall b laid down by the NDMA and by the SDMAs in terms of sections 12 and 19 respectively.

5.14. FOOD & NUTRITION

People affected by disasters may be deprived of food and therefore food aid shall be provided to sustain life. The following measures shall be taken:

1. Where necessary free distributions of food shall be made to those who need the food most.
2. The food distribution will be discontinued as soon as possible.
3. Wherever possible dry rations shall be provided for home cooking.
4. Community Kitchen for mass feeding shall be organised only for an initial short period following a major disaster particularly where affected people do not have the means to cook
5. While providing food assistance, local food practices shall be kept in mind and commodities being provided must be carefully chosen, in consultation with the affected population.
6. Foods must be of good quality, safe to consume, and appropriate and acceptable to recipients.
7. Rations for general food distributions shall be adopted to bridge the gap between the affected population's requirements and their own food resources
8. Food distributed should be of appropriate quality and fit for human consumption
9. Food should be stored, prepared and consumed in a safe and appropriate manner at both household and community levels
10. Food should be distributed in a responsive, transparent, equitable manner
11. NGOs, CBOs and other social organizations should be involved for supplementing the efforts of the Government.
12. The nutritional needs of the population should be met and malnutrition and micronutrient deficiencies of identified at risk groups addressed.

5.15. WATER

Water supply is invariably affected in natural disasters. Safe drinking water might not be available particularly in hydro-meteorological disasters. The following measures shall be taken by the State Governments/ district administration:

1. The State Governments shall identify alternative sources of water and make necessary arrangements for supply to the affected population.

2. The State Governments shall ensure that affected people have adequate facilities and supplies to collect, store and use sufficient quantities of water for drinking, cooking and personal hygiene.
3. It shall be ensured that drinking water supplied conforms to the prescribed quality standards
4. It shall be ensured that water made available for personal and domestic hygiene should not cause any risk to health.

5.16. HEALTH

During post disaster phase many factors increase the risk of diseases and epidemics. These include poverty, insecurity, overcrowding, inadequate quantity and quality of water, poor environmental and sanitary conditions, inadequate shelter and food supply.

5.17. MEDICAL RESPONSE

Medical response has to be quick and effective. The execution of medical response plans and deployment of medical resources warrant special attention at the State and District level in most of the situations. The following measures shall be taken by the States/Districts:

1. A mechanism for quick identification of factors affecting the health of the affected people shall be established for surveillance and reporting.
2. An assessment of the health and nutritional status of the affected population shall be done by experts with experience of emergencies and, if possible, local knowledge.
3. The voluntary deployment of the nearest medical resources to the disaster site, irrespective of the administrative boundaries, will be warranted.
4. Mobile medical hospitals and other resources available with the Central Government shall be provided to the States/UTs.
5. Adequate supply of medicines, disinfectants etc. shall be made.
6. Where necessary inoculation shall be done.
7. Vaccination of the children & pregnant women shall be undertaken.
8. Vector-borne diseases are a major cause of sickness and death in many disaster situations. Vector control measures shall be undertaken.
9. Water borne diseases may cause sickness and deaths and therefore adequate measures shall be taken to prevent such outbreaks.

5.18 .MENTAL HEALTH SERVICES:

Disasters cause tremendous mental trauma to the survivors. Psychosocial support and mental health services should be made available immediately in the aftermath of disaster so as to reduce the stress and trauma of the affected community and facilitate speedy recovery. The following measures shall be undertaken by States/UTs:

1. A Nodal Mental Health Officer shall be designated for each affected District.
2. Rapid needs assessment of psycho-social support shall be carried out by the Nodal Officer/ Health Department.
3. Trained man power for psycho-social and mental health services shall be mobilized and deputed for psycho-social first aid and transfer of critically ill persons to referral hospitals.
4. Psycho-social first aid shall be given to the affected community/population by the trained community level workers and relief and rescue workers.
5. Psycho-social first aid givers shall be sensitized to local, cultural, traditional and ethical values and practices.
6. Psycho-social support and mental health Services shall be arranged in relief camps set-up in the post disaster phase.
7. Where large number of disaster victims has to be provided psychosocial support a referral system for long term treatment shall be followed.
8. The services of NGOs and CBOs may be requisitioned for providing psycho-social support and mental health services to the survivors of the disasters.
9. Community practices such as mass prayers, religious discourse etc. should be organized with four preventive and promotive mental health services.

5.19. CLOTHINGS & UTENSILS:

During disasters, people lose their clothing and utensils. The following measures shall be taken by State/District authorities:

1. The people affected by the disaster shall be provided with sufficient clothing, blankets etc. to ensure their dignity, safety and well-being.
2. Each disaster-affected household shall be provided with cooking and eating utensils.

5.20. SHELTER:

In a major disaster a large number of people are rendered homeless. In such situations shelter becomes a critical factor for survival of the affected people in the initial stages of a disaster.

Further, shelter becomes essential for safety and security and for protection from the adverse climatic conditions.

Shelter is also important for human dignity and for sustaining family and community life in difficult circumstances. The following measures shall be taken by State/District authorities for providing shelter to the affected people:

1. Disaster affected people who have lost their dwelling units or where such units have been rendered damaged/useless shall be provided sufficient covered space for shelter.
2. Disaster affected households shall be provided access to appropriate means artificial lighting to ensure personal security.
3. Disaster-affected households shall be provided with necessary tools, equipment and materials for repair, reconstruction and maintenance for safe use of their shelter.

5.21. <u>RELIEF CAMP.</u>

Adequate numbers of buildings or open space shall be identified where relief camps can be set up during emergency.

1. The following steps shall be taken for setting up relief camps in the affected areas:
2. The use of premises of educational institutions for setting up relief camps shall be discouraged.
3. One member of the Incident Command Team of the district trained in running and management of relief camps will be deputed for management of relief camps.
4. The requirements for operation of relief camps shall be worked out in detail in advance.
5. Agencies to supply the necessary stores will be identified in the predisaster phase.
6. The temporary relief camps will have adequate provision of drinking water and bathing, sanitation and essential health-care facilities.
7. Adequate security arrangements shall be made by local police
8. Adequate lighting arrangements shall be made in the Camp Area including at water points, toilets and other common areas.
9. Wherever feasible, special task forces from amongst the disaster affected families will be set up to explore the possibility of provision of food through community kitchens, provision of education through the restoration of schools and anganwadis.
10. Efficient governance systems like entitlement cards, identification cards, bank accounts for cash transfers etc shall be developed.

5.22. SANITATION AND HYGIENE:

Sanitation services are crucial to prevent an outbreak of epidemics in post disaster phase. Therefore a constant monitoring of any such possibilities will be necessary. It should be ensured that disaster-affected households have access to sufficient hygiene measures. Soap, detergents, sanitary napkins and other sanitary items should be made available to ensure personal hygiene, health, dignity and well-being. In the relief camps, toilets should be sited, designed, constructed and maintained in such a way as to be comfortable, hygienic and safe to use.

5.23. PROVISION OF INTERMEDIATE SHELTERS:

In the case of devastating disasters, where extreme weather conditions can be life-threatening or when the period of stay in temporary shelters is likely to be long and uncertain, the construction of intermediate shelters with suitable sanitary facilities will be undertaken to ensure a reasonable quality of life to the affected people. Such shelters shall be designed to be cost effective and as per local needs.

5.24. MANAGEMENT OF RELIEF SUPPLIES:

Speedy supplies of relief materials shall be ensured in relief operations. A supply chain management system shall be developed. Standard Protocols shall be put in place for ensuring the procurement, packaging, transportation, storage and distribution of relief items. A mechanism shall be developed for receiving donations in cash or kind and their distribution.

5.25 .TRANSPARENCY IN RELIEF:

SDMAs/DDMAs shall take all appropriate measures for transparency in the relief operations. Affected people shall be apprised of the nature and quantum of relief admissible to them. Proper formats will be developed to acknowledge the receipt of relief materials and their further distribution.

CHAPTER VI

STANDARD OPERATING PROCEDURE

6.1. INTRODUCTION:

Prompt and well-coordinated and effective response mounted in the aftermath of disasters not only minimizes loss of life and property but also facilitates early recovery. The important ingredients of an effective response system are integrated institutional arrangements, state of the art forecasting and early warning systems, safe communication system, rapid evacuation of threatened communities, quick deployment of specialized response forces and coordination and synergy among various agencies at various levels in dealing with any disaster.

Most importantly, all the agencies and their functionaries must clearly understand their roles and responsibilities and specific actions they have to take for responding to disaster or threatening disaster situations.

This SOP lays down, in a comprehensive manner, the specific actions required to be taken by various Departments and Organizations under the control of Government of Nagaland at the State level and concerned district administration for responding to natural disasters of any magnitude and dimension.

6.2. OBJECTIVES OF SOP:

a) To provide, in a concise and convenient form, a list of major executive actions involved in responding to natural disasters and necessary measures for preparedness, response and relief required to be taken.

b) To ensure that all concerned Departments and Organizations of the Government of Nagaland and District Administrations know the precise measures required of them at each stage of the process and also to ensure that all actions are closely and continuously coordinated.

c) To indicate various actions this would be required by the State Governments within their sphere of responsibilities so that they may prepare and review the Contingency Action Plans accordingly.

The instructions contained in this SOP should not be regarded as exhaustive of all the actions that might be considered necessary. It will also be necessary for each Department and

Organization which is required to provide Emergency Support Functions (ESF) during or the other natural disasters to prepare detailed SOPs so as to translate each action point in a number of steps required to be taken by each of them.

In line with the guidelines evolved by the National Disaster Management Authority, the State Disaster Management Plan shall incorporate the "L" concept and "Trigger Mechanism" in the response Plan at the State Level as well as the District Level. The "L" concept will be utilized to denote the different levels of disaster in order to facilitate effective response at appropriate levels of response.

6.3. L CONCEPT:

L0 shall denote normal times during the course of which activities relating to monitoring, Documentation, Prevention and Preparatory activities shall be taken up at the District as well as State Level. Training of Search and Rescue, rehearsals, evaluation, inventory updating and data collections or response activities will be carried out during this period.

L1 level denotes the level at which the disaster can be managed at the district level and the State and Centre in case the district requires assistance for Disaster Relief and/or recovery operations.

L2 level disaster situations are those which require assistance and active participation of the State mobilization of its resources for management of disasters.

L3 level denotes a large scale disaster situation where the District and State authorities have been overwhelmed and require assistance from the Central Government for reinstating the State and District Machinery as well as assistance for search and rescue efforts, relief and other response and recovery measures.

The State Disaster Management Authority will determine the scale and intensity of the disaster for declaration of L3 disaster.

6.4. RESPONSE MECHANISM

6.4.1. At the Community Level:

At the community level, the ADC or SDO/EAC shall appoint a VC/VDB as the case may be to the Response Coordinator at the Community level.

It shall be the responsibility of the Relief Coordinator to ensure that immediate relief provisions are made available and activate in the event of emergency at the community level.

At the Community level, the VC/VDB as the case may be, shall be in the incident commander and shall regularly appraise the SDO/EAC or ADC and all the networking voluntary and assisting organization through available channels of information. In case normal means of communication are rendered useless, he/she shall utilize facilities at the nearest PS/POP communication channels.

He/she shall inform the ADC or SDO/EAC of the magnitude of the disaster and whether the emergency/disaster situation can be controlled within his/her resources.

6.4.2. At the Sub-Divisional Level:

At the Sub-Divisional level, the Deputy Commissioner shall appoint an EAC/SDO or ADC as the case may be to be the Response Coordinator at the Sub-divisional level.

It shall be the responsibility of the Relief Coordinator to ensure that immediate relief provisions are made available and activate in the event of emergency at the sub-divisional to the village level.

At the Sub-divisional to the village level, the EAC/SDO or ADC as the case may be, shall be the Incident Commander and shall regularly apprise the DC and all networking voluntary and assisting organizations through available channels of information. In case normal means of communication are rendered useless, he/she shall utilize facilities at the nearest PS/POP communication channels.

He/she shall inform the Deputy Commissioner of the magnitude of the disaster and whether the emergency/disaster situation can be controlled within his/her resources.

6.4.3. At the District Level:

The Deputy Commissioner shall on receiving the information convene the District Disaster Management Authority (DDMA) and also inform the State Commander. The Deputy Commissioner must mandatorily carry out an on- site inspection of the affected area and send an independent report to the State Commander.

The Deputy Commissioner shall be the District Response Coordinator and shall be called the District Commander. He shall:

- Be responsible for effective coordination of resources and services within the District.
- In the event of uncertainty, determine which agency is to perform its statutory response role.
- Ensure that an effective control structure is established in the District.
- Arrange to provide requested resources to the control/support/operating agencies from within the district or outside the district.
- Monitor the provision of emergency relief and supply.
- Alert the public to existing and potential dangers arising from serious emergencies.
- Assess need for declaration of an emergency area in consultation with the State Control Agency.
- Notification of relevant Government and Non-Government agencies.
- Record maintenance.
- Provision of medical treatment/ first Aid.
- Notification of Hospitals.
- Registration of persons evacuated or otherwise affected.
- Provision of relief needs of evacuees, control and support agencies where necessary.
- Co-operation and coordination with all participating Departments/Agencies/ Authorities.

6.4.4. At the State Level:

At the State level, the Chief Secretary of Nagaland shall be the ex-officio Chairperson of State Executive Committee and shall be called the State Commander during an emergency or Disaster situation. He shall, after due assessment of the situation, declare L1 and L2 disaster situation enabling suitable mobilization of personnel, resources and assistance. The Departments/ Organizations concerned with these SOPs at State level will be as under.

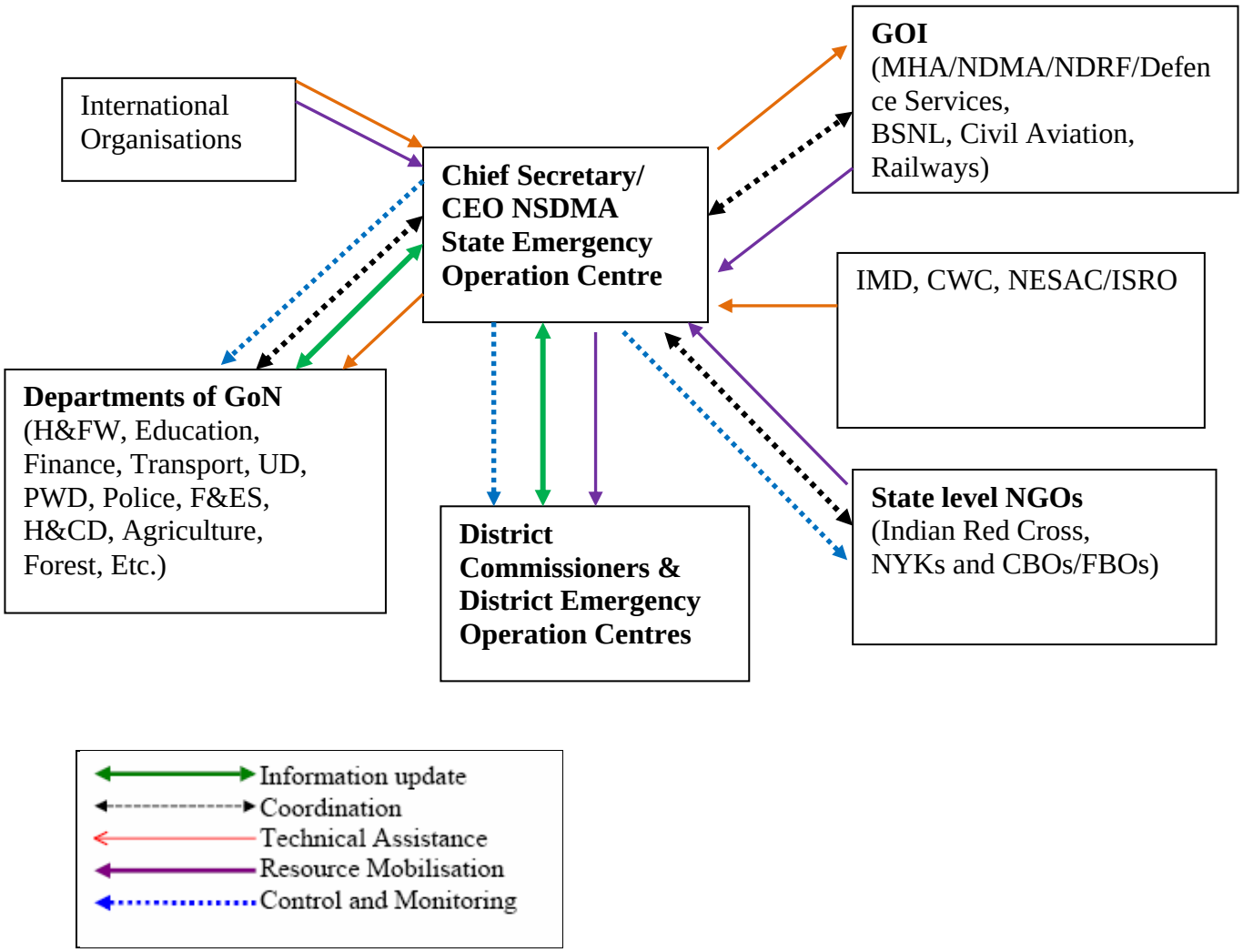
6.5. INSTITUTIONAL ARRANGEMENTS:

All disaster specific mechanisms would come under a single umbrella allowing for attending to all kinds of disasters with the objective of having a simplified and uncluttered system of response in a disaster situation.

The Chief Secretary as the Chief of Operations will be supported by the Relief Commissioner through the Branch arrangements at the Emergency Operations Centre (EOC).

In case of widespread disaster, the role of the Sub-Divisional Officer comes into prominence under the guidance of District Magistrate and Collectors.

`Institutional arrangement and flow of information chart is outlined:



6.6. DURING AN EARTHQUAKE:

Structural Mitigation and role of different departments

It is often said that earthquakes do not kill people, but badly constructed buildings do. Construction practices should incorporate earthquake resistant features like raft or pile foundation, braces, lintel bindings, edge-beams and Base Isolation Techniques etc. Retrofitting of existing buildings will be undertaken after proper vulnerability analysis. Public utility buildings and vital installations will be retrofitted on priority by the concerned departments in consultation with experts in the field. A detailed risk and hazard analysis will be undertaken district wise, based on which stringent zonation norms be formulated and enforced.

Early warning or prediction of earthquake is not possible. However it is possible to detection and monitors the earthquakes and the aftershocks. IMD is the nodal agency of Government of India responsible for monitoring seismic activity in and around the country. IMD is responsible for quickly estimating the earthquake source parameters immediately on occurrence of an earthquake and disseminates the information to all the user agencies including the concerned State and Central Government agencies responsible for carrying out relief and rehabilitation measures. IMD shall also transmit earthquake information to public information channels, press, media, etc. and posts in its website**.**

6.7. FOLLOWING ARE THE EMERGENCY SUPPORT FUNCTIONS FOR RESPONSE TO EARTHQUAKE:

Sl. No.	Emergency Support Functions	Scope ESF	Team Leader	Primary Agency	Support Agency
1.	Communication	Establishing, using, maintaining, augmenting, and providing backup for all of the types of communications devices needed during emergency response operations.	DGP at the State Level supported by DIG (NPTO) Commanding Officer NSDMA/SEOC SP at the District Level supported by DEOC	NTPO, Police Department and NSDMA/SEOC	BSNL, NIC, Private Telecom Operators, Public Relation Department
2.	Damage Assessment	Conduct of ground surveys to determine the scope of the damage, casualties, and the status of key facilities.	Addl. CS/ Commissioner Nagaland at the State Level supported by Home Commissioner DC at the District level.	Nagaland Commissioner's Office supported by NSDMA and Education Department at the State Level District Administration/DDMA supported by SDO/EAC VBO at the District Level	Police Department, Municipal Corporation , Electricity Board, Public Health Engineering Department, Health Department, Block Offices, PWD, Building Department and DM
3.	Emergency Public Information, Help line & Warning	The flow of accurate and timely emergency information is critical to the protection of lives and property in the wake of a catastrophic event. preparation and dissemination of notifications, updates, warnings, and instructional messages, making the help line operational	Secretary NSDMA in collaboration with DIPR at the State level. District Commissioner/DDMA at the district level	NSDMA (SEOC) and DIPR at the State level. Police Department and District Commissioner (DEOC) at the district level	Media, NGOs, Health Department, Police Department

4.	Transport	Provides transportation out of a disaster area for people in need, and provides transportation essential to support emergency response in the event of a disaster, coordinating for resurrection of transport infrastructure.	State Transport Officer at the State level. District Transport officer at the district level.	Transport Department	SDMA, PWD, Municipal Cooperation, BRO, all leading public sector and private organizations, Community Volunteers, Voluntary Organizations
5.	Access Control and Re-Entry	Control of access to the area severely affected until it is safe. Only those people directly involved in emergency response operations should be allowed to enter. Also determining the appropriate time to allow evacuees and the general public to re-enter the area that was severely impacted.	SP Traffic at the State level. DSP traffic/SDPO/OC at the district level.	Police Department, Sub-Divisional Office	PWD, BRO
6.	Search & Rescue	Removal of trapped and injured persons from buildings collapses and other structural collapses, administering first aid, and assisting in transporting the seriously injured to medical facilities. This activity involves the use of professional and volunteer search teams including the use of dog teams.	DGP & DG, Home Guard & Civil Defense in collaboration with Commanding Officer NSDMA (SDRF) at the State level. SPSDPO/OC of the incident area.	SDRF/Police/Home Guards & Civil Defense,	Community First Responders, Health department, State Electricity Board, NCC, NYKS, Community Volunteers, Red Cross, Civil Society Organizations, Para-military agencies CISF, GRP,CRPF

7.	Evacuation	Immediately following an crisis people may need to be evacuated from place/structures that have been damaged and are likely to receive more damage when hit by one or more of the aftershocks	DGP & DG Home Guards & Civil Defense in collaboration with Commanding Officer NSDMA (SDRF) at the State level. SP/SDPO/OC of the incident area.	SDRF/Police/Home Guards & Civil Defense,	Municipal Council to provide logistic, Community First Responders, Health Department, State Electricity Board, NCC, NYKS, Community Volunteers, Red Cross, Civil Society Organizations, Para-military agencies CISF, GRP,CRPF
8.	Emergency Medical services and Public Health	Mass fatality management, Public health, Medical, Mental health services	Commissioner & Secretary Health and Family Welfare at the State level. Chief Medical Officer at the district level.	Health Department	Red Cross, Rotary Club, Lions Club, Medicine Stockiest, Volunteer Organizations, Private Hospitals and Nursing Homes, Ambulance Services, Blood banks.
9.	Fire Fighting	Coordination of firefighting operations	IG Fire Service. SP Fire Service	Fire & Emergency Services	SDRF/Police/Home Guards & Civil Defense
10.	Debris Clearance & Equipment support	The identification, removal, and disposal of rubble, wreckage, and other material which block or hamper the performance of emergency response functions and procure needed equipments from support agencies	Secretary NSDMA at the State Level District Commissioner/DDMA at the District Level	NSDMA (SDRF) District Administration and Municipal Councils	PWD/Paramilitary Forces
11.	Inspection , Condemnation and Demolition	Inspection of buildings and other structures to determine whether it is safe to inhabit or use them after an earthquake has occurred or any other crisis.	Chief Executive Engineer, PWD.	PWD	PWD, UDD, SDMA and Municipal Cooperation.
12.	Public Works and Engineering	Infrastructure protection and emergency repair infrastructure restoration	Chief Executive Engineer, PWD	PWD, Municipal Councils	PWD, UDD, SDMA and Municipal Cooperation

13.	Water Supply and Sanitation	Restoration and repair of water supply system to minimize the impact on critical service to the public	Commissioner & Secy., PHE	PHE/Water & Soil Conservation./ Municipal Cooperation	Water & Soil Conservation, Zoology & Mining, Forest & Environment.
14.	Electricity Restoration	Restoration and repair of electrical power system to minimize the impact on critical service to the public	State Electricity Board	Power Department	Power Department/New & Renewable Energy
15.	Resources Mobilization, Contracting Services, Volunteer and Donation Support	Mobilizing support (human, equipment and other) from various organizations, Contracting Services, mobilizing Volunteer support, facilitating donations	CEO-NSDMA/ Commissioner & Secretary, Social Welfare	NSDMA and Social Welfare, Women & Child Development	Social Welfare, Women & Child Development/ Planning
16.	Food and Civil Supplies	Optimizing Food and Civil Supplies to the needful	CEO-NSDMA and Director-Supply Department	NSDMA and Supply Department	Agriculture Marketing Board, Chamber of Commerce, Market Associations, Local Civil Suppliers
17.	Law and Order Enforcement	Law and Order enforcement for Public Safety	The DGP at the state level and the S.P at the district level.	Law and Order section, Police Department	Home Guards & Civil Defense, other Para-military agencies, Community Volunteers, Voluntary Organizations
18.	Relief Camps	Accommodating homeless and affected people and providing mass care	NSDMA and Social Welfare	NSDMA and Social Welfare	Supply Department, All leading public sector and private organizations, Community Volunteers, Voluntary Organizations
19.	Animal Care	Controlling spread of diseases in animal and providing animal care	Secretary-Animal Husbandry	Vet & Animal Husbandry Department	Vet Doctors, NGOs, Community Volunteers

6.8. EMERGENCY SUPPORT FUNCTION DURING FIRE EMERGENCY:

Sl. No.	Emergency Support Functions	Scope ESF	Team Leader	Primary Agency	Support Agency
1.	Communication	Establishing, using, maintaining, augmenting, and providing backup for all of the types of communications devices needed during emergency response operations.	IG F&ES at the State Level supported by Commanding Officer NSDMA/SEOC SP F&ES at the District Level supported by DEOC	F&ES and NSDMA (SEOC)	BSNL, NIC, Private Telecom Operators, Public Relation Department
2.	Damage Assessment	Conduct of ground surveys to determine the scope of the damage, casualties, and the status of key facilities.	Addl. CS/Commissioner Nagaland at the State Level supported by Home Commissioner DC at the District level.	Nagaland Commissioner's Office supported by NSDMA and Education Deptt at the State Level District Administration/DDMA supported by SDO/EAC VBO at the District Level	Police Department, Municipal Corporation , Electricity Board, Public Health Engineering Department, Health Department, Block Offices, PWD, Building department and DM
3.	Emergency Public Information, Help line & Warning	The flow of accurate and timely emergency information is critical to the protection of lives and property in the wake of a catastrophic event. preparation and dissemination of notifications, updates, warnings, and instructional messages, making the help line operational	Secretary NSDMA in collaboration with DIPR at the State level. District Commissioner/DDMA at the district level	NSDMA (SEOC) and DIPR District Commissioner (DEOC) at the district level	Media, NGOs, Health Department, Police Department

4.	Transport	Provides transportation out of a disaster area for people in need, and provides transportation essential to support emergency response in the event of a disaster, coordinating for resurrection of transport infrastructure.	State Transport Officer at the State level. District Transport officer at the district level.	Transport Department	SDMA, PWD, Municipal Cooperation, BRO, all leading public sector and private organizations, Community Volunteers, Voluntary Organizations
5.	Access Control and Re-Entry	Control of access to the area severely affected until it is safe. Only those people directly involved in emergency response operations should be allowed to enter. Also determining the appropriate time to allow evacuees and the general public to re-enter the area that was severely impacted.	SP Traffic at the State level. DSP traffic at the district level.	Police Department, Sub Divisional Office	PWD, BRO
6.	Search & Rescue	Removal of trapped and injured persons from buildings collapses and other structural collapses, administering first aid, and assisting in transporting the seriously injured to medical facilities. This involves the use of professional and volunteer search teams including use of dog teams.	DGP & DG Home Guards & Civil Defense in collaboration with Commanding Officer NSDMA (SDRF) at the State level. DSP of the incident area.	SDRF/Police/Home Guards & Civil Defense,	Community First Responders, Health Department, State Electricity Board, NCC, NYKS, Community Volunteers, Red Cross, Civil Society Organizations, Para-military agencies CISF, GRP,CRPF
7.	Evacuation	Immediately following an crisis people may need to be evacuated from place/structures that have been damaged and are likely to receive more damage when hit by one or more of the aftershocks	DGP & DG Home Guards & Civil Defense in collaboration with Commanding Officer NSDMA (SDRF) at the State level. DSP of the incident area.	SDRF/Police/Home Guards & Civil Defense,	Municipal Council to provide logistic,Community First Responders, Health Deptt, State Electricity Board, NCC, NYKS, Community Volunteers, Red Cross, Civil Society Organizations, Para-military agencies CISF, GRP,CRPF

8.	Emergency Medical Services and Public Health	Mass fatality management, Public Health, Medical, Mental Health Services	Commissioner & Secretary, Health & Family Welfare at the State level. Chief Medical Officer at the district level.	Health Department	Red Cross, Rotary Club, Lions Club, Medicine Stockiest, Volunteer Organizations, Private Hospitals and Nursing Homes, Ambulance Services, Blood banks.
9.	Fire Fighting	Coordination of firefighting operations	IG Fire Service. SP Fire Service	Fire & Emergency Services	SDRF/Police/Home Guards & Civil Defense
10.	Debris Clearance & Equipment support	The identification, removal, and disposal of rubble, wreckage, and other material which block or hamper the performance of emergency response functions and procure needed equipments from support agencies	Secretary, NSDMA at the State Level District Commissioner/DDMA at the District Level	NSDMA (SDRF) District Administration and Municipal Councils	PWD/Paramilitary Forces
11.	Inspection , Condemnation, Demolition	Inspection of buildings and other structures to determine whether it is safe to inhabit or use them after an earthquake has occurred or any other crisis.	Chief Executive Engineer, PWD.	PWD	PWD, UDD, SDMA and Municipal Cooperation.
12.	Public Works and Engineering	Infrastructure protection and emergency repair Infrastructure restoration	Chief Executive Engineer, PWD	PWD, Municipal Councils	PWD, UDD, SDMA and Municipal Cooperation
13.	Water Supply and Sanitation	Restoration and repair of water supply system to minimize the impact on critical service to the public	Commissioner & Secretary, PHE	PHE/Water and soil conservation./ Municipal cooperation	Water & Soil Conservation, Zoology & Mining, Forest & Environment.
14.	Electricity Restoration	Restoration and repair of electrical power system to minimize the impact on critical service to the public	State Electricity Board	Power Department	Power Department/ New & Renewable Energy

15.	Resources Mobilization, Contracting Services, Volunteer and Donation Support	Mobilizing support (human, equipment and other) from various organizations, Contracting Services, mobilizing Volunteer support, facilitating donations	CEO-NSDMA/ Commissioner & Secretary, Social Welfare	NSDMA and Social Welfare, Women & Child Development.	Social Welfare, Women & Child Development/ Planning
16.	Food and Civil Supplies	Optimizing Food and Civil Supplies to the needful	CEO-NSDMA and Director, Supply Department	NSDMA and Supply Department	Agriculture Marketing Board, Chamber of Commerce, Market Associations, Local Civil Suppliers
17.	Law and Order Enforcement	Law and Order enforcement for Public Safety	DGP	Law and Order section, Police Department	Home Guards & Civil Defense, other Para-military agencies, Community Volunteers, Voluntary Organizations
18.	Relief Camps	Accommodating homeless and affected people and providing mass care	NSDMA and Social Welfare	NSDMA and Social Welfare	Supply department, All leading public sector and private organizations, Community Volunteers, Voluntary Organizations
19.	Animal Care	Controlling spread of diseases in animal and providing animal care	Secretary-Animal Husbandry	Vet & Animal Husbandry Department	Vet nary Doctors, NGOs, Community Volunteers

6.9. EMERGENCY SUPPORT FUNCTION DURING LANDSLIDE:

Geological Survey of India issues alerts and warnings to all designated authorities and agencies of the Central Government and State Governments/ district Administration for landslides in the following categories:

Category IV: Landslides of small dimensions that occur away from habitations and do not affect either humans or their possessions.

Category III: Landslides which are fairly large and affect infrastructural installations like strategic and important highways and roads, rail routes and other civil installations like various appurtenant structures of hydroelectric and irrigation projects.

Category II: The landslides that may occur on the fringes of inhabited areas and result in limited loss of life and property.

Category I: Landslides of large dimensions that is located over or in close vicinity of inhabited areas like urban settlements or fairly large rural settlements. Activity on these slides can result in loss of human lives, dwellings on large scale.

6.9.1. DURING LANDSLIDE THE FOLLOWING EMERGENCY SUPPORT FUNCTION WILL BE ACTIVATED:

Sl. No.	Emergency Support Functions	Scope ESF	Team Leader	Primary Agency	Support Agency
1.	Communication	Establishing, using, maintaining, augmenting, and providing backup for all of the types of communications devices needed during emergency response operations.	Commanding Officer NSDMA/SEOC and Secretary PWD at the State Level DDMA/DEOC and District Officer in-charge of PWD	NSDMA/SEOC and PWD	BSNL, NIC, Private Telecom Operators, Public Relation Department
2.	Damage Assessment	Conduct of ground surveys to determine the scope of the damage, casualties, and the status of key facilities.	Chief Engineer- PWD	PWD	BRO, Urban Development and Municipal Council

3.	Emergency Public Information, Help line & Warning	The flow of accurate and timely emergency information is critical to the protection of lives and property in the wake of a catastrophic event. preparation and dissemination of notifications, updates, warnings and instructional messages, making the help line operational	Secretary NSDMA in collaboration with DIPR at the State level. District Commissioner/DDMA at the district level	NSDMA (SEOC) and DIPR at the State level District Commissioner (DEOC) at the district level	Media, NGOs, Health Department, Police Department
4.	Transport	Provides transportation out of a disaster area for people in need, and provides transportation essential to support emergency response in the event of a disaster, coordinating for resurrection of transport infrastructure.	State Transport Officer at the State level. District Transport officer at the district level.	Transport Department	SDMA, PWD, Municipal Cooperation, BRO, all leading public sector and private organizations, Community Volunteers, Voluntary Organizations
5.	Access Control and Re-Entry	Control of access to the area severely affected until it is safe. Only those people directly involved in emergency response operations should be allowed to enter. Also determining the appropriate time to allow evacuees and the general public to re-enter the area that was severely impacted.	SP Traffic at the State level. DSP traffic at the district level.	Police Department, Sub Divisional Office	PWD, BRO
6.	Search & Rescue	Removal of trapped and injured persons from buildings collapses and other structural collapses, administering first aid, and assisting in transporting the seriously	DGP & DG, Home Guards & Civil Defense in collaboration with Commanding Officer NSDMA (SDRF) at the State level.	SDRF/Police/Home Guards & Civil Defense,	Community First Responders, Health Department, State Electricity Board, NCC, NYKS, Community Volunteers, Red Cross, Civil Society Organizations, Para-

		injured to medical facilities. This activity involves the use of professional and volunteer search teams including the use of dog teams.	DSP of the incident area.		military agencies CISF, GRP,CRPF
7.	Evacuation	Immediately following a crisis, people may need to be evacuated from place/structures that have been damaged and are likely to receive more damage when hit by one or more of the aftershocks	DGP & DG Home Guards & Civil Defense in collaboration with Commanding Officer NSDMA (SDRF) at the State level. DSP of the incident area.	SDRF/Police/Home Guards & Civil Defense,	Municipal Council to provide logistic, Community First Responders, Health department, State Electricity Board, NCC, NYKS, Community Volunteers, Red Cross, Civil Society Organizations, Para-military agencies CISF, GRP,CRPF
8.	Emergency Medical Services and Public Health	Mass fatality management, Public Health, Medical, Mental Health Services	Commissioner & Secretary, Health & Family Welfare at the State level. Chief Medical Officer at the district level.	Health Department	Red Cross, Rotary Club, Lions Club, Medicine Stockiest, Volunteer Organizations, Private Hospitals and Nursing Homes, Ambulance Services, Blood banks.
10.	Debris Clearance & Equipment support	The identification, removal, and disposal of rubble, wreckage, and other material which block or hamper the performance of emergency response functions and procure needed equipments from support agencies	Secretary NSDMA at the State Level District Commissioner/DDMA at the District Level	NSDMA (SDRF) District Administration and Municipal Councils	PWD/Paramilitary Forces
11.	Inspection , Condemnation and Demolition	Inspection of buildings and other structures to determine whether it is safe to inhabit or use them after an earthquake has occurred or any other crisis.	Chief Executive Engineer, PWD.	PWD	PWD, UDD, SDMA and Municipal Cooperation.
12.	Public Works and Engineering	Infrastructure protection and emergency repair Infrastructure restoration	Chief Executive Engineer, PWD	PWD, Municipal Councils	PWD, UDD, SDMA and Municipal Cooperation

13.	Water Supply and Sanitation	Restoration and repair of water supply system to minimize the impact on critical service to the public	Commissioner & Secretary, PHE	PHE/Water and soil conservation./ Municipal cooperation	Water & Soil Conservation, Zoology & Mining, Forest & Environment.
14.	Electricity Restoration	Restoration and repair of electrical power system to minimize the impact on critical service to the public	State Electricity Board	Power Department	Power Department/ New & Renewable Energy
15.	Resources Mobilization, Contracting Services, Volunteer and Donation Support	Mobilizing support (human, equipment and other) from various organizations, Contracting Services, mobilizing Volunteer support, facilitating donations	CEO-NSDMA/ Commissioner & Secretary-Social Welfare	NSDMA and Social Welfare, Women & Child Development	Social Welfare, Women & Child Development/ Planning
16.	Food and Civil Supplies	Optimizing Food and Civil Supplies to the needful	CEO-NSDMA and Director-Supply Department	NSDMA and Supply Department	Agriculture Marketing Board, Chamber of Commerce, Market Associations, Local Civil Suppliers
17.	Law and Order Enforcement	Law and Order enforcement for Public Safety	DGP	Law and Order section, Police Department	Home Guards & Civil Defense, other Para-military agencies, Community Volunteers, Voluntary Organizations
18.	Relief Camps	Accommodating homeless and affected people and providing mass care	NSDMA and Social Welfare	NSDMA and Social Welfare	Supply department, All leading public sector and private organizations, Community Volunteers, Voluntary Organizations
19.	Animal Care	Controlling spread of diseases in animal and providing animal care	Secretary-Animal Husbandry	Vet & Animal Husbandry Department	Vet nary Doctors, NGOs, Community Volunteers

6.10. EMERGENCY SUPPORT FUNCTION DURING ROAD/NATIONAL HIGH ACCIDENTS:

Sl. No.	Emergency Support Functions	Scope ESF	Team Leader	Primary Agency	Support Agency
1.	Communication	Establishing, using, maintaining, augmenting, and providing backup for all of the types of communications devices needed during emergency response operations.	DGP at the State Level supported by Commanding Officer NSDMA/SEOC SP (Traffic) at the District Level supported by DEOC	Police Department and NSDMA/SEOC	BSNL, NIC, Private Telecom Operators, Public Relation Department
2.	Damage Assessment	Conduct of ground surveys to determine the scope of the damage, casualties, and the status of key facilities.	SP Traffic	Police Department (Traffic)/SDRF	Police Department, Municipal Corporation , PWD,
3.	Emergency Public Information, Help line & Warning	The flow of accurate and timely emergency information is critical to the protection of lives and property in the wake of a catastrophic event. preparation and dissemination of notifications, updates, warnings, and instructional messages, making the help line operational	SP Traffic and Commanding Officer-NSDMA-SEOC	Police Department	Media, NGOs, Health Department,
4.	Immediate Rescue	Provides transportation out of a disaster area for people in need, and provides transportation essential to support emergency response in the event of a disaster, coordinating for resurrection of transport infrastructure.	SP Traffic and Commanding Officer NSDMA (SDRF Mobile Rescue Team)	Police Department and NSDMA	PWD, Municipal Cooperation, BRO, all leading public sector and private organizations, Community Volunteers, Voluntary Organizations

5.	Access, Control and Re-Entry	Control of access to the area severely affected until it is safe. Only those people directly involved in emergency response operations should be allowed to enter. Also determining the appropriate time to allow evacuees and the general public to re-enter the area that was severely Impacted.	SP Traffic at the State level. DSP traffic at the district level.	Police Department, Sub-Divisional Office	PWD, BRO
6.	Emergency Medical Services and Public Health	Mass fatality management, Public Health, Medical, Mental Health Services	Commissioner & Secretary Health and Family Welfare at the State level. Chief Medical Officer at the district level.	Health Department	Red Cross, Rotary Club, Lions Club, Medicine Stockiest, Volunteer Organizations, Private Hospitals and Nursing Homes, Ambulance Services, Blood banks.

6.11. EMERGENCY SUPPORT FUNCTION DURING CLOUD BURST/STORM:

Sl. No.	Emergency Support Functions	Scope ESF	Team Leader	Primary Agency	Support Agency
1.	Communication	Establishing, using, maintaining, augmenting, and providing backup for all of the types of communications devices needed during emergency response operations.	DGP at the State Level supported by Commanding Officer NSDMA/SEOC SP at the District Level supported by DEOC	Police Department and NSDMA/SEOC	BSNL, NIC, Private Telecom Operators, Public Relation department
2.	Damage Assessment	Conduct of ground surveys to determine the scope of the damage, casualties, and the status of key facilities.	Addl. CS/Commissioner Nagaland at the State Level supported by Home Commissioner DC at the District level.	Nagaland Commissioner's Office supported by NSDMA and Education Department at the State Level District Administration/DDMA supported by SDO/EAC VBO at the District Level	Police Department, Municipal Corporation , Electricity Board, Public Health Engineering Department, Health Department, Block Offices, PWD, Building Department and DM
3.	Emergency Public Information, Helpline & Warning	The flow of accurate and timely emergency information is critical to the protection of lives and property in the wake of a catastrophic event. preparation and dissemination of notifications, updates, warnings, and instructional messages, making the help line operational	Secretary NSDMA in collaboration with DIPR at the State level. District Commissioner/DDMA at the district level	NSDMA (SEOC) and DIPR District Commissioner (DEOC) at the district level	Media, NGOs, Health Department, Police Department

4.	Transport	Provides transportation out of a disaster area for people in need, and provides transportation essential to support emergency response in the event of a disaster, coordinating for resurrection of transport infrastructure.	State Transport Officer at the State level. District Transport officer at the district level.	Transport Department	SDMA, PWD, Municipal Cooperation, BRO, all leading public sector and private organizations, Community Volunteers, Voluntary Organizations
5.	Access Control and Re-Entry	Control of access to the area severely affected until it is safe. Only those people directly involved in emergency response operations should be allowed to enter. Also determining the appropriate time to allow evacuees and the general public to re-enter the area that was severely impacted.	SP Traffic at the State level. DSP traffic at the district level.	Police department, Sub Divisional Office	PWD, BRO
6.	Search & Rescue	Removal of trapped and injured persons from buildings collapses and other structural collapses, administering first aid, and assisting in transporting the seriously injured to medical facilities. This involves the use of professional and volunteer search teams including the use of dog teams.	DGP & DG, Home Guards & Civil Defense in collaboration with Commanding Officer NSDMA (SDRF) at the State level. DSP of the incident area.	SDRF/Police/Home Guards & Civil Defense	Community First Responders, Health Department, State Electricity Board, NCC, NYKS, Community Volunteers, Red Cross, Civil Society Organizations, Para-military agencies CISF, GRP,CRPF
7.	Evacuation	Immediately following an crisis people may need to be evacuated from place/structures that have been damaged and are likely to receive more damage when hit by one or more of the aftershocks	DGP & DG, Home Guards & Civil Defense in collaboration with Commanding Officer NSDMA (SDRF) at the State level. DSP of the incident area.	SDRF/Police/Home Guards & Civil Defense	Municipal Council to provide logistic, Community First Responders, Health Deptt, State Electricity Board, NCC, NYKS, Community Volunteers, Red Cross, Civil Society Organizations, Para-military agencies CISF, GRP, CRPF

8.	Emergency Medical Services and Public Health	Mass fatality management, Public Health, Medical, Mental Health Services	Commissioner & Secretary, Health & Family Welfare at the State level. Chief Medical Officer at the district level.	Health Department	Red Cross, Rotary Club, Lions Club, Medicine Stockiest, Volunteer Organizations, Private Hospitals and Nursing Homes, Ambulance Services, Blood banks.
9.	Fire Fighting	Coordination of firefighting operations	IG Fire Service. SP Fire Service	Fire & Emergency Services	SDRF/Police/Home Guards & Civil Defense
10.	Debris Clearance & Equipment support	The identification, removal, and disposal of rubble, wreckage, and other material which block or hamper the performance of emergency response functions and procure needed equipments from support agencies	Secretary NSDMA at the State Level District Commissioner/DDMA at the District Level	NSDMA (SDRF) District Administration and Municipal Councils	PWD/Paramilitary Forces
11.	Inspection , Condemnation and Demolition	Inspection of buildings and other structures to determine whether it is safe to inhabit or use them after an earthquake has occurred or any other crisis.	Chief Executive Engineer, PWD.	PWD	PWD, UDD, SDMA and Municipal Cooperation.
12.	Public Works and Engineering	Infrastructure protection and emergency repair Infrastructure restoration	Chief Executive Engineer, PWD	PWD, Municipal Councils	PWD, UDD, SDMA and Municipal Cooperation
13.	Water Supply and Sanitation	Restoration and repair of water supply system to minimize the impact on critical service to the public	Commissioner & Secy. PHE	PHE/Water and soil conservation./ Municipal cooperation	Water & Soil Conservation, Zoology & Mining, Forest & Environment.
14.	Electricity Restoration	Restoration and repair of electrical power system to minimize the impact on critical service to the public	State Electricity Board	Power Department	Power Department/ New & Renewable Energy

15.	Resources Mobilization, Contracting Services, Volunteer and Donation Support	Mobilizing support (human, equipment and other) from various organizations, Contracting Services, mobilizing Volunteer support, facilitating donations	CEO-NSDMA/ Commissioner & Secretary-Social Welfare	NSDMA and Social Welfare, Women & Child Development.	Social Welfare, Women & Child Development/ Planning
16.	Food and Civil Supplies	Optimizing Food and Civil Supplies to the needful	CEO-NSDMA and Director-Supply Department	NSDMA and Supply Department	Agriculture Marketing Board, Chamber of Commerce, Market Associations, Local Civil Suppliers
17.	Law and Order Enforcement	Law and Order enforcement for Public Safety	DGP	Law and Order section, Police Department	Home Guards & Civil Defense, other Para-military agencies, Community Volunteers, Voluntary Organizations
18.	Relief Camps	Accommodating homeless and affected people and providing mass care	NSDMA and Social Welfare	NSDMA and Social Welfare	Supply Department, All leading public sector and private organizations, Community Volunteers, Voluntary Organizations
19.	Animal Care	Controlling spread of diseases in animal and providing animal care	Secretary-Animal Husbandry	Vet & Animal Husbandry Department	Vet nary Doctors, NGOs, Community Volunteers

6.12. EMERGENCY CONTACT DETAILS:

Sl. No.	Emergency/Disaster	Responsible Officer	Contact Detail	Support Agency	Support Agency Contact Detail
1.	Earthquake	Secretary -NSDMA	NSDMA- SEOC (Common Emergency No.)	Police Department, Home Guards & Civil Defense and F&ES	
2.	Fire Emergency	IG F&ES/SP F&ES	Fire Control Room	NSDMA-SEOC (SDRF) and Home Guards & Civil Defense, PHE, Power Department	
3.	Landslide	Secretary-NSDMA	NSDMA- SEOC (Common Emergency No.)	PWD, BRO, Urban Development	
4.	Road/National High Accidents	SP Traffic	Traffic Control Room	NSDMA (SDRF), Home Guards & Civil Defense, BRO	
5.	Cloudburst	NSDMA-Secretary	NSDMA- SEOC (Common Emergency No.)	Police Department, Home Guards & Civil Defense	

The occurrence of the disaster will be communicated to:

- The Governor
- The Chief Minister
- All members of NSDMA
- The MPs and MLAs from affected areas
- The PMO
- The Chief Secretary
- The SEC Members
- The Secretary, NSDMA- Home
- The Secretary, Agriculture
- The Joint Secretary, NDM, Ministry of Agriculture, GOI
- All DEOCs
- The Army HQ, Kohima

The occurrence of disaster would essentially mean the following activities have to be undertaken:

- Expand the Emergency Operations Centre to include Branch arrangements with responsibilities for specific tasks depending on the nature of disaster and extent of its impact.
- Arrangement of alternate makeshift EOC and field EOC at the site of affected area if needed.
- Establish an on-going VSAT, wireless communication and hotline contact with the District Commissioner/s of the affected district/s.

6.13. LEVEL OF ASSISTANCE:

As per the provision of relief services, the actual assistance offered is dependent on the basic human needs created by the event and the resources of the victim at the time of the disaster.

However as outlined in Norms for Relief Assistance, the following minimum assistance must be provided for items listed below that were destroyed by the disaster and which are needed immediately by the family.

- Food- Provision of food for one week.
- Clothing and outer garments- "Provision of one complete set of new clothing, including shoes, for each victim." During winter months coats or outer garments may also be provided.

- Toilet Articles- No financial assistance is provided for this item. Comfort kits should be made available for distribution to clients. Pre-made comfort kits allow us to provide a universal, consistent service while providing our donors with a better value for their contribution.
- Shelter- Hotel/motel sheltering may be provided in commercial facilities suitable for the composition of the family for a maximum of three days unless the disaster receives a Presidential declaration. It is provided only when mass shelter is not available or when health or other considerations make living in a shelter inadvisable.

Deviations from the above must be referred to the CEO-NSDMA and CEO-DDMA. Additional assistance outlined in the Standardized Emergency Assistance Price List of SPHERE-India will be referred, such as medical or rental reimbursement.

CHAPTER VII

INCIDENT COMMAND SYSTEM:

The first response unit (be it the Local Community/Police/Fire etc.) which rushes to an emergency site assumes command of the incident until relieved by either;

1. Someone with a better skill set in incident management.
2. By an agency better suited to command the incident or
3. By an agency that has a legal mandate to assume command.

This means that one may be the first incident commander simply by virtue of being there first. In order to equip him to handle the situation appropriately, the 5 S Protocol, applicable to any emergency service, may be followed.

S	MEANS	ACTION
SAFETY	Is the scene safe for me to be here?	If it is, go to the next step S. If it is not, get out now; or take the actions you need to take to make it safe
SIZE-UP	Conduct a size –up as you approach the site	How big is the incident, size of the areas, number of people affected etc.
SEND	Send for help	Contact control room/the District Commander etc. as appropriate to report what you have found and request additional help
SET-UP	Set-up incident Command	Assume command and begin assigning jobs to the resources you have available for them to complete within their capabilities
START	Start Emergency Procedures	Start taking emergency actions to control the incident

Table 7.1: 5 S Protocols in Incident Command System.

7. 1.Organizational Model:

Recognizing that Incident command is highly flexible system with variability depending on the size and magnitude of the incident, the Nagaland State Disaster Management Plan proposes to follow the following model as a standard.

1. **Incident Commander-** Incidents, no matter their size, are commanded by a single individual, the Incident Commander. The Incident Commanders at the Block/Sub-Division level will be the respective EACs/SDO (C)/or the ADC; while at the District level, the Deputy Commissioner shall assume the responsibility. If the disaster is declared a State disaster, then the Chief Secretary or an officer designated by him shall assume the charge as Incident Commander. Incident Commanders command the incident and are responsible for making the resource allocations and setting the tactics for a successful resolution, and for **ensuring that all needed functions are performed.**

2. **Command Staff-** Incident Commanders are assisted by a three member Command Staff, comprising of:
   a. A Safety Officer, the staff safety expert with authority to stop operations to correct any unsafe condition.
   b. A Public Information Officer, responsible for liaison with the news media and for coordinating all news media activity at the incident.
   c. A Liaison Officer, responsible for liaison with other organizations that do not become part of the Incident Command System structure.

3. **General Staff-**The main organizational structure is provided by four Sections, each headed by a Section Chief, as shown in Figure 1.

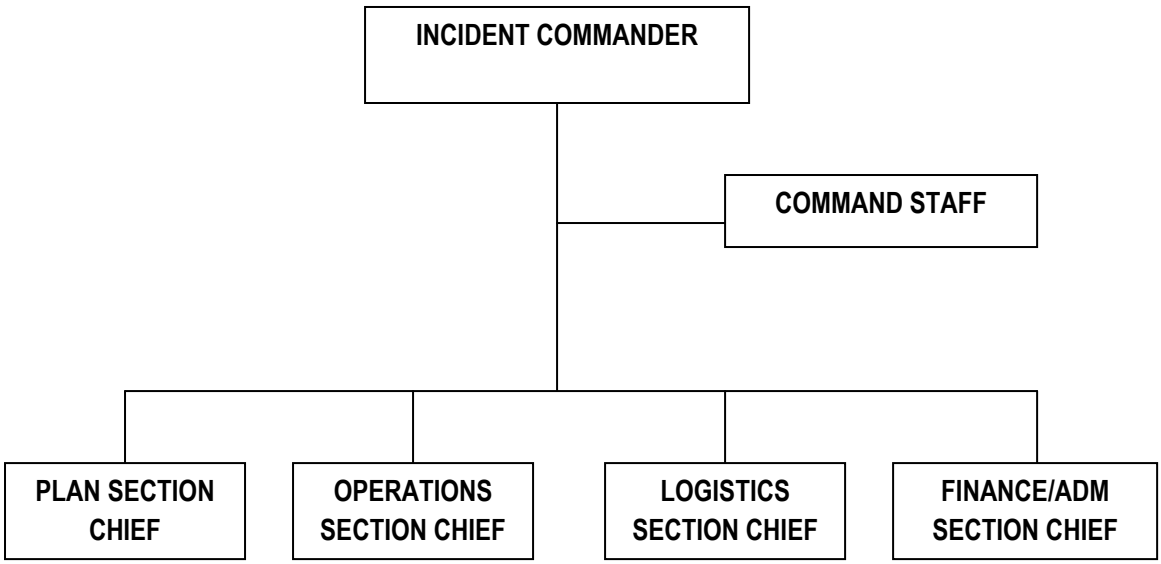


Figure 7.2.Incident Command System Section Organization:

Almost any incident of any size will have an Operations Section to supervise Single Resources, Strike Teams and Task Forces.

The function of the Operations Section is to use its resources to control the incident and provide services to those who require them. Almost any type of resource can fit within the Operations Section and be used to perform incident work. These resources are aggregated as follows:

1. **<u>At the lowest level:</u>**
    - Single Resources – one of anything that performs a function. A single Doctor providing medical aid or a single fire brigade dousing fire can be termed a single resource.
    - Strike Teams – multiple single resources of the same type assigned to a Leader and operating as a unit.
    - Task Force – resources of different types assigned to work as a unit under a Leader. A good example of a task force working at a fire incident would be a fire tender, an ambulance, a team of doctors etc.

2. **<u>At an intermediate level:</u>**
    - Sectors – geographical combinations of varied resources under supervisor assigned to manage and perform operations in an area.
    - Groups – functional combinations of the same type of resources under a Supervisor assigned to provide a specific type of service across the entire event.

3. **<u>At a large incident:</u>**
    - Branches - may be combinations of sectors or combinations to handle very large numbers of resources.
    - Probably the second most common Section activated is the Logistics Section, responsible for supporting operations by ordering equipment, supplies, and people needed, providing communications, messaging and billeting the responders, and providing medical care for responders.
    - On events that will extend for some length of time, activation of the Plans Section is critical. The Plans Section tracks resource status, develops an accurate picture of how

the incident is developing, documents the response, employs technical experts in various areas of the situation, and plans for demobilization. The major effort of the Plans Section is the preparation and publication of an Incident Action Plan for each operational period during the event.

7.2. Setting up of a Single Command Post:

The incident command system staff must be under a single incident command post which must ideally be located in a safe area, outside the immediate impact area of an ongoing event. With modern communications systems and remote sensing capabilities, the Incident Command Post must be equipped to develop an accurate situation picture of an ongoing incident from the reports of the Single Resources, Strike Teams, Task Forces, Sectors, as applicable. All of the players need to be in the Incident Command Post so that they can perform as a team.

It must be ensured that the command post is beyond the affected area so that the command post itself should not be engulfed by the incident. For example, in case of an earthquake the Command Post should be established in an open space – preferably a local ground etc.

7.3. Unified Command:

In a bigger incident, multiple agencies have legal authority over and real operational concerns about how an incident is commanded. The Army, Para – Military, various State and Central agencies and International agencies are likely to be involved in a major incident and managing and commanding multiple agencies may pose a problem. Therefore, in such a situation, a Unified Command model shall be followed in which various agencies shall work under a single Incident Commander.

7.4 .Incident Action Plans:

In extended events, the Plans Section is required to work out an Incident Action Plan for the next operational period in a 12 hour planning cycle. Such plans must specify control objectives for the period in a methodical effort to successfully control the incident. In short duration incidents the plan is often planned by the Incident Commander and under good conditions may be reflected on a tactical worksheet or command board.

7.5. Standardization:

In so far as possible the State Government of Nagaland shall follow standardized procedures. This means standardization terminology, standardized position titles, standardized radio procedures, etc. when multiple organizations respond. Standardization greatly simplifies operational interface and curtails the period required to learn each other's language.

In order to achieve the above mentioned standardization, it will be required that all the stake holders and the Government functionaries at all levels are given training in incident Command System so that any incident can be managed effectively following the principles of Incident Command System.

7. 6. Emergency Support Functions (ESFs):

The Nagaland State Disaster Management Plan recognizes the need to strengthen and place priority on the following identified Emergency Support Functions. The assumption, as the definition of disaster enunciates, is that when normal systems have collapsed and the situation is beyond the control of the local community. The first 72 hours are the most crucial in any emergency, because average human beings can withstand most dangers up to a maximum of 72 hours. Quick response teams that can spring into action the moment any emergency strikes will have to be created. The characteristics of such teams will be:

1. Totally self-sufficient from the point of view of transportation, communication, accommodation, food and medical supplies for 72 hours.
2. Each unit should be equipped with life saving search and rescue equipment, medical supplies, and air lifting facilities, security arrangements, communication facilities and emergency rations.
3. Unit should be able to move out within/hours of getting information from any source.
4. Different units should be able to galvanize into bigger unit or break into smaller units as the need arises. But each unit retain the basic characters.
5. The Units will be trained in latest techniques of search, rescue and communications in collaboration with international agencies.
6. During normal period (L0), these agencies would assist in building the capacity of local administration in response activities.

While the State response plan will focus on advanced emergency preparedness, strengthening of infrastructure and personnel through training, drills, etc. the other priorities of the State Government shall be to put in place an effective response mechanism that is aimed at:

- Strengthening and modernizing existing control rooms and other emergency response infrastructure including communications systems, shelters etc.
- Take legislative and policy decisions and enforce rules that will minimize activities which increases vulnerability
- Initiate decentralized planning to develop and update Village, Block, District and State plans.
- Monitoring and development of the Disaster Management Cells.
- High priority for developing trained and equipped groups/teams for search and rescue, evacuation management and emergency medical assistance at the local levels with the objective to minimize their dependence on external support.
- To ensure that all concerned Departments draw up a plan of advanced emergency preparedness.

CHAPTER VIII

APPROACH AND STRATEGY FOR IMPLEMENTATION: PRE-DISASTER PHASE, IMPACT PHASE & POST-DISASTER PHASE

To reduce the loss of life, damage to property and impact on the social and economic activities of the communities in the State, the Nagaland State Disaster Management Plan emphasizes on developing strategies for implementation at the Pre-disaster, impact phase and the Post Disaster Phase.

During the Pre-Disaster Phase the emphasis shall be on risk reduction, Disaster preparedness and Disaster mitigation activities.

The key tasks in Risk reduction activities shall be:

1. Initiating measures to avoid habitation in sensitive areas.
2. Developing and using technological interventions to reduce and eliminate natural Hazards
3. Developing Hazard resistant Structures.
4. Developing a strategy of preparedness at all levels of response to enable quick recovery from any disaster situation.

Disaster preparedness essentially involves developing an effective response plan to a disaster threat that includes estimating emergency needs and identifying resources to meet such needs. It is aimed at equipping the local community and stakeholders to respond to a disaster situation. Disaster Preparedness measures include;

1. Capacity Building efforts at various levels of response.
2. Building and Strengthening local response structures. This means that effective response plans should be developed right upto the level of each village council unit so as to ensure that each plan takes into consideration the unique problems and needs at the village level. This also applies to each Ward and Colony at the Municipal and Town committee level of response to any disaster threat.
3. Building effective systems of Response at the district levels. Towards this, each District shall draw up a District Plan within a given time frame.
4. Building an inventory of existing facilities and resources at each level of response. This shall be reflected in the District Plans.

5. Identifying and building up effective warning systems that can be identified and understood by the local community.
6. Carrying out Information and awareness activities through media, seminars, workshops, creating syllabi for educational institutions etc.

The Nagaland State Disaster Management Plan recognizes the importance of incorporating Disaster Mitigation Strategies as part of the State's Pre-Disaster Plan. Disaster Mitigation focuses on the hazards that cause Disaster and tries to eliminate possible causes in the local environment so as to eliminate or reduce such hazards that have a direct effect. Disaster Mitigation Measures includes:

1. Ensuring strict adherence to building codes and by-laws.
2. Surveying and assessing structurally weak buildings and structures.
3. Strengthening infrastructure in sensitive areas.
4. Micro-zonation of Districts and at District levels to develop appropriate response plans.
5. Involving local communities through incorporating their Indigenous traditional knowledge to eliminate hazards and threats.
6. Risk assessment and vulnerability assessments to be carried out at each District level through identified competent agencies.
7. To invest in R& D activities as well as technology transfer appropriate to the local environment.
8. Development of Vulnerability reduction programs for sensitive areas and populations in the interior Districts of the State.
9. Encouraging and creating partnerships between the local Governments, CBOs, NGOs and Community organizations to strengthen and develop mitigation strategies as per the need at each level of response.
10. Regulating land use and ensuring safe sitting of buildings and infrastructures.
11. Incorporating an evaluation mechanism in the Response plan that comprises of periodic surveys, periodic reporting and periodic meetings to review progress. This should be incorporated at the District and State level to assist in reassessing and examining options available to policy makers as well as the community.

Post-Disaster Phase activities shall focus on **Recovery**. Recovery relates to all assistance provided to persons and communities affected by emergencies so as to enable them to achieve a proper and effective level of functioning. Recovery activities can be divided into short term and long term recovery activities.

Short Term Recovery activities includes:

1. Restoration of vital services to the affected area.
2. Reconstruction of damaged infrastructure, houses and buildings.
3. Assessment of damages to infrastructure, economic and productive life.
4. Providing specialist services to assist in the social, financial and psychological aspects of individuals, families and communities.

Long Term recovery activities include;

1. Assessment and development of the affected area.
2. Evaluation of the effectiveness of the Disaster Management Plan.
3. Evaluating and redesigning mitigation plans of the affected area.

Community Awareness and Participation: The Nagaland State Disaster Management Plan is based on the principle of community involvement and participation. A participative and partnership approach wherein the community and stakeholders are involved in the planning and execution of the Nagaland State Disaster Management Plan will mitigate and reduce the risks and vulnerability of the people as well as ensure effective implementation of the plan.

Communities and individuals will be encouraged to be self reliant at a time of a disaster by creating awareness and providing them the requisite knowledge to cope during emergencies. This must also include intensive workshops, seminars during the pre-disaster stage where Tribal Hohos, community leaders, Gaonburas and community organizations shall be encouraged to have a realistic understanding of their role and responsibilities during any emergency or disaster situation.

Acknowledging that community participation in all aspects of planning and activities has been the strength of the State of Nagaland, all efforts shall be made to capitalize on the community involvement in Disaster Management. Capacity building and awareness generation activities shall be designed specifically to take care of the special needs of the communities of the State.

ANNEXURE I: SOP FOR BOMB EXPLOSION

Once the trigger is initiated, following a bomb blast incident, the details follow up action to be taken on the following points. Cordon of site/place of occurrence:

- The first duty of the officer-in-charge of the concern police station is to cordon the site and prevent intrusion of public, press which will damage the evidence available at the site.
- In case of bomb explosion the place of occurrence should be covered by Tarpaulin/plastic sheet.
- There should be cleared by BDDS for any emergency explosives or body trap, aimed for a secondary blast.
- Services of Dog Squad may be utilized.
- Photographs of blast site:
- Take photographs of site, keeping the seat of explosion in the foreground from different directions. Some photographs should be taken from a higher point to give aerial view of the area.
- Statement of the concern photographs should be recorded immediately and negatives to be taken charge of under investigation.
- Video recording.

  The video recording of the blast site should be done through the videographers. The officers from police station should be trained in handling the video and still cameras. The video graph of the scene of offence should also be done by PS officers. Statement of the concern videographer should be recorded immediately and video cassette be taken charge of under investigation.
- Call the expert for the Inspection of Blast site.

  As already mentioned, the area should be cleared by BDDS for any remaning explosives or body trap, aimed for a secondary blast. Service of dog squad may be utilized. Clues Team from CID should be summoned immediately. Experts from National Bomb Data Centre, a Unit of NSG, Manesar, may be called. Experts should collect samples/blast remnants, under Panchnama to be prepared by the Investigation team. The reconstruction of the Blast scene to find out the signature of the explosive device with the help of experts should be done. This nay give the investigation team some leads regarding persons involved and level of their sophistication. Find out the details of similar types of blast, which might have occurrence in past elsewhere from the data cell and National Bomb Data Centre, Manesar.

ANNEXURE-II: SOP FOR DEALING WITH MAJOR LAW AND ORDER OUT BREAK.

Introduction:

This Sop has been formulated to deal with any kind of Law and order problem in any particular place or in the state as a whole. Large scale disturbance or near complete breach of law and order may cause due to the following :-

- External aggression/war.
- Large -scale labor troubles taken violent turn.
- Large –scale student unrest taking violent turn.
- Large –scale political violence.

Institution Support System:

Control Room: the state Control Room shall function as " Crisis Management Centre" and shall keep the DGP and other members of the Crisis Management Team informed about the development. The District Control Room Shall Carry out the same exercise.

CHAPTER –IX

CHECKLISTS: DO'S AND DON'TS

OPERATIONAL GUIDELINES OF WHAT TO DO IN THE EVENT OF DISASTER

FLOOD:

Pre-Disaster

Individual:

- Know the route of the nearest safe shelter
- First Aid Kit should be ready with extra medicines for snake bite and diarrhea.
- Tie up all valuables at the top of the roof
- Radio with extra batteries, torch, ropes to be kept ready
- Store dry ration, kerosene, biscuits, baby food for at least 7 days
- Water proof bags, polythenes to store clothes and valuables
- Be ready with umbrella & bamboo sticks (To protect yourself from snake
- Identify a highland/mound for the cattle & have sufficient fodder for them
- As soon as you receive warning tune to the local news in the radio/TV for the latest
- update
- Check your emergency kits
- If you have to evacuate pack clothes, essential medicines, valuables, personal papers in
- a water proof bags
- Inform the DMT member to the place that you are shifting to
- Raise furniture and appliances to a higher place
- Switch off all electrical appliances
- Put sandbags in the toilet bowl and cover all sewage backflow
- Lock your house and take the route suggested
- Don't go into water of unknown depth and current.
- Don't spread rumors. Get authentic data and then announce it
- Don't go into water of unknown depth and current.

Government Preparedness:

- Update all the resource inventory
- Control room should be functional for 24 hours

- Identify all the shelter places where people could be evacuated
- Activate all the First Aid and the Rescue & Evacuation team
- See to it that there is no blockage in the flow of the river
- Ascertain the availability of dry food, drinking water & medicines
- Ascertain the fodder availability for cattle
- Mobilize boats, vehicles which will help in evacuation and rescue operation and also in the distribution of relief
- Prior storage of food grains in the vulnerable pockets
- Identify the relief centers
- Inspect, strengthen and repair all the approach roads and culverts
- Provide mobile wireless sets the villages likely to be cut off
- Arrange adequate hand pumps where wells are likely to be inundated
- Liaison with army, Navy etc
- Prepare maps of alternate route, resources available

<u>During - Disaster:</u>

Individual:

- Drink boiled water or put halogen tablets
- Keep food covered. Don't take heavy meals and eat food that is hot
- Use raw tea, rice water, coconut water during diarrhea
- Be careful of snakebites
- Don't let children stay in empty stomach
- Avoid entering flood water. Stay away from water which is above knee depth.

Government:

- Carry out rescue and evacuation
- Operation of control room and provide warning update
- Provide relief materials
- Mobilizing resources like boat, dry food, temporary shelter
- Ensuring the availability of medicines, drinking water, tankers etc
- Coordination at various levels and agencies
- Mobile health units to be made available

- Damage assessment of life, livestock, crop and livelihood.

Post -Disaster:

Individual:

- Listen to the latest flood bulletin before moving from the shelter place
- Use recommended routes to return back
- Dry all electrical equipments before using it
- Avoid touching any loose wire
- Beware of snake bites
- Clean the house and disinfect the surrounding by using bleaching powder.

Government:

- Rescue people who are stranded
- Restore roads and power supply
- Provide safe drinking water
- Check outbreak of any epidemics
- Mobile health teams to be mobilized
- Take the help of the NGOs
- Carry out damage assessment
- Ensure that adequate, timely and speedy credit is available to the farmers for purchasing agricultural inputs and cattle

CYCLONE:

Pre-Disaster

Individual:

- Listen to the weather report in radio/TV and if possible disseminate the information to the local people
- Move cattle to high land
- Store adequate food grains, water medicines, kerosene, kerosene, lantern, matchbox, dry cell
- Keep important papers in the emergency kit
- Keep doors & windows locked and if damaged get it repaired

- Make sure that proper diet is carried for children and old people
- Keep the list of important address and phone number like police, Block Dev. Officer, relatives residing outside that particular place
- Conduct mock drill for yourself and be calm

Government:

- See to it that there is no blockage in the drainage system
- Make the Control room functional for 24 hours
- Keep sufficient food grains in the areas likely to be cut off
- Resource inventory mainly of boats, vehicles for evacuation and providing relief to be maintained
- Health departments to be set up mobile health units in the vulnerable pockets like to be cut off
- Identify the safe cyclone shelters and the route chart for evacuation
- Identify First Aid and Rescue teams
- Ascertain the fodder availability for cattle
- Identify relief centers
- Inspect, strengthen and repair all approach roads and culverts
- Provide mobile wireless sets likely to be cut off
- Liaison with the Army, Navy etc

During - Disaster:

Individual:

- Listen to the radio/community warning system for further details
- Close all doors and windows and stay indoors
- Paste papers on the glass windows to prevent splints flying into the house
- Keep food items and cloths in water proof bags
- Don’t venture into the sea
- Wear warm cloths for protection
- Avoid being misled by rumors. Disseminate information that is only official
- Stay away from low lying areas, electric poles, trees
- Switch off all electrical appliances

Government:

- Evacuate people to the cyclone shelters immediately
- Arrange a patrolling group who would take care of the property left by the people
- See to it that all vehicles are stopped
- See to it that there is enough food stock, drinking water and common medicines
- Announce the latest bulletin to the community at periodic interval

Post - Disaster:

Individual:

- Don't move out until officially informed
- Use the recommended route for returning
- Check whether there is a gas leak before using the stove
- Dry electrical appliances thoroughly before use
- Get oneself inoculated against diseases immediately at the nearest hospitals and seek medical help
- Be careful of snake bite
- All debris should be cleared
- Damage assessment to be done

Government:

Do's

- Rescue and evacuation process to be initiated immediately for those who are stranded
- Restore roads and power supply
- Provide relief and safe drinking water to the affected population
- Check outbreak of any epidemics
- Mobile health units to be mobilized
- Help from voluntary organizations may be welcomed
- Damage assessment to be carried out

Don'ts

- Don't keep loose objects like cans, tins outside
- Don't spread rumors
- Don't stay indoors if asked by the authorities to evacuate
- Don't touch loose wires

EARTHQUAKE:

Pre Disaster

Individual:

- Shelves for bookcases etc should be fixed to the walls. Remove heavy objects from shelves above head level as these can topple over and fall
- Locate beds away from the windows and heavy objects that could fall
- Secure applications that could move, causing rupture of gas or electrical lines. Know location of master switches and shut off valves
- Make sure that overhead lightening fixtures are well secured to the ceiling &
- Replace glass bottles with plastic containers or move them to the lowest shelves
- Be aware that with a severe EQ all services such as electric, water will probably be down. Emergency services may be extremely limited for few days.
- Store emergency supplies like water, food, first aid kit, medicines, tools, portable radio, flash light, batteries, blankets, fire extinguisher etc.

Government:

- Whether preparation of maps on earthquake prone areas done.
- Analysis of seismic risk & zonings for general purposes to be carried out
- Development of seismic codes of design & construction of various structures enforced
- Training of engineers & architects in earthquake engineering principles & use of codes
- Development of simple methods for upgrading the seismic resistance of traditional non-engineered construction and their dissemination to the common builders and owners by mass communication media, demonstration etc.
- Awareness to the community residing in the earthquake prone areas.

During Disaster:

Individual

- Keep calm & help others to be calm
- Try to run safely to a nearest open space which is not surrounded by buildings, trees etc but do so with great cautiousness.
- Do not use an elevator during the earthquake & do not rush to the roof of the house.
- Choose your exit as carefully as possible
- Once you feel it not possible to get out of the house/building fastly & safely, especially

when you are inside a high rise building stay inside calmly

- While inside the house /building, choose a safe place to protect yourself take a shelter under a desk , table , bed or stand below the doorway(in case of an Assam type)
- If you are moving in a vehicle, move immediately to a place which is away from buildings, structures, bridges, electric lines etc & stop the vehicle there. Remain inside the car till the EQ stops
- Do not light candles, gas stove, and cigarette (to prevent any fire from possible leakage of gas.
- Close your gas connection
- Free all your pets, domestic animals etc
- Though the shaking of the ground is frightening do not panic
- Turn your radio on…..

Post - Disaster

Individual:

- Check yourself for injuries
- Examine all sections of your building & ensure that your building is not in danger of collapsing
- Get everyone of your house if it is found unsafe
- Use a helmet or cover your head with a pillow or rubber sheet while moving around inside the building
- Be prepared for additional earthquake shock called “after shock”
- Be prepared for additional earthquake shock called “after shock”
- Stay away from hanging portions of buildings etc and power electric lines and poles
- Close the valve of the gas cylinder and do not use open flames
- Do not switch on electric appliances if gas leakage is suspected
- Wear shoes while moving around
- Attend to injured person and inform the medical authorities as fast as possible
- If you are trapped inside a collapsed building, wait patiently for help. Remain calm and try to develop confidence
- Use a pipe or bamboo to detect any life inside a collapsed building.
- Do not spread rumors
- Turn on your radio

Government:

- Areas affected should be cordoned off
- Affected people should be shifted to safe shelter places that has been identified
- Make arrangement for burning dead bodies and animal carcass
- Mobile health teams to be activated
- Clean the roads blocked.

FIRE:

- Don't leave your gas or cylinder knobs open.
- If you smell gas open your doors & windows. Do not light a match or use electrical switches.
- Keep matches and lighters away from the reach of children.
- Keep inflammable items away from the gas store.
- Practice fire escape drills.
- Take special precautions during celebrations.
- Keep emergency phone no's handy.
- Keep a fire extinguisher handy.
- Avoid wearing loosely fitted and easily inflammable clothing while cooking in the kitchen.
- Teach your family members about fire fighting and fire safety rules.
- Know your way out of the building so that you don't land up in a dead end.
- Do not use the gas, stove or switches of any electrical equipment.
- Alert everybody else by sounding the fire alarm.
- Use the fire extinguisher and try to put off the fire.
- If the fire was caused due to petrol, oil or electricity then use sand instead of water to fight the fire.
- In case the building is on fire use the staircases only.
- Try to get out in open air as soon as possible if the building is on fire.
- Do not climb up to the roof of the building.
- If you are caught in a dense smoke don't walk. Crawl on your knees.
- Try to cover your nose and mouth with wet cloth.

- If your clothes catch fire then cover your face instantly and roll on the floor to put out the fire.
- Do not use the lift in case of fire. Use only an open staircase

PHOTO SECTION.


TRAINING ON COMMUNITY FIRST R
IN DISASTER MANAGEMENT FOR PH


TRAINING ON COMMUNITY FIRST RESPONDER
DISASTER MANAGEMENT FOR PHEK DISTRICT


Make Your Child
a Global Leader
LANDSLIDES OCCUR WITHOUT WARNING
Be Prepared
Protect Yourself
ALERT TODAY
ALIVE TOMORROW
PREVENT LANDSLIDES
NSDMA


Earthquakes
Don't Kill...
Unsafe Buildings Do
Think
&
Build
Safe
NSDMA


NAGALAND STATE
DISASTER MANAGEMENT AUTHORITY
NSDMA


State Level Capacity Building Workshop on Disaster Management
for Municipal Council Members, Police/Home Guard and Civil

NAGALAND STATE DISASTER MANAGEMENT AUTHORITY
(Home Department)
Nagaland Civil Secretariat
Kohima – 797001, Nagaland
E.mail – sdma.nagaland@gmail.com