UTTAR PRADESH

STATE DISASTER MANAGEMENT PLAN FOR

NUCLEAR ATTACK

(Draft)

Table of Contents

III. Demographic, Socio-economic and Health profile of Uttar Pradesh State as compared to India figures

IV. Data on Food Grain Production

V. Detailed Information about Departments and Institutions

VI. International Nuclear Event Scale

VII. List of Instruments and Equipments, and Protective Gear for Specialized Response Teams

VIII. How India is Ready to Face Nuclear Emergency

IX. Details of the Laboratory Required for Nuclear Response

X. Important Contact Information

Executive Summary

Approach to disaster management sector has seen a paradigm shift, that is, from top-down relief and response it has gradually moved to a more technocratic approach and presently to towards a culture of prevention and preparedness. This approach has three distinct but interrelated components: *hazard assessment, vulnerability analysis* and *enhancement of management capacity*. It is now recognized that risks (physical, social and economic) unmanaged (or mismanaged) for a long time lead to occurrence of disasters. This evolution of approaches from relief and response to risk management has begun to influence the way disaster management programs are now being planned and financed.

India is vulnerable to varying degrees to a large number of natural as well as man-made disasters. High Powered Committee (HPC) on Disaster Management was constituted in August 1999 with the approval of the Prime Minister under the Chairmanship of Shri J.C. Pant, former Secretary to the Government of India. The HPC prepared comprehensive model plans for DM at the national, state and district levels. Though the original mandate of the HPC was confined to preparation of plans for natural disaster only, man-made disasters like accidents, industrial and chemical accidents, biological disasters, etc. were included to ensure a holistic approach for preparation of Disaster Management Plans. Our national approach in disaster management received a boost with coming into force of Disaster Management Act, 2005.

With precedence of Hiroshima and Nagasaki Tragedy, documented proof and detailed account exists about the effects and repercussions of nuclear disasters. Unlike a bomb explosion or use of traditional warfares, effects of nuclear attacks are transported beyond geographical boundaries and generations. Nuclear disasters of such intensity may mean nothing to the population since they are under the perception that it may never happen in their lifetime and more so since the chances of worldwide nuclear war have receded after the break up of

the former Soviet Union. With easy availability of nuclear know-how, this danger has increased manifold. In the 1970s, India and Pakistan, countries openly hostile to each other, developed nuclear weapons. At the backdrop of terrorism our country is facing and the turmoil in Pakistan, though the chances are weak, but, nuclear weapons may fall in the hands of terrorists. It would lead to unimaginable mass causalities and loss of assets and properties. A nuclear attack could cause substantial fatalities, injuries, and infrastructure damage and may cripple the nation considerably.

Uttar Pradesh State Disaster Management Plan (UPSDMP) on Nuclear Attacks has been prepared in consultation with various departments and agencies of the Government of Uttar Pradesh and other stakeholders expected to participate in disaster management. Instead of the bottom-up approach, in case of a nuclear attack, top down approach would be followed. The Objectives of UPSDMP are to develop plans through a consultative approach; to understand socio-economic vulnerability of people and integrate into disaster management activities in case of a Nuclear attack; to strengthen existing organisational and administrative structures; to prepare resource inventory and other mechanisms to combat nuclear attacks; to ensure effective response and recovery; and to channelise involvement of various government departments, research, specialised agencies, multilaterals, bilateral, non government organisations training institutes, Community Based Organisations etc.

The **Chapter II on profile of Uttar Pradesh** helps us to understand political, social, economic and demographic concerns that have to be weaved in while preparing UPSDMP on Nnuclear Attacks. Uttar Pradesh is the fourth largest and most populous state in India sharing international border with Nepal. U.P. is facing a difficult demographic situation. It has both high people numbers and high population growth rate. The high demographic growth rate has resulted in high

density of population, tremendous Pressure on land and other infrastructure. The state is also high in unemployment rate as well as illiteracy rate.

The **Chapter IV on Vulnerability Assessment and Risk Analysis** helps us in mapping the risk exposure and vulnerability of the state. Although there has been only one instance of nuclear attack in the entire human history, it is significant to note that in last few years India has faced incidents of terrorist attacks. With a nuclear powered nation like Pakistan, who is often accused of fomenting terror in India, India is at a considerable risk. In case of a war with Pakistan, there is a bleak possibility that it may use nuclear weapons against India. Pakistan itself is facing danger from various groups like Taliban. There has been disturbing news of some places in UP sheltering terrorists and supporting terrorist activities. This has really increased vulnerability of the state and its people. Given the high population density, there would be tremendous damage to human and cattle lives, agriculture and economy of the state in case of a biological attack. The infection would spread at an alarming proportion. The present medical infrastructure would be inadequate to deal with such an emergency.

The **Chapter V on Preventive and Preparedness Measures** deals with measures like medical preparedness including advanced facilities like setting up nuclear wards, laboratories, stem cell harvesting etc; strengthening Intelligence and Surveillance etc. It also entails resource inventory; roles and responsibilities for preparedness and mitigation

The **Chapter VI on Response** would help in optimisiing the outputs, given the resource constraints. Response management is based on the three key management tasks of command, control and coordination. Response plan contains the actions to be taken immediately after a disaster including disseminating warning/alert to the potential victims; disseminate information to vertical and horizontal administrators

for disaster management; and declaring disaster based on severity / vulnerability. The chapter entails a detailed Emergency Response Structure. Although measures like medical preparedness can be taken, if a nuclear attack were to happen, response arrangements will be playing crucial role. This has to come from Central Government and if needed, other countries.

The **Chapter VII on Recovery Plans** provides a structure for the management of all the inputs into the recovery process in a way that is appropriate to the needs of the community. It allows individuals, families and communities to attain a proper level of functioning through the provision of information, specialist services and resources. In case of a nuclear attack, the Recovery process will be a very long process in which the central government will oversee the entire operations and will be assisted by state government, self-government institutions, the NGOs, and the community. In case of a nulcear attack, there would be mass casualties and the effect may spread to huge areas. The survivors and affected people spread over a large geographical area would require support, both in tangible and intangible form, to regain normalcy and start life afresh from where it got disrupted.

The **Chapter IX on Capacity Building** focuses on important components of preparedness include planning, capacity building; well-rehearsed hospital DM plans, training of doctors and paramedics, and up-gradation of medical infrastructure at various levels to reduce morbidity mortality. This is important since departments dealing with this disaster need to be equipped with state-of-the-art tools for rapid investigation.

The **Chapter X on Institutional Arrangements and Roles and Responsibilities** covers who will do what in case of a nuclear attack. Uttar Pradesh Disaster Management Authority (UPDMA) has been set up under the UP Disaster Management Act, 2005, and is headed by the Chief Minister as its Chair person and has a 14 member Governing Body. The Authority clearly allocates responsibilities among various stakeholders. This Plan has proposed setting up of a Crisis

Management Group to deal with Nuclear Attacks. UP already has a GIS based mapping of the entire state and there are Emergency Operation Centres that have been set up in the state. This Chapter also defines the role of Incident Commander who will take charge in case of a nuclear attack.

The **Chapter XI on Partnerships with other Stakeholders** covers role of community, NGOs, International Cooperation, Public Private Partnership and Mass Media.

The **Chapter XII on Financial Arrangements** deals with budgetary allocations for carrying out preventive, preparedness and post-disaster relief work in case of a nuclear attack. Expenditure on relief, rescue and rehabilitation way beyond the expenditure on prevention and management. This should therefore, be the underlying principle for allocation of adequate funds at industry and government level for prevention, mitigation and preparedness rather than concentrating on their management at the time of a disaster. The basic principle of return on investment may not be applicable in the immediate context but the long-term impact would be highly beneficial. Thus, financial strategies should be worked out such that necessary finances are in place and flow of funds is organised on a priority basis by the identification of necessary functions, both in the phases of preparedness and response, relief and rehabilitation respectively.

The **Chapter XIII on Follow Up Actions** discusses follow up actions that have to be undertaken by various agencies/departments to operationalise the Plan.

The main vision of this document is to initiate coordinated efforts to have an effective disaster management strategy for the State, with focus on extremely quick, efficient and coordinated response and recovery to minimise impact of nuclear attacks, if it were to happen.

Chapter-I Introduction

Almost in parallel with the paradigm shift in poverty reduction programs – from income poverty to human poverty -- the disaster management sector has also seen a paradigm shift. Disasters are no longer seen as extreme events created entirely by natural forces but as manifestations of unresolved problems of development. The disaster management practices have evolved from largely a top-down relief and response approach to a more inter-sectoral risk management approach. In the current paradigm of risk management approaches, there is more room than ever before for addressing the issues of risk reduction. Till a few decades ago, disasters were viewed as one-off events and responded by governments and relief agencies without taking into account the social and economic implications and causes of these events. With significant advancement in our understanding of the natural processes that underlie the hazardous events, a more technocratic approach came into existence which believed that the "only way to deal with disasters was by public policy application of geophysical and engineering knowledge". These approaches looked at disasters as exceptional events, not related to the ongoing social and developmental processes. Gradually this attitude changed to an emphasis on preparedness measures, such as stockpiling of relief goods, preparedness plans and a growing role for relief agencies such as the Red Cross.

In recent years, a more comprehensive approach that of disaster risk management has emerged. This approach has three distinct but interrelated components: *hazard assessment, vulnerability analysis* and *enhancement of management capacity*. It is closely integrated with ongoing development processes. Disasters are no longer viewed as extreme events created entirely by natural forces but as unresolved problems of development. It is now recognized

that risks (physical, social and economic) unmanaged (or mismanaged) for a long time lead to occurrence of disasters.

This evolution of approaches from relief and response to risk management has begun to influence the way disaster management programs are now being planned and financed. There are initiatives aimed at reducing social and economic vulnerability and investing in long-term mitigation activities. Unfortunately such initiatives aimed at prevention and mitigation are few, poorly funded and insignificant in comparison with money spent by donors and development banks on humanitarian assistance and relief, as well as on post disaster reconstruction.

The main vision of this document is to initiate coordinated efforts to have an effective disaster management strategy for the State, with focus on extremely quick, efficient and coordinated response and recovery to minimise impact of nuclear disaster.

1.2 Evolution of the document

1.2.1 International precedence

The initiative for disaster management globally started with the member states of the United Nations General Assembly declaring the 90s as the International Decade for Natural Disaster Reduction (IDNDR). The international initiative was conceived to motivate concerted international action and cooperation that could "reduce the loss of life, property damage, social and economic disruptions caused by natural disasters, especially in developing countries." IDNDR is based on the understanding that there is sufficient scientific and technical knowledge that can save lives and property from natural and other disasters through more extensive application. International impact on the subject was expanded in May 1994 at the World Conference of Natural Disaster Reduction convened by the UN at Yokohama, Japan. Participating countries including India adopted the fundamental principles

of natural disaster prevention, preparedness and mitigation embodied in the Yokohama Strategy and Plan of Action for a Safer World. The Yokohama Conference underlined the economic rationale for disaster reduction, complementing the scientific foundation with an essential commitment from public policy authorities.

The goals that were established for the IDNDR are:

- To improve the capacity of each country to mitigate the effects of natural disasters, in the assessment of disaster damage potential and in the establishment of early warning systems and disaster resistant capabilities.
- To devise appropriate guidelines and strategies for applying existing scientific and technical knowledge.
- To foster scientific and engineering endeavours aimed at addressing critical gaps in knowledge.
- To disseminate existing and new technical information.
- To develop measures for the assessment, prediction, prevention and mitigation of natural disasters through programmes of technical assistance and technology transfer, education and training and to evaluate effectiveness of programmes.

In essence, the decade's activities sought to shift the emphasis from post-disaster relief to pre-disaster risk reduction.

The main tasks identified for risk reduction are:

- Avoiding habitation in hazardous areas;
- Developing structures resistant to the onslaught of hazards;
- Developing the ability to rapidly evacuate hazardous areas and shift residents to hazard- resistant structures;

- Reducing or eliminating natural hazards through technological intervention (e.g., dams, plantations, etc); and
- Establishing, through preparedness, the means to quickly recover from disasters with minimal additional suffering and loss of life.

1.2.2 Disaster Management in India

India is vulnerable to varying degrees to a large number of natural as well as man-made disasters, ranging from earthquakes, floods, cyclones, tsunamis, droughts, avalanches, landslides etc. Further, the vulnerability to Nuclear, Biological and Chemical (NBC) disasters and terrorism has also increased manifold as India is having nuclear capabilities in power and defence sectors and is surrounded by hostile neighbours having biological warfare and nuclear capabilities.

Disaster risks in India are further compounded by increasing vulnerabilities, due to a variety of factors. These include population, poverty, rapid urbanisation, increasing industrialisation, development within high-risk zones, environmental degradation, climate change etc. This increased vulnerability has seriously threatened national security and present & future course of development.

For planning and coordination of Disaster Management Activities in India, a High Powered Committee (HPC) on Disaster Management was constituted in August 1999 with the approval of the Prime Minister under the Chairmanship of Shri J.C. Pant, former Secretary to the Government of India. The HPC prepared comprehensive model plans for DM at the national, state and district levels. Though the original mandate of the HPC was confined to preparation of plans for natural disaster only, man-made disasters like accidents, industrial and chemical accidents, biological disasters, etc. were included to ensure a holistic approach for preparation of Disaster Management Plans.

The HPC constituted 5 sub-groups to develop detailed history of each type of disaster and the type of plans of actions needed to have the most effective preparedness, response and recovery strategies for each type of disaster.

The five sub-groups were: Water & Climate related hazards, Geological hazards, Industrial, Chemical and nuclear hazards, Accidents, Biological Hazards.

Our national approach in disaster management received a boost with setting up of National Disaster Management Authority (NDMA) headed by the Prime Minister, through an Act of Parliament. This Act got the consent of the President on 23 December 2005. Its aim is to initiate a holistic and integrated approach to Disaster Management in the country. The holistic, multi-disciplinary and integrated approach of NDMA in DM at all levels aims to mainstream DM into development effort.

The DM Act, 2005, mandates a paradigm shift from a response and relief-centric approach, to a proactive, and comprehensive mindset towards DM covering all aspects from prevention, mitigation, preparedness to rehabilitation, reconstruction and recovery.

It also provides for:

- The creation of a policy, legal and institutional framework, backed by effective statutory and financial support.
- The mainstreaming of multi-sectoral DM concerns into the developmental process and mitigation measures through projects.
- A continuous and integrated process of planning, organising, coordinating and implementing policies and plans in a holistic, community based participatory, inclusive and sustainable manner.

1.2.3 National Vision

The national vision is to build a safer and disaster resilient India by developing a holistic, proactive, multi-disaster and technology driven strategy for DM. This will be achieved through a culture of prevention, mitigation and preparedness to reduce the impact of disasters on people. The entire process will centre stage the community and will be provided momentum and sustenance through the collective efforts of all governmental agencies supported by NGOs.

1.2.4 State Vision

Uttar Pradesh Disaster Management Plan (UPSDMP) on Radiation Disaster is a result of this approach of preparedness to face this man-made calamity. UPDMP has been prepared for its operationalisation by various departments and agencies of the Government of Uttar Pradesh and other stakeholders expected to participate in disaster management. This addresses the state's preparedness to response to demands from the district administration and in extraordinary emergencies at multi-district levels.

1.3 Objectives of UP State Disaster Management Plan on Nuclear Attack

Nuclear Disasters are characterised by some or all of the following:

- They cause mass scale damage of disastrous consequences
- They are disruptive to very large communities;
- They are beyond normal life expectations;
- They are unpredictable in occurrence and effects;
- They require a response for which normal local resources may be inadequate;
- They have a wide range of effects and impacts on the human and physical environment;

- There are complex needs in dealing with them;
- They can be of sudden onset

Disaster preparedness and the promotion of disaster resilience have been recognised as essential components of all development strategies. The experience of coping with disaster of this nature is very limited.

With this background, the Objectives of UPSDMP on Nuclear Attack are as follow:

- To develop plans through a consultative approach involving all the stakeholders that will lead to a society wherein in case of occurrence of nuclear attack, risk to human health, life and the environment can be understood and minimised.
- To understand socio-economic vulnerability of people and integrate into disaster management activities in case of a nuclear attack;
- To strengthen existing organisational and administrative structures for disaster management. In case of a nuclear attack, national government will supervise Disaster Management;
- To ensure that the following components of disaster management are organised to facilitate planning, preparedness, operational coordination and community participation.
    - Prevention: the elimination or reduction of the incidence or severity of disasters and the mitigation of their effects.
    - Response: the combating of emergencies and the provision of immediate rescue and relief services;
    - Recovery: the assisting of people and communities affected by disasters to achieve a proper and effective level of functioning.

Chapter-I Profile of Uttar Pradesh

2.1 Overview

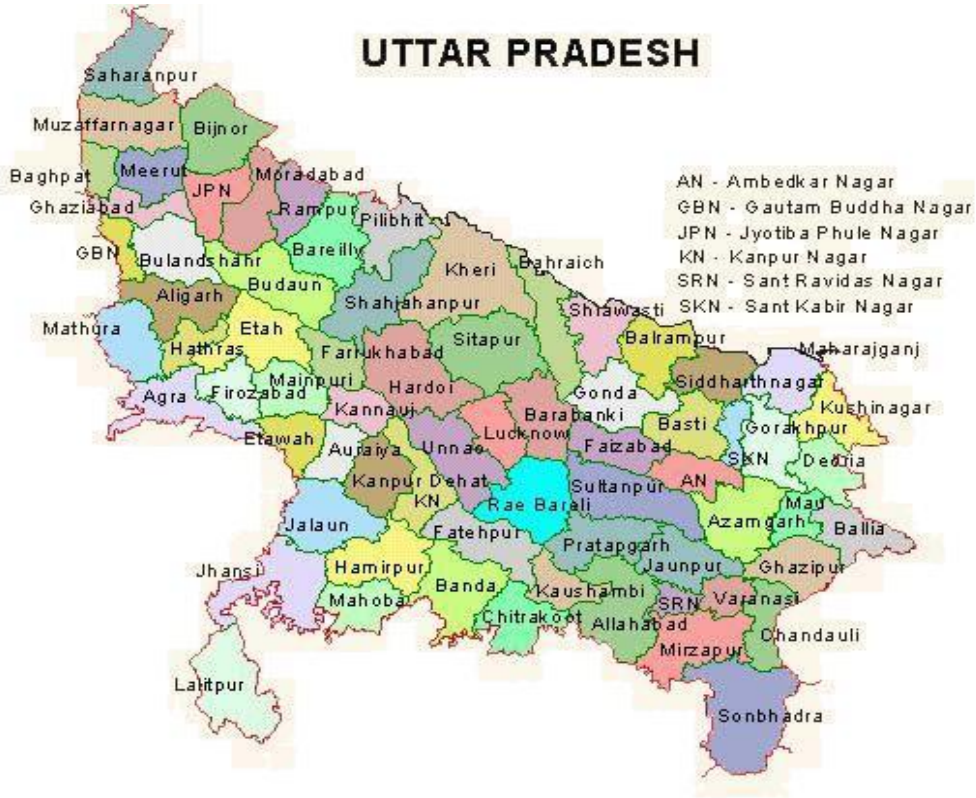
Uttar Pradesh is the land of multi-hued Indian Culture that has blossomed from times immemorial. Blessed with a variety of geographical land and many cultural diversities, Uttar Pradesh, has been the area of activity of historical heroes like - Rama, Krishna, Buddha, Mahavira, Ashoka, Harsha, Akbar and Mahatma Gandhi. Rich and tranquil expanses of meadows, perennial rivers, dense forests and fertile soil of Uttar Pradesh have contributed numerous golden chapters to the annals of Indian History. Dotted with various holy shrines and pilgrim places, full of joyous festivals, it plays an important role in the politics, education, culture, industry, agriculture and tourism of India.

Its area of 2,36,286 sq km lies between latitude 24 deg to 31 deg and longitude 77 deg to 84 deg East. Area wise it is the fourth largest State of India. In sheer magnitude it is half of the area of France, three times of Portugal, four times of Ireland, seven times of Switzerland, ten times of Belgium and a little bigger than England.

2.2 Location

Uttar Pradesh is a state located in the northern part of India covering a large part of the highly fertile and densely populated upper Gangetic plain. Situated between 23^{o} 52'N and 31^{o} 28 N latitudes and 77^{o} 3' and 84^{o} 39'E longitudes, this is the fourth largest state in the country. It shares an international border with Nepal and is bounded by the states of Uttarakhand, Himachal Pradesh, Haryana, National Capital Territory of Delhi, Rajasthan, Madhya Pradesh, Chhattisgarh, Jharkhand and Bihar.

2.3 Area and administrative division



With an area of 2,36,286 sq. km[1] , Uttar Pradesh is divided into 71 districts under 18 divisions: Agra, Aligarh, Allahabad, Azamgarh, Bareilly, Basti, Chitrakoot, Devipatan, Faizabad, Gorakhpur, Jhansi, Kanpur, Lucknow, Meerut, Mirzapur, Moradabad, Saharanpur and Varanasi.

A district is governed by a District Collector also known as a District Magistrate. DM is an officer from either Indian Administrative Service (IAS) or Uttar Pradesh Public Service Commission (UPPSC), and is appointed by the State Government of Uttar Pradesh. Each district is divided into subdivisions. A subdivision is governed by a sub-divisional magistrate (SDM). Other than urban units such as town municipalities, a subdivision contains 'community development blocks' (also

[1] http://upgov.nic.in/

known as CD blocks or blocks). A block consists of urban units such as census towns and rural units called gram panchayats. A block is administered by a Block Development Officer (BDO). The Panchayati Raj has a three-tier structure with Zilla Parishad, Panchayat Samiti and Gram Panchayat.

A Senior Superintendent/ Superintendent of Police or SP, heads the District Police organization of Uttar Pradesh Police. For every subdivision, there is a Subdivision Police, headed by a Police officer of the rank of Assistant Superintendent of Police or Deputy Superintendent of Police. Under subdivisions, there are Police Circles, each headed by a Circle Officer. A Police Circle consists of Police Stations, each headed by an Inspector or Sub-Inspector of Police. The Allahabad High Court has the jurisdiction of the state of Uttar Pradesh.

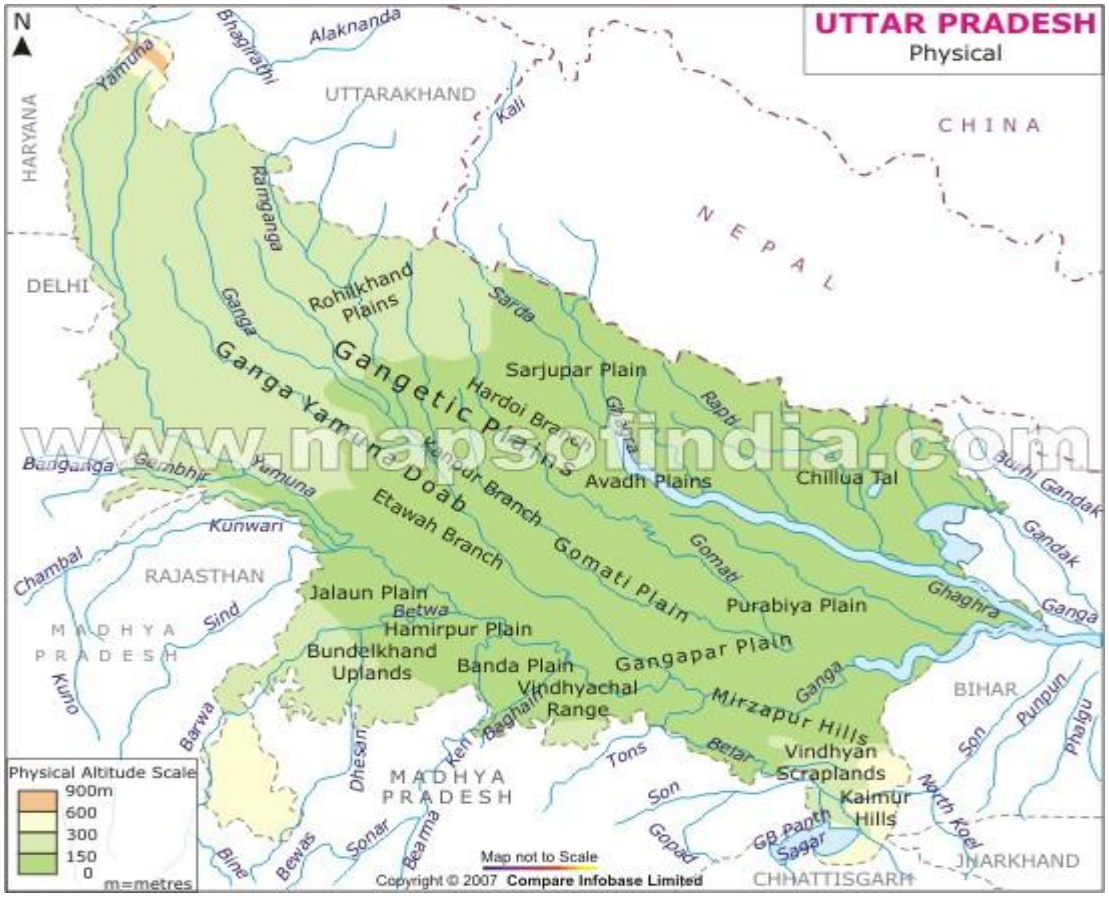
2.4 Physical Regions

Uttar Pradesh can be divided into two distinct hypsographical regions:

1. The Gangetic plain in the centre: The most important area for the economy of the state is the Gangetic plain which stretches across the entire length of the state from east to west. The entire alluvial plain can be divide into three sub-regions. The first in the eastern tract consisting of 14 districts which are subject to periodical floods and droughts and have been classified as scarcity areas. These districts have the highest density of population which gives the lowest per capita land. The other two regions, the central and the western are comparatively better with a well-developed irrigation system. They suffer from water logging and large-scale user tracts. The Gangetic plain is watered by the Yamuna, the Ganga and its major tributaries, the Ramganga, the Gomati, the Ghaghra and Gandak. The whole plain is alluvial and very fertile.

3. The Vindya hills and Deccan plateau in the south: The Southern fringe is demarcated by the Vindhya Hills and plateau. It comprises four districts of

Jhansi, Jalaun, Banda, and Hamirpur in Bundelkhand division, Meja and Karchhana tehsils of Allahabad district, the whole of Mirzapur District south of Ganga and Chakia tehsil of Varanasi District. The Betwa and Ken rivers join the Jamuna from the south-west in this region. It has four distinct kinds of soil, two of which are agriculturally difficult to manage. They are black cotton soil. Rainfall is scanty and erratic and water-resources are scare. Dry farming is practical on a large scale.



2.5 Climate and rainfall

Uttar Pradesh is located in the north-western part of the country. It spreads over a large area, and the plains of the state are quite distinctly different from the high mountains in the north. The climate of Uttar Pradesh can also vary widely, with temperatures as high as 47 °C in summer, and as low as -1 °C in winter.The

climate of Uttar Pradesh is predominantly subtropical, but weather conditions change significantly with location and season.

Tropical Monsoon Climate is marked by three distinct seasons:

- Summer (March-June): Hot & dry (temperatures rise to 45 °C, sometimes 47-48 °C); low relative humidity (20%); dust laden winds.
- Monsoon (June-September): 85% of average annual rainfall of 990 mm. Fall in temperature 40-45° on rainy days.
- Winter (October-Fabruary): Cold (temperatures drop to 3-4 °C, sometimes below -1 °C); clear skies; foggy conditions in some tracts.

Rainfall: Rainfall in the State ranges from 1,000–2,000 mm (40–80 inches) in the east to 600–1,000 mm (24–40 inches) in the west. About 90 percent of the rainfall occurs during the southwest monsoon, lasting from about June to September. With most of the rainfall concentrated during this four-month period, floods are a recurring problem and cause heavy damage to crops, life, and property, particularly in the eastern part of the state, where the Himalayan-origin rivers flow with a very low north-south gradient.

Snowfall: In the Himalayan region of the State, annual snowfall averaging 3 to 5 metre (10 to15 feet) is common between December and March.

2.6 Temperature

Depending on the elevation, the average temperatures vary from 12.5–17.5°C (54.5–63.5°F) in January to 27.5–32.5°C (81.5–90.5°F) in May and June. The highest temperature recorded in the State was 49.9°C (121.8°F) at Gonda on May 8, 1958.

2.7 Demographic profile

U.P. is the largest State in the country in terms of people living in it. Its population, at 16.62 crores in 2001, comprised 16.2% of India's population. Population density is 689 and sex ratio adverse at 898. Only about 60% of the people are literate. Infant mortality is still high at around 80. About one third of its people live below the poverty line.

The State reflects many contrasts such as fertile lands, very considerable water resources, good rainfall and massive manpower on one hand; and poverty, unemployment, poor incomes, relatively low productivity levels and low quality of life on the other. Per capita income as estimated in 1950-51 was only 3% below the national average. In 2001-2002, it had fallen to as much as 41% below the national average.

U.P. is facing a difficult demographic situation. It has both high people numbers and high population growth rate. During 91-01 decade its population went up by over 25.8%. Literacy rate in 2001 was more than 10% below the national average, at 57.36%. Similarly, sex ration at 898 was lower than the national figure of 933. According to the Economic Survey of India (2003-04) unemployment rate was 4.08%, having gone up in the preceding seven year by about 18%.

The density of population in U.P. at 689 per sq. km is much higher than that obtaining in many other States in the country. The high demographic growth rate has resulted in:

1. Rise in density of population per sq.km from 473 in 1971 to 548 in 1991, and 689 in 2001.
2. Pressure on land has tremendously increased. Land holdings, mostly small and marginal, have been further fragmented making modernisation of agriculture and capital investments on it very difficult.

3. Available financial resources have not matched the needs of infrastructure. Unemployment rate is also high in the state.

2.8 Geology

Uttar Pradesh is characterised by rock formations ranging in age from the Archean (the Bundelkhand Graniticgneisses) to the Recent (the Ganga alluvium). The Ganga plain which dominates the landscape and nearly covers three fourth of the geographical area of the State, lies between the rocky Himalayan belt in the north and the southern hilly tract comprised of mainly Pre-Cambrian rocks. Flexing of the Indian lithosphere in response to the compressive forces due to collision, and thrust fold loading produced the Ganga Plain foreland basin. It is

filled with recent alluvial sediments which is at places more than 1,000 m. thick and an amalgam of sand, silt, clay in varying proportions.

The southern hilly tract is roughly parallel to the Ganga-Yamuna lineament. The tract is underlain by granitic complex in Bundelkhand region and in Sonbhadra. It is overlain by rocks Mahakoshal (Bijawar) and Vindhyan Supergroup. The younger rock comprise of coal bearing Gondwana in south Sonbhadra and basaltic rocks in southern part of Lalitpur.

The granitic complex is considered to be potential for the search of metallic minerals like copper, lead, zinc, molybdenum, gold, nickel, Uranium and Platinum group of elements. The overlying sediments of Mahakoshal (Bijawar) and associated Iron Formation show a potential for the search of copper, uranium, and gold in Lalitpur and andalusite, sillimanite, gold, calcite, marble and clay in sonbhadra. The lower Vindhyan sediments of Sonbhadra contain deposits of cement grade limestone, flux grade dolomits, building stone and is also potential for the search of gold and other metals. The Upper Vindhyan sandstones are suitable for making decorative slab/tiles or ballast. Deposits of silica sands and bauxite are available in Allahabad and chitrakoot districts while coal deposits occur in the Gondwana rocks in southwestern corner of Sonbhadra.

2.9 Economy

Uttar Pradesh is the second largest state economy in India after Maharashtra contributing 8.17% to India's total GDP. Between 1999 and 2008, the economy grew only 4.4% per year, one of the lowest rates in India. The major economic activity in the state is agriculture and, in 1991, 73% of the population in the state was engaged in agriculture and 46% of the state income was accounted for by agriculture. UP has retained its pre-eminent position in the country as a food-

surplus state. Uttar Pradesh is home to largest number of Small Scale units in the country.

2.10 Education

Female literacy situation in Uttar Pradesh is dismal. Only one out of four in the 7+ age group was able to read and write in 1991. This figure go down to 19 per cent for rural areas, 11 per cent for the scheduled castes, 8 per cent for scheduled castes in rural areas, and 8 per cent for the entire rural population in the most educationally backward districts. The 1981 census figures suggest that in Uttar Pradesh the crude female literacy rate among scheduled castes in rural Uttar Pradesh in 1981 was below 18 per cent in 18 out of Uttar Pradesh's 56 districts and below 2.5 per cent in a majority of districts.

In terms of more demanding criteria of educational attainment on the completion of primary or secondary education, in Uttar Pradesh, in 1992-93 only 50 percent of literate males and 40 per cent of literate females could complete the cycle of eight years of schooling involved in the primary and middle stages. One other distinguishing feature of Uttar Pradesh education system is the persistence of high level of illiteracy in the younger age group. Within the younger age group, the illiteracy was endemic in rural. In the late 1980s, the incidence of illiteracy in the 10-14 age group was as high as 32 percent for rural males and 61 per cent for rural females, and more than two-thirds of all rural girls in the 12-14 age group never went to school.

The problem of education system is exacting. Due to public apathy the school are in disarray, privately run school are functional, but beyond the reach of ordinary people. The State government has taken programmes to make the population totally literate. Steps are being taken with the help of NGOs and other organizations to raise popular participation. At the level of higher education and

technical education Uttar Pradesh has 16 general universities, 3 technical universities, one Indian Institute of Technology (Kanpur), one Indian Institute of Management (Lucknow), one Indian Institute of Information Technology and large number polytechnics, engineering institutes and industrial training institutes. This provides the State with firm basis for providing opportunities for higher education to its youth.

2.11 Health

The Total Fertility Rate of the State is 3.8. The Infant Mortality Rate is 69 and Maternal Mortality Ratio is 517 (SRS 2001 - 03) which are higher than the National average. The Sex Ratio in the State is 898 (as compared to 933 for the country).

Please refer Annexure for figures of major health indicators.

2.12 Forests

Forests constitute about 12.8% of the total geographical area of the state. The Himalayan region and the terai and bhabhar area in the Gangetic plain have most of the forests. The Vindhyan forests consists mostly of scrub. The districts of Jaunpur, Ghazipur and Ballia have no forest land while 31 other districts have less forest area.

Near the snow line there are forests of rhododendrons and betula (bhojpatra). Below them are forests of silver fir, spruce, deodar, chir and oak. On the foothills and in the terai bhabhar area, grow the valuable sal and gigantic haldu. Along river courses the Shisham grows in abundance. The Vindhyan forests have dhak, teak, mahua, salai, chironji and tendu. The hill forests also have a large variety of medicinal herbs. Sal, chir, deodar and sain yield building timber and railway sleepers. Chir also yield resin, the chief source of resin and turpentine. Sisso is mostly used for furniture. Semal and gutel are used as matchwood and Kanju in

the plywood industry. Babul provides the principal tanning material of the state. Some of the grasses such as baib and bamboo are raw material for the paper industry. Tendu leaves are used in making bidis and cane is used in baskets and furniture.

2.13 Agriculture

The western region of the state is more advanced in terms of agriculture. Majority of the population depends upon farming as its main occupation. Wheat, rice, sugar cane, pulses, oil seeds and potatoes are its main products. Sugar cane is an important cash crop almost through out the state and sugar mills and other cane crushers who produce gur and Khandsari are common throughout the state. Uttar Pradesh is an important state so far as horticulture is concerned. Apples and mangoes are produced in the state.

2.14 Cropping Patterns

In Uttar Pradesh rice is grown on 19 percent (4.6 m ha) of its cropped area and represents about 12.4 per cent of the all-India area under this crop. Rice is concentrated in the eastern districts of Uttar Pradesh where the alternative crops are pulses, groundnut, sugarcane, bajra and jowar in the decreasing order of their importance. Tobacco is grown in some districts.

2.15 Livestock and Fishery

Uttar Pradesh supports about 15% of the country's total livestock population. Of its livestock in 1961, 15% were cattle, 21% buffaloes, 13% goats and 8% other livestock. Between 1951 and 1956 there was an overall increase of 14% in the livestock population. There are nearly eight lakh hectares of water area, including lakes, tanks, rivers, canals and streams. The fishing area is over two lakh hectares and more than 175 varieties of fish, excluding the sornamental

varieties are found. Among them are rohu, hilsa, mahseer, mangar, snow trout and mirror carp.

2.16 Land Use pattern

Land use	Area in ` 000 ha	Percentage
Total Geographical area	29,441	
Reporting Area for land utilization	29,794	100.00
Forests	5,150	17.29
Not available for cultivation	3,516	11.80
Permanent Pasture & Grazing land	296	0.99
Land under misc. tree crops & groves	513	1.72
Culturable waste land	945	3.17
Fallow land other than current fallows	832	2.79
Current fallows	1,067	3.58
Net area Sown	17,475	58.65

Source: Land use statistics at a Glance 1996-97, Ministry of Agriculture, GOI, 2000

2.17 Industry

There are different types of minerals and several industries have come up based on the minerals. There are cement plants in the Mirzapur area in the Vindhya region, a bauxite based aluminium plant in the Banda area. In the hills a number of minerals are to be found, mainly non-metallic minerals which are used as industrial raw materials. Coal deposits are found in the Singrauli area. The industries include a large printing establishment units engaged in manufacturing of scales, locks, letter boxes, furniture, badges and belts, leather goods, scissors etc. Handloom, carpet, glass, electrical goods, electro plating, building material industries are also found in the city.

2.18 Transport and Communication

Utter Pradesh has a well-defined transport system having an impressive network of roadways and railways that help commuters to move around within and outside the state. Flights also operate between major cities such as Lucknow, Varanasi, Agra, Allahabad and Kanpur.

Intercity Transportation in Uttar Pradesh

The cities of Uttar Pradesh are well linked through a network of road and railways. The best mode of transportation is trains. Almost all the major as well as minor towns in Utter Pradesh are linked through railways. Numerous Express and Super Fast trains ply between these stations. There are Intercity and Passenger trains too that are short distance trains whose routes are generally confined to 200 km. Though cheaper than Express trains, these trains are very slow and crowded. Commuters and smalltime traders generally use these trains. They tend to stop at every other station.

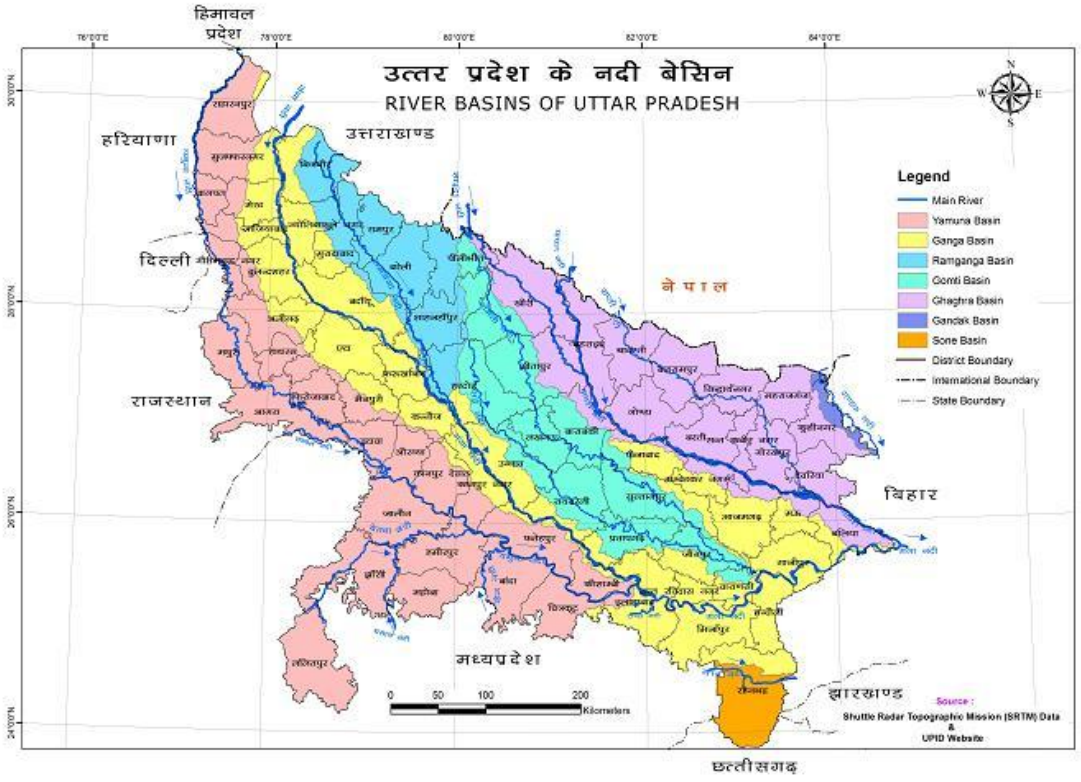
Uttar Pradesh State Transport Corporation has a fleet of buses that ply between different cities. The buses range from uncomfortable coaches for short distance

to the Luxury coaches for the longer ones. Apart from that there are luxury coaches run by private operators too. Several Matadors, Mini-Buses and Diesel-run Autos are also available for relatively short distances, say between 50 to 100 km.

Intra-city Transportation in Utter Pradesh

Auto rickshaws and taxis are easily available in bigger cities such as Kanpur, Agra, Mathura, Lucknow, Varanasi, Ghaziabad and Allahabad. In other cities, Autos and Taxis that run on share basis are available. Rickshaws are another good mode to move around in the city. They are the chief transport option in smaller towns as well as congested alleys of large towns.

2.19 River System and Dams



Major Dams and Reservoirs

- Govind Ballabh Pant Sagar on Rihand River in Sonbhadra
- Kalagarh Dam on Ramganga River in Kalagarh
- Parichha Dam on Betwa River in Parichha (Jhansi District).
- List of Dams in Lalitpur District, Uttar Pradesh

(A) Matatila Dam constructed during 1952-1964 on Betwa River in Lalitpur District, Uttar Pradesh, Length 6.30 km, Height 33.53 Meters, Area 20,720 km^2, Storage 1132.68 m.c.m

(B) Jamni Dam constructed during 1962-1973 on Jamni River in Lalitpur District, Uttar Pradesh, Length 6.40 km, Height 19.18 Meters, Area 414 km^2, Storage 92.89 m.c.m

(C) Rohini Dam constructed during 1976-1984 on Rohini River in Lalitpur District, Uttar Pradesh, Length 1.65km, Height 15.50 Meters, Area 44 km^2, Storage 12.12 m.c.m

(D) Shahzad Dam constructed during 1973-1992 on Shahzad River in Lalitpur District, Uttar Pradesh, Length 4.16 km, Height 18.00 Meters, Area 514 km^2, Storage 130.00 m.c.m

(E) Govind Sagar Dam constructed during 1947-1953 on Shahzad River in Lalitpur District, Uttar Pradesh, Length 3.60 km, Height 18.29 Meters, Area 368 km^2, Storage 96.8 m.c.m

(F) Sajnam Dam constructed during 1977-1990 on Sajnam River in Lalitpur District, Uttar Pradesh, Length 5.15 km, Height 18.78 Meters, Area 290 km^2, Storage 83.50 m.c.m

(G) Sukma-Dukma Dam a below water construction on Betwa River near Jhansi District, Uttar Pradesh, Length 2.15 km, Height 20.78 Meters

Chapter III Nuclear Attack

3.1 Nuclear Attacks – An Introduction

Since time immemorial, human beings have continuously been exposed to naturally occurring ionising radiation. With advancements, scientists gradually discovered nuclear technology. Since then, there has been an exponential growth in the application of nuclear science and technology in the fields of power generation, medicine, industry, agriculture, research and defence.

However, this technology has been misused to develop weapons of mass destruction in the form of nuclear bombs. These disasters by their very nature invoke a great deal of emotions, horror, revulsion and disbelief. With precedence of Hiroshima and Nagasaki Tragedy, documented proof and detailed account exists about the effects and repercussions of nuclear disasters. Unlike a bomb explosion or use of traditional warfares, effects of nuclear disaster are transported beyond geographical boundaries and generations.

Nuclear disasters of such intensity may mean nothing to the population since they are under the perception that it may never happen in their lifetime and more so since the chances of worldwide nuclear war have receded after the break up of the former Soviet Union. However, with proliferation of nuclear technology, the chances of it taking place has multiplied. With easy availability of nuclear know-how, this danger has increased manifold. Thus, terrorism and spread of nuclear weapons have enlarged the scope of human induced disasters.

3.2 Types of Nuclear Disaster

Nuclear disasters can be of three kinds as follows:-

Type 1 - During nuclear attack in a war scenario

Type 2 - Nuclear leaks in nuclear reactors during normal functioning due to Human error, carelessness during routine working mishaps during carriage of nuclear material from one place to another

Type 3 - Nuclear weapons falling in the hands of anti- national elements or sabotage or militant threat to strategic targets like seat of power, national symbol (like the Parliament, Vidhan Sabha etc), military establishments, densely populated areas, nuclear establishments, reactors and so on

Nuclear Warfare

Unlike a "dirty bomb" which disperses radioactive material using conventional explosives, a **nuclear attack** is the use of a device that produces a nuclear explosion. A nuclear explosion is caused by an uncontrolled chain reaction that splits atomic nuclei (fission) to produce an intense wave of heat, light, air pressure, and radiation, followed by the production and release of radioactive particles. For ground blasts, these radioactive particles are drawn up into a "mushroom cloud" with dust and debris, producing fallout that can expose people at great distances to radiation.

Nuclear warfare, or **atomic warfare**, is a term for a military conflict in which nuclear weapons are used. The term is thus distinguished from the achievement of military or political ends through the possession or threat of nuclear weapons without their actual use; these strategies might include nuclear deterrence or nuclear blackmail.

Compared to conventional warfare, nuclear warfare is vastly more destructive in range and extent of damage. A major nuclear exchange could have severe long-term effects, primarily from radiation release but also from possible atmospheric pollution leading to nuclear winter, that could last for decades, centuries, or even millennia after the initial attack Nuclear war is considered to bear existential risk for civilization on earth

The first, and to date only, nuclear war was the atomic bombings of Hiroshima and Nagasaki, Japan by the United States shortly before the end of World War II. At the time of those bombings, the United States was the only country to possess atomic weapons. After World War II, nuclear weapons were also developed by the United Kingdom, France, the Soviet Union, and the People's Republic of China, which contributed to the state of conflict and tension that became known as the Cold War. In the 1970s, India and Pakistan, countries openly hostile to each other, developed nuclear weapons.

After the collapse of the Soviet Union in 1991 and the resultant end of the Cold War, the threat of a major nuclear war between the superpowers was generally thought to have receded. Since then, concern over nuclear weapons has shifted to the prevention of localized nuclear conflicts resulting from nuclear proliferation, and the threat of nuclear terrorism.

The possibility of using nuclear weapons in war is usually divided into two subgroups, each with different effects and potentially fought with different types of nuclear armaments.

The first, a *limited nuclear war* (sometimes *attack* or *exchange*), refers to a small scale use of nuclear weapons by one or more parties. A "limited nuclear war" would most likely consist of a limited exchange between two nuclear superpowers targeting each other's military facilities, either as an attempt to pre-emptively cripple the enemy's ability to attack as a defensive measure or as a prelude to an invasion by conventional forces as an offensive measure. It will also refer to a nuclear war between minor nuclear powers, who lack the ability to deliver a decisive strike. This term would apply to any limited use of nuclear weapons, which may involve either military or civilian targets.

The second, a *full-scale nuclear war*, consists of large numbers of weapons used in an attack aimed at an entire country, including military, economic and civilian

targets. Such an attack would seek to destroy the entire economic, social, and military infrastructure of a nation by means of an overwhelming nuclear attack.

Some Cold War strategists argued that a limited nuclear war could be possible between two heavily armed superpowers (such as the United States and the Soviet Union) and if so several predicted that a limited war could "escalate" into an all-out war. Others have called limited nuclear war "global nuclear holocaust in slow motion" arguing that once such a war took place others would be sure to follow over a period of decades, effectively rendering the planet uninhabitable in the same way that a "full-scale nuclear war" between superpowers would, only taking a much longer and more agonizing path to achieve the same result.

Even the most optimistic predictions of the effects of a major nuclear exchange foresee the death of hundreds of millions of civilians within a very short amount of time; more pessimistic predictions argue that a full-scale nuclear war could bring about the extinction of the human race or its near extinction with a handful of survivors (mainly in remote areas) reduced to a pre-medieval quality of life and life expectancy for centuries after and cause permanent damage to most complex life on the planet, Earth's ecosystems, and the global climate, particularly if predictions of nuclear winter are accurate. It is in this latter mode that nuclear warfare is usually alluded to as a doomsday scenario. Such hypothesized civilization-ending nuclear wars have been a staple of the science fiction literature and film genre for decades.

Either a limited or full-scale nuclear exchange could be an *accidental nuclear war*, in which a nuclear war is triggered unintentionally. Possible triggers for this scenario have included malfunctioning early warning devices and targeting computers, deliberate malfeasance by rogue military commanders, accidental straying of planes into enemy airspace, reactions to unannounced missile tests during tense diplomatic periods, reactions to military exercises, mistranslated or

miscommunicated messages, and so forth. A number of these scenarios did actually occur during the Cold War, though none resulted in a nuclear exchange.

3.3 Classification of International Atomic Energy Agency

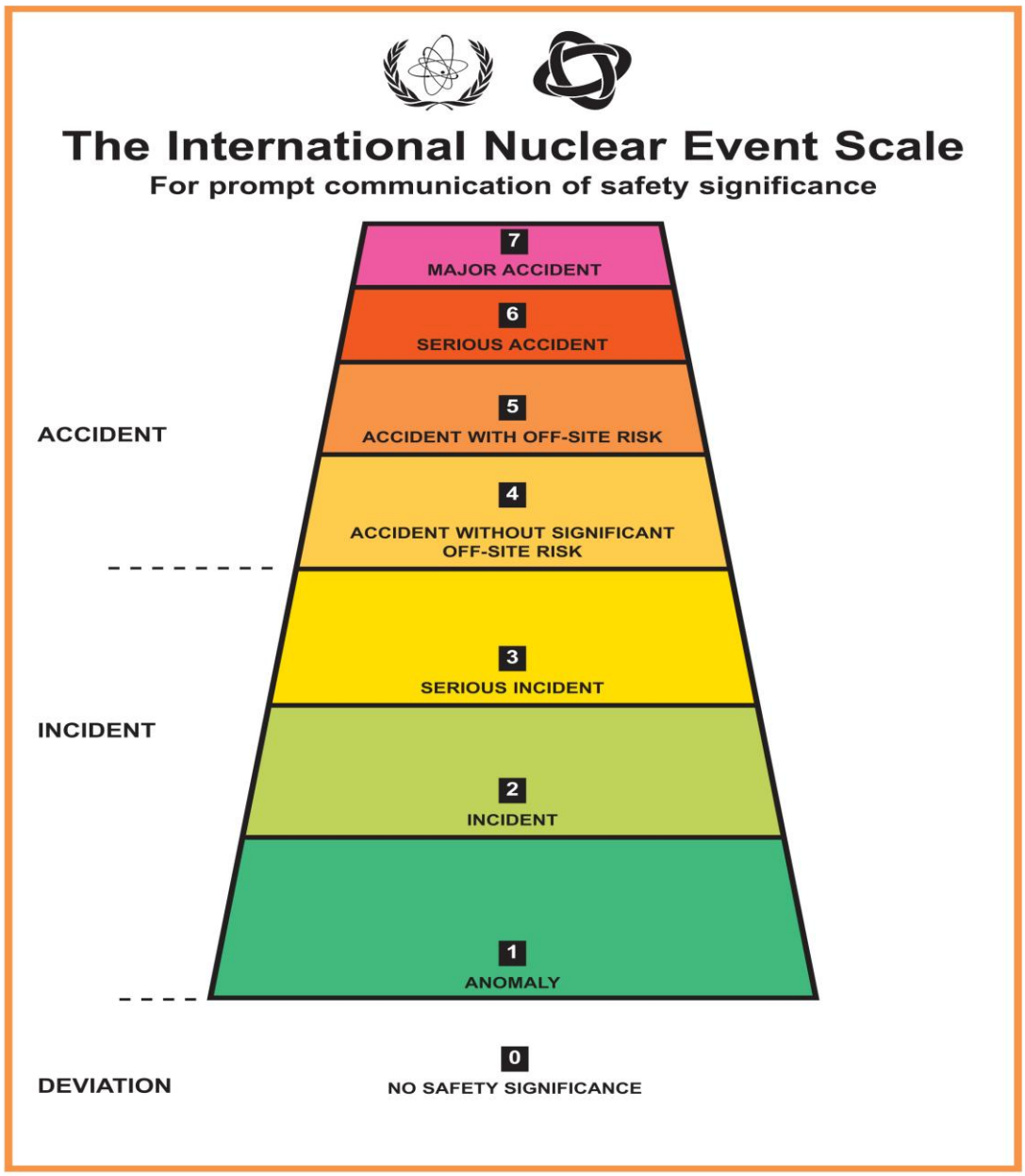
According to the International Atomic Energy Agency, the nuclear emergencies can be classified into two broad categories- nuclear and radiological:

The nuclear emergency is an emergency situation in which there is, or presumed to be, a hazard due to the release of energy along with radiation from a nuclear chain reaction (or from decay of products of chain reaction). This covers accidents in nuclear reactors, 'criticality' situations in fuel cycle facilities, nuclear explosions, etc.

One the other hand emergency situations that has arisen due to exposure to the radiation are known as radiological emergencies.

The International Nuclear Event Scale (INES) is a means for promptly communicating to the public, in consistent terms, the safety significance of events reported at nuclear installations. BY putting events into proper perspective, the Scale can ease common understanding among the nuclear community, the media and the public. It was designed by an international group of experts convened jointly in 1989 by International Atomic Energy Agency (IAEA) ant the Nuclear Energy Agency (NEA) of the Organisation for Economic Cooperation and Development.

The communication process has therefore led each participating country to set up a structure which ensures that all events are promptly rated using the INES rating procedure to facilitate communication whenever they have to be reported outside. Events are classified on the scale at 7 levels, the upper levels (4-7) are termed 'accidents' and lower levels (1-3) 'incidents'. Events which have no safety significance are classified below the scale at level 0 and are termed 'deviations'. Events which have no safety relevance are termed 'out of scale'.



3.4 Impact of a Nuclear Disaster

Hiroshima, Nagasaki and Chernobyl give a glimpse into what impact a nuclear disaster can create. In simple words it the impact would be catastrophic. It would lead to unimaginable mass causalities and loss of assets and properties. A

nuclear attack could cause substantial fatalities, injuries, and infrastructure damage from the heat and blast of the explosion, and significant radiological consequences from both the initial nuclear radiation and the radioactive fallout that settles after the initial event. An electromagnetic pulse from the explosion could also disrupt telecommunications and power distribution. The energy released by a nuclear explosion is distributed roughly as 50% shockwave; 35% heat; 5% initial nuclear radiation; and 10% fallout radiation. This distribution varies depending on the design of the weapon and the altitude of the explosion. Box 1[2] describes the characteristics of a nuclear explosion.

Nuclear explosions are classified based on the amount of energy they produce, or "yield." A nuclear attack by terrorists would be expected to have a yield of less than one to

Characteristics of a Nuclear Explosion

A **fireball**, roughly spherical in shape, is created from the energy of the initial explosion. It can reach tens of millions of degrees.

A **shockwave** races away from the explosion and can cause great damage to structures and injuries to humans.

A **mushroom cloud** typically forms as everything inside of the fireball vaporizes and is carried upwards. Radioactive material from the nuclear device mixes with the vaporized material in the mushroom cloud.

Fallout results when the vaporized radioactive material in the mushroom cloud cools, condenses to form solid particles, and falls back to the earth. Fallout can be carried long distances on

wind currents as a plume and contaminate surfaces miles from the explosion, including food and water supplies.

The ionization of the atmosphere around the blast can result in an **electromagnetic pulse (EMP)** that, for ground detonations, can drive an electric current through underground wires causing local damage. For high-altitude nuclear detonations, EMP can cause widespread disruption to electronic equipment and networks.

[2] A fact sheet from the National Academies and the U.S. Department of Homeland Security

several kilotons. A kiloton is not the weight of the bomb but rather the equivalent energy of an amount of the explosive TNT (1kT=1,000 tons of TNT). Large military nuclear weapons are in the megaton (MT) range (1MT=1,000kT). The area that would be affected would depend on the yield of the nuclear device, the topography at the explosion site (buildings and geological structures), the altitude of the explosion, and weather conditions. The general pattern of damage for a 10-kT bomb may as follows:

● Initial effects (or prompt effects) of the nuclear explosion—the shockwave, thermal (heat) energy, and initial radiation—cover an approximately circular area of devastation. Effects decrease with distance from ground zero. For nuclear devices with a higher yield, heat damage becomes the primary initial effect of concern, eclipsing both the damage from the shockwave and the initial radiation.

● Radioactive fallout spreads in an irregular elliptical pattern in the direction the wind blows. The most dangerous fallout would occur near the explosion site within minutes of the explosion, but fallout carrying lethal radiation doses could be deposited several miles away. Fallout could potentially travel hundreds of miles, but its concentration and radiation dose decrease as it spreads and as time passes.

Secondary Hazards

The intense heat of the nuclear explosion will produce fires throughout the immediate blast zone. Damaged buildings, downed power and phone lines, leaking gas lines, broken water mains, and damaged roads, bridges, and tunnels are among the hazardous conditions that could exist. The detonation can also produce an electromagnetic pulse (EMP, see Box 1) that interferes with electronic equipment.

Persistence of Radioactivity Levels

The mixture of radioactive elements formed in a nuclear explosion is so complex, with both short- and long-lasting isotopes, that radioactive decay can only be estimated. During the first hour after a nuclear explosion, radioactivity levels drop precipitously. Radioactivity levels are further reduced by about 90% after another 7 hours and by about 99% after 2 days.

The number and type of fatalities and injuries depend on many factors including the yield of the nuclear device, the population near the site of the explosion and in the fallout path, and weather conditions. Even a partial nuclear detonation could produce many casualties in a densely populated area. An extensive weapons effects testing program and studies of the 1945 bombings of Hiroshima and Nagasaki provide what we know about the effects of nuclear explosions.

Health Effects from the Shockwave and Thermal Energy

Fatalities and injuries will result from the pressure of the shockwave, bodies being thrown, falling buildings, and flying debris. Thermal (heat) energy including the fireball can cause fatalities and severe burns to the skin and eyes.

Health Effects from Radiation

People who survive the physical shockwave and heat may suffer health effects from radiation. The health effects of radiation depend on the:

- Amount of radiation absorbed by the body (the dose, measured in unit called rads),
- Type of radiation,
- Route of exposure (absorbed by the body, inhaled, or ingested),
- Length of time exposed.

If a reasonable estimate can be made of a person's dose, health effects at that dose can be predicted with good accuracy. There are both short- and long-term effects of radiation.

Short-term Effects

Acute Radiation Syndrome (ARS) may develop in those who are exposed to radiation levels of 50-100 rad, depending on the type of radiation and the individual. Symptoms of ARS include nausea, vomiting, diarrhea, and reduced blood cell counts. Radiation, especially beta radiation, can also cause skin burns and localized injury. Fatalities begin to appear at exposures of 125 rad, and at doses between 300-400 rad, about half of those exposed will die without supportive treatment[3]. At very high doses, greater than 1000 rad, people can die within hours or days due to effects on the central nervous system.

Radiation exposure inhibits stem-cell growth; for those who die within weeks to months, death is usually caused by damage to the gastrointestinal lining and to bone marrow where stem cell growth is crucial. Fetuses are more sensitive to radiation; effects may include growth retardation, malformations, or impaired brain function.

Long-term Effects

Radiation exposure increases the risk of developing cancer, including leukemia, later in life. The increased cancer risk is proportional to radiation dose. The survivors of the Hiroshima and Nagasaki atomic bombs have about a 10% increased risk of developing cancers over normal age-specific rates, some occurring more than 50 years following the exposure. A long-term medical surveillance program would likely be established to monitor potential health

[3] Hall, E.J., 2001

effects of survivors of a nuclear attack. There is no evidence of genetic changes in survivors' children who were conceived and born after the bombings in Hiroshima and Nagasaki.

Table 1: Range in miles for significant effects.[4]

Significant effects are 50% mortality from shockwave and heat, and a radiation dose of 400 rads.

Yield	Shockwave	Heat	Initial radiation	Fallout Radiation
1	0.2	0.4	0.5	Upto 3.4
10	0.4	1.1	0.8	Up to 6.0

Early Effects of Radiation

Dose (Gy)	Effects
Up to 1.5	No short term effects
1.5-2;5	Nausea and vomiting within 3-6 hours, lasting up to 24 hours. Symptoms re-appear 10-14 days after irradiation and last for 4 weeks.
2. 5-3.5	Nausea and vomiting within 1-6 hours, lasting for 1-2 days. Symptoms re-appear 1-2 weeks after irradiation and last up to 6 weeks. Fatalities: 30 %.
3. 5-6	Nausea and vomiting within 1-6 hours, lasting for 1-2 days.

[4] National Council on Radiation Protection and Measurements,(USA) Report No. 138, 2001.

Dose (Gy)	Effects
	Symptoms re-appear 1-4 weeks after irradiation and last up to 8 weeks. Fatalities: 30-90 % within 2-12 weeks.
6-10	Nausea and vomiting within 15-30 minutes, lasting for 2 days. Fatalities: 90-100 % within 1-6 weeks.
10-25	Nausea and vomiting within 5-30 minutes; no latent period at higher doses. Fatalities: 100 % within 4-14 days.
25	Immediate nausea and vomiting. Fatalities: 100 % within a day or two.

Psycho-Social Effects

Radiation exposure in a radiation accident or nuclear can result in numerous psychiatric disorder in exposed individuals, depending upon the type of accident distance of the patient from the site of the accident, etc. Common post-disaster disorder include anxiety, Acute Organic Brain Syndrome, Post Traumatic Stress Disorder (like flashbacks, nightmares, irritability, dysfunction in normal routine, etc.), depression, numbness, acute burst of fear, panic, or aggression,.

Chapter IV Vulnerability Assessment and Risk Analysis

4.1 Introduction

Disasters impede socio-economic development. Disasters affect population where there is physical, infrastructural, environmental or socio-economic vulnerability. The higher the individual and other vulnerabilities, the higher are the risks. A comprehensive understanding of the pattern of various hazards is crucial in order to have a focus and prioritise the scarce resources for ensuring sustainable development in areas and populations at risk. Similarly, identification of various disasters and the assessment of the consequent effects of such disasters are essential to adopt preventive, preparedness, response and recovery measures to minimise losses during disasters and ensure quick recovery. For a highly populous state like UP, it is essential to ensure that vulnerability and risk reduction aspects are taken into account for all developmental plans and programmes.

Effective risk management requires information about the magnitude of the risk faced (risk assessment), and on how much importance society places on the reduction of that risk (risk evaluation). Qualification of the level of risk is an essential aspect of both preparedness planning and mitigation.

There are three essential components to the quantification or estimation of risk:

Hazard Occurrence Probability: the probability of occurrence of a specified natural hazard at a specified severity level in a specified future time period

Elements at risk: an inventory of those people or things which are exposed to the hazard

Population	**Numbers**
Human	166.2 millions as per Census 2001
Major Cattle Population in Millions as per Cattle Census 2003	
Bulls	10.18
Cows	10.86
Buffalo	17.75
Goat	12.94
Pig	2.28
Sheep	1.4

Vulnerability: the degree of loss to each element should a hazard of given severity occurs

4.2 Socio-economic Vulnerability

The vulnerability of an area is determined by the capacity of its social, physical, environmental and economic structures to withstand and respond to hazards. An analysis of the vulnerability in a given geographic location, an understanding of the socio-economic factors and the capability of the community to cope with disasters, will give an understanding to the development and disaster managers to plan for risk reduction against future hazards.

Uttar Pradesh being one of the largest states of the country is always vulnerable to nuclear attacks. Two the the countries neighbour i.e. China and Pakistan are have advanced nuclear weapon system and have the governance system that may not deter them from using against India. In the event of such attacks the western Uttar Pradesh will be most vulnerable as it is close to Capital city of Delhi. The socio-economic loss will be enormous affecting more than 30 million

population (depending on the size of such attacks) leading to loss of billions of rupees.

4.3 Hazard Vulnerability in UP

Uttar Pradesh does not have a history of any nuclear attack. But, due to present socio-political conditions, this eventuality, though very negligible, cannot be negated entirely. With surge in terrorist activities (along with possibilities of local involvement) the danger of terrorist attack using nuclear bombs, or attack from nuclear powered enemy is a possibility.

On 8 December 2004, two persons were detained by Izzatnagar Police, Bareilley, Uttar Pradesh (UP) on suspicion of being small time drug peddlers. They were carrying a sophisticated metal box, which when examined by Bhabha Atomic Research Centre, turned out to be containing 253.6 gms of 99 per cent enriched uranium. Natural uranium contains 0.7 per cent uranium 235 (U 235). To convert it into a form suitable for nuclear weapons it must be enriched by increasing the concentration of U 235 to about 90 per cent. The amount of enriched uranium needed to make a nuclear weapon varies with the degree of enrichment and the sophistication of the weapon. A 'dirty bomb', however, does not require such enriched uranium.

Technology for making atom bomb is readily available. However, enriched uranium can only be processed in state owned sophisticated facilities. Although, a highly sophisticated implosion nuclear weapon can be made from just nine to twelve kilograms (kgs) of highly enriched uranium (90 per cent), for a 'dirty bomb', the requirement is much less. Similarly, a number of thefts of Cobalt 60 have reportedly taken place from the cancer hospitals in the capital. Cobalt 60 can be used for making 'dirty bomb' easily. One does not require technical knowledge to make one. All this leads to the conclusion that there is a likelihood of nuclear material being used by terrorists to spread terror in the state.

India is already struggling with low intensity conflict and terrorism in Jammu and Kashmir and insurgencies in the North East for several years now. Various bomb blasts in the past in different parts of India including Uttar Pradesh highlights the vulnerability of the state. With a nuclear armed Pakistan as a neighbor, which itself is embroiled in turmoil and political unrest, the threat of a nuclear attack is not entirely ruled out. The likelihood of nuclear weapons, (may be of crude variety), falling into the hands of terrorists and militants can also not be ruled out. If such a catastrophe strikes, given the population density of the state, losses of human lives, assets and structural and environmental damage etc would be enormous.

Some examples of the potential targets for the terrorists in UP could include:

- Strategic missile sites and military bases such as Manauri, Bamarauli, Bareiley, Hindon, etc.
- Centres of government and state capital
- Important transportation and communication centres
- Manufacturing, industrial, technology and financial centres
- Electrical power stations and chemical plants
- Major airfields and large railway yards
- Large public gatherings such as Kumbha mela
- Military headquarters, ammunition depots and so on
- Narora power plant

Given the area and population of the state, the resources, especially the ones that will be required in case of a disaster, are not sufficient. Even the critical departments like PWD, BSNL, Fire, Revenue etc do not have sufficient resources. Moreover the resources, are not present uniformly, that is, they are concentrated in selected pockets.

Chapter V Preventive Measures and Preparedness

Unlike the management of radiation emergencies and natural disasters which essentially adopt the 'bottom-up' approach (where the response starts at the local level to begin with), a nuclear attack will require a 'top-down' approach through a well-established trigger mechanism where the National Crisis Management Committee (NCMC) will have a major role to play. The impact of a nuclear attack is beyond the coping capability of local authorities and calls for handling at the national level, and even warrants that international authorities must step in.

At the national level, the arrangements (particularly in response and recovery) are intended to permit the situation to be assessed, and to provide for the graduated marshalling and utilisation of the resources required to deal with it, under systems set up under the relevant overall plan and the participating departments and agencies' own plans.

As per the NDMA mandate, the Director General, Civil Defence, should be nominated as a nodal response agency for all nuclear disasters, except in the war zone. He would coordinate plans and organise mock drills periodically.

At present the state does not have any plans to prevent or respond to in the event of Nuclear Attack as it is more of a Central subject therefore it is entirely left to Central agencies and Armed forces to respond to such disasters.

5.1 Measures for Prevention and Preparedness against Nuclear Attacks

A. Medical Preparedness

- Creation of Decontamination Room in the district hospitals at Meerut and Gorakhpur and Sanjay Gandhi Post Graduate Institute at Lucknow with the help of experts and National Disaster Management Authority. Army hospitals

at Bareilly and Allahabad will also be requested to have decontamination rooms.

- Nuclear Ward fitted with Dust-Filter to treat the radiation affected persons.
- Radioactive bio-waste disposal facilities in the hospitals having facilities to treat affected persons.

- **Laboratories:** Following laboratories will be established in the designated districts:

- Radio Bio-Dosimetry Laboratory having Facilities like Fluorescence inSitu Hybridization (FISH) to Study Chromosomal Aberration.
- Haematology Laboratory with cell Separator for Granulocyte Concentrate
- Genetic Laboratory
- Molecular Laboratory
- Immunology Laboratory
- Bone Marrow Bank, Bone Marrow Transfusion and Stem cell Harvesting Facilities

  The Sanjay Gandhi PG Institute has such facilities in the State that will be expanded to district hospitals at Meerut and Gorakhpur.

C. **Specialised medical stores** consisting of Amifostine and other radio protectors, de-corporation agents [like diethyl triamine-penta acetate(DTPA)and prussian blue],potassium iodide, growth factors, colony stimulating factors, and radiation recovery agents will be in place.

- **Early Warning System**

The Home department of state Government will maintain direct communication with the Army and Ministries of Home and Defence of government of India in the

event of a war. A warning system using Public Address System, TV and Radio will be used to inform people about possible air-raids. An early warning already exists at all the military and air force bases which will be activated.

- **Strengthening of Intelligence Network**

The intelligence network of state police will be strengthened to gather advance information on possible terrorist or anti-national activities being planned to be carried out in the state. State police and intelligence department personnel will be trained to detect and defuse any nuclear device if found from any one. National agency such as DRDO will be engaged to impart such trainings to the select task force on nuclear devices, its defusal and other preventive aspects.

5.2 Resource Inventory

Item Name	**Qty**	**Item Name**	**Qty**
Communication		**Rescue**	
GPS Handsets	27	Control Van	6
Mobile Phone GSM	19982	Hydraulic Platform	4
Mobile Phone CDMA	776	DCP Tender	5
INMARSAT	1	Hazmat Van	1
Mini-M3	10	Extension Ladder	339
V-SAT	13	Clothing - Chemical protective (A, B, C)	66
Video Phone Set	2	Suit - NBC	2

Item Name	**Qty**	**Item Name**	**Qty**
VHF Sets Static	2669	Basket Stretcher	83
VHF Sets Mobile	1724	Pneumatic Rope Launcher	6
UHF Sets Static	103	Defibrillator	26
UHF Sets Mobile	24	Mechanical ventilators	78
Walkie Talkie Sets	2858	Fire Tender	225
HF Sets Static	127	Foam Tender	34
Transport		Rescue Tender	25
Bus	3988		
Tractor	242732	**Drinking Water**	
Trailer	4788	Water Tanker - Medium capacity	2065
Heavy Truck	6357	Water Tanker - Large capacity	133
4 wheel drive vehicle	38104-	Water filter	4240
Matador	613	Water tank	131888
Truck	13765	Reservoirs treatment tank	29
RTV	4068		
Mini Bus	962		
Light Ambulance Van	432		

Item Name	**Qty**	**Item Name**	**Qty**
Medium Ambulance Van	226		
Equipment Toeing Tender	29		
Mobilization Truck	74		

Health Infrastructure of Uttar Pradesh

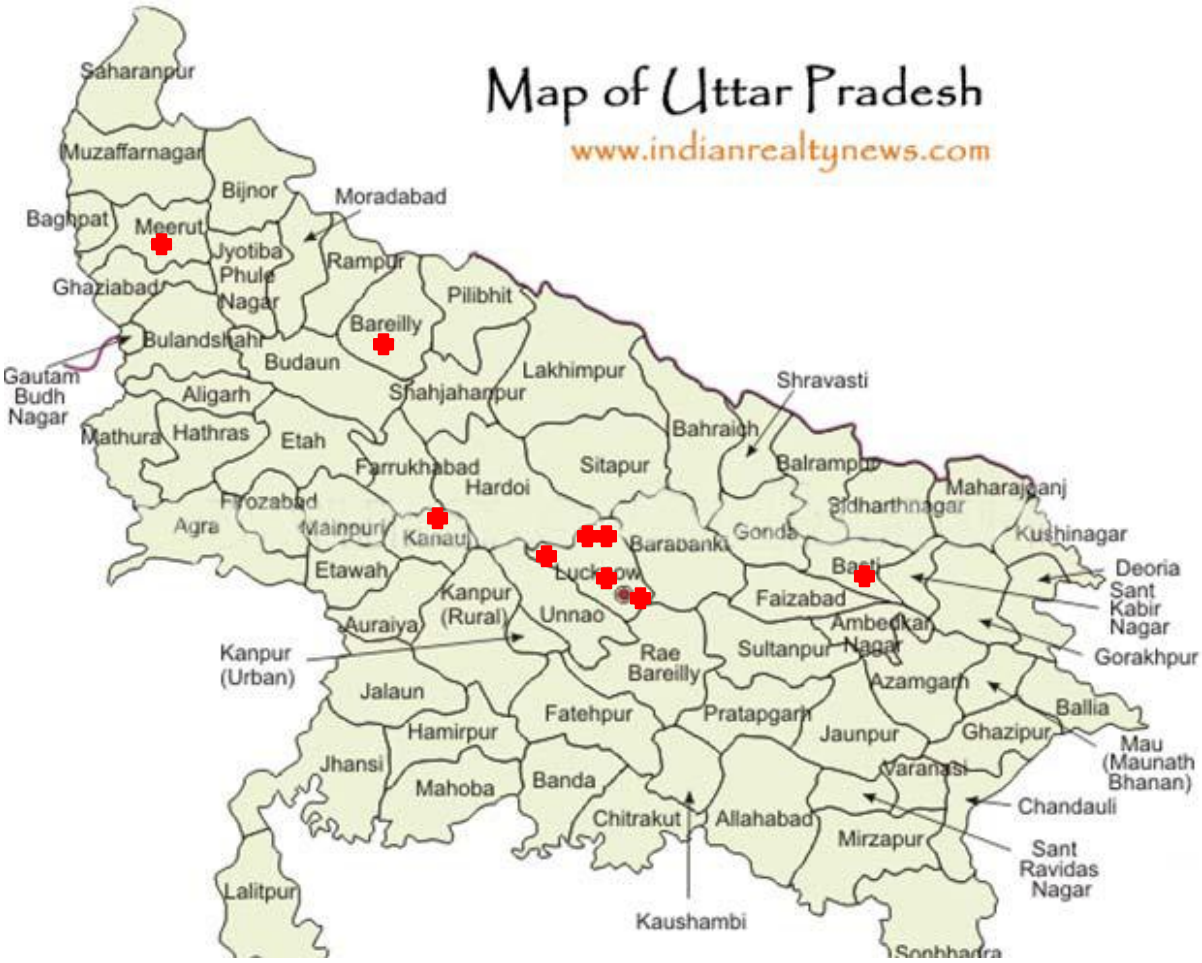
Particulars	Required	In position	shortfall
Sub-centre	26344	20521	5823
Primary Health Centre	4390	3660	730
Community Health Centre	1097	386	711
Multipurpose worker (Female)/ANM at Sub Centres & PHCs	24181	21900	2281
Health Worker (Male) MPW(M) at Sub Centres	20521	5732	14789
Health Assistant (Female)/LHV at PHCs	3660	2128	1532
Health Assistant (Male) at PHCs	3660	4061	-
Doctor at PHCs	3660	NA	NA
Obstetricians & Gynaecologists at CHCs	386	123	263
Physicians at CHCs	386	123	263
Paediatricians at CHCs	386	13	373

Particulars	Required	In position	shortfall
Total specialists at CHCs	1544	413	1131
Radiographers	386	NA	NA
Pharmacist	4046	NA	NA
Laboratory Technicians	4046	NA	NA
Nurse/Midwife	6362	NA	NA

The other Health Institution in the State are detailed as under:

Health Institution	Number
Medical College	16
District Hospitals	74
Ayurvedic Hospitals	1768
Ayurvedic Dispensaries	340
Unani Hospitals	204
Unani Dispensaries	49
Homeopathic Hospitals	1
Homeopathic Dispensary	1482

(Source: RHS Bulletin, March 2007, M/O Health & F.W., GOI)



Location of Hospitals that can Manage Mass Causalities in the State

There are specialized medical institutions like Sanjay Gandhi Post Graduate Institute of Medical Sciences situated at Lucknow, which have all the testing facilities including the advanced ones as well, but this is one of its kind and is already under severe pressure. More such centres spread over Uttar Pradesh should be settled which take lead in case of disasters.

5.3 Roles and Responsibilities for Preparedness and Mitigation

Lay down policies and plans for Nuclear Attack management in the State.	U.P. Disaster Management Authority (UPDMA)
Provide policy directions and integration of Disaster Management programmes in the state development framework.	U.P. Disaster Management Authority (UPDMA)

Maintain record of the disaster inputs for the CRF planning. Ensure that the agreed percent is allocated for the vulnerability reduction fund. Deployment of calamity relief fund	Calamity Relief Fund Committee (CRFC) Department of Revenue
Capacity Building of Medical and Para-medical staff	Health Ministry; Department of Medical Health and Family Welfare Uttar Pradesh Academy of Administration and Management (UPAAM)
Implementation of State Disaster Management Plan on Nuclear Attacks	State Executive Committee for Disaster Management (SEC)
Community Awareness on Nuclear Attacks	Department of Medical Health and Family Welfare State Technical Committee; Department of Science and Technology Department of Information
Establishment of Laboratories and Procurement of necessary items	Department of Medical Health and Family Welfare
Maintenance of Stock piles	Department of Medical Health and Family Welfare
Intelligence Network to detect plans for Nuclear Attacks	Department of Home Armed Forces
Funds for Training and Capacity Building	Department of Planning Department of Revenue

Chapter VI Response

Response involves the combating of emergencies and the provision of search, rescue and immediate relief services to those affected.

6.1 PLANNING

In case of nuclear attacks instead of bottom up, top down approach would be followed, that is, Centre would take over all response arrangements and state would simply assist the relief operations. The role would be:

(a) State

At the State level, the Crisis Management Group, chaired by the Chief Secretary with representatives of emergency services, other relevant organisations, which focus on specific aspects of response planning will be the apex body. The Group will be responsible for the State Emergency Response Co-ordination on:

- The level of response preparedness;
- Development of detailed planning and co-ordination arrangements; and
- Policy guidance and planning support for the district level institutions.

(b) District

Each of the Collectors in the 71 districts will function as the District Coordinators and in-charge of response co-ordination. The District Collector will be responsible for: the preparation of a District Contingency Plan (Response Plan), and establishment of a district response planning committee.

Each district shall have a response planning committee, chaired by the District Collector as co-ordinator, with memberships drawn from various line departments, district-level personnel of emergency services specially armed

forces and local intelligence departments/offices. The role of the district committee will be:

- Prepare and maintain a district response plan;
- Report on the level of response capability for the district to the UPDMA for handling nuclear emergencies;
- Ensure the operationalisation and review of district plans;

6.2 Response Plans

(a) **State**

The State Emergency Response Plan sets out the roles and responsibilities of the agencies involved in emergency response, and establishes the response co-ordination arrangements. The response plan does not contain detailed plans of action, and these will be prepared by the respective departments/ agencies.

At the state level the Crisis Management Group will be responsible to coordinate response mechanism with the Armed Forces and other line departments through Nodal Officers. As nuclear attacks cause mass destruction, Police department would designated as control agency under the guidance of CMG. Health department will work as a support agency to the Control agency.

(b) District

At the district level the District Collector will form a core group to respond to the nuclear attacks. The suggested members of the core group will be Senior/ Superintendent of Police, Chief Engineer, PWD, Chief Medical Officer, Vetenarary Surgeon, Information Officer, Chief of Fire Brigade, Civil Defence and Local Commander of the Army (if available).

6.3 Operational Co-Ordination

Emergency response is based on a set of arrangements, which are in position at all times. Accordingly, there is no need for activation of response. *Agencies* or

strategies may be activated when a need is evident. However, to ensure effective, efficient, quick and coordinated response, the plan shall include dates of drills and practices for various emergencies and a review report on the efficiency and performance of such drills.

Emergency response arrangements in case of nuclear attacks operate in respect of any emergency, no matter how small, in which more than one organisation are involved. Under response arrangements, primary responsibility rests at the district and State levels.

Under response arrangements, incident control is vested in control agencies, which are primarily responsible for responding to specific emergencies. Support agencies provide services, personnel or material to support or assist control agencies or affected persons. Response agencies can perform the role of either control or support agencies depending upon the particular emergency.

In the event of nuclear emergencies, the Crisis Management Group will;

- Ensure that effective control has been established in responding to an emergency;
- Ensure effective co-ordination of resources and services;
- In the event of uncertainty, determine which agency is to perform its statutory response role within a district or other specified area, where more than one agency is empowered to perform that role;
- Arrange for the provision of resources requested by control and support agencies;
- Review and dispatch situation reports;
- Ensure that consideration has been given to:
    - Alerting the public to existing and potential dangers arising from a serious emergency direct or through the media;
    - Any need for evacuation.
    - Advise recovery agencies of the emergency.

Evacuation

Evacuation is the planned relocation of persons from dangerous or potentially dangerous areas to safer areas and eventual return. It is a safety strategy that uses distance to separate the people from the danger created by the emergency. In the event of Nuclear Attacks, the evacuation will done by the specialised personnel from the Armed Forces, Civil Defence, Medical Department, Home Department (Police) and the international specialised agencies. The vulnerable population will be evacuated to safer places and be kept in the isolation till they all examined for radiation.

Legal and Operational Considerations

The designated response agencies will make an assessment of the situation and will recommend evacuation and assist evacuation of affected people through a safe and efficient evacuation process with the support of radiation experts from national, international, DRDO and Army organisations.

The decision to recommend that people evacuate will rest with the CMG and District Collectors, in conjunction with police and other expert advice, unless time constraints prevent this consultation.

6.4 Disaster Management During Post - Disaster Phase

The post-impact Disaster Management will include the following tasks:

- Assessment of radiation level and its expansion in the war affected and surrounding areas.
- Assessing primary and secondary impacts in the affected and in adjacent locations;
- Monitoring immediate assessment of physical, environmental, social, economic, and psychological impacts on various socio- economic groups at affected locations;

- Monitoring emergency response activities at different levels including rescue and search, food relief, medical aid, emergency shelter, emergency needs of vulnerable individuals/ families /social groups,
- Monitoring quality of emergency response activities and quality of relief aid provided;
- Monitoring deployment of emergency agencies and equipment;
- Monitoring role of external/non-government agencies involved in emergency management process;
- Documentation of all response activities and compilation of data/information for rehabilitation and recovery activities
- Management of necessary data and information for post-impact rehabilitation/recovery planning;
- Monitoring all recovery/rehabilitation activities carried out by different departments and agencies; and
- Documentation of response and recovery activities for learning.

6.5 Emergency Support Functions (ESFs)

The emergency support functions deals with the first response whenever a disaster strikes.

The major areas where strengthening of ESFs is required is given in the box below. In the event of nuclear attack, to respond to emergencies, there are self sufficient military and para-military agency/agencies that get into actions without waiting for any notification. The dependence of these agencies on local resources will be minimal. The assumption, as the definition of disaster enunciates, is that the normal systems have collapsed and the situation is beyond the control of local society. The first 72 hours are the most crucial in any

- Communication
- Power
- Transport
- Health and Medical Care (Mobile hospitals)
- Food
- Information and Planning
- Search and Rescue
- Public Works and Engineering
- Relief Supplies
- Donation Coordination
- Drinking Water (Water tankers/Water treatment plant)
- Shelter

emergency, because average human beings can withstand most dangers up to a maximum of 72 hours. Therefore, apart from the State Response Arrangements, the State and Central Governments will have to create quick response teams that can spring into action the moment there is nuclear strikes.

In the event of nuclear strike, the state machinery may become insufficient in handling the disaster. To overcome such obstacle, Govt. of India has developed disaster management portals which facilitates the disaster managers and administrates to track down resource stocks in the country or at least in the neighbouring areas. This website, called **www.idrn.gov.nic.in** is intended to gather data from the government resources. Data are collected from local units and line departments and uploaded by the District Administration after verification and scrutiny. In case of nuclear attacks, the incident commander will get in touch with IDNR to mobilise required resources.

6.6 Emergency Response Structure

Action	Responsible Department
Overall coordination, implementation of the EOC activities and documentation and reporting to the CMG.	Department of Revenue and UPDMA
Assessment of Damage	Ministry of Health; Ministry of Defence; Home Ministry, Agriculture and Veterinary

Action	**Responsible Department**
Deployment of Team of Experts	Armed Forces, Civil Defence DRDO, International Agencies and Department of Medical Health and Family Welfare
Monitoring Emergency Plans	Crisis Management Group
Maintenance of public infrastructure, safer places for evacuations and isolation of victims	Department of Public Works (PWD)
Security, evacuation, emergency assistance, search and rescue, first aid, law and order, communication, shifting of people to hospitals, traffic management and burial work of dead bodies.	Ministry of Defence and Home Ministry, Department of Health and Transport
Power supply for public facilities such as hospital, police stations, telecommunication building and meteorological stations.	Department of Energy
Critical communication links with disaster sites	Department of Home, Civil Defence and Armed Forces
Arrangement of Ambulances, medical care, staff, medical professionals, equipments, vaccines, medicines and para-medical staff	Department of Health
Financial Arrangements	Department of Revenue and Department of Finance
Fodder needs assessments, supply and management during disaster	Department of Animal Husbandry, Department of Panchayati Raj
Ensure that Standard Operating Procedures are adhered to	Department of Home and Department of Health and Family Welfare
Assistance in response	NGOs and INGOs

WHAT SHOULD WE DO IN CASE OF NUCLEAR ATTACK

The three basic ways people can reduce exposure to radiation are through time, distance, and shielding:
Time: Decrease the amount of time spent in areas where there is radiation.
Distance: Increase your distance from a radiation source. Doubling your distance from a point source divides the dose by four. If sheltered in a contaminated area, keep your distance from exterior walls and roofs.
Shielding: Create a barrier between yourself and the radiation source with a building or vehicle. Buildings—especially those made of brick or concrete—provide considerable shielding from radiation. Exposure is reduced by about 50% inside a one-story building and by about 90% a level below ground.

Practical Steps
If there is advanced warning of an impending nuclear attack, people should listen to authorities about whether to evacuate the area or to seek shelter underground as soon as possible.

People outside when a blast occurs should:
1. Lie face down on the ground and protect exposed skin (i.e., place hands under the body), and remain flat until the heat and shock waves have passed.
2. Cover the mouth and nose with a cloth to filter particulates from the inhaled air.
3. Evacuate or find shelter.
a. Evacuation: If a cloud of debris is moving toward them, leave the area by a route perpendicular to the path of the fallout.
b. If a cloud is not visible or the direction of the fallout is unknown, seek shelter.
A basement or center of a high-rise building away from windows or doors would be best.
4. If possibly exposed to contaminated dust and debris, remove outer clothing as soon as is reasonable; if possible, shower, wash hair, and change clothes before entering a shelter. Do not scrub harshly or scratch skin.
5. Listen for information from emergency responders and authorities.
People sheltering-in-place should:
1. Go as far below ground as possible. Shut off ventilation systems and seal doors or windows until the fallout cloud has passed, generally a matter of hours.
2. Stay inside until authorities say it is safe to come out.
3. Use stored food and drinking water.
4. Listen to the local radio or television for official information. Broadcasts may be disrupted for some time as a result of power outages.
For those in the path of the fallout who have survived the initial effects of the explosion, protection from fallout radiation is the most important life-saving measure.
Because the material can travel high into the atmosphere, the fallout dispersal pattern cannot be accurately predicted using surface winds. Authorities will advise people to either shelter-in-place or to evacuate.
People advised to evacuate should:
1. Listen for information about evacuation routes, temporary shelters, and procedures to follow.
2. If there is time before leaving, close and lock windows and doors and turn off air conditioning, vents, fans, and furnace in order to keep radioactive material from being sucked inside.

7.1 Definitions of Recovery

Recovery can be defined as "the assisting of persons and communities affected by emergencies to achieve a proper and effective level of functioning". Recovery is an enabling and supportive process that allows individuals, families and communities to attain a proper level of functioning through the provision of information, specialist services and resources. Recovery includes all aspects of mitigation and also incorporates the continuation of the enabling process, which assists the affected persons and their families not only to overcome their losses, but also to achieve a proper and effective way to continue various functions of their lives. The Recovery process is therefore a long-terms process in which everyone has a role – the Government including the self-government institutions, the NGOs, and especially the affected people, their families and the community.

7.2 Recovery after a Nuclear Attack

In case of a nuclear attack, there would be mass destruction and chances of survival in a radius of few kilometres are very bleak. The effect may spread to huge areas. The survivors and affected people spread over a large geographical area would require support, both in tangible and intangible form, to regain normalcy and start life afresh from where it got disrupted.

The Recovery Plan Should Include:

Medical Treatment

- Medical treatment would be provided to people with burns and injuries and to those suffering from radiation sickness.
- Treatment for acute radiation syndrome would include the prevention and treatment of infections, stem cell and platelet transfusions, psychological support, and careful observation of skin injury, weight loss, and fever.
- Exposed and contaminated people can be safely handled by trained responders and medical personnel. If people ingest or inhale fallout,

treatment could include the use of various diluting or mobilizing agents that help rid the body of radioactive elements. Potassium iodide or KI pills are not a general cure-all; they are only effective in blocking the uptake of inhaled or ingested radioactive iodine into the thyroid gland if taken before or just after inhalation or ingestion.

Monitoring and Clean-up of Affected Areas

Most of the fallout will dissipate after a few weeks to months. Clean-up activities would focus on areas near ground zero contaminated with long-lasting radioactive isotopes, such as certain plutonium and uranium isotopes. There are temporary measures that can be taken to "fix" radioactive materials in place and stop the spread of contamination.

These include "fixative" sprays such as flour and water mixtures, road oil, or water that can be used to wet ground surfaces. In the days and weeks following the attack, officials will:

- Establish a plan for careful monitoring and assessment of affected areas.
- Impose quarantines on contaminated areas as necessary to prevent further exposures.
- Remove contamination from areas where people might continue to be exposed.
- Keep citizens informed about the situation.

Control of Contaminated Food Supplies

Public health officials should be able to identify contaminated water and food, such as milk and produce, and replace them with clean food from outside the area.

7.3 Co-ordinating Agency for Recovery

In case of a Nuclear Attack Central Government and other national and international agencies would oversee the entire operation. The relief and recovery will spread over years to come.

7.4 Recovery Management at State Level

UPDMA will be in charge of recovery management at State level. Its overall responsibility will be:

- Develop policy issues on recovery management
- Conceive and solicit programmes from Govt. departments, district administration and NGOs.
- Prioritise projects.
- Decide on the terms and conditions of execution
- Mobilize resource for operations
- Liaise and co-ordinate with the implementing agencies
- Facilitate and Monitor operations
- Suggest norms for the recovery projects at GP and Block level
- Represent the Government in the affected community
- Present the interests, concerns and needs of affected communities to the State Government;
- Support the local management of recovery by ensuring State co-ordination of resources from all sources;

Chapter VIII Capacity Building

8.1 Capacity Building for Preparedness

The important components of preparedness include planning, evacuation plans, capacity building, well-rehearsed hospital DM plans, training of doctors and paramedics, and up-gradation of medical infrastructure at various levels to reduce morbidity mortality. The primary objective of preparedness is to have a better response mechanism from all stakeholders, that is, participation of health officials, doctors, various private and government hospitals, and the public at the national, state and district levels. Central and state government health departments also need to be equipped with state-of-the-art tools for rapid curtailment of radiation disaster.

8.2 Components of Capacity Building

Establishment of Command, Control and Coordination Functions

The incident command system needs to be encouraged and instituted so that the overall action is brought within the ambit of an incident commander who will be supported by logistics, finance, and technical teams etc. Emergency Operation Centres will be established in the Department of Home with an identical nodal person as Director (Emergency) for coordinating a well orchestrated response.

District hospitals at Meerut and Gorakhpur will be upgraded with the laboratory and other equipment facilities similar to the Sanjay Gandhi Post Graduate Institute, to response and provide necessary medical support to the affected population from nearby districts in case of Nuclear Attack.

Capacity Development for Nuclear/Radiological Emergencies

The UP Disaster Management Cell with active support of Ministry of Home Affairs, GoI, Department of Home, Government of Uttar Pradesh, UP Education Board and CBSE will introduce relevant curricular activities in the schools and colleges to build the capacity of students on nuclear and radiological related disasters.

The various first responder groups at the Centre like fire service personnel, police force, civil defence personnel, disaster response forces, medical teams, etc. will be trained extensively on nuclear emergency/disaster management through the regular courses conducted by CBRN trained personnel of the NDRF with assistance from agencies like DRDO and NDMA. There will be regular refresher courses to keep them up to date with new developments in the field of nuclear safety and security.

With assistance from DAE and DRDO, NIDM at the national level and ATIs at the state level would organise training of administrative personnel from all departments of the state governments in various aspects of the management of nuclear emergencies/disasters, including its preparedness and response requirements.

Chapter IX Institutional Arrangements & Roles and Responsibilities

9.1 Institutional Arrangement at the Centre

In accordance with the provisions of the DM Act 2005, the central government will take all such measures, as it deems necessary or expedient, for the purpose of DM and will coordinate actions of all agencies. It will ensure that central ministries and departments integrate measures for the prevention and mitigation of disasters into their developmental plans and projects, make appropriate allocation of funds for pre-disaster requirements and take necessary measures for preparedness to effectively respond to any disaster situation or disaster. The nodal ministry for the disaster management in case of Nuclear attack is the Ministry of Defence and Ministry of Home Affairs, along with other departments that are responsible for the technical aspects the disaster.

- **National Disaster Management Authority**

The Disaster Management (DM) Act 2005 lays down institutional, legal, financial and coordination mechanisms at the national, state, district and local levels. The new institutional framework is aimed at ensuring operationalisation of the national desire for a paradigm shift in DM from a post event and relief-centric syndrome to a regime that lays greater emphasis on preparedness, prevention and mitigation, leading to a more prompt and effective response to disasters.

NDMA concentrates on prevention, preparedness, mitigation, rehabilitation, reconstruction and recovery and also formulate appropriate policies and guidelines for effective and synergised national disaster response and relief. It will also coordinate the enforcement and implementation of policies and plans.

- **National Executive Committee**

The National Executive Committee (NEC) comprises the secretary to the GoI in the ministry or department having administrative control of the subject of DM, as the chairperson and the secretaries to the GoI in the ministries/departments of Agriculture, Atomic Energy, Defence, Drinking Water Supply, Environment and Forests, Finance (Expenditure), Health, Power, Rural Development, Science and Technology, Space, Communications, Urban Development, Water Resources and the Chief of the Integrated Defence Staff to Chairman of the Chiefs of Staff Committee as members.

It is the executive committee of the NDMA, and is statutorily mandated to assist the Authority in the discharge of its functions and ensure compliance of the directions issued by the central government, apart from preparing the National Plan and securing its approval by the NDMA and performing such other functions as required by the NDMA. Based on the policy and guidelines, the NEC will be responsible for preparing the national plan, getting it approved by the NDMA and then operationalising it. The NEC will also require any department or agency of the government to make available such men or material resources for the purposes of handling threatening disasters, emergency response, rescue and relief, as required by the NDMA. It will coordinate the response in the event of any threatening disaster situation or disaster. It will also perform such other functions as the NDMA may require it to perform.

- **National Disaster Response Force**

For the purpose of specialised response to a threatening disaster situation or disasters both natural and man-made, the DM Act, 2005 has mandated the creation of a National Disaster Response Force (NDRF). The general superintendence, direction and control of this force shall be vested in and exercised by the NDMA and the command and supervision of the NDRF shall vest

in an officer to be appointed by the central government as the Director General of the NDRF.

- **National Institute of Disaster Management**

The National Institute of Disaster Management (NIDM), which functions within the framework of the broad policy and guidelines laid down by the NDMA, has capacity development as one of its major responsibilities, along with training, research, documentation and the development of a national level information base. It networks with other knowledge-based institutions and assist in imparting training to trainers, DM officials, etc. It is also be responsible for synthesizing research activities and will be geared towards emerging as a 'centre of excellence' at the national and international levels.

9.2 Institutional Arrangement at the State-level

At the state level, the department of Home and Civil Defence will be the nodal departments for the emergencies of Nuclear Attacks. These will coordinate various actions taken for disaster mitigation, response and recovery.

State Guidelines on Disaster Management road map

- Setting up a State Disaster Management Authority
- State Relief & Rehabilitation Department to be converted to department of Disaster management
- State/District/Block/village Disaster Management plans
- Setting up of Emergency operations Centre
- Having Specialised Search & Rescue teams---each team consisting of one coy of State Armed Police trained in Rescue & Relief operations, one mobile engineering unit with necessary equipment, one Medical assistance team, to function as a single unit under a designated officer

- Control rooms in State and Districts to coordinate both law& order as well as disaster management
- Annual Plans, Five-year plans to specifically address disaster mitigation concerns and such plans to be given priority.
- Funds available for ongoing schemes to be used for mitigation preparedness.
- State on-line inventory of resources, both private & public to be made available for easy mobilization of resources in time of emergencies.
- Development of early warning systems
- GIS based database for Disaster Management
- Both in service training as well as initial training Curriculum to include Capsules on disaster management.
- Disaster management in school curriculum, engineering courses, certification for practicing engineers, builders, architects
- Hospital Preparedness and Emergency Health Management in Medical Education
- Strengthening of Civil Defence

Keeping in view the above guidelines, the Govt. of UP has initiated major steps towards disaster preparedness.

Uttar Pradesh Disaster Management Authority (UPDMA)

The Authority set up under the UP Disaster Management Act, 2005, is headed by the Chief Minister as its Chair person and has a 14 member Governing Body, The Authority clearly allocates responsibilities among various stakeholders and is primarily responsible for the following:

- Promoting an integrated and coordinated system of disaster management and acts as a central planning, coordinating & monitoring body for disaster management and post disaster reconstruction, rehabilitation,

evaluation and assessment as well as promoting general awareness /education.

- Evolving a total Disaster Management Support System by making use of Satellite Remote Sensing and imagery data, GIS. The UP Remote Sensing Agency, Lucknow has been designated as the special Advisor to the Authority.
- Allocation of responsibilities to the various stakeholders and coordination in carrying out their responsibilities.
- Acting as repository of information concerning disasters & disaster management
- Ensuring establishment of communication links and setting up of emergency communication and early warning systems in the State
- Developing guidelines for preparation of disaster management plans at all levels -state, district, block & village level.
- Dissemination of information and awareness building among the public.
- Setting up Crisis Management Group
- Supervising state of preparedness
- Laying down guidelines for subordinate plans
- Establishing disaster management information systems
- Coordinating disaster management training

Members of the UP State Disaster Management Authority

1 The Chief Minister of Uttar Pradesh
2 The Minister for Revenue Department
3 The Minister for Agricultural Department
4 The Chief Secretary, Uttar Pradesh
5 The Principal Secretary and Agriculture Production Commissioner
6 The Principal Secretary, Revenue
7 The Principal Secretary, Finance

8 The Principal Secretary, Home

9 The Principal Secretary, Energy

10 The Principal Secretary, Urban Development

11 The Principal Secretary, Health

12 The Principal Secretary, Irrigation

13 The Director General of Police

14 The Relief Commissioner

Special Invitees

1 The Principal Secretary, Agriculture

2 The Principal Secretary, Panchayati Raj

3 The Principal Secretary, Forest

4 The Principal Secretary, Environment

5 The Director Remote Sensing Application Centre, Uttar Pradesh

6 Department of Science and Technology

Major Initiatives by Govt. of UP

- **UP Disaster Management Act, 2005, enacted**--- third State do so after Gujarat and MP. It provides legal backing to all preparatory and post disaster measures and responses & allocates major responsibilities to all the stakeholders.
- **Setting up Uttar Pradesh State Disaster Management Authority**
- **Emergency Operations Centres** has been set up at State level in Bapu Bhawan & in 13 district HQs.
- **Closed User Group Mobile Phone Network** of the Police Department has been extended to cover all Revenue Officials at the State, Commissionery, District and Tehsil level and Fire Services etc. so that there is better connectivity during relief operations.
- Natural Resources related **GIS mapping** of districts.
- **UP Academy of Administration and Management**, Lucknow, is the Nodal Institute for all Training programmes related to Disaster Management.
- **Disaster Management Module** adopted for all in-service training programmes in the State.
- **Fire Service Training Institute**, Unnao, declared as the Nodal Institute for training in specialized Search & Rescue operations.
- **Emergency Operations Centres** has been set up at State level in Bapu Bhawan & in 13 district HQs.

Emergency Operation System

The State Emergency Operation Centre (SEOC) is the hub of all disaster related activities. The primary function of the SEOC is to implement the State Disaster Management Plan which includes coordination, data collection, operation management, record keeping, public information and resource management. Emergency Operations Centres at the State (SEOC) and the District (DEOC) and Incident Command Post (ICP) at the disaster site are the designated focal points that will coordinate overall activities and the flow of relief supplies from the State.

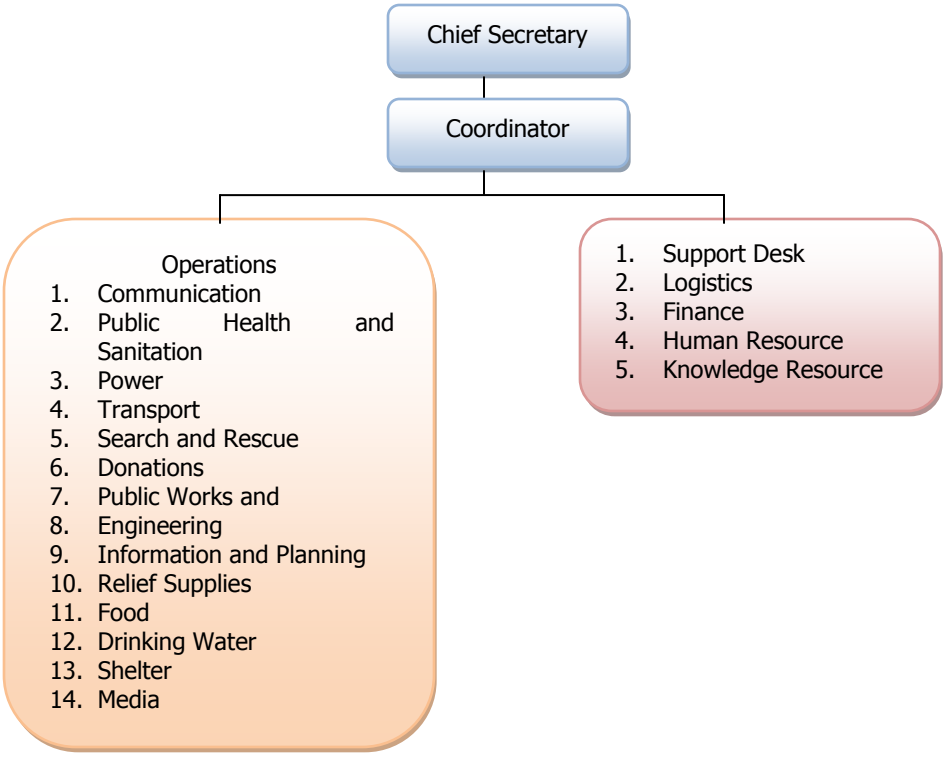
SEOC has Representatives of State Departments - Public Works, Irrigation, Energy, Home, Revenue, Health, Agriculture, Industries, Animal Husbandry and Science & Technology. During non-disaster times, the SEOC works under the supervision of the Relief Commissioner. In a disaster situation, the SEOC will come under direct control of the Chief Secretary or the person designated by him as the Chief of Operations. He is the primary role player in the EOC, and is responsible for the overall coordination and decision-making. He will also report the status of the SEOC operations and the disaster situation to the Chief Secretary.

The layout of the SEOC is given below.

- Activation of the SEOC should immediately follow the declaration of a State Level Emergency.
- The Individuals staffing the SEOC are responsible for establishing communications with their respective departments through radio and telephone etc.
- The SEOC Chief or designee will determine what staff he/she deems necessary to effectively operate the SEOC apart from the prescribed staff.
- The designated officers of the Police will provide security at the SEOC.

- It is recommended that an alternate SEOC must also be established. It is suggested to setup the backup SEOC within the secretariat building, as most of the departmental heads sits there.

Structure of the Emergency Operation System



Emergency Support Functions

This would help in proper coordination among different agencies involved in DM:

S. No	Function	Responsibility
1	Communications	• Will ensure the provision of state wide telecommunication, support to the state, and district in response efforts
2	Public health and sanitation	• Provide coordinated assistance to supplement state and local resources in response to public health and medical care needs following significance natural or man made disaster. • Resources will be furnished when the state and district resource are overwhelmed and medical and public health assistance is requested from the State government.

S. No	Function	Responsibility
3	Power	• Power To facilitate restoration of energy systems after a natural disaster
4	Transport	• Provide coordination of state transport support and local government. • Coordinate the use of transportation resources to support the need of emergency support forces requiring transportation capacity to perform their emergency response, recovery and assistance missions. It will works with outside agencies for transportation, coordination and preparedness resource request for assistance when needed.
5	Search and Rescue	• Provide specialized life saving assistance to state and local authorities. In the event of a major disaster or emergency. Its operational activities include locating, extricating and providing on site medical treatment to victims trapped in collapsed structures.
6	Donations	• Donation management is necessary to control the flow of goods and services into a disaster area. If trucks, trains, and planes are allowed into the disaster area to draw their donations, they can easily interfere with other ongoing disaster response operation. Uncontrolled donations can also put undue burden on disaster response operations, as they required scarce response resources. Above all it is necessary to manage the flow of donated gods to be sure that the needs of disaster victims are being met as effectively as possible. • Expedite delivery of voluntary goods and services to support relief effort in a coordinated manner
7	Public works and Engineering	• Provides technical advice and evaluation engineering services, contracting for construction management and inspection, contracting for emergency repair of water, and waste water treatment facilities, potable water, emergency power, real state support to assist the states in meeting the goals related to life sustaining actions, damage mitigation and recovery activities following a major disaster. Provide PW and engineering support to assist need related to life saving or protecting prior to, during and immediately following an event. Perform immediate damage assessment of the infrastructure
8	Information and Planning	• To collect, process and disseminate information about an actual or potential situation. To facilitate the overall activities of all responders in providing assistance to an effected area. Should maintain a database of all related disaster related information inform of GIS that will allow easy access and retrieval of information during a disaster.
9	Relief Supplies	• Coordinate activities involved with emergency provisions of temporary shelters, emergency mass feeding, and bulk distribution of coordinated relief supplies for victims of disasters. In some instances services may also be provided to disaster workers and logistical and resource support to local entities involved in delivering emergency and recovery efforts, shelter, food and emergency first aid following a disaster.

S. No	Function	Responsibility
		• Operate disaster welfare information, to collect receive and report the status of victims and assist family reunification; and coordinate bulk distribution of emergency relief supplies.
10	Food	• To identify the basic needs of food in the aftermath of a disaster or emergency. To obtain appropriate supplies and transporting such supplies to the disasters area and identify secure, and arrange to transport food assistance to the affected areas and authorize food stamp assistance following a major disaster or emergency requiring state response
11	Drinking water	• To provide a minimum quantity of clean drinking water and to reduce the spread of diseases through water during disaster times and to allow to people to perform daily task.
12	Shelter	• To meet the physical needs of individuals, families and communities for safe. Secure and comfortable living space. To meet primary social needs incorporating self-management in the process.
13	Media	• To provide and collect reliable information on the status of disaster and disaster victims for effective coordination of relief work at sate level.
14	Help lines	• To collect, process and disseminate information about of the welfare of citizens of the affected area and managing the tremendous flow of information. The speed with which information is received with which it changes requires that assistance be developed to ensure accuracy as well as easy and appropriate access. The help lines will be responsible for providing, directing, and coordinating, logistical resource operations.

- *During non-disaster times the ESF will operate in preparedness mode for their respective departments.*
- *Each ESF is headed by a primary agency, which has been selected based on its authority, resources and capabilities to support the functional area.*
- *Each ESF is headed by a lead department for coordinating the delivery of goods and services to the disaster area, and it's supported by various departments and agencies.*

Role of SEOC

During non-disaster times	During Disaster times
SEOC stays operational through-out the year in preparedness mode, in order to take care of the following: • Ensure that all districts prepare and regularly update the District Disaster Management Plans. • Encourage districts to prepare area-specific plans for areas prone to specific disasters.	The aim of the SEOC will be to provide centralized direction and control of all the following functions • Emergency operations • Communications and warning, which includes handling of 24 hrs emergency toll free numbers. • Handle requests for emergency personnel, equipment, state level disaster resource

During non-disaster times	During Disaster times
• Monitor training imparted to state level officials, private sector and NGOs. • Keep record of the State and district disaster management plans. • Disseminate information about the State DMP to other departments. • Ensure that the warning and communication systems and instruments in the SEOC are in working conditions round the clock. • Keep and update state level disaster resource inventory • Establish functional facility of Toll free emergency numbers • Report on Status of preparedness/vulnerability data of the district Training, monitoring support and budget allocation if required.	database and other resources • Requesting additional resources during the disaster phase from neighbouring districts of the affected Area • Coordinating overseas support and aid • Issuing emergency information and instructions specific to departments, consolidation, analysis, and dissemination of Damage Assessment data and preparation of consolidated reports • Maintain documentation of resource inventories, allocation and availability • Manage finances for SEOC operations

Equipment Requirements

The SEOC will need to operate round the clock, and may itself be subjected to adverse conditions due to the impact of disaster. It needs to be equipped with the following hardware and software for its efficient functioning:

- Resource Inventories and databank of maps and plans at block, district and state level on a GIS platform for quick retrieval and analysis.
- State-of-art communication equipment for staying linked with the Chief Secretary's office, headquarters of line departments, district collectors, field teams, media, and national and international support agencies.
- A mobile command vehicle with communication equipment.
- Workstations and communication lines for all representatives of the line ministries.
- Radios and television sets tuned to different news channels and coverage.
- Video conferencing facility.

- Projection equipment and screens.

Incident Command System

The SEOC will therefore need to field its own field teams and through them establish an Incident Command System. The system will comprise:

- Field command
- Field information collection
- Inter agency coordination at field level
- Management of field operations, planning, logistics, finance & administration

Rapid Assessment Teams and Quick Response Teams will be fielded by the SEC through the SEOC as part of the Incident Command System.

Activation Procedure of the EOC

Once the Sub-Divisional officer/SDM deems a disaster to be beyond the management capacity of local authorities, the District Disaster Management Authority (DDMA) will declare it as a District Level Disaster and activate the DEOC. Once the DDMA deems a disaster magnitude to be beyond its management capability, it will forward the report to the SEOC for deliberation at the SDMA and subsequent appropriate State intervention. On verification of the magnitude of the disaster, and the scale of response required, the State Emergency Operations Centre will get activated and after declaring a State Disaster, will take control.

Step 1: The State EOC is activated on orders from the Chief Secretary. On receipt of a disaster warning, the Chief Minister, after verification that the situation merits declaration of a State Disaster, will convene a meeting of the Crisis Management Group. Based on the ratification of the Authority, the Chief Minister, will declare a State Disaster.

Step 2: SEOC is upgraded to emergency mode. The SEOC, till then operating in the preparedness mode, will be upgraded to the emergency mode. Concerned line departments will be informed to post their representatives at the SEOC on a round the clock basis with immediate effect. SEOC will be activated and all community preparedness measures will be put into operation and the ESF to be on full alert and activate their SOPs. The activation of the SEOC should be followed after the DDMA declares a major disaster.

Step 3: Field Assessment Reports. The Chief Secretary/Relief Commissioner will assume the role of the Chief of Operations for Disaster Management. The Chief of Operations of the EOC will coordinate for setting up the ESFs and are asked to prepare and send the Field Assessment Report to the SEOC. The Chief of Operations of the SEOC will spell out the priorities coordinate services of the ESFs, including national and aid agencies.

Quick response teams of specialized personnel will have to be sent for effective management of disaster. Depending on the magnitude of the disaster, two different types of teams will be fielded by the SEOC: (i) Rapid Assessment Teams; (ii) Quick Response Teams

Rapid Assessment Teams

The Rapid Assessment Teams will be multi-disciplinary teams comprising four or five members. They will mainly comprise senior level specialized officers from the field of army, civil defence, police, health, engineering, search and rescue, communication and one who have knowledge of disaster affected area, physical characteristic of the region, language etc. These officials should share a common interest and commitment. There should be a clear allocation of responsibilities among team members. To make a first / preliminary assessment of damage, the assessment report will contain the following basic elements or activities:

- Human and material damage
- Resource availability and local response capacity
- Options for relief assistance and recovery
- Needs for national / international assistance

Quick Response Teams / Rapid Response Teams

Deployment of search and rescue teams can help in reducing the numbers of deaths. A quick response to urgent needs must never be delayed for the reason that a comprehensive assessment has yet to be completed. The following teams must be sent to disaster site or disaster affected area as early as possible, even prior to First Information Report.

- First Aid Team
- Search and Rescue team
- Communication Teams
- Power Team
- Relief Teams
- Rehabilitation teams
- Transport Team

All other focal departments will keep ready their response teams, which may be deployed after receiving the first information report.

Crisis Management Group

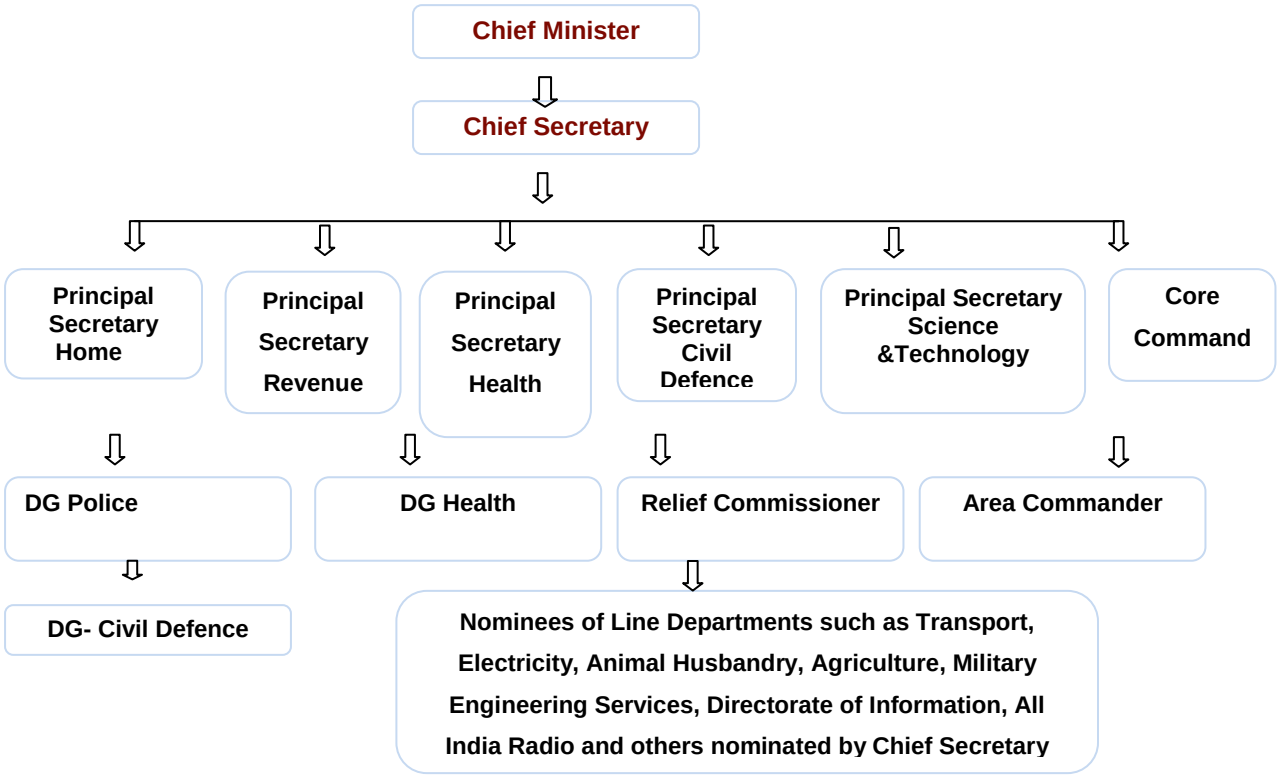
Suggested framework for Crisis Management Group at State:

1. Chief Secretary, Uttar Pradesh: Chairperson
2. Principal Secretary, Home: Coordinator
3. Principal Secretary, Civil Defence: Coordinator
4. Principal Secretary, Revenue
5. Principal Secretary, Medical, Health and Family Welfare
6. Director General Police, U.P: Member

7. Additional Director General Police (Information): Member
8. Joint Director (I.P) Lucknow: Member
9. Relief Commissioner: Member
10. Principal Secretary, Science and Technology
11. Any alternative officer can also be nominated as a member of the Group by a member in case of his/her absence

Crisis Management Group should have a representative from Army.

Structure of Crisis Management Group at State Level



Crisis Management Group at State Level: Functions

•This group has to remain informed of all developments in case of any Biomedical disasters.

•The group has to send alerts to all districts and related persons of any activities/developments that have any impacts on the security or on normal functioning in any way.

•The group also has to provide advice and guidelines to other adjoining areas to avoid any negative impacts on them.

•This group has to co-ordinate with the central and other state governments. The group can ask for required assistance by coordinating with Central Para military forces, other Police forces, Intelligence and Security agencies.

•The Group has to report to the Crisis Management Group at Centre informing about its progress and developments.

Crisis Management Group at District Level: Composition

(1) District Magistrate: Chairperson

(2) Superintendent of Police / Inspector General Police: Member

(3) Local Representative of Intelligence Bureau: Member

(4)Chief medical Officer

(5) Additional District Magistrate (Finance & Revenue): Co-ordinator

(6) Local Army Commander

(7) Any other member designated by the district collector

Crisis Management Group at District Level: Functions

•District Crisis Management Group is responsible for managing the situation in case of any Emergency/Crisis.

•The group will arrange for required assistance from all concerned agencies in case of any emergency.

•If some specialist team has been engaged for assistance by District/State Crisis Management Group, then the group has to consider the advice of the team. But the final decision rests with the District/State Crisis Management Group.

Crisis Management Group at Departments

Each Department shall have a Crisis Management Group headed by the Secretary of the Department for managing emergencies relevant to the subject dealt with by the department, and report to the State Crisis Management Group.

District Disaster Management Authority

At the cutting edge level, the District Disaster Management Authority (DDMA) headed by the District Magistrate, with the elected representative of the local authority as the co-chairperson, acts as the planning, coordinating and implementing body for DM and take all necessary measures for the purposes of DM in the district in accordance with the guidelines laid down by the NDMA and SDMA. It is responsible for preparing the district DM plan including the response plan for the district, coordinate and monitor the implementation of the national policy, the state policy, the national plan, the state plan and the district plan and ensure that the guidelines for prevention, mitigation, preparedness and response measures laid down by the NDMA and the SDMA are followed by all departments of the government at the district level and the local authorities in the district.

Local Authorities

These include Panchayati Raj Institutions (PRIs) and Urban Local Bodies (ULBs), such as municipal corporations, municipalities, district and cantonment boards and town planning authorities for control and management of civic services. PRIs and ULBs will ensure capacity building of their officers and employees in DM, carry out relief, rehabilitation and reconstruction activities in the affected areas and will prepare DM plans in consonance with the guidelines of the NDMA, SDMAs and DDMAs.

Chapter X Partnerships with other Stakeholders

Non Government Organisations

They will be involved for community education and sensitization. Community-based social workers can assist in first aid, psychosocial care, distribution of food, water, and organization of community shelters under the overall supervision of elected representatives of the community.

International Cooperation

Disaster of this nature would also need international cooperation. Agencies like World Health Organisation (WHO) and Red Cross can play an important role in carrying out relief and rehabilitation post this disaster.

Public Private Partnership

The private sector has substantial infrastructure capabilities and is engaged in R&D for various products that are part of defence research. Government agencies like DRDO can collaborate with private sector. Also, the private sector can play a major role in enhancing the nation's preparedness by integrating its capacities with government organizations such as DRDE and NICD. They may also provide facilitation for:

Collaboration with international pharma agencies and other technical laboratories for meeting the peak requirement of drugs during disaster period

Sourcing and procurement of counter-measures available with manufacturing capacities in a ready state to enable their continuous supply

Developing a PPP system for stockpiling, distribution and cold chain system for sophisticated diagnostic kits and antidotes

Private sector facilities are required to be included in district-level DM plans and collaborative strategies evolved to effectively utilize their manpower and infrastructure.

Role of Community

While all the stakeholders do have some role or the other to play in all the four stages, the role of the community is most pronounced in all the stages. Particularly, the communities have to meet the challenges on their own during and immediately after a disaster. The community during a disaster has a shared responsibility of providing physical and psychological support to each individual, particularly to the vulnerable sections.

Mass Media

The role of media is vital in educating the people about disasters; warning of hazards, gathering and transmitting information about affected areas, alerting government officials, relief organisations, and the public to specific needs and facilitating discussions about disaster preparedness and response leading to greater transparency in the whole operation. A regular and effective working relationship with the media will be developed. Regular, routine interaction, before a disaster is important for effective working relationships in the aftermath of a disaster. Media and the disaster mitigation organisations should be encouraged to take advantage of opportunities to work together, to provide relevant training for reporters and field personnel to enhance disaster preparedness, mitigation and relief efforts and the timeliness, quality, and accuracy of reporting about natural hazards.

Chapter XI Financial Arrangements

Financial Resources for Implementation

In case of a nuclear attack, massive expenditure on relief, rescue and rehabilitation would be required. This should therefore, be the underlying principle for allocation of adequate funds at industry and government level for prevention, mitigation and preparedness rather than concentrating on their management at the time of a disaster. The basic principle of return on investment may not be applicable in the immediate context but the long-term impact would be highly beneficial. Thus, financial strategies should be worked out such that necessary finances are in place and flow of funds is organised on a priority basis by the identification of necessary functions, both in the phases of preparedness and response, relief and rehabilitation respectively.

Finance Commissions

After Independence, the history of funding relief expenditure is intertwined with the awards of the Finance Commissions. These Commissions were appointed under Article 280 of the Constitution of India every five years. They were mandated, amongst others things, to assess the funding needs (non developmental) of the States, and to figure out grants to the States. The Finance Commissions make recommendations on the mechanisms by which the Central Government can assist States in funding expenditure on relief. Earlier, the Commission was restricted to suggesting the pattern of financial assistance by the Centre. Now, the recommendations even cover the "scheme of financing relief expenditure".

It was recognized that the primary responsibility of handling disasters vested with the States. The Central Government however, was expected to provide financial support. The First Finance Commission (1952) provided for Central assistance equivalent to 50% of the requirements for relief works. This was in

the form of loans and a grant (not exceeding $ 0.45 million annually per State) for gratuitous relief to destitute. Further assistance could be provided to States to handle severe natural calamities through advances.

The Fourth Finance Commission introduced the system of Central Team visits to affected States. It was necessary where the Relief Expenditure on a calamity was expected to exceed $ 200000. Emphasis was usually placed on funding relief expenditure, as far as possible, within the Plan allocations. The Central Government was expected to fund only half of the expected expenditure. Since most States in India were under fiscal stress, a need was realized to make available recurring funds to States to fund immediate relief effort in routine calamities. This was popularly known as "margin money". Each State was sanctioned a certain amount based on its past expenditure on relief. Any amounts in excess of this margin money, after severe calamities were to be assessed by Central Teams. Additional Central assistance was envisaged only, where relief requirements of a severe calamity could not be met from state resources.

The Ninth Finance Commission (1991) through the Calamity Relief Fund (CRF) extended the concept of "margin money". The CRF provided for contributions of the Central and State Governments in the ratio of 3:1. The Fund was to be kept outside the Government Account. This was to avoid cash flow difficulties in initiating relief operations. The contributions of the Central and State Governments credited twice a year. The Chief Secretary of the state operates this fund with a committee. The CRF concept was only different from margin money in that it prescribed a larger contribution by the Central Government.

The fundamental shift was in the introduction of the 'normative approach' to relief expenditure. This approach entailed expenditure from CRF on predetermined items, at predetermined rates. This system is there, despite procedural changes suggested by later Finance Commissions. For calamities of a

severe nature, where the relief expenditure could not be funded from the CRF, the Eleventh Finance Commission in 2001, constituted a National Calamity Contingency Fund (NCCF).

Although the primary responsibility of DM is of the State Governments, the Central Government plays a key role in providing financial and logistic assistance to the states in tackling both natural and man-made disasters. The administration of Nuclear Attacks would be responsibility of Department of Home and Civil Defence.

Hence, financing of will be explored from the following sources:

- From budgetary provisions for recovery plans and programmes in normal developmental activities; at State, District and village level
- Calamity Relief Fund
- National Calamity Contingency Fund
- Prime Minister's Relief Fund
- Chief Minister's Relief Fund
- Special programmes of Govt. of India
- Loans and assistance from national and international funding agencies

In case of nuclear attack, major portion of funding would come from Central government and if required international agencies.

Immediate Financial Resources

At present the required amount for training and capacity building of the field staff and medical professionals may be allocated from the Calamity Relief Fund. However in future the National Disaster Mitigation Fund proposed by Government of India can be explored to meet the cost of maintaining inventory, establishment of labs, provision of equipments, capacity building of staff, and awareness and education.

Chapter XII **Follow Up**

Follow up Actions

The UPSDMP has evolved out of secondary sources and consultation with departments involved with DM in UP. Various mechanisms of disaster preparedness, responses, and recovery followed in different parts of the world were also taken into account while preparing the document. This chapter discusses follow up actions that have to be undertaken by various agencies/departments to operationalise the Plan.

12.2 Priority Areas for Follow Up Action

Some of the priority areas which need immediate attention or updating from time to time are:

• Preparation of district, block, municipality and Gram Panchayat plans (based on village as the unit of planning)

• Preparation of Standard Operation Procedures and field manuals

•Preparation of handbooks and checklists for prevention, preparedness, response, mitigation activities

•Review existing developmental schemes/ projects and incorporate disaster management principle in all schemes and all plans

• Ensuring sensitivity and incorporation of environment, gender, ethnicity, vulnerability of socio-economically disadvantaged groups (Children, elders and the physically challenged), food and income security, disaster proofing measure in all development, response and recovery plans

• Modernisation of existing control rooms and strengthening of infrastructure in disaster prone areas keeping in mind the vulnerability to different hazards

• Preparation and updating technical and quality control aspects of all civil constructions and non civil installations based on review of past disasters

• Updating existing Laws, Rules and Codes for better administration of relief and recovery measures to the affected people during and after a disaster.

• Similarly enforcement of other relevant Laws and Rules has considerable significance in reducing the risk and impact of disasters.

The response to a disaster requires both indigenous systems as well as effective planning and preparedness strategies. Since the damage and effect of the disasters are so extreme, in case of a response situation, multiple players have to effectively coordinate and communicate with each other for a quick and efficient recovery and control over the emergency situation. However, both the response and recovery measures require detailed and unique planning and implementation strategy from all the stakeholders keeping in mind the local economic, social and cultural variables.

Primarily, all concerned departments/agencies or authorities will have to further detail out their operations in respect of Emergency Support Functions, emergency preparedness, mitigation and recovery measure as per the guidelines given in this document.

12.3 List of Checklists and Handbooks

Documents Required for Quick Assessment and Response

1. Declaration of Format of Disaster
2. Deployment of Assessment Team-Format
3. SRC Responsibilities-Handbook
4. Survival Kit-Checklist
5. Assessment Equipment – Checklist
6. Damage Assessment – Format
7. Format for Media Release
8. Handbooks for International NGOs, NGOs, Media personnel, Researchers/Students, Field/Relief Workers, Volunteers and Government Functionaries
9. Emergency Operation Centre Checklists
10. Layout and dimensions, equipment, etc.,
11. ESF Desk – Checklist
12. Do's and don'ts to be followed during disaster times

14. Regular staff – Schedule and Checklist
15. Staff on Call – Schedule and Checklist
16. Staff on Disaster Duty – Schedule and Checklist

Documents for Disaster Management Teams

1. Communication
2. Checklist of tool kits
3. Handbook on Disaster Telecommunication Assistance
4. Handbook on Team Equipment and Inventory
5. Responsibilities of Primary Agency
6. Responsibility of each Support Agency
7. Emergency tool kits
8. Equipment Damage Assessment Operational checklists
9. On-site operations
10. Planning checklist
11. Deactivation checklist
12. List of PSUs and Private Agencies

Public Health and Sanitation

1. Detailed checklist of symptoms of common diseases along with medicine dosages for each disease
2. Checklist of doctor's tool kit for specialised doctors
3. Checklist for maintaining hygienic conditions
4. Disaster Health Assistance and emergency services
5. Team Equipment and Inventory
6. Responsibilities – Primary /Support Agencies
7. Minimum standards of health facilities
8. Location of health facilities in disaster area (map)
9. Information manual for biological disaster

10. Doctor's manual for emergency relief
11. Emergency toolkits
12. Operational checklists for health officials
13. Planning checklist - Qualification of health personnel –
14. Checklist of doctor's tool kit - Symptoms of common ailments
15. Deactivation checklist ¤ Dosages checklist for common epidemics and ailments during a disaster

Power

1. Handbook on Disaster Power Assistance (alternative power supply arrangements and quick restoration of electrical installations)
2. Handbook on Team Equipment and Inventory
3. Responsibilities of Primary Agency
4. Responsibility of each Support Agency
5. Manuals on handling of equipment which is unique to a particular disaster
6. Emergency toolkits
7. Operational checklists
8. Equipment Damage Assessment
9. On-site operations
10. Planning checklist
11. List of PSUs and private agencies

Transport

1. Inventories of available transport facilities ¤ Responsibilities of Primary Agency
2. Responsibility of each Support Agency
3. Handbook on transport assistance
4. Handbook on Team equipment and Inventory
5. Emergency tool kits

6. Operational checklists
7. Equipment Damage Assessment
8. On-site operations
9. Formats for check of roads, bridges and other civil works
10. Planning checklist
11. List of PSUs and private Agencies

Search and Rescue

1. Training handbooks on Search & Rescue
2. Inventory of professionally trained volunteers in Search & Rescue
3. Handbook on team Equipment and Inventory
4. Responsibilities of Primary Agency
5. Responsibility of each Support Agency
6. Emergency toolkits, search & rescue kits/equipments
7. Operational checklists ¤ Medical tool kits
8. On-site aerial surveys
9. MFR and CSSR kits
10. Deactivation checklist
11. List of PSUs and Private Agencies/NGOs working in the area

Relief Supplies

1. Handbook on Relief Supplies Assistance ¤ Handbook on Team Equipment and Inventory
2. Responsibilities of Primary Agency and each Support Agency
3. Guidelines on specific types of items for each type of disaster
4. Guide for developing relief supplies needs list
5. Manual on disaster-specific relief operations Emergency tool kits
6. Emergency tool kits
7. Operational checklists for team leaders and team members

8. Handling/Storage of relief supplies
9. On-site operations ¤ Planning checklist
10. Deactivation checklist
11. List of PSUs and Private Agencies

Shelter

1. Inventories of manufacturing agencies
2. Procedures of storage
3. Minimum standards for relief camps
4. Minimum requirement of space per person
5. Handbook on Team Equipment and Inventory
6. Responsibilities of Primary Agency
7. Responsibility of each Support Agency
8. Handbook on tent structure and other collapsible structures
9. Handbook on assembling of structures
10. Inventories of agencies that can be used for putting up tents

ANNEXURE-1

Alphabetical listing of divisions

Division	Headquarters	Districts
Agra division	Agra	Agra Firozabad Mainpuri Mathura
Aligarh division	Aligarh	Aligarh Etah Mahamaya Nagar Kanshiram Nagar
Allahabad division	Allahabad	Allahabad Fatehpur Kaushambi Pratapgarh
Azamgarh division	Azamgarh	Azamgarh Ballia Mau
Bareilly division	Bareilly	Badaun Bareilly Pilibhit Shahjahanpur
Basti division	Basti	Basti Sant Kabir Nagar Siddharthnagar
Chitrakoot division	Chitrakoot	Banda Chitrakoot Hamirpur Mahoba
Devipatan division	Gonda	Bahraich Balarampur Gonda Shravasti
Faizabad division	Faizabad	Ambedkar Nagar Barabanki Faizabad Sultanpur
Gorakhpur division	Gorakhpur	Devaria Gorakhpur

		Kushinagar Maharajganj
Jhansi division	Jhansi	Jalaun Jhansi Lalitpur
Kanpur division	Kanpur	Auraiya Etawah Farrukhabad Kannauj Kanpur Dehat Kanpur Nagar
Lucknow division	Lucknow	Hardoi Lakhimpur Kheri Lucknow Raebareli Sitapur Unnao
Meerut division	Meerut	Bagpat Bulandshahr Gautam Buddha Nagar Ghaziabad Meerut
Mirzapur division	Mirzapur	Mirzapur Sant Ravidas Nagar Sonbhadra
Moradabad division	Moradabad	Bijnor Jyotiba Phule Nagar Moradabad Rampur
Saharanpur division	Saharanpur	Muzaffarnagar Saharanpur
Varanasi division	Varanasi	Chandauli Ghazipur Jaunpur Varanasi

Annexure - 2

Alphabetical listing of districts

Code [9]	District [10]	Headquarters [10]	Population As of 2001[update] [10]	Area (km2) [10]	Density (/km2 [10]
AG	Agra	Agra	3,611,301	4,027	897
AH	Allahabad	Allahabad	4,941,510	5,424	911
AL	Aligarh	Aligarh	2,990,388	3,747	798
AN	Ambedkar Nagar	Akbarpur	2,025,373	2,372	854
AU	Auraiya	Auraiya	1,179,496	2,051	575
AZ	Azamgarh	Azamgarh	3,950,808	4,234	933
BB	Barabanki	Barabanki	2,673,394	3,825	699
BD	Badaun	Badaun	3,069,245	5,168	594
BG	Bagpat	Bagpat	1,164,388	1,345	866
BH	Bahraich	Bahraich	2,384,239	5,745	415
BI	Bijnor	Bijnor	3,130,586	4,561	686
BL	Ballia	Ballia	2,752,412	2,981	923
BN	Banda District	Banda	1,500,253	4,413	340
BP	Balrampur	Balrampur	1,684,567	2,925	576
BR	Bareilly	Bareilly	3,598,701	4,120	873
BS	Basti	Basti	2,068,922	3,034	682
BU	Bulandshahr	Bulandshahr	2,923,290	3,719	786
CD	Chandauli	Chandauli	1,639,777	2,554	642
CT	Chitrakoot	Chitrakoot	800,592	3,202	250
DE	Deoria	Deoria	2,730,376	2,535	1,077
ET	Etah	Etah	2,788,270	4,446	627
EW	Etawah	Etawah	1,340,031	2,287	586
FI	Firozabad	Firozabad	2,045,737	2,361	866
FR	Farrukhabad	Fatehgarh	1,577,237	2,279	692
FT	Fatehpur	Fatehpur	2,305,847	4,152	555
FZ	Faizabad	Faizabad	2,087,914	2,765	755
GB	Gautam Buddha Nagar	NOIDA	1,191,263	1,269	939
GN	Gonda	Gonda	2,765,754	4,425	625
GP	Ghazipur	Ghazipur	3,049,337	3,377	903
GR	Gorkakhpur	Gorakhpur	3,784,720	3,325	1,138

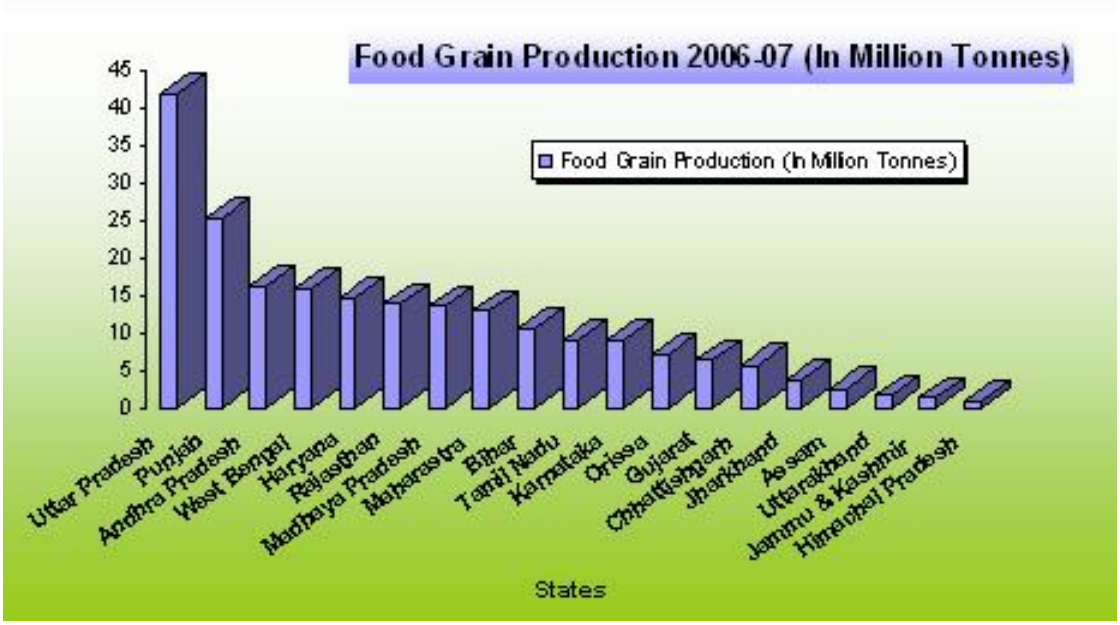
GZ	Ghaziabad	Ghaziabad	3,289,540	1,956	1,682
HM	Hamirpur	Hamirpur	1,042,374	4,325	241
HR	Hardoi	Hardoi	3,397,414	5,986	568
HT	Mahamaya Nagar	Hathras	1,333,372	1,752	761
JH	Jhansi	Jhansi	1,746,715	5,024	348
JL	Jalaun	Orai	1,455,859	4,565	319
JP	Jyotiba Phule Nagar	Amroha	1,499,193	2,321	646
JU	Jaunpur District	Jaunpur	3,911,305	4,038	969
KD	Kanpur Dehat	Akbarpur	1,584,037	3,143	504
KJ	Kannauj	Kannauj	1,385,227	1,993	695
KN	Kanpur Nagar	Kanpur	4,137,489	3,029	1,366
-	Kanshi Ram Nagar	Kasganj	-	-	-
KS	Kaushambi	Manjhanpur	1,294,937	1,837	705
KU	Kushinagar	Padarauna	2,891,933	2,909	994
LA	Lalitpur	Lalitpur	977,447	5,039	194
LK	Lakhimpur Kheri	Kheri	3,200,137	7,680	417
LU	Lucknow	Lucknow	3,681,416	2,528	1,456
MB	Mau	Mau	1,849,294	1,713	1,080
ME	Meerut	Meerut	3,001,636	2,522	1,190
MG	Maharajganj	Maharajganj	2,167,041	2,948	735
MH	Mahoba	Mahoba	708,831	2,847	249
MI	Mirzapur	Mirzapur	2,114,852	4,522	468
MO	Moradabad	Moradabad	3,749,630	3,648	1,028
MP	Mainpuri	Mainpuri	1,592,875	2,760	577
MT	Mathura	Mathura	2,069,578	3,333	621
MU	Muzaffarnagar	Muzaffarnagar	3,541,952	4,008	884
PI	Pilibhit	Pilibhit	1,643,788	3,499	470
PR	Pratapgarh	Pratapgarh	2,727,156	3,717	734
RA	Rampur	Rampur	1,922,450	2,367	812
RB	Rae Bareli	Rae Bareli	2,872,204	4,609	623
SA	Saharanpur	Saharanpur	2,848,152	3,689	772
SI	Sitapur	Sitapur	3,616,510	5,743	630
SJ	Shahjahanpur	Shahjahanpur	2,549,458	4,575	557
SK	Sant Kabir Nagar	Khalilabad	1,424,500	1,442	988

SN	Siddharthnagar	Navgarh	2,038,598	2,751	741
SO	Sonbhadra	Robertsganj	1,463,468	6,788	216
SR	Sant Ravidas Nagar	Gyanpur	1,352,056	960	1,408
SU	Sultanpur	Sultanpur	3,190,926	4,436	719
SV	Shravasti	Shravasti	1,175,428	1,126	1,044
UN	Unnao	Unnao	2,700,426	4,558	592
VA	Varanasi	Varanasi	3,147,927	1,578	1,995

Annexure -3

Demographic, Socio-economic and Health profile of Uttar Pradesh State as compared to India figures

S. No.	Item	Uttar Pradesh	India
1	Total population (Census 2001) (in million)	166.20	1028.61
2	Decadal Growth (Census 2001) (%)	NA	21.54
3	Crude Birth Rate (SRS 2007)	29.5	23.1
4	Crude Death Rate (SRS 2007)	8.5	7.4
5	Total Fertility Rate (NFHS-III)	3.8	2.7
6	Infant Mortality Rate (SRS 2007)	69	55
7	Maternal Mortality Ratio (SRS 2001 - 2003)	517	301
8	Sex Ratio (Census 2001)	898	933
9	Population below Poverty line (%)	31.15	26.10
10	Schedule Caste population (in million)	35.15	166.64
11	Schedule Tribe population (in million)	0.11	84.33
12	Female Literacy Rate (Census 2001) (%)	42.2	53.7



Annexure -4

Detailed Information about important Departments and Institutions

Administrative Department	
Administrative Reforms Department	Agriculture Production Commissioner
Ambedkar Gram Vikas Vibhag	Animal Husbandry & Fisheries
Appointment Department	Backward Welfare - Citizen Charter
Banking & Institutional Finance	Board of Revenue
Chief Minister Office	Civil Aviation
Cooperative Department	Customs and Central Excise Kanpur
Election : Office of Chief Electoral Officer	Entertainment Tax
Excise Department	Externally Aided Projects Department
Finance Department	Fisheries Department
Food & Civil Supplies	Forest Department
Geology & Mining Directorate	Handicap Welfare Department
Handloom Directorate	Higher Education Department
Horticulture Department	Housing Department
Industrial Development	Information Directorate
Information Technology & Electronics	Irrigation
Land Records	Mahila Kalyan

Medical, Health & Family Welfare	Minor Irrigation Department
Planning Department	Prantiya Rakshak Dal & Youth Welfare
Public Works Department (PWD)	Rajya Sampatti Vibhag
Revenue (Scarcity)	Rural Engineering
Rural Development	Ruralsoft
Sarvjanik Udyam Vibhag	Sericulture
Sports Directorate	Town and Country Planning Department
Trade Tax	Transport Department
Treasuries	Uttar Pradesh Budget
Uttar Pradesh Ganna Vikas Vibhag	Uttar Pradesh Police
Vidyut Suraksha	Vigilance Department
E-mail Directory	Raj Bhawan, Uttar Pradesh
Vidhan Sabha, Uttar Pradesh	High Court, Allahabad, Uttar Pradesh
Etawah Court	Kanpur Dehat Court
Lok Ayukta, Uttar Pradesh	Sankhikiya Patrika
State Election Commission, U.P.	State Information Commission, U.P.

Source: http://www.upgov.nic.in

Central Government Offices	
Accountant General, Uttar Pradesh and Uttaranchal	Advanced Level Telecommunication Training Centre(ALTTC)
Aligarh Muslim University(AMU)	Artificial Limbs Manufacturing Corporation of India(ALIMCO)
Bal Vikas Pariyojana Parishad, Uttar Pradesh	Banaras Hindu University(BHU)
Birbal Sahni Institute of Palaeobotany	Cantonment Board, Jhansi
Central Avian Research Institute(CARI)	Central Drug Research Institute(CDRI)
Central Government Health Scheme(CGHS), Allahabad	Central Ground Water Board, Northern Region, Lucknow
Central Institute for Research on Goats(CIRG)	Central Institute of Higher Tibetan Studies(CIHTS)
Central Institute of Medicinal and Aromatic Plants(CIMAP)	Chief Electoral Officer, Uttar Pradesh
Competent Authority, Customs and Narcotics, Lucknow	Customs and Central Excise, Kanpur

Department of Computer Science and Engineering, Indian Institute of Technology, Kanpur	Diesel Locomotive Works(DLW)
Educational Consultants India Limited(EDCIL)	Fertilizer Corporation of India Limited(FCIL)
Field Gun Factory, Kanpur	Giri Institute of Development Studies(GIDS)
Homoeopathic Pharmacopoeia Laboratory(HPL)	India Government Mint, Noida
Indian Institute of Information Technology, Allahabad(IIITA)	Indian Institute of Management, Lucknow(IIML)
Indian Institute of Pulses Research(IIPR)	Indian Institute of Sugarcane Research(IISR)
Indian Institute of Technology, Kanpur(IITK)	Indian Institute of Vegetable Research(IIVR)
Indian Veterinary Research Institute(IVRI)	Indira Gandhi Rashtriya Uran Academy(IGRUA)
Industrial Toxicology Research Centre(ITRC)	Inland Waterways Authority of India(IWAI)
Institute of Technology, Banaras Hindu University	Kendriya Hindi Sansthan
Krishak Bharati Co-operative Limited(KRIBHCO)	Mehta Research Institute of Physics and Mathematical Physics
Motilal Nehru National Institute of Technology(MNNIT), Allahabad	National Academy of Sciences
National Botanical Research Institute(NBRI)	National Centre for Medium Range Weather Forecasting(NCMRWF)
National Commissioner for Linguistic Minorities	National Handloom Development Corporation Limited(NHDC)
National Institute for Entrepreneurship and Small Business Development(NIESBUD	National Internet eXchange of India(NIXI)
National Research Centre for Agroforestry(NRCAF)	National Research Laboratory for Conservation of Cultural Property(NRLC
National Sugar Institute	Noida Special Economic Zone(NSEZ)
North Central Zone Cultural Centre(NCZCC)	North Eastern Railway
Northern India Textile Research	Northern Railway Carriage and

Association(NITRA)	Wagon Workshop(NRC&W)
Principal Controller of Defence Accounts(Central Command	Principal Controller of Defence Accounts(Pensions
Projects and Development India Limited(PDIL	Railway Recruitment Board, Allahabad
Railway Recruitment Board, Gorakhpur	Rampur Raza Library
Research Designs and Standards Organisation(RDSO	Small Industries Service Institute(SISI), Kanpur
State Institute of Education Technology, Lucknow	Uttar Pradesh(East) Telecom Circle
Uttar Pradesh(West) Telecom Circe	V. V. Giri National Labour Institute(VVGNLI

Source: http://www.juteworld.com

Eductional Institutions/Institutes	
Aligarh Muslim University (AMU), Aligarh	Allahabad University
Amity University	Banaras Hindu University (BHU), Varanasi
Birbal Sahni Institute of Palaeobotany, Lucknow	Board of High School & Intermediate Education, U.P., Allahabad
Board of Technical Education, U.P., Lucknow	Bundelkhand Institute of Engineering & Technology, Jhansi
Chhatrapati Shahuji Maharaj University, Kanpur	Community Development Scheme of U.P. Polytechnics
Department of Computer Science & Engineering, IIT Kanpur	Footwear Design and Development Institute, Noida
Govind Ballabh Pant Social Science Institute	Harcourt Butler Technological Institute (HBTI), Kanpur
Harish Chandra Research Institute, Allahabad	Indian Institute of Information Technology, Allahabad (IIITA)
Indian Institute of Management, Lucknow (IIML)	Indian Institute of Sugarcane Research, Lucknow (IISR)
Indian Institute of Technology, Kanpur (IITK)	Indian Veterinary Research Institute, Izatnagar, Bareilly
Indira Gandhi Institute of Cooperative Management	Indira Gandhi Rashtriya Uran Academy
Institute of Engineering & Technology (IET), Lucknow	Institute of Judicial Training and Research, Lucknow
Institute of Research, Development	Jaipuria Institute of Management (JIM),

and Training, Kanpur	Lucknow
Joint Entrance Examination Council, U.P., Lucknow	Kendriya Hindi Sansthan, Agra
King George Medical University, Lucknow	Lucknow University
MJP Rohilkhand University	Motilal Nehru National Institute of Technology (MNNIT), Allahabad
NIC Training Division, UPSU, Lucknow	Raza Library, Rampur
Sampurnanad Sanskrit Vishwa Vidyalaya	Uttar Pradesh Combined Pre Medical Test (UPCPMT)
Small Industries Service Institute, Kanpur	State Institute of Educational Technology, U.P.
V.V. Giri National Labour Institute, Noida	Uttar Pradesh Technical University (UPTU), Lucknow
Sanjay Gandhi Post Graduate Institute of Medical Sciences (SGPGIMS), Lucknow	

Source: http://www.juteworld.com

Basic Structure of the Scale

(Criteria given in matrix are broad indicators only)
Detailed definitions are provided in the INES User's Manual

	CRITERIA OR SAFETY ATTRIBUTES		
	OFF-SITE IMPACT	ON-SITE IMPACT	DEFENCE IN DEPTH DEGRADATION
7 MAJOR ACCIDENT	MAJOR RELEASE: WIDESPREAD HEALTH AND ENVIRONMENTAL EFFECTS		
6 SERIOUS ACCIDENT	SIGNIFICANT RELEASE: LIKELY TO REQUIRE FULL IMPLEMENTATION OF PLANNED COUNTERMEASURES		
5 ACCIDENT WITH OFF-SITE RISK	LIMITED RELEASE: LIKELY TO REQUIRE PARTIAL IMPLEMENTATION OF PLANNED COUNTERMEASURES	SEVERE DAMAGE TO REACTOR CORE/RADIOLOGICAL BARRIERS	
4 ACCIDENT WITHOUT SIGNIFICANT OFF-SITE RISK	MINOR RELEASE: PUBLIC EXPOSURE OF THE ORDER OF PRESCRIBED LIMITS	SIGNIFICANT DAMAGE TO REACTOR CORE/RADIOLOGICAL BARRIERS/FATAL EXPOSURE OF A WORKER	
3 SERIOUS INCIDENT	VERY SMALL RELEASE: PUBLIC EXPOSURE AT A FRACTION OF PRESCRIBED LIMITS	SEVERE SPREAD OF CONTAMINATION/ACUTE HEALTH EFFECTS TO A WORKER	NEAR ACCIDENT NO SAFETY LAYERS REMAINING
2 INCIDENT		SIGNIFICANT SPREAD OF CONTAMINATION/ OVEREXPOSURE OF A WORKER	INCIDENTS WITH SIGNIFICANT FAILURES IN SAFETY PROVISIONS
1 ANOMALY			ANOMALY BEYOND THE AUTHORIZED OPERATING REGIME
0 DEVIATION	**NO**	**SAFETY**	**SIGNIFICANCE**
OUT OF SCALE EVENT	**NO SAFETY RELEVANCE**		

Basic Structure of the Scale

(Criteria given in matrix are broad indicators only)
Detailed definitions are provided in the INES User's Manual

	CRITERIA OR SAFETY ATTRIBUTES		
	OFF-SITE IMPACT	ON-SITE IMPACT	DEFENCE IN DEPTH DEGRADATION
7 MAJOR ACCIDENT	MAJOR RELEASE: WIDESPREAD HEALTH AND ENVIRONMENTAL EFFECTS		
6 SERIOUS ACCIDENT	SIGNIFICANT RELEASE: LIKELY TO REQUIRE FULL IMPLEMENTATION OF PLANNED COUNTERMEASURES		
5 ACCIDENT WITH OFF-SITE RISK	LIMITED RELEASE: LIKELY TO REQUIRE PARTIAL IMPLEMENTATION OF PLANNED COUNTERMEASURES	SEVERE DAMAGE TO REACTOR CORE/RADIOLOGICAL BARRIERS	
4 ACCIDENT WITHOUT SIGNIFICANT OFF-SITE RISK	MINOR RELEASE: PUBLIC EXPOSURE OF THE ORDER OF PRESCRIBED LIMITS	SIGNIFICANT DAMAGE TO REACTOR CORE/RADIOLOGICAL BARRIERS/FATAL EXPOSURE OF A WORKER	
3 SERIOUS INCIDENT	VERY SMALL RELEASE: PUBLIC EXPOSURE AT A FRACTION OF PRESCRIBED LIMITS	SEVERE SPREAD OF CONTAMINATION/ACUTE HEALTH EFFECTS TO A WORKER	NEAR ACCIDENT NO SAFETY LAYERS REMAINING
2 INCIDENT		SIGNIFICANT SPREAD OF CONTAMINATION/ OVEREXPOSURE OF A WORKER	INCIDENTS WITH SIGNIFICANT FAILURES IN SAFETY PROVISIONS
1 ANOMALY			ANOMALY BEYOND THE AUTHORIZED OPERATING REGIME
0 DEVIATION	**NO**	**SAFETY**	**SIGNIFICANCE**
OUT OF SCALE EVENT	**NO SAFETY RELEVANCE**		

The International Nuclear Event Scale

For prompt communication of safety significance

LEVEL/ DESCRIPTOR	NATURE OF THE EVENTS	EXAMPLES
ACCIDENTS 7 **MAJOR ACCIDENT**	• External release of a large fraction of the radioactive material in a large facility (e.g. the core of a power reactor). This would typically involve a mixture of short and long-lived radioactive fission products (in quantities radiologically equivalent to more than tens of thousands of terabecquerels of iodine-131). Such a release would result in the possibility of acute health effects; delayed health effects over a wide area, possibly involving more than one country; long-term environmental consequences.	Chernobyl NPP, USSR (now in Ukraine), 1986
6 **SERIOUS ACCIDENT**	• External release of radioactive material (in quantities radiologically equivalent to the order of thousands to tens of thousands of terabecquerels of iodine-131). Such a release would be likely to result in full implementation of countermeasures covered by local emergency plans to limit serious health effects.	Kyshtym Reprocessing Plant, USSR (now in Russia), 1957
5 **ACCIDENT WITH OFF-SITE RISK**	• External release of radioactive material (in quantities radiologically equivalent to the order of hundreds to thousands of terabecquerels of iodine-131). Such a release would be likely to result in partial implementation of countermeasures covered by emergency plans to lessen the likelihood of health effects. • Severe damage to the installation. This may involve severe damage to a large fraction of the core of a power reactor, a major criticality accident or a major fire or explosion releasing large quantities of radioactivity within the installation.	Windscale Pile, UK, 1957 Three Mile Island, NPP, USA, 1979
4 **ACCIDENT WITHOUT SIGNIFICANT OFF-SITE RISK**	• External release of radioactivity resulting in a dose to the critical group of the order of a few millisieverts.* With such a release the need for off-site protective actions would be generally unlikely except possibly for local food control. • Significant damage to the installation. Such an accident might include damage leading to major on-site recovery problems such as partial core melt in a power reactor and comparable events at non-reactor installations. • Irradiation of one or more workers resulting in an overexposure where a high probability of early death occurs.	Windscale Reprocessing Plant, UK, 1973 Saint-Laurent NPP, France, 1980 Buenos Aires Critical Assembly, Argentina, 1983
INCIDENTS 3 **SERIOUS INCIDENT**	• External release of radioactivity resulting in a dose to the critical group of the order of tenths of millisievert.* With such a release, off-site protective measures may not be needed. • On-site events resulting in doses to workers sufficient to cause acute health effects and/or an event resulting in a severe spread of contamination for example a few thousand terabecquerels of activity released in a secondary containment where the material can be returned to a satisfactory storage area. • Incidents in which a further failure of safety systems could lead to accident conditions, or a situation in which safety systems would be unable to prevent an accident if certain initiators were to occur.	Vandellos NPP, Spain, 1989
2 **INCIDENT**	• Incidents with significant failure in safety provisions but with sufficient defence in depth remaining to cope with additional failures. These include events where the actual failures would be rated at level 1 but which reveal significant additional organisational inadequacies or safety culture deficiencies. • An event resulting in a dose to a worker exceeding a statutory annual dose limit and/or an event which leads to the presence of significant quantities of radioactivity in the installation in areas not expected by design and which require corrective action.	
1 **ANOMALY**	• Anomaly beyond the authorised regime but with significant defence in depth remaining. This may be due to equipment failure, human error or procedural inadequacies and may occur in any area covered by the scale, e.g. plant operation, transport of radioactive material, fuel handling, waste storage. Examples include: breaches of technical specifications or transport regulations, incidents without direct safety consequences that reveal inadequacies in the organisational system or safety culture, minor defects in pipework beyond the expectations of the surveillance programme.	
DEVIATIONS 0 **BELOW SCALE**	• Deviations where operational limits and conditions are not exceeded and which are properly managed in accordance with adequate procedures. Examples include: a single random failure in a redundant system discovered during periodic inspections or tests, a planned reactor trip proceeding normally, spurious initiation of protection systems without significant consequences, leakages within the operational limits, minor spreads of contamination within controlled areas without wider implications for safety culture.	**NO SAFETY SIGNIFICANCE**

* *The doses are expressed in terms of effective dose equivalent (whole dose body). Those criteria where appropriate can also be expressed in terms of corresponding annual effluent discharge limits authorized by National authorities.*

99-00305/FS-05

International Atomic Energy Agency
Wagramerstrasse 5
A-1400 Vienna, Austria

OECD Nuclear Energy Agency
Le Seine Saint-Germain-12
Boulevard des Iles
92130 Issy-les-Moulineaux, France

Annexure-6

List of Instruments and Equipments, and Protective Gear for Specialised Response Teams

S. No.	Equipment and Instruments
1	Ambulance with radiation monitoring and decontamination facility
2	Portable Gamma ray spectrometer for isotope detection
3	Requirement for aerial survey monitoring Aerial monitoring system Monitors, protective equipment, PC/laptop, etc.
4	Environmental Radiation Monitor with Navigational Aid (ERMNA) with monitoring vehicle
5	Alpha, beta and gamma counting stup
6	Digital dosimeter
7	GPS for monitoring van
8	T.L. dosimeter
9	Portable contamination monitor
10	CBRN suit with respirator, rubber clothes, gloves and gum bbots
11	Dust mask
12	Comfo respirator
13	Decontamination kit including monitoring facility
14	Potassium Iodide/ Potassium Iodate tablets
15	Operational manuals for all equipments training and guidance literature
16	Protective coverall, cotton gloves, caps, socks and shoes
17	Electric Generator
18	Torch
19	Binoculars
20	Miscellaneous sampling kits: Charcoal papers and cartridges (for iodine sampling/ protection) Plastic sheets (for packing of contaminated material) Spare batteries
21	Micro R survey Meter
22	Mini Rad meter
23	GM Survey meter

24	Teletector
25	Portable Alpha Contamination monitor
26	First Aid Kits
27	Radiation tags/symbols
28	PA system
29	Battery operated air sampler with filter paper
30	Cordoning tape
31	Tongs (2 ft) lead flask of 1" thickness and 2" diameter
32	Breathing apparatus set with spare cylinders

Annexure - 7

How India is ready to Face Nuclear Emergency

The threats discussed above in the paper and growing concern over the nuclear danger, Indian government has been trying to enhance the domestic preparedness and response mechanisms to cope with NBCR attacks/fallout. In India the work of the Army is equally complemented by the para-military forces like the Central Industrial Security Force (CISF) and Indo- Tibetan Border Police (ITBP). Both have trained special units to respond to natural and man made disasters. THE Union Government has already declared the Basic Training Centre of the Indo Tibetan Border Police (ITBP) at Bhanu, Chandigarh as a national-level institute to conduct nuclear, biological and chemical first responder course and a nodal centre for training specialists who will be the first to take action in case of NBCR emergencies. Recently constituted National Disaster Management Authority (NDMA)14 has plan to set up a National Disaster Response Force (NDRF), comprising 8,000 specially trained personnel of the central paramilitary forces, for undertaking rescue and relief operations in times of natural calamities and other disasters.

The NDMA will be assisted by a National Executive Committee comprising secretaries of ministries/departments such as agriculture, atomic energy, defence, water resources, environment and forests, finance, health, power, rural

development, science and technology, space, telecommunications etc, besides the chief of the integrated defence staff. The NDMA would be responsible for drawing up the disaster management plan, coordinating and monitoring its implementation. Likewise it will ensure measures by various wings of the government for prevention and mitigating the effects of disasters and for undertaking a holistic, coordinated and prompt response to any natural or man-made disasters.

The first among eight proposed NDRF battalion is going to be stationed in Pune while the other seven would be based in Greater Noida near Delhi, Arrankonam near Chennai, Barasat near Kolkata, Gandhinagar in Gujarat, Guwahati in Assam, Mundali in Orissa, and Chandigarh. There would be 15 regional response centres. However, it is yet to lay down plans and policies for disaster management and approve the national disaster management plans. Again, the question remains how far these bases would oversee India's nuclear installations during emergency. The government has to ensure prompt mobilisations and response. The task at hand is uphill since its not nuclear emergencies alone which can be taken care of by these forces.

Annexure-8

IMPORTANT CONTACT INFORMATION

CHIEF MINISTER (CHAIRPERSON OF UPDMA)

Designation	**Office Phone**
Chief Minister	2239296, **Fax**: 2239234
Officer on Special Duty	2225757, 2239296
Secretary	2238251, 2239299, 2238286
Special Secretary	2238288, 2238258, 2238316
Joint Secretary	2237250
Special Secretary	2238279
Chief Minister Information Centre	
Deputy Director (Press)	2238271
Information Officer (Media Centre)	2239303
Information Officer	2236094

Chief Secretary

Designation	**Office Phone**
Chief Secretary	2221599, 22238212, 22239461 **Fax**: 22239283

Staff Officer	22238942, 22208553, 22205736 **Fax**: 22238282
Additional Chief Secretary	22208797, 22238277, **Fax**: 22238979

State Emergency Operation Centre (SEOC)

SEOC Toll Free Number			**1070 (For Lucknow) 1077 (for other districts)**
SEOC In Charge	Relief Commissioner	22238200	9415906050
Nodal Officers Emergency Support Functions			
Communications			
Public health and sanitation			
Energy	Principal Secretary		9415906018
Transport	Principal Secretary		9415906029
Search and Rescue			
Donations			
Public works	Principal Secretary		9415906016
Planning	Principal Secretary		9415906015
Relief supplies			
Food and civil supplies	Principal Secretary		9415906014
Drinking water			
Housing	Principal Secretary		9415906015
Media			

Principal Secretary

Principal Secretary, Urban Dev./ Emp./ Poverty Erad.	2237314, 2238263 **Fax**	9415906023
Principal Secretary, Transport	2238068, 2236977	
Principal Secretary, Tourism	2238956	
Principal Secretary, Technical Education	2239331, 2238106	
Principal Secretary, Taxes & Registration	2239387	
Principal Secretary, Secretariat Administration	2238065	
Principal Secretary, Secondary Education	2238058	
Principal Secretary, Revenue/ Relief	2238089	
Principal Secretary, R.I.D.C, Ambedkar Gram Vikas, Rural Development	2238126	9415906017
Principal Secretary, Public Enterprises	2238456	
Principal Secretary, Planning	2238973, 2238467	
Principal Secretary, Parliamentary Affairs	2238315	
Principal Secretary, Panchayati Raj	2238083	9415906019
Principal Secretary, P.W.D.	2200399,	9415906016

	2221154	
Principal Secretary, Medical, Health & Family Welfare	2625449	9415906012
Principal Secretary, Labor	2238682	
Principal Secretary, Justice & Legislature	2238108	
Principal Secretary, Irrigation	2238461	9415906011
Principal Secretary, Information & Public Relation	2238249	
Principal Secretary, I.D.C., Civil Aviation	2239530, 2238265	
Principal Secretary, Home	2238291, 2239279	
Principal Secretary, Higher Education	2238155	
Principal Secretary, General Administration	2238989	
Principal Secretary, Forest	2238669	
Principal Secretary, Food & Civil Supply	2238411, 2238242	
Principal Secretary, Finance	2238062, 2238434	
Principal Secretary, Excise	2238674	
Principal Secretary, Energy	2238244, 2236517	
Principal Secretary, Civil Defense/ Home guard	2239282	
Principal Secretary, Appointment/ Personnel	2238256, 2239288 **Fax**	

Principal Secretary, Agro-Industry/ Export Promo.	2238137	
Principal Secretary, Administrative Reforms	2238416	
Principal Secretary, S.W.C.	2237165	

Divisional Commissioner

District & STD Code	Post	Office	Residence	Mobile
Agra (0562)	Divisional Commissioner	2226812, 2226810	2226533, 2226536	2226115
Allahabad (0532	Divisional Commissioner	2640250	2642900, 2642800	2640196
Azamgarh (05462)	Divisional Commissioner	224816, 228465	243900	9454417494
Bareilly (0581)	Divisional Commissioner	2455663, 2455661	2550501, 2550502	9454417495
Basti (05542)	Divisional Commissioner	283432, 283685	246269	9454417496
Chitrakoot Dham (05192)	Divisional Commissioner	224546, 285658	225291	9454417497
Devipatan	Divisional	222012	222011	9454417498

District & STD Code	**Post**	**Office**	**Residence**	**Mobile**
(05262)	Commissioner			
Faizabad (05278)	Divisional Commissioner	224243, 222310	222309, 224242	9454417499
Gorakhpur (0551)	Divisional Commissioner	2333076, 2335238	2336022	9454417500
Jhansi (0517)	Divisional Commissioner	2443313	2443310, 2452500	9454417501
Kanpur (0512)	Divisional Commissioner	2304304, 2304480	2294100, 2294441	9454417502
Lucknow (0522)	Divisional Commissioner	2229522	2220441, 2204460	9454417503
Meerut (0121)	Divisional Commissioner	2664431	2641377, 2651155	9454417504
Mirzapur (05442)	Divisional Commissioner	256888	256544	9454417505
Moradabad (0591)	Divisional Commissioner	2413586	2426644, 2435255	9454417506
Saharanpur (0132)	Divisional Commissioner	2760063	2761028	9454417507
Varanasi (0542)	Divisional Commissioner	2502158, 2508203	2382333	9454417508

Inspector General (I.G.)

District & STD Code	Post	Office	Residence	Fax
Allahabad (0532)	I.G.	2624825	2621502	---
Bareilly (0581)	I.G.	2420215, 2511060	2457061	---
Gorakhpur (0551)	I.G.	2333707	2333777	---
Kanpur (0512)	I.G.	2214450	---	---
Lucknow (0522)	I.G.	2393300	2721212	2393350
Meerut (0121)	I.G.	2763664	2763733	---
Varanasi (0542)	I.G.	2507575	2501433	---

Deputy Inspector General (D.I.G.)

District & STD Code	Post	Office	Residence
Agra (0562)	D.I.G.	2363343	2261000
Allahabad (0532)	D.I.G.	2609327	2603730
Azamgarh (05462)	D.I.G.	243201	243249
Bareilly (0581)	D.I.G.	2511049	2427075
Basti (05542)	D.I.G.	246487	---
Chitrakoot Dham (05192)	D.I.G.	224792	224792
Devipatan (05262)	D.I.G.	222253	229777

District & STD Code	Post	Office	Residence
Faizabad (05278)	D.I.G.	224248	224247
Gorakhpur (0551)	D.I.G.	2333442	2201100
Jhansi (0517)	D.I.G.	2443351	---
Kanpur (0512)	D.I.G.	2304461	---
Lucknow (0522)	D.I.G.	2225480, 2217884	2225480
Meerut (0121)	D.I.G.	2642550	2641566
Mirzapur (05442)	D.I.G.	256366	257401
Moradabad (0591)	D.I.G.	2435532	2435698
Saharanpur (0132)	D.I.G.	2761795	2761465
Varanasi (0542)	D.I.G.	2508181	2508163

District Magistrate (D.M.)

District & STD Code	Post	Office	Residence	Mobile
Agra (0562)	D.M.	2260184	2361210	9454417509
Akbarpur (Knp. dehat- 05111)	D.M.	2304008, 22066	2304660, 220433	-
Aligarh (0571)	D.M.	2400202	2400798, 2400799	9454417513

District & STD Code	Post	Office	Residence	Mobile
Allahabad (0532)	D.M.	2641253	2640300, 2640400	9454417517
Ambedkarnagar (05271)	D.M.	246999	244345	9454417539
Auraiya (05683)	D.M.	245528	244888	9454417550
Azamgarh (05462)	D.M.	220930	220402	9454417521
Badayun (05832)	D.M.	266406	224301	9754417525
Bagpat (0121)	D.M.	220520	221999	9454417562
Bahraich (05252)	D.M.	232815	232401	9454417535
Ballia (05498)	D.M.	220879	220311	9454417522
Balrampur (05263)	D.M.	233942	232231	9454417536
Banda (05192)	D.M.	224632	224333	9454417531
Barabanki (0524)	D.M.	2822730	2822229	9454417540
Bareilly (0581)	D.M.	2473303, 2457043	2557147, 2558764	9454417524
Basti (05542)	D.M.	282005	246306	9454417528
Bijnaur (01342)	D.M.	264444	262021, 262465	9454417570
Bulandshahar	D.M.	224351,	231343	9454417563

District & STD Code	Post	Office	Residence	Mobile
(05732)		226440		
Chandauli (05412)	D.M.	262557	262555	9454417576
Chitrakoot (05198)	D.M.	235016	235305	9454417532
Dewaria (05568)	D.M.	222316	222306	9454417543
Etah (05742)	D.M.	233302	233301, 233777	9454417514
Etawah (05688)	D.M.	254770	252219, 252544	9454417551
Faizabad (05278)	D.M.	224286	222221, 224205	9454417541
Farrukhabad (05692)	D.M.	234133	234297, 234165	9454417552
Fatehpur (05180)	D.M.	224502, 224414	224439	9454417518
Firozabad (05612)	D.M.	285001, 285066	285002, 285111	9454417510
Gautambuddhnagar (0120)	D.M.	2320089, 2326030	2552552	9454417564
Gazipur (0548)	D.M.	2220204	2220240	9454417577

District & STD Code	Post	Office	Residence	Mobile
Ghaziabad (0120)	D.M.	2714416	2710106, 2701616	9454417565
Gonda (05262)	D.M.	222400, 225125	229666	9454417537
Gorakhpur (0551)	D.M.	2336005	2344544, 2336007	9454417544
Hamirpur (05282)	D.M.	222330, 222251	222201	9454417533
Hardoi (05852)	D.M.	234537	234680	9454417556
Hathras (05722)	D.M.	233401	224001	9454417515
Jalaun (05162)	D.M.	252201	252200	9454417548
Jaunpur (05452)	D.M.	260666	260201, 260202	9454417578
Jhansi (0517)	D.M.	2470556	2331520, 2443324	9454417547
Jyotibarao Phule Nagar (05922)	D.M.	259988	262999	9454417571
Kannauj (05694)	D.M.	237697	234500	9454417555
Kanpur (0512)	D.M.	2306577	2304287, 2304436	9454417554

District & STD Code	Post	Office	Residence	Mobile
Kaushambi (05331)	D.M.	233467	233358	9454417519
Kushinagar (05564)	D.M.	242592	242392	9454417545
Lakhimpur Kheri (05872)	D.M.	252838, 252822	252715, 252879	9454417558
Lalitpur (05176)	D.M.	272200	274003	9454417549
Lucknow (0522)	D.M.	2223024, 2225653	2623912, 2214700	9454417557
Maharajganj (05523)	D.M.	222044	222206	9454417546
Mahoba (05281)	D.M.	244412	244472, 244473	9454417534
Mainpuri (05672)	D.M.	234308	234401	9454417511
Mathura (0565)	D.M.	2404152	2403200	-
Mau (0547)	D.M.	2220233	2500411	9454417523
Meerut (0121)	D.M.	2664133, 2643976	2642232, 2640166	9454417566
Mirzapur (05442)	D.M.	252480	252340, 257400	9454417567
Moradabad (0591)	D.M.	2413288	2413967, 2413016	9454417572

District & STD Code	Post	Office	Residence	Mobile
Muzaffarnagar (0131)	D.M.	2405103	2433125, 2433970	9454417574
Pilibhit (05882)	D.M.	237912	257911	9454417526
Pratapgarh (05342)	D.M.	220405	220401	9454417520
Raibareli (0535)	D.M.	2202302	2202301, 2202180	9454417559
Rampur (0595)	D.M.	2350403	2351061	9454417573
Saharanpur (0132)	D.M.	2723434, 2726838	2727144, 2725526	9454417575
Sant Ravidasnagar (05414)	D.M.	250203	250202	9454417568
Sant kabirnagar (05547)	D.M.	222890	222889	9454417529
Shahjahanpur (05842)	D.M.	222540	222221	9454417527
Shravasti (05250)	D.M.	222287	222288	9454417538
Siddharthnagar (05544)	D.M.	222169	222333	9454417530
Sitapur (05862)	D.M.	242900, 242996	242600, 242212	9454417560

District & STD Code	Post	Office	Residence	Mobile
Sonbhadra (05444)	D.M.	222190, 222090	252644	9454417569
Sultanpur (05362)	D.M.	222202	222203	9454417542
Unnao (0515)	D.M.	2820207	2820201	9454417561
Varanasi (0542)	D.M.	2508585	2348080, 2502626	9454417579

Senior Superintendent of Police (S.S.P.)

District & STD Code	Post	Office	Residence	Fax
Agra (0562)	S.S.P.	2262221	2227255	2227256
Aligarh (0571)	S.S.P.	2400444, 2400638	2703111, 2703110	---
Allahabad (0532)	S.S.P.	2641902	2640600	2440700
Badayun (05832)	S.S.P.	266342	224308	---
Bareilly (0581)	S.S.P.	2457021	2510500	2427003
Bulandshahar (05732)	S.S.P.	224705	224338	---
Etah (05742)	S.S.P.	233319	231942, 233307	---
Etawah (05688)	S.S.P.	254041	---	254978

District & STD Code	**Post**	**Office**	**Residence**	**Fax**
Faizabad (05278)	S.S.P.	224214	224215	224220
Gautambuddhnagar (0120)	S.S.P.	2350241	2549330	2444546
Ghaziabad (0120)	S.S.P.	2710758	2710157	2711120
Gorakhpur (0551)	S.S.P.	2334629	2334204	2333127
Jhansi (0517)	S.S.P.	2443340, 2443341	---	2443304
Kanpur (0512)	S.S.P.	2304407	2530547, 2532153	---
Lucknow (0522)	S.S.P.	2228965	2225983, 2225984	2274204
Mathura (0565)	S.S.P.	2405172	2404600	2409620
Meerut (0121)	S.S.P.	2660548	2664634	2664588
Moradabad (0591)	S.S.P.	2412654	2412562	---
Saharanpur (0132)	S.S.P.	2727143	2661740, 2661737	
Varanasi (0542)	S.S.P.	2502644	2502655	2502655

Superintendent of Police (S.P.)

District & STD Code	Post	Office	Residence	Fax
Akbarpur (Knp. dehat- 05111)	S.P.	220211	2383575	220296
Ambedkarnagar (05271)	S.P.	244445	244229	---
Auraiya (05683)	S.P.	244421	---	244887
Azamgarh (05462)	S.P.	220107	220403	---
Bagpat (0121)	S.P.	220518	222395	220517
Bahraich (05252)	S.P.	232892	232407	232405
Ballia (05498)	S.P.	220373	220312	220859
Balrampur (05263)	S.P.	233100	232490	---
Banda (05192)	S.P.	224624	224444	---
Barabanki (0524)	S.P.	2822277	2822244	2822244
Basti (05542)	S.P.	282904	246309	246804
Bijnaur (01342)	S.P.	262002	262026	261071
Chandauli (05412)	S.P.	262480	262479	262478
Chitrakoot (05198)	S.P.	235500	235241	---
Dewaria (05568)	S.P.	222755, 241400	222311	---
Farrukhabad (05692)	S.P.	234410	234206	---

District & STD Code	Post	Office	Residence	Fax
Fatehpur (05180)	S.P.	224413	224288	224288
Firozabad (05612)	S.P.	285110	285004	285052
Gazipur (0548)	S.P.	2220538	2220567	---
Gonda (05262)	S.P.	222544	222760	---
Hamirpur (05282)	S.P.	222329	---	244474
Hardoi (05852)	S.P.	234749	234694	234904
Hathras (05722)	S.P.	232100	235100	234100
Jalaun (05162)	S.P.	252237	252233	252791
Jaunpur (05452)	S.P.	261660	261203	261205
Jyotibaraofulenagar (05922)	S.P.	259288	263244	263244
Kannauj (05694)	S.P.	235439	234808	---
Kaushambi (05331)	S.P.	233411	233603	---
Kushinagar (05564)	S.P.	242393	242390	242341
Lakhimpur Khiri (05872)	S.P.	253157	---	---
Lalitpur (05176)	S.P.	272387, 277100	278100	278100
Maharajganj (05523)	S.P.	222246	222062	---
Mahoba (05281)	S.P.	244168, 254068	244474	244475
Mainpuri (05672)	S.P.	234442, 234660	234402	234540

District & STD Code	Post	Office	Residence	Fax
Mau (0547)	S.P.	2220629	2500620	2500620
Mirzapur (05442)	S.P.	252578	256655	256565
Muzaffarnagar (0131)	S.P.	2403294	2403393	2403393
Pilibhit (05882)	S.P.	257183	257182	257182
Pratapgarh (05342)	S.P.	220423	220403	220403
Raibareli (0535)	S.P.	2202315	2202304	2202126
Rampur (0595)	S.P.	2350996	2351900	2350080
Sant Ravidasnagar (05414)	S.P.	250236	250285	250227
Santkabirnagar (05547)	S.P.	222892	222891	223140
Shahjahanpur (05842)	S.P.	222553	222415	223344
Shravasti (05250)	S.P.	222328	---	222715
Siddharthnagar (05544)	S.P.	222183	222302	222170
Sitapur (05862)	S.P.	243207	242229	242404
Sonbhadra (05444)	S.P.	252631	252614	252673
Sultanpur (05362)	S.P.	222301	222302	223685
Unnao (0515)	S.P.	2820228	2820202	2828903

Police Administration

Director General of Police, Headquarters	
Designation	**Office Phone**
Director General of Police	2206104
Additional Director General of Police (Crime/Law & Organisation)	2208857
Additional Director General of Police (Personnel)	2208000
Additional Director General of Police (Human Rights)	2391765
Inspector General of Police (Establishment)	2207907
Inspector General of Police (Administration)	2207997
Inspector General of Police (Personnel)	2207995
Inspector General of Police (Operation)	2208370
Inspector General of Police (STF)	2205302
Inspector General of Police (Crime)	2208598
Inspector General of Police (Human Rights)	2391465
Deputy Inspector General of Police (Human Rights)	2208371
Additional Superintendent of Police (Crime)	2206903
Information Officer	2206559

Police Headquarters, Allahabad (0532)

Additional Director General of Police	2623666, **Fax**: 2622031
Inspector General of Police (Housing)	2623721
Inspector General of Police (Budget)	2621216
Additional Inspector General of Police (Establishment)	2623937
Deputy Inspector General of Police (Headquarters)	2623277
Superintendent of Police (Personnel)	2623628
Superintendent of Police (Headquarters)	2623117
P.A.C. Headquarters	
Additional Director General of Police	2385052, **Fax**: 2385732
CID Headquarters	
Deputy Director General	2720713
Intelligence Headquarter	
Additional Superitendent of Police (Intelligence)	2205166, 2209728
Anti Corruption Cell	
Additional Director General of Police	2287245
Railway Police Headquarters	
Deputy Director General of Police	2287241-2
Economic Crime Cell	
Additional Director General of Police	2287253
Technical Services U.P.	
Additional Director General of Police	2286309
Radio Headquarters	
Additional Director General of Police	2385983
Police Training Headquarters	
Additional Director General of Police	2287247, 2287269
Fire Service Headquarters	
Director General of Police	2228736
Prosecution Directorate	
Director General of Police	2720656
Special Enquiry Headquarters	
Additional Director General of Police	2287658
Home Guards, Public Security	
Commandant General	2451388
Police Housing Development Corporation	
Chairman/Managing Director	2391818

Vigilance Establishment, Lucknow	
Director	2236319, 2211228
U.P. Nepal Border Police	
Additional Director General of Police	2397117, **Fax**: 2396291

List of NGOs

1. Rotary Club Lucknow Rajdhani
   28, Halwasiya Market, Hazratganj
   Hazratganj, Lucknow, Uttar Pradesh 226001
   0522 3013505

2. Lions Club
   Club Address:86 chand ganj garden lucknow 226024
   Club Tel:0522-320725

3. Zonal Director
   Nehru Yuva Kendra Sangathan
   2/62M Visalkhand-2,Gomti Nagar
   Near Ambedkar Chauraha
   Lucknow
   Uttar Pradesh 226010
   0522-2397002

4. Programme Adviser's Cell
   National Service Scheme (NSS)
   12/11, Jamnagar House, New Delhi
   Ph. : 91-11-23073324, 23384513
   E-mail : pacell-nss@nic.in

5. NCC and NSS
   IPPR Center,
   University of Lucknow
   Lucknow-Phone: 0522-2740086

Annexure – 9

Details of the Laboratories Required for Managing the Nuclear Attacks in the State as per the Guidelines of the National Disaster Management Authority

- ***Radio Bio-Dosimetry Laboratory having Facilities like Fluorescence inSitu Hybridization (FISH) to Study Chromosomal Aberration***

Radio bio-dosimetry includes lymphocyte estimation along with the other formed elements of the blood. Chromosomal study is an important tool for radiation bio-dosimetry. Chromosome exchanges resulting in unstable aberration such as dicentrics, rings, acentric fragments and other asymmetrical rearrangements may be measured using the technique of Fluorescence in Situ Hybridization (FISH) which is currently the essay of choice for definitive bio-dosimetry. Measurements of radiation induced apoptosis in human lymphocytes are also considered the most sesitive reproducible bio-dosimeter. Counting the frequency or number of micro nuclei in the cytoplasm of irradiated cells, electron spin resonance detection of free radical formation in tooth enamel and measurement of serum bio chemical markers such as amylase, inter Leukine-6, cholesterol and apolipoprotein levels have also been considered as potential techniques for determining the radiation dose received.

Haematology Laboratory with cell Separator for Granulocyte Concentrate

Blood and bone marrow are most sensitive organs in the body affected by radiations. Following radiation exposures, neutropaenia will occur suppressing the immunity of the causality leading to infection. To combat the problem, Granulocyte concentrates is very useful; therefore, a haematology laboratory

with cell separator for Granulocyte concentrates is an essential requirement for the management of radiation injuries.

Genetic Laboratory

Genetic damage is one of the long-term adverse effects of radiations. Genetic studies must be carried out in a properly equipped genetic laboratory for proper monitoring, surveillance and counselling of victims.

Molecular Laboratory

Radiation injury damages DNAs, therefore a molecular laboratory needs to be established in radiation injury treatment centres for DNA and other molecular studies.

Immunology Laboratory

Immuno-suppression is the major damage caused by radiation injuries. Proper immunological studies will help for the restitution of the immune system and bone marrow transfusion. Immunology laboratories will facilitate studies of cell medicated and humeral immunity.

Bone Marrow Bank, Bone Marrow Transfusion and Stem cell Harvesting Facilities

For restitution of immune system, bone marrow transfusion is very important. However, there are problems of getting a donor, HLA compatibility and host versus graft reaction which may lead to rejection of bone marrow. Stem cell harvesting and transfusion will avoid the above problems. These problems will also be avoided through the availability of bone marrow bank where the bone marrow of high radiation exposure risk personnel can be stored under cryo-preservation and the same can be replenished at the time of requirement. Therefore, stem cell harvesting facilitates and a bone marrow bank needs to be created for a RITC.

Specialised medical stores consisting of Amifostine and other radio protectors, de-corporation agents [like diethyl triamine-penta acetate(DTPA)and prussian blue],potassium iodide, growth factors, colony stimulating factors, and radiation recovery agents will be in place.

In addition to the usual drugs mentioned above, medical stores need to cater to the treatment of radiation injuries. Amifostine significantly decreases radiation toxicity in patients receiving radiotherapy for cancer, when 200mg/m2 is given intravenously 15-30 minutes prior to each radiation fraction. De-corporation agents (DTPA, prussian blue)eliminates radio nuclides entering the body, thus reducing internal contamination. The de-corporation agents acts as diluting, blocking, mobilising and chelating agents, Decorporation should be initiated as soon as is practical. Gastric lavage, emetics, purgatives, laxatives and enemas can also be used to eliminate radioactive material from the body. Prior administration of potassium iodide prevents iodide prevents damage to thyroid from radiation. Growth factors, colony stimulating factors and other radiation recovery agents are useful for restitution of the immune system.

List of References

Web References

http://upgov.nic.in/upinfo/up_eco.html

http://forest.up.nic.in

http://www.webindia123.com/uttar/land/forests.htm

http://www.krishiworld.com/html/crop_pattern2.html

http://www.upenvis.nic.in/

National Disaster Management Guidelines on Management of Nuclear Disasters (Reproduction and Guidelines)