

**A FRAMEWORK FOR ESTABLISHMENT OF NATIONAL DISASTER RESPONSE
FORCE**



By

Saqib Hameed

A thesis is submitted in partial fulfillment of the requirements for the degree of
Master of Science
in
Disaster Management

Civil Engineering Wing

Military College of Engineering

National University of Sciences & Technology

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This is to certify that the
thesis titled

“A FRAMEWORK FOR ESTABLISHMENT OF NATIONAL DISASTER RESPONSE
FORCE”

Submitted by

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has been accepted towards the partial fulfillment of the requirements for the degree of

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To

MY TEACHERS, FAMILY & FRIENDS

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ABSTRACT

Specialized agencies have proved to be very effective in handling and managing the emergency situations; be it natural or manmade disasters. Pakistan is prone to multitude of disasters and recurrence of these has ranked it as a high risk country. Past experiences of disaster management (Earthquake 2005, 2008 & 2015, Super Floods 2010, Blockade of Karakorum Highway 2016 and Chitral Floods not only highlight the weakness but also demand strengthening response mechanism. Enthusiasm and supporting role of Pakistani people during these disasters, though, was exemplary but to accomplish post disaster early recovery and to support long term strategies a dedicated response setup is required. Identified local training needs and corresponding requirement of resources coupled with contingency planning based on risk assessment during peace time by these dedicated forces would help prepare for such emergencies.

This study is focused on the basic contours and formation of National Disaster Response Force (NDRF) for Pakistan. In this background, I have studied, analyzed and compared the disaster response forces and setups of different countries; NDRF India, Homeland Response Force of USA, Indonesian Rapid Response and Assistance (INDRRA) other response models and took guidance from their organizational structures, working principles and setups in the proposed model for NDRF Pakistan. The main focus of this research study is to propose a framework for NDRF Pakistan by contemporary study of disaster response models and analyze existing capabilities of stakeholders. The proposed model is expected to institutionalize disaster response, provide a platform to coordinate all stakeholders and prepare for future by training and preparing for maximum efficiency in all possible disaster challenges. Finally, outlined recommendations need to be adopted in order to achieve the set objectives and overcome the key challenges of disaster response.

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LIST OF ABBREVIATIONS

ADRC	Asian Disaster Reduction Center
AJ&K	Azad Jammu & Kashmir
CBRNE	Chemical, biological, radiological, nuclear and explosive
CC	Climate Change
CCA	Climate Change Adaptation
CERTs	Company Emergency Response Teams
CPEC	China-Pakistan Economic Corridor
CSSR	Collapsed Structure Search and Rescue
DCO	District Coordination Officer
DDMA	District Disaster Management Authority
DM	Disaster Management
DO	District Officer
DR	Disaster Response
DRF	Disaster Response Force
DRM	Disaster Risk Management
DRR	Disaster Risk Reduction
E&DM	Emergency & Disaster Management
FEMA	Federal Emergency Management Authority USA
GB	Gilgit Baltistan
GCCVI	Global Climate Change Vulnerability Index
GHGs	Green House Gases
HAZMAT	Hazardous Materials Rescue Team
HFA	Hyogo Framework for Action
HKH	Hindu Kush-Karakoram-Himalayan
HRF	Homeland Response Force
ICT	Islamabad Capital Territory
INDRRA	Indonesia Rapid Response and Assistance
INGOs	International NGOs
INSARAG	International Search and Rescue Advisory Group
IPCC	Intergovernmental Panel on Climate Change
IRC	Integrated Resilient Capacity
IRS	Indus River System
IRSA	Indus River System Authority
KKH	Karakurram Highway
KMC	Karachi Metropolitan Corporation
MoI	Ministry of Interior Pakistan
MoU	Memorandum of Understanding
NCC	National Cadet Corps
NCCP	National Climate Change Policy
NDM-Act	National Disaster Management – Act

NDMO	National Disaster Management Ordinance
NDMP	National DM Plan
NDRF	National Disaster Response Force
NDRMF	National Disaster Risk Management Framework
NDRP	National Disaster Response Plan
NDRRP	National Disaster Risk Reduction Policy
NFC	Note For Consideration
NIDM	National Institute of Disaster Management
NLC	National Logistics Cell
NUST	National University of Science & Technology
OCHA	Office for Coordination of Human Assistance
PDMA	Provincial Disaster Management Authority
PDRF	Provincial Disaster Response Force
PMD	Pakistan Meteorological Department
PST	Pakistan Standard Time
RDA	Rawalpindi Development Authority
SAR	Search and Response
SDGs	Sustainable Development Goals
SDMA	State Disaster Management Authority
SFDRR	Sendai Framework for Disaster Risk Reduction
SPD	Strategic Plans Division
STSMCZ	Subtropical Triple Season Moderate Climate Zone
SUPARCO	Space and Upper Atmosphere Research Commission
UN	United Nations
UNDP	United Nations Development Program
UNFCCC	United Framework Conventiofn on Climate Change
UNISDR	United Nations International Strategy for Disaster Reduction
VARG	Vulnerability and Adaptation Resource Group
WAPDA	Water and Power Development Authority
WASA	Water and Sanitation Authority
WCDR	World Conference on Disaster Reduction
WHO	World Health Organization

INTRODUCTION

1.1 General.

Mega development on the global level, greenhouse effects and climate change has disturbed the natural balance on planet earth. We live in a world that is increasingly affected by disaster events. Disasters are a reality and are on increase. Recent decades have seen significant growth figure 1.1.1 in the number of reported disaster such as floods, earthquake, cyclones, landslides, drought and man-made disasters. More and more people are being adversely affected by these events and have negative impacts on health, education, nutrition and morbidity. The science tells us that this trend is likely to be exacerbated, aggravated and worsened due to a number of reasons. Atomic sub-soil and submarine experiments had also contributed a lot towards plate tectonic movements and the occurrence of extreme weather events has increased manifold; Pakistan is no exception. The Great East Japan Earthquake 2011 has redefined disaster power where multiple disasters were created by a single disaster (Yamashita and Shigemura, 2013); earthquake followed by tsunami and other secondary effects like nuclear power plant accident etc. Increased happening of disastrous events have realized us to be more cautious and take steps towards mitigation and prevention rather than only focusing on post-disaster activities. The occurrence of these events is more frequent in the South-Asian Region where the most densely populated area has shown more uncertainty in the last few decades (Guha-Sapir et al., 2017). It is therefore very important to have matching response.

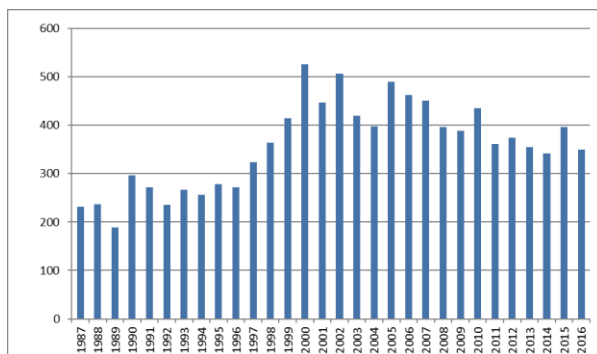


Figure 1.1.1 Graph of World Disaster Trend Source: (ADRC, 2016)

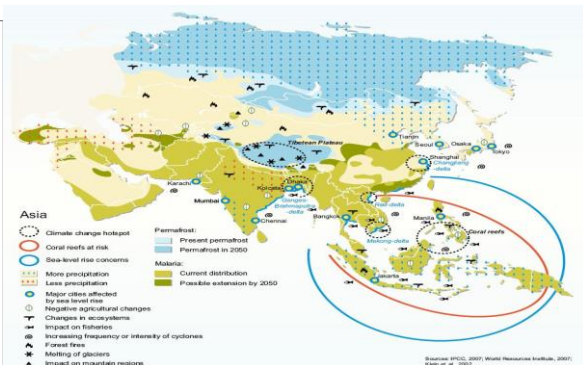


Figure 1.1.2 Effects of Climate Change in the world Source: (IPCC, 2007)

1.2 Background

In Pakistan no lesson has been learnt in centuries. In 1660 French Tourist Dr Francis Bernier in his Indian Travel Accounts mentioned recurring losses due to floods around Lahore over 350 years ago. (Kundra, 2010). We still find repeated devastation by floods till to date. Disasters do not discriminate. Although Disaster Risk is inversely proportional to Capacity but lessons learnt from history reveal that even the most elaborate and resourceful setups have failed to deliver as was the case in Hurricane Katrina and the leanest have registered success as in case of Bangladesh Cox's bazaar Cyclones where for Cyclones with equal Intensity, loss of lives was reduced many times by increasing capacity/number of shelters, by well-defined responsibilities and coordinated / efficient response (JICA, 2015). Pakistan has to do a lot in mitigating disastrous effects of calamities. Pakistan has been afflicted by notable floods in 1950, 1956, 1973, 1976, 1988, 1992, 2010 and more recently in 2014 (Shah et al., 2017). In each case, a severe loss resulted, agriculture land inundated and a large number of houses were damaged.

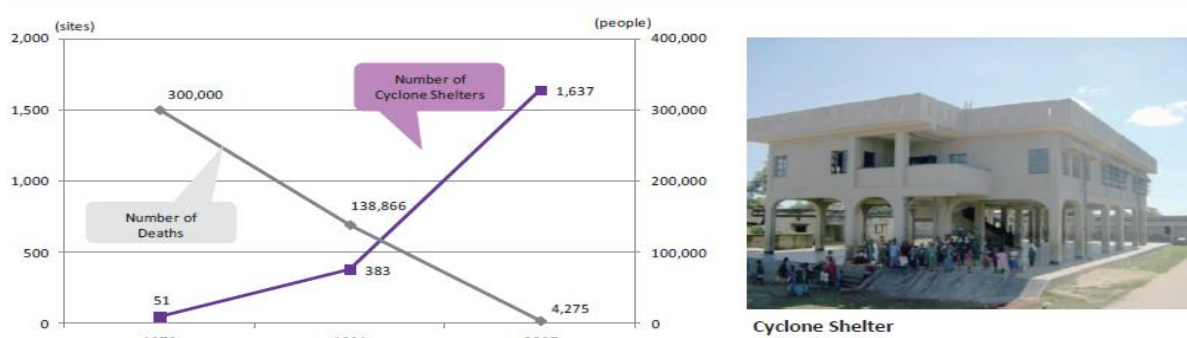


Figure 1.2.1 Bangladesh Cox's Bazaar Cyclones, increase in number of shelter decrease number of deaths: (JICA, 2015)

1.3 Disaster Risk Vulnerability of Pakistan

1.3.1 Hazard

Vulnerability to disasters for Pakistan could be viewed as moderate to severe (Abbas et al., 2015). Natural hazard comprising cyclones, pest attacks, avalanches, glacial lake outbursts, droughts, storms, floods, landslides, epidemics, earthquakes, river erosion and tsunami expose Pakistani society to risks (Shah et al., 2017). A number of human induced hazards threaten the society, environment and economy. These consist of transport, urban, industrial & forest fires, displacement of communities internally and oil spills. Exposures in terms of occurrence and level of impact are flooding, droughts, earthquakes, cyclones and landslides that have caused severe damage and losses in the history (Khan, 2003; Atta-ur-Rahman, 2010). A broad view of key problems that put Pakistan at risks are appended below:-

1.3.1.1 Earthquake

Indo-Australian tectonic plate upon which India, Nepal and Pakistan lie, is constantly subducting below the Eurasian plate by moving northward; resulting in earthquakes and raising

Himalayan Mountains higher slowly. Between the Hindu Kush, Suleiman, and Karakorum ranges, in KPK district Chitral and the Northern Areas, Kashmir including Muzaffarabad, in Balochistan, Dalbandin, Sibi, Khuzdar, Quetta, Zhob, Chaman, Makran coast including Gwadar and Pasni are all regarded as extremely vulnerable high risk districts. Pakistan faced few major earthquakes in 20th Century including Quetta earthquake (1935), Makran coast earthquake 1945, Kashmir/ KPK earthquake 2005, and Awaran earthquake 2013 (DAWN, 27th October, 2015).

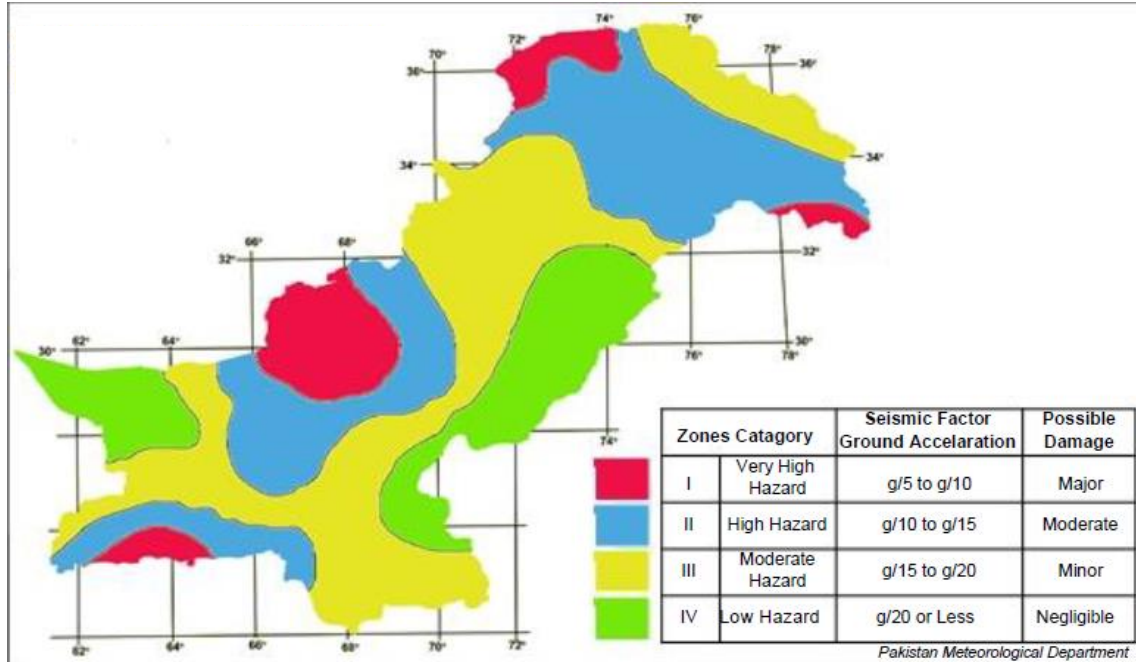


Figure 1.3.1.1 Seismic Zones of Pakistan Source: (Pakistan Metrological Department, 2000)

1.3.1.2 Drought

The frequency of drought is increasing in Pakistan with impact on sustainable development on sectors of livestock, food, water resources, agriculture, hydro-electricity and environment (Mancosu et al., 2015). Less precipitation & excessive temperature variations are features of the Pakistan climate. Almost 60% of land area out of the total is classified as arid; which receives negligible rainfall annually. These arid rangelands include Tharparkar, D. G. Khan, Kohistan, D.I Khan, , Western Balochistan and Cholistan. Average rainfall in provinces of Sindh and Balochistan is almost 160 mm comparing 400 mm for province of Punjab and almost 630 mm in the KPK province (Mancosu et al., 2015). Variation in rainfall in different seasons is also significantly large. Southern lower half of country's climate is hyper-arid and arid. However some parts of the country stay drastically dry in each province and are very exposed for drought from low mean rainfall with tiny deviations (Bacha et al., 2018).

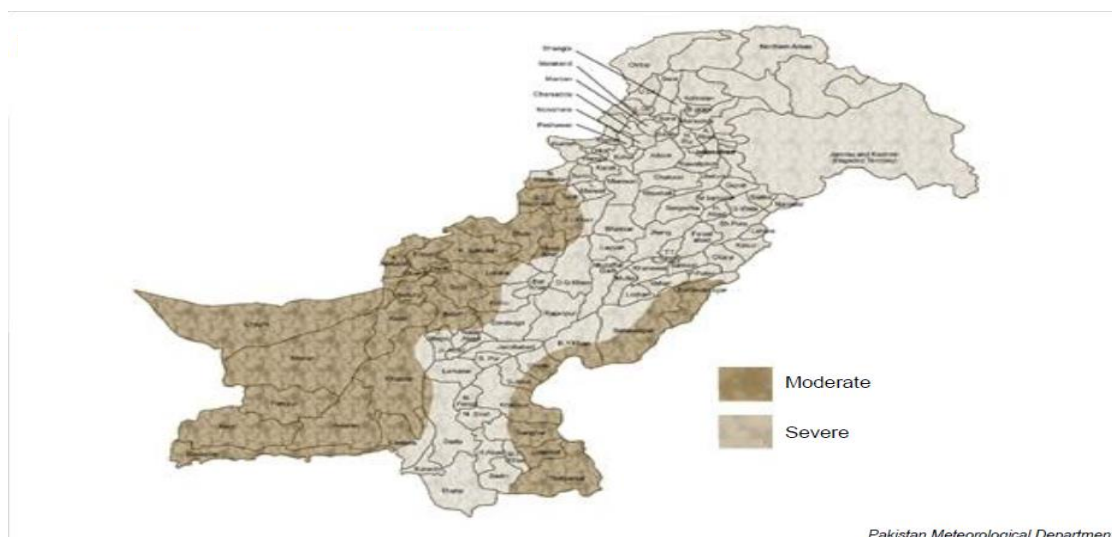


Figure 1.3.1.2 Drought at the end of Dec 2000 in Pakistan Source: (Pakistan Metrological Department. 2000)

1.3.1.3 Floods

Most of Indus river basin i.e. fifty six (56%) lies in Pakistan and it comprises of almost 70% of the country's total area (Shah et al., 2017). Most of the dangerous floods in Pakistan occurred in the Indus basin during late summer the time for heavy monsoon rains for South Asia region. In the northern reaches of this Basin, tributaries of Chenab & Jhelum typically cause floods in Pakistan (NDRMFP, 2007). Flooding is primarily related to monsoon low pressures that originates from Bengal Bay and shifts through India to enter Pakistan. Flood in rivers mostly hit Punjab and Sindh while higher areas of Northern Areas, Balochistan and KPK are mostly affected by hill torrents. River Kabul flooding endangers Peshawar, Mardan, Charsadda and Nowshera districts in KPK. There are also chances of flash floods hitting hilly and mountain areas of Punjab, which can result in road erosion & landslides. Vulnerabilities to flooding for large cities have increased in recent years (Asian Development Bank, 2017).

1.3.1.4 Tsunami

Pakistan has faced tsunami disasters as well. On 28 November 1945, a big tsunami was witnessed which was caused by a massive earthquake of 8.3 magnitue in offshore Makran Coast. The tsunami generated 12-15 meters high sea waves that killed 4000 people at least in Pasni and adjoining areas. Karachi, which is 450 km away from the epicenter, faced sea waves of 6 feet which caused difficulty in harbor activities (Asian Development Bank, 2017). The reality is Karachi is a city which lie closes to likely epicenters for large underwater earthquakes, which requires a special attention for improvement of local capabilities for risk reduction disaster, quick warning and rapid response in order to decrease damages from tsunami events.

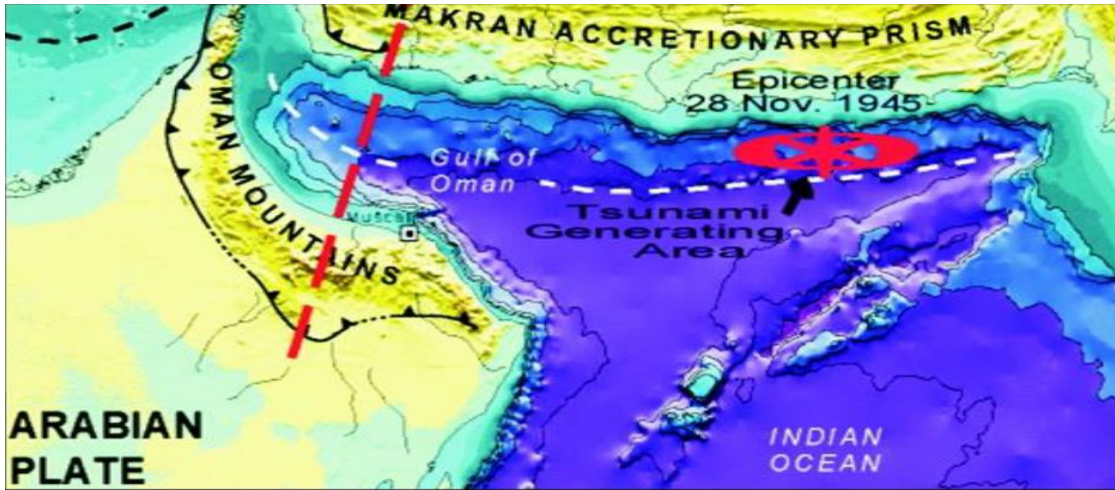


Figure 1.3.1.3 Potential Tsunami Risk in Pakistan Source : (NDRMF-2007)

1.3.2 Overall Risk Profile of Pakistan

The hazards and vulnerabilities overlaid for the analysis of the risk with GIS software; the values of each layer divided into five levels indicating from high hazard/risk to low hazard/risk. In the all hazard risk map “red” means high hazard/risk and “blue” means low hazard/risk (NDMP, 2015).

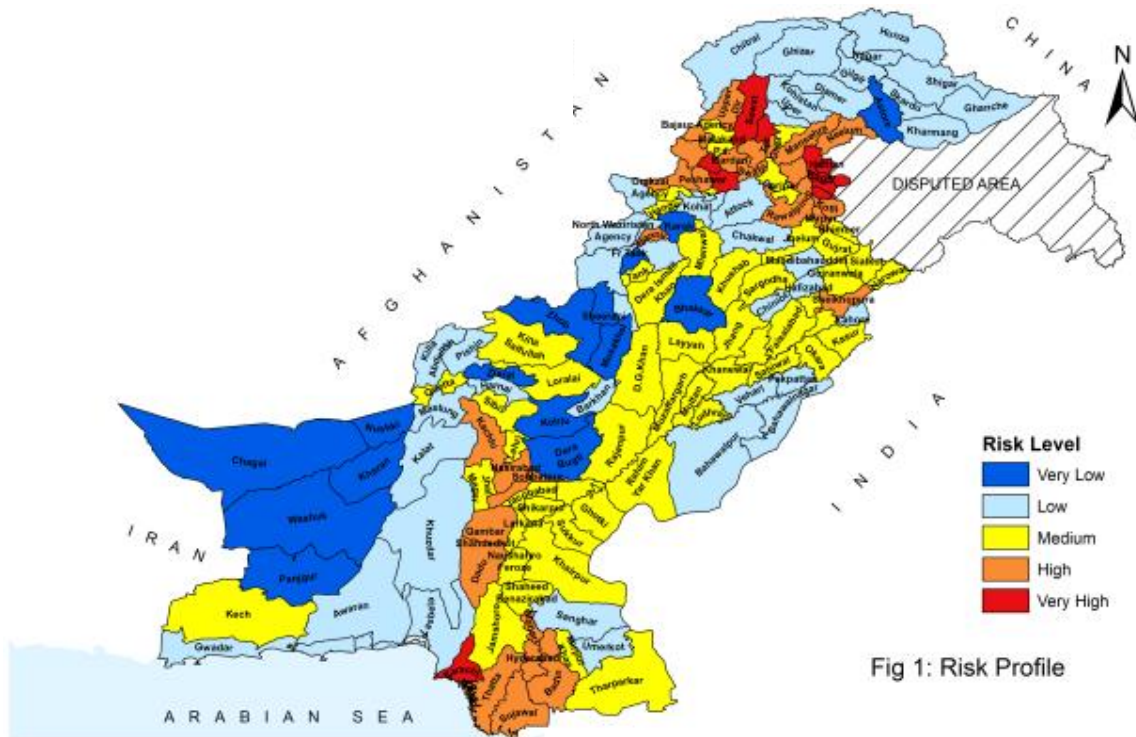


Fig 1: Risk Profile

Figure 1.3.2 Map showing Risk Indexing of Pakistan Source : (NDMP, 2015)

1.4 Statement of Research Problem

A need was felt to put emphasis on strengthening response capabilities of the Nation. To do so there is a need to study feasibility of different possibilities of employing trained employees at different levels with organized volunteers to support government and communities when required. A number of models are available for NDRF around the world, both in developed and developing countries. Diverse disaster natures, different levels of vulnerability/ risks, varying capacities / resources availability and different awareness levels and priorities make a few very good models less practicable for us.

1.5 Pakistan and its Disaster Response (DR) concerns

1.5.1 The Term National Disaster Response Force (NDRF)

A relatively new concept, the term NDRF was first used in India. Similar force is known as Homeland Response Force (HRF) in USA and Indonesia Rapid Response and Assistance (INDRRA) in Indonesia. Many countries have smaller Emergency Response Teams with different names. The three countries adopting NDRF became reality after having suffered from a disaster India; Bhuj 2001 and 2005 Kashmir earthquakes (NDMA, 2006), Indonesia; 2004 Tsunami (Ben Hillman, 2011) and USA Hurricane Katrina in 2004 (FEMA, 2005). The Topic “Establishment of a Framework for NDRF Pakistan” was proposed by NDMA to NUST.

By simple components of NDRF it is evident that the organization or force has to respond by providing humanitarian assistance, cleanup, temporary repairs, and services restoration. Disaster response would include emergency response, initial response and informatics, damage assessment (what, where, how much), emergency relief needs assessment (what, where, quantity and delivery), identify priority for recovery, emergency relief (mobilize recovery resources), emergency repair and requirements of emergency rehabilitation. Time is most precious resource. Life could be saved by responding in time i.e. up to 80% by responding within 24 hours (USRT1 Course Notes, 2005). -Time can be reduced by planning and training, by manipulating of resources, by having well structured and balanced response force and by forward placement of response agency.

1.5.2 Search and Rescue (SAR) Teams verses NDRF.

If we study past two major disasters of Pakistan i.e. 2005 earthquake and 2010 (NDMA, 2011) flood it is obvious from mere magnitude of area affected indicated that the response has to be deliberate, wholesome, coordinated, and effective in area of responsibility and could involve specialist response including Chemical, biological, radiological, nuclear and explosive (CBRNE). To be effective in larger area on more locations requires an organization having representation in tiers i.e. national, provincial, district and community all levels. Likely end state and time line of NDRF Pakistan has to be represented from international level down to communities in next ten years.

1.5.3 NDRF Need

High frequency of recurring disasters in the country result in repeated losses

Identified in legislation of NDMA Act

No single potent response Force available in the country

Disasters are normally simultaneously effecting more than one provinces/ wider area

To learn from good practices of developed countries

1.5.4 NDRF Peculiarities

A Force under NDMA Capable of Specialist Response

Convenient / justified Location/Locations for timely response based on Disaster profiles of Provinces/ Districts

Must Manage Disaster-being ultimate Responder

Deployment anywhere in the World by NDMA & able to coordinate/ absorb any international assistance

Desired versus minimum Capabilities of NDRF

Could Consist of a possible combination of Stake Holders Capable to perform as potential NDRF

1.5.5 Current Perspective NDRF System in Pakistan

There are numerous response agencies practically working and developing their local level response policies and contingencies plans. Their effectiveness is still lacking due to different reasons i.e. failure in liaison, inefficient employees, lack in funding resources, and having no monitoring system. Moreover, it is required to link all response agencies into an overall tiered response to reduce the casualties and losses. Proposed NDRF framework needs acknowledgment for integration of resources including manpower. Furthermore, policies and plans for NDRF also need to be developed and their implementation will have to be articulated at all levels with resolve.

1.6 Gaps in Theory and Practice

After 2005 devastated earthquake in Kashmir (NDMA,2007), Pakistan has formulated policies, plans to counter disasters and to adopt a proactive approach instead of reactive actions. National Disaster Management Ordinance (NDMO) 2006, followed by National Disaster Management - NDMA Act 2010 but remained short of a framework for it implementation. Need for NDRF was identified and legislation done. Occurrence of floods in 2010 further emphasized the need. A National Level Disaster Response Force is needed to cope up the mega disaster at national, provincial, district and community levels. In this regard, activities leading to national level plans needed to be prioritized in the country (Shah et al., 2017).

1.7 Significance of the Research

- i. Address policy and institutional level challenges of disaster response
- ii. Establish a framework for NDRF Pakistan
- iii. Organization of the Research Report as NUST MS Thesis

The establishment of a proposed framework for NDRF Pakistan addresses policy and institutional level challenges of disaster response that occur due to lack of preparation, coordination and resources.

1.8 Rationale/ Justification of the study

Over 200 Million Population of Pakistan live in an area of 882,363 Square km (including all Provinces and Regions). Over 50% of the land area of Pakistan is not accessible through roads if critical bottle necks are choked. The extremely diverse geography and climate of Pakistan is a blessing; however, it could also act as a menace during disasters and result in loss of lives, property, infrastructure and national exchequer. These hazards have been further exacerbated due to rapid increase in population, industrialization, unplanned urbanization, inhabitation in risk prone areas, encroachment of flood plains and visible shift in Climatic Patterns. Climate change has led to an increase in the frequency and intensity of hydro-meteorological hazards (Springer, 2015) moreover Pakistan's is highly prone to earthquakes due to its location on an active seismic belt.

After 18th constitutional amendment, disaster management became a devolved subject and role of NDMA was limited to policy/ plans making and coordination with different stakeholders. Past experiences of disaster management (Earthquake 2005, 2008 & 2015, Super Floods 2010, Blockade of KKH-2016, Chitral Floods etc.) not only highlight the gross weakness of PDMAs but also demand strengthening response mechanism of Disaster Management Bodies. Therefore, a dire need of raising of a dedicated National Disaster Response Force (NDRF) directly under NDMA's control was realized.

In view of budgetary constraints and deteriorating condition of existing Emergency & Disaster Management (E&DM) services of Islamabad; during 5th National Disaster Management Commission's (NDMC) meeting held on 28 March 2018, NDMA (vide Agenda Point no 10) proposed raising of NDRF by merger of CDA USAR Team, Components of Federal Civil Defence and Emergency Services of ICT and the Commission headed by Prime Minister of Pakistan approved the proposal.

1.9 Research Objectives

- i. Review of the existing Disaster Response force/ infrastructure of the contemporary countries with a view to benchmark it with Pakistan.
- ii. Analysis of the existing capabilities of stake holders for their potential to be used as a NDRF.
- iii. Suggesting a framework for formulation of NDRF

1.10 Scope and Limitations of the Study

- i. Mainly Focus and restrict to case studies of dedicated NDRFs and Disaster Response Forces
- ii. Considering only major stake holders

This research is primarily focused on assessing the existing policies and plans of developed countries that how they have managed their emergency events through development of NDRF. Assessment was done to identify the benefits and challenges associated with the NDRF framework implementation among the policy makers and disaster responders. For NDRF users to know current state of policy and planning of the NDRF in Pakistan and existing NDRF incorporated response organizations. For potential NDRF beneficiaries the objective was to assess the current progress and state of model proto type and knowledge of the policy makers of Pakistan.

The scope of research is limited only to main contemporary models of NDRF and major state holder at federal, provincial and district levels to visualize its implementation in a realistic time frame during an emergency through available resources in Pakistan.

1.11 Advantages of the Research Study

- i. Propose and visualize org structure of NDRF/ for operational execution.
- ii. Proposed location and details of manpower and resources.
- iii. Utility as permission and role.
- iv. Employment in different phases and types of disaster.

This research study shall create awareness about NDRF among the stakeholders while focus primarily shall remain on timely tiered response throughout the country at all levels through coordinated action of the concerned departments. The necessary response policy tools in the proposed NDRF are providing practical information about the challenges faced and benefits realized in Pakistan. It will benefit the NDMA, PDMA, DDMA, Rescue 1122 and Civil Defence. It helps in efficiency of disaster response agencies. It will also benefit the academia and future researchers of Pakistan to utilize the key findings and search for possible solutions.

1.12 Areas of Application

Following are the areas of application.

- i. This proposed NDRF framework is applicable to all policy makers and state holders including volunteers and public to enhance their capacity at regional, national, and local level.
- ii. It provides way forward for institutionalized coordination among national institutions i.e. NDMA, PDMA, DDMA and all stakeholders to enhance response level during an emergency.

- iii. It is useful for planning and coordination across all the sectors in country.

1.13 Chapters Organization

Thesis is organized as under:

- i. Chapter 1 – Introduction
- ii. Chapter 2 – Literature reviews
 - Review of contemporary NDRF models.
 - Review of stake holders capability in Pakistan.
 - Interviews of national level key practitioners.
- i. Chapter 3 – Research Methodology.
- ii. Chapter 4 – Results and Discussions.
- iii. Chapter 5 – Conclusions and Recommendations.
- iv. Bibliography

1.14 Chapter Summary

In this chapter background, objectives, rationale, research area, and advantages of research are briefly discussed. Moreover, significance and scope of research are described in detail with respect to national need. A review of literature related to research thesis is described in next chapter.

2.1 Introduction

In chapter two NDRF related literature review is to be discussed at length which is obtained from different sources including books, journals, reports, articles and government documents etc. The topic, Concept of NDRF is comparatively new, implemented only in a handful countries so far therefore comparatively less publications, journals/materials is available on the subject, therefore, open source internet, conferences and discussions at global level are also included.

2.2 Conceptual overview and emergence of NDRF

This basic concept was first introduced in India. “The National Disaster Response Force (NDRF) is a disaster response agency, under National Disaster Management Authority (NDMA) created by the Ministry of Home Affairs, Government of India. It was established in 2009 in Delhi, for disaster management and specialized response to natural and man-made disasters. Functioning at state and center level is under the National Disaster Management Authority” (India NDMA, 2005). A specialist board was made to finalize raising formalities of NDRF/SDRF. Battalion size Civil Armed Forces units under NDMA and SDMA. Similar force exists in some other countries as well.

2.3 Refinement of Research Topic - NDRF Pakistan

Although the topic is covered in legislation/ policy, its further implementation was slow. Progress so far at different levels is summarized to refine this study.

- i. Article 27 of the National Disaster Management Act, 2010 stipulates that “There shall be established a National Disaster Response Force for the purpose of specialist response to a threatening disaster situation or disaster” (NDMA Act-2010). The objective of raising NDRF was aimed at enhancing the state of readiness at National level to quickly respond to any type of disaster through dedicated specialized force 8 March 2017
- ii. In NDMP 2012 need for NDRF identified with no timeline and Fund as under:-
 - Need for a specialized response mechanism
 - For SAR & Evacuation
 - Established across the country
 - Institutionalization be an appropriate next step
 - Proposed TORs including composition
 - Established in country to respond to Disasters an Emergencies
 - Comprise of 86 members, each as per INSRAG standards
 - Under F/G/S/PDMAs

- Training under Emergency Svc Academy Lahore & NIDM and in other related institutions both in country and abroad
 - Supervision, dir& ops under NDMA in consultation with PDMAs
 - Deployment anywhere in the World by NDMA
- iii. In NDMP 2012 Intervention 9 for establishment of national emergency response system Rs 10 million have been earmarked till 2021 to enhance emergency response capabilities like Emergency Operation Centres (EOCs), Civil Defence and Urban search and rescue teams in major cities.
- vi. Raising of NDRF was included as an agenda point in NDMC. The highest DM forum of the country in July 2012.
- v. In the “4th NDMC Meeting” on it was decided to raise NDRF, as a Pilot Project by merging Federal component of Civil Defence, USAR Team of CDA and Emergency Services of ICT and utilization of Civil Defence Institute in Islamabad for Disaster Management (courses / training) by National Institute of Disaster Management.

2.3.1 Visualized Employment Scenarios for NDRF Pakistan

In view of past experience of disasters in Pakistan i.e. earthquake 2005, flood 2010, Blockade of KKH 2016, presence of nuclear facilities and wars with nuclear adversary, employment scenarios have been visualized to quantify NDRF requirement/ research parameters.

- i. Scenario 1 – Earthquake A magnitude 7 Earthquake resulting in ¼ losses than 2005 is a likely. Kashmir, Northern KPK and Federal Capital affected with few buildings collapsed each including one 5 storey residential tower
- ii. Scenario 2 – Flood Floods effecting KPK, Punjab and Later Sind with limited Warning
- iii. Scenario 3 - An Explosion in KANUPP Nuclear Power Plant Karachi resulting in contamination and environmental damage in area
- iv. Scenario 4 - A major Land slide Blocking CPEC Route

2.3.2 NDRF Research Parameters

- i. Organization - manpower including volunteers and equipment required
- ii. Specialties, skill /expertise required
- iii. Placement - location and time frame
- iv. Financial feasibility / requirement
- v. Legislation requirement
- vi. Coordination / partnerships
- vii. Training requirements
- viii. Future outlook

2.3.3 Research Literature Reviewed

- i. Scholarly journals
- ii. Books.
- iii. Dissertations.
- iv. Government documents.
- v. Policy reports and presented papers.

vi. Computer: on line systems.

2.4 Findings literature review - Research Objective 1 (Review of Contemporary NDRFs to benchmark it with Pakistan)

2.4.1 NDRF India. Some relevant/ important findings shared along with a few pertinent recommendations of experts for consideration in analysis are as under:-

- NDRF India mainly consists of battalion size Civil Armed Forces units
- Meant for a high-tech specialist response at State and National level under NDMA/ MoH.



Figure 2.4.1 NDRF deployment in India Source: (Wikipedia, 2010)

CONSTITUTION OF SEARCH AND RESCUE TEAM FOR NBC EMERGENCIES

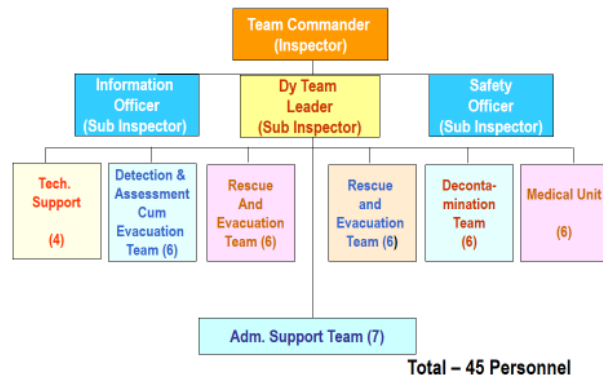


Figure 2.4.2 Organization of an NBC SAR Team Source: (Khanna B.K., 2005)

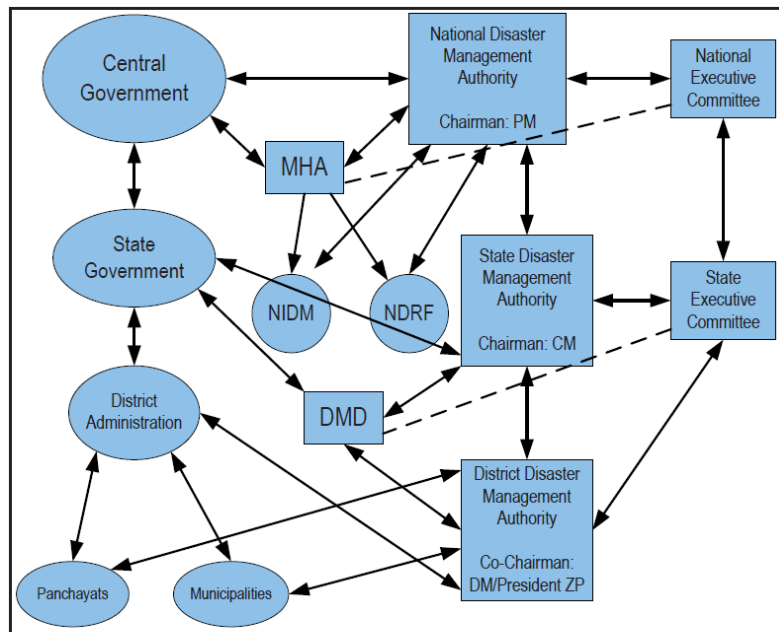


Figure 2.4.3 Institutional Framework of DM in India Source: (Dhar Chakarbarti, 2006)

The period of chaos that followed the Bhuj earthquake made the government realize the need to have a systematic and well trained agency to focus entirely on the disasters that occur. This resulted in the establishment of NDRF.

Policy Formulation Team Composition

- i. Concerned Member of Authority
 - ii. Concerned Ministry – Representative
 - iii. Lead/Nodal Organizations / Departments – Representatives
 - iv. Project Team (When Study ordered on the Subject)
 - v. Advisors/Experts
 - vi. Leading National (Academic – IITs) Institutions
 - vii. Secretarial Support
 - Additional Secretary
 - Joint Secretary Planning
 - DDG Strategic Planning
- List of NDRF Equipment. Procurement of 310 types of equipment at a cost of 180 crores.

Table 2.4.1 Item of permissible expenditure under SDRF / NDRF Source : (Balakrishnan, 2009)

Type	Items of Permissible Expenditure
1. Response	1. Evacuation 2. Search and rescue 3. Clearance of debris 4. Disposal of dead bodies/ carcasses 5. Draining of flood water 6. Hiring boats 7. Ambulance, temporary dispensaries 8. Air dropping of essential supplies
2. Immediate relief	1. Temporary shelter, food, clothing 2. Emergency supply of drinking water 3. Medicines, disinfectants, insecticide etc 4. Care of cattle/ poultry against epidemics
3. Gratuitous relief	1. Ex-gratia payment for deaths and injuries 2. Supplementary nutrition
4. Rural population	1. Assistance to small/ marginal farmers 2. Input subsidy to other farmers 3. Assistance to sericulture farmers 4. Assistance to animal husbandry sector 5. Assistance to Fishermen 6. Assistance to artisans 7. Employment generation
5. Housing	1. Repair and restoration of damaged houses
6. Infrastructure	1. Immediate repair/ restoration of damaged infrastructure seven sectors, such as (a) Roads & bridges (b) Drinking water (c) Irrigation (d) Power (e) Primary education (f) Primary Health Centre and (g) Community assets 2. Replacing damaged medical equipments
7. Preparedness	1. Specialized training for disaster management 2. Procuring search & rescue and communication equipments

Ten Year Review - Revisiting India’s Disaster Response Mechanism by Senior Panel Headed by General NC Vij Former Indian COAS and Founding VC NDMA

Over the last ten years NDRF has acquired a niche for itself for its professionalism in handling different types of disasters. However, it has been increasingly felt that having one professional response mechanism at national level alone is not enough. What is required is;-

- A multi- level response mechanism:
- The NDRF and the Armed forces at national level;
- State Disaster Response Forces (SDRF) at state level;
- Fire & Emergency Services, Civil Defence, Police, Home Guards, NSS and NYKS etc at district level and
- Well aware community at grass root level.

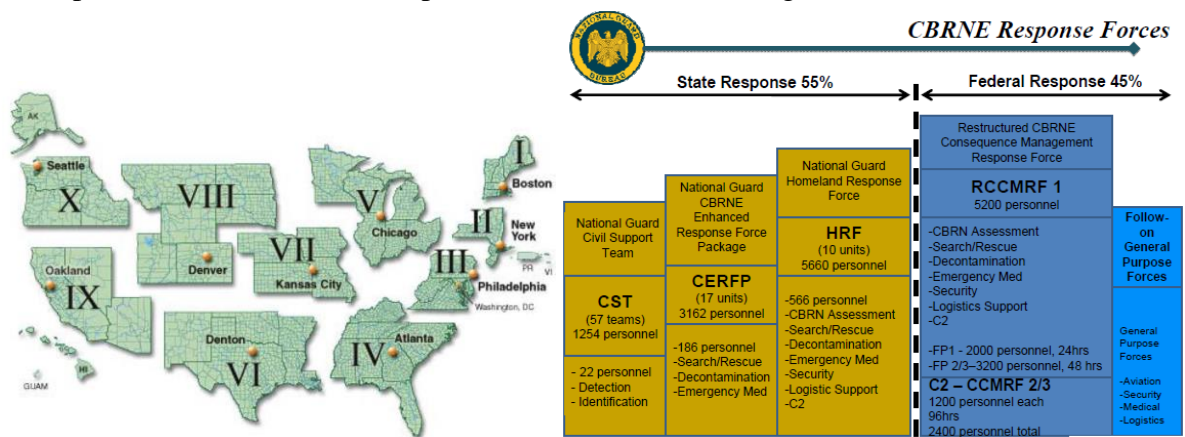
Having a multi- level disaster response mechanism at state, district and local levels is all the more important because handling of disasters is primarily the responsibility of state governments.

Ref: Revisiting India’s Disaster Response Mechanism by Senior Panel Headed by General NC Vij Former Indian COAS and Founding VC NDMA India.

2.4.2 Homeland Response Force (HRF) USA

USA had an elaborate DM System which was further strengthened when challenged on September 11, 2001. But Hurricane Katrina proved too much for this elaborate system in 2004. This disaster resulted in major structural changes in US DM System. The establishment of 10 units of new Homeland Response Force resulted. The force is part of a larger reorganization of the Defense Department's domestic consequence management enterprise, recommended in the 2010 Quadrennial Defense Review.

US response Forces model is comprehensive and has following characteristics:-



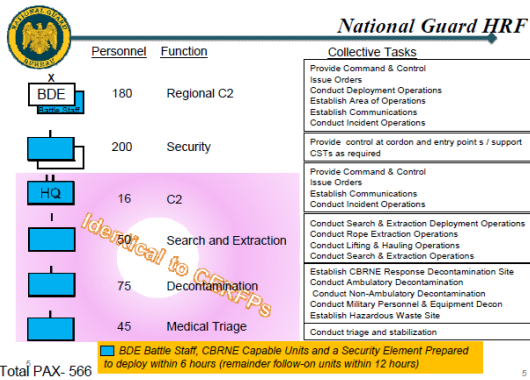


Figure 2.4.2.3 NG HRF Source
 (http://www.Fema.gov, 2009)

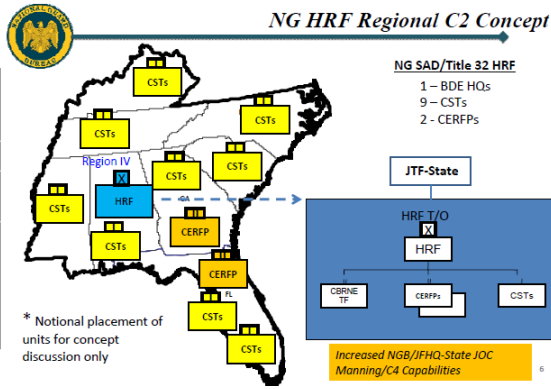


Figure 2.4.2.4 Regional C2 Concept Source
 (http://www.Fema.gov, 2009)

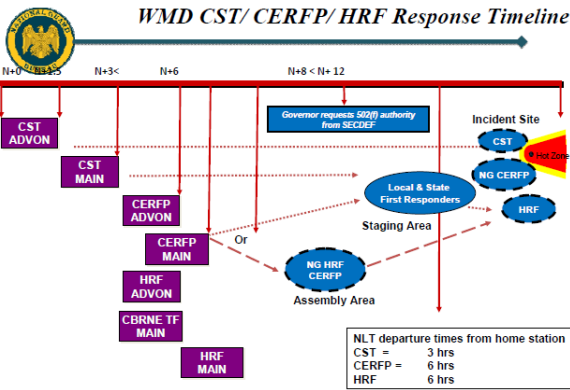


Figure 2.4.2.5 HRF different tiers response timelines Source
 (http://www.Fema.gov, 2009)

Package	Page Reference	Personnel	Cost	Equipment	Total Per Day	Response Time
CERFP						
CBRNE Enhanced Response Force	A-4.1	\$38-\$42,000	\$75,000	\$113-\$117,000		N+6 hours
Search and Extraction	A-4.2	\$9-\$12,000	\$22,000	\$31-\$34,000		N+6 hours
Urban Search and Rescue (Hazmat)	A-4.3	\$4,000	\$500	\$4,500		N+6 hours
Urban Search and Rescue (Heavy)	A-4.4	\$2-\$3,000	\$1,000	\$3-\$4,000		N+6 hours
Mass Decontamination Element	A-4.5	\$10-\$13,000	\$28,500	\$38-\$41,500		N+6 hours
Mass Decontamination Trailer	A-4.6	\$2-\$3,000	\$2,000	\$4-\$5,000		N+6 hours
Medical Triage and Stabilization	A-4.7	\$10-\$12,500	\$18,000	\$28-\$30,500		N+6 hours
Fatality Search and Recovery Team	A-4.8	\$2-\$2,500	\$14,500	\$16,500-\$17,000		N+12-24hours
C2 Homeland Response Force						
Mission Command Strike Package	A-5.1	\$4-\$7,000	\$4,000	\$8-\$11,000		N+4 hours
Incident Management Team	A-5.2	\$800-\$1,200	\$35	\$835-\$1,235		N+2hours
CBRNE Assistance Support Element (CASE-Platoon)	A-5.3	\$34-\$37,000	\$7,000	\$41-\$44,000		N+12hours
Base Supply Installation Services Company	A-5.5	\$5-\$7,000	\$7,000	\$12-\$14,000		N+12hours
Joint Incident Site Communications Capability	A-5.6	\$1-\$2,000	\$7,000	\$8-\$9,000		N+12(HRF)/N+6(CERFP)

Figure 2.4.2.5 FEMA Region-2 Financial Requirement of Mission Ready Packages Source
 (http://www.Fema.gov, 2009)

HRF is a Virtual Organization

Elements/sub-units is pooled from different headquarters. For region two elements are pooled as under.

HRF Mission Command

42nd Infantry Division Headquarters

Based in Troy, N.Y.

CBRN Task Force Headquarters

Command and staff of 104th Military Police Battalion

Based in Kingston, N.Y.

Search and Extraction Element

Soldiers of the 206th Military Police Company

Based in Latham, N.Y.

Decontamination Element

Company 222nd Chemical Company

Based in Brooklyn, N.Y.

Medical Triage Element

Air National Guard medical forces from across the New York Air National Guard

Assistance and Support Element

Security personnel from the New Jersey National Guard include members of the 508th Military Police Company

Based in Teaneck, N.J.

Fatality Search & Recovery Team

New York National Guard's 107th Airlift Wing personnel

Based in Niagara Falls, N.Y.

Highlights of HRF

HRF units conduct unit training for CBRN response in addition to the unit's wartime mission requirements.

Directs and deploys the overall activity of the HRF while improving Common Operating Picture (COP) of deployed NG Consequence Management forces

Bridges a gap between initial NG response and Title 10

HRFs can provide:

- i. Command and Control
- ii. CBRN Assessment
- iii. Decontamination
- iv. Medical Triage
- v. Communications
- vi. Security
- vii. Search and Extraction
- viii. Logistic Support

2.4.3 INDRRA Indonesia

Two Indonesian NDRF Model Indonesian Rapid Response and Assistance (INDRRA) are located in Jakarta and Java air bases. Its main features include:-

- i. International cooperation & support integration.
- ii. Civil-military cooperation.
- iii. Support team experts & liaison officers.
- iv. Resource organization
- v. Not known so far, detailed organization of manpower and equipment, deployment layout and financial details.

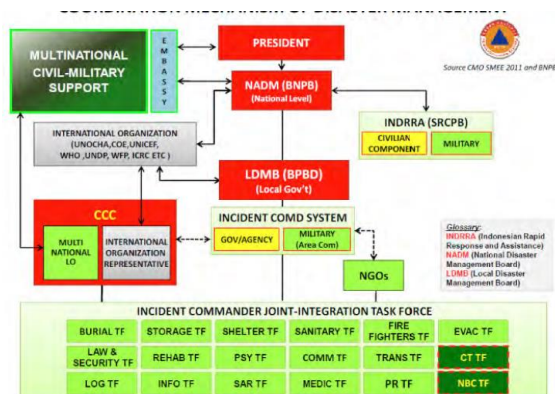
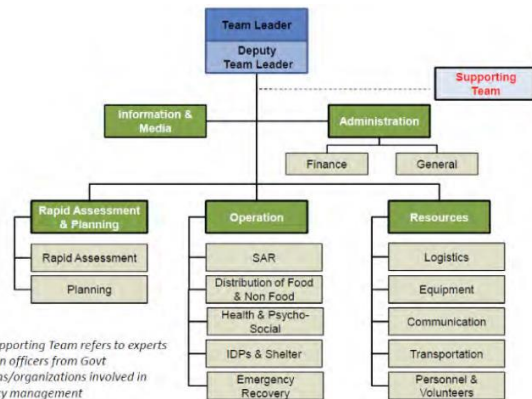


Figure 2.4.3.1 Indonesia Coordination Mechanism of DM Source (DM Handbook Indonesia, 2015)



Note : Supporting Team refers to experts and liaison officers from Govt institutions/organizations involved in emergency management

Figure 2.4.3.2 Organization of INDRRA Source (DM Handbook Indonesia, 2015)

2.4.4 Other Countries

Japan Japanese Response Organizations are mobilized for duration of only emergency. Community is well aware and a lot of trained volunteers are available. Japanese Disaster response is one of the most efficient because of following reasons:-

- i. Dedicated Ministry of DM
- ii. Good organizational structure
- iii. Regular documentation, Yearly white paper
- iv. Just 92 full time employees
- v. Set SOPs following a disaster
- vi. All hazard approach and Cross ministerial response
- vii. Minimum budget \$50 million as compared to US budget \$13.6 billion in 2013
- viii. DM given priority at policy level and Regular allocation and publication of details of DM budget
- ix. Younger volunteers serve the nation for average 40 years .
- x. To meet financial requirements consistent government efforts to include insurance, mutual assistance pacts between communities, districts , provinces and internationally , financial loans and issue of bonds etc.
- xi. Comprehensive CBRNE response plan including separate headquarters to deal with such disasters.

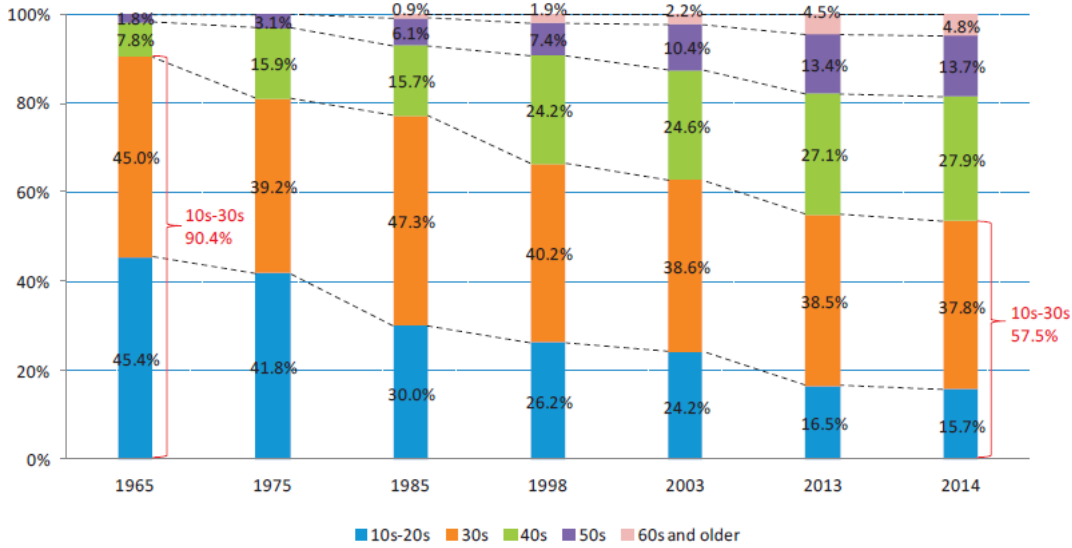


Figure 2.4.4.1 Japan Trends in Age Composition Ratios Among Fire Corps Volunteers
 Source: (Japan DM White Paper, 2015)

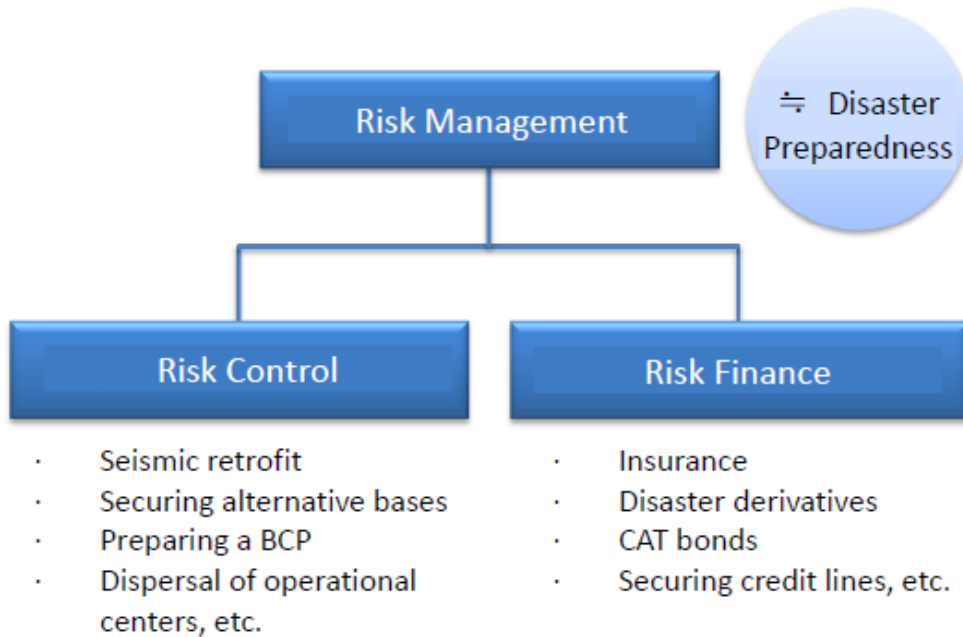


Figure 2.4.4.2 Concept of Risk Management Concerning Natural Disasters Japan Source: (Japan DM White Paper, 2016)

Singapore. Six men small Company Emergency Response Teams (CERTs) model in private sector, it is compulsory for Private industries. Singapore Concept of Compulsory National Service in a long term cost effective solution for trained volunteer management in future. (Singapore Civil Defence Force Magazine – Rescue 995, 2017)

Australian Brisbane Central Business District Emergency Response Plan activation levels of Normal, Alert, Lean Forward, Stand Up and Stand Down is a good practice.

INSARAG USAR Team international model of Search and Rescue Teams is a progressive model for up gradation. It overall falls in SAR Team domains. It has disadvantages of cost, sanctions, security, strict rules and procedures. Can be used for Training the trainers and recommended at Levels 2, 3 &4 but its standards could be followed and implemented for developing own SOPs and for training. Although a number of international Crisis Management Disaster Response Teams like NATO Crisis Management Disaster Response and Organization for Economic Cooperation and Development (OECD) Regional Disaster Response Teams are available but UN OCHA INSARAG international Team Model is recommended to be gradually inducted and increased as part of NDRF. Characteristics are:-

- i. It has a model for all response levels.
- ii. Is Costly
- iii. Has strict rules and procedures
- iv. Could cause security concerns
- v. Is better than other alternatives

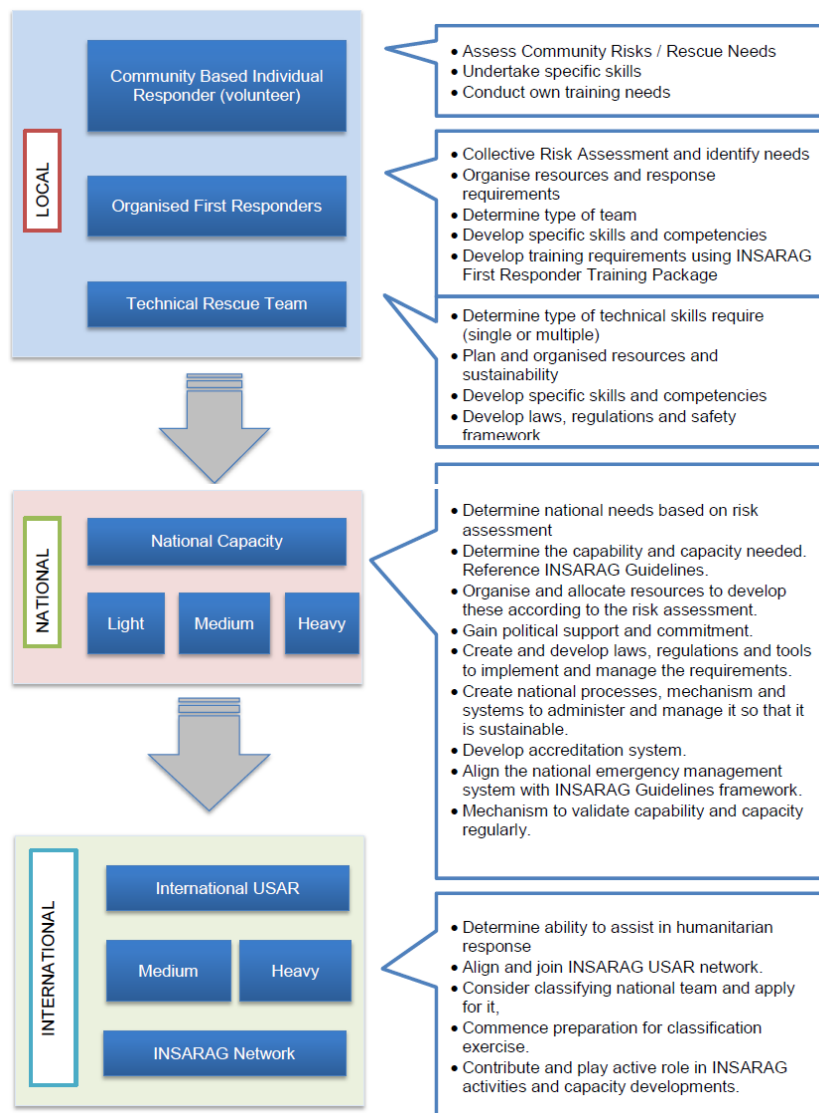


Figure 2.4.4.3 Development Structure of INRARAG Teams Source: (INSARAG Guidelines, 2015)

2.5 Review of the existing capabilities of stake holders for their potential as NDRF

2.5.1 Civil Defence

Civil Defence was established after an Act of Parliament in 1952, the Civil Defence Act 1952. The Act was amended in 1996 to change the definition to include any measures not amounting to actual combat for affording defence against any form of hostile attack by a foreign power or its effects. Whether such measures are taken before, during or after the time of attack. It also includes remedial measures against natural and manmade disasters in peace time.” After the 18th Amendment, Civil Defence became a devolved subject and is under purview of the Provinces / Regions.

Civil Defence operates in a Three Tiered System, much like disaster management system i.e. at Federal, Provincial and District. At Federal Level, Civil Defence falls under the Ministry of Interior (Policy, Training and Guiding Role Only). At Provincial Level, it falls under each

respective Home Department (Provincial Management, Training and Response). At District Level, it falls under District Level Authorities (First Responders). Home Departments of respective Provinces exercise both Administrative and Financial control on two tiers.

Civil Defence Academy, established in 1958 at Lahore is providing a National Premier Institute of Training in the Field of Civil Defence. This centre has been recognized as a Regional Training Centre for International Civil Defence Organization (ICDO) Member Countries. Civil Defence Training Schools conduct Civil Defence Courses and provide services and guidance in formulation of plans for Civil Defence. Training Schools have been established at 6 locations (Faisalabad, Lahore, Karachi, Quetta, Peshawar and Muzaffarabad).

A National Institute of Fire Technology has also been established at Islamabad providing training in the field of fire-fighting related technologies and sciences. Bomb Disposal Unit based at Lahore is imparting training in the field of bomb disposal to all concerned agencies.

Eight Federal Civil Defence Women Mobile Field Training Teams were also established in 1988 to provide Civil Defence training to female students and women in schools / colleges, industrial / commercial, homes, etc.

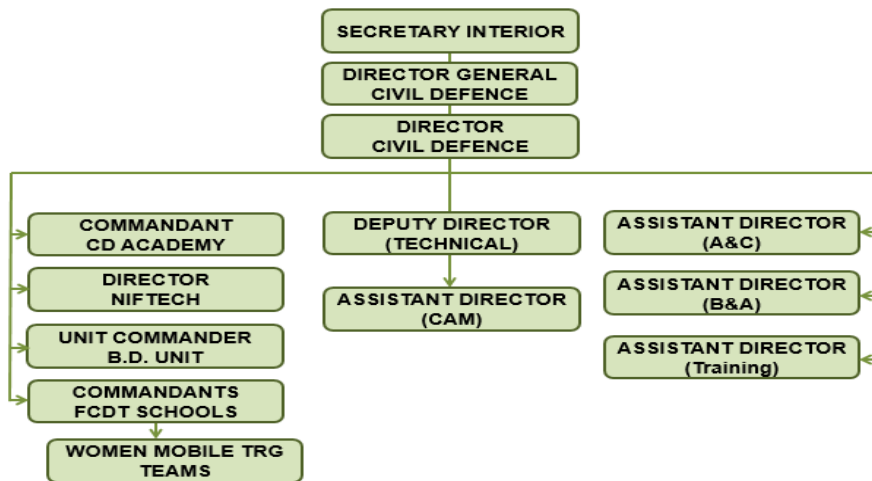


Figure 2.5.1.1 Structure of Civil Defence at Federal Level Source: (Rescue 1122, 2016)

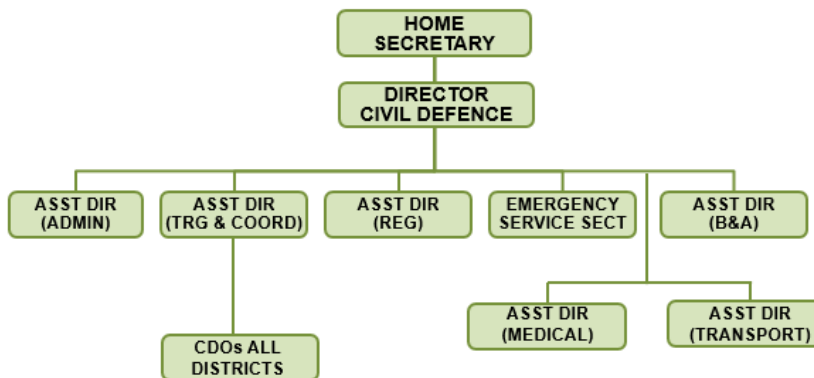


Figure 2.5.1.2 Structure of Civil Defence at Povincial Level Source: (Rescue 1122, 2016)

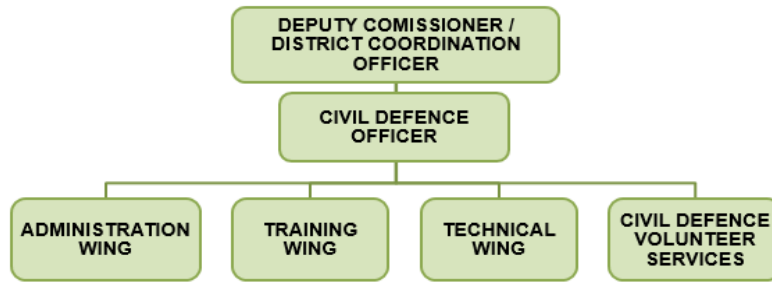


Figure 2.5.1.3 Structure of Civil Defence at District Level Source: (Rescue 1122, 2016)

2.5.2 Emergency Service Rescue 1122

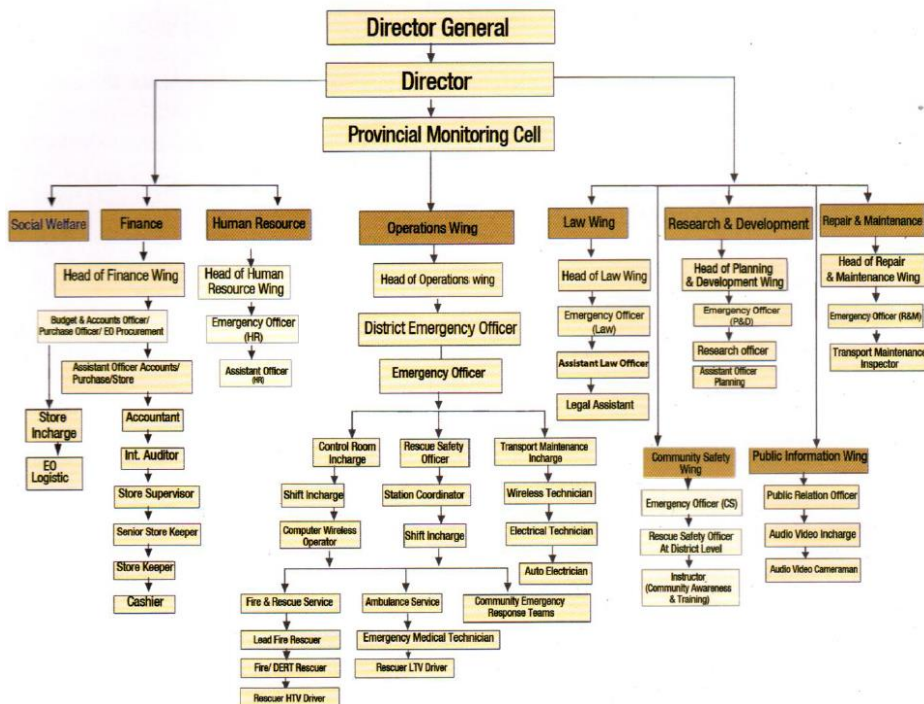


Figure 2.5.2.1 Rescue 1122 Organizational Structure in Punjab Source: (Rescue 1122, 2016)

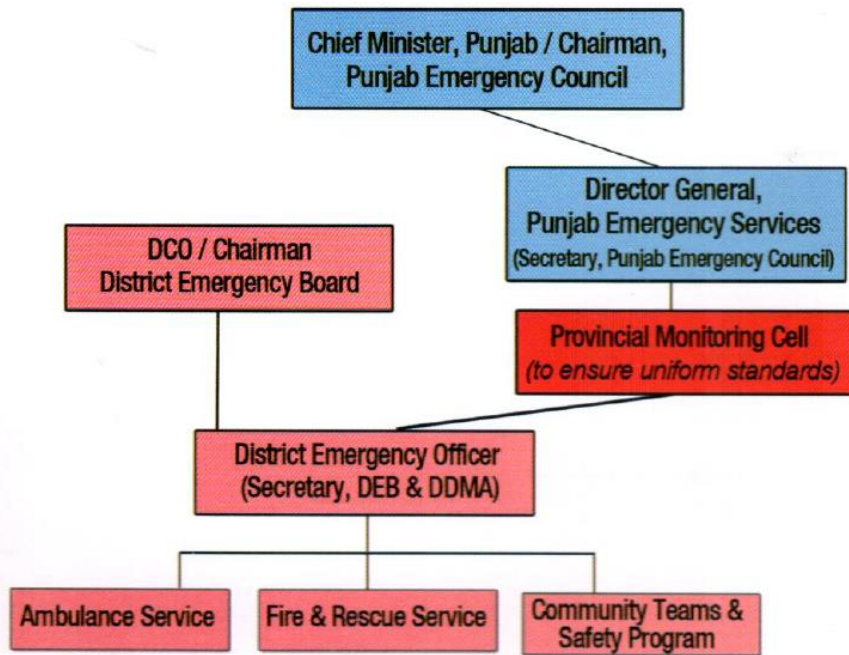
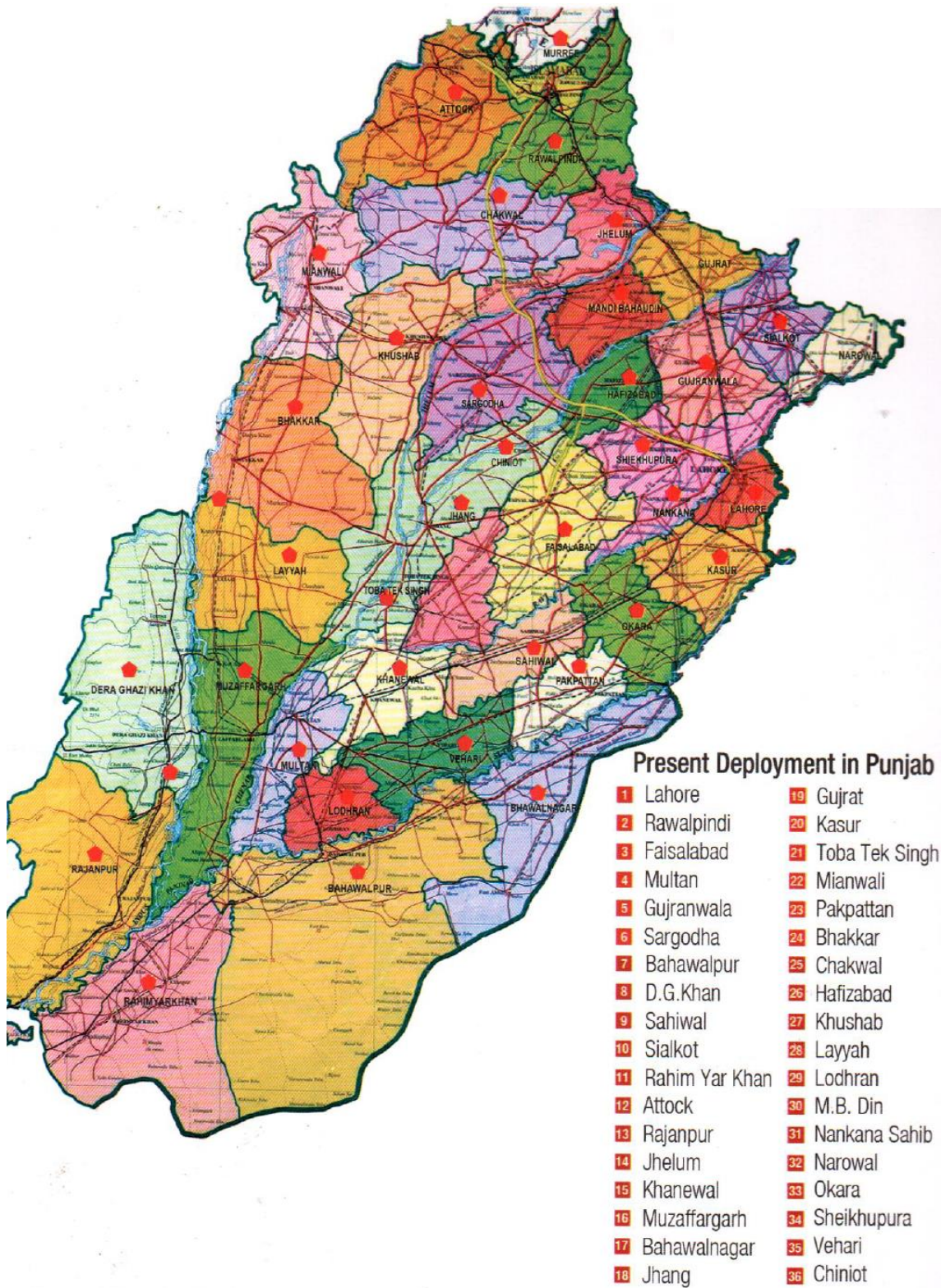


Figure 2.5.2.2 Rescue 1122 Organizational Structure in Punjab Source: (Rescue 1122, 2016)



Rescue 1122 is functional in all 36 Districts and major Tehsils of Punjab, the largest province of Pakistan with population of over 100 million. Rescue 1122 has also become functional in other provinces including Khyber Pakhtunkhwa, Azad Kashmir and Gilgit Baltistan

Figure 2.5.2.3 Rescue 1122 Deployment in Punjab Source: (Rescue 1122, 2016)

Table 2.5.2.1 Evolution of Rescue 1122 Source: (Rescue 1122, 2016)

1993	Amendment in Civil Defence Act to include Disaster Management
2001-02	Civil Defence Reforms finalized by Interior Ministry of Pakistan
October, 2004	Launch of Punjab Emergency & Ambulance Service Lahore Pilot Project
October, 2005	Pakistan Earthquake on 8 th October, 2005
11 April, 2006	Start of Emergency Services Academy
9 th June, 2006	Punjab Emergency Service Act passed by the Punjab Assembly
8 th Oct., 2006	Launching of First Disaster Emergency Response Team
5 th June, 2007	Start of First Modern Fire Rescue Service of Pakistan from Lahore
2007-08	Service established in 12 major Cities of Punjab
July, 2009	Establishment of Aman Ambulance Service, Karachi
Feb., 2010	Assistance % Training of Emergency Services of Azad
June, 2010	Establishment of Emergency Services of Khyber Pakhtun Khwa
2009-10	Expansion to remaining 24 Districts of Punjab
2011-12	Establishment of Emergency Service in 15 Tehsils
2012	Assistance & Training of Emergency Services of Gilgit – Baltistan
2012-14	Expansion of Emergency Service in 12 Tehsils
2015	Establishment of new purpose built Emergency Services Academy
2015	Assistance & Training of Emergency Services of Balochistan
2015-17	Expansion to remaining 62 Tehsils of Punjab

Rescue 1122 is playing an important role in disaster preparedness, response and prevention except relief and rehabilitation including financial compensation etc. which are managed by PDMA. Government of Punjab has notified Punjab emergency service as DRF and Home Department Government of Punjab has also transferred flood relief function along with resources from CD to Punjab Emergency services on 28 May 2011. Nomination for award of Medium Level INSARAG team has been accepted and in process. Light SAR Teams have been established in 36 districts of Punjab. Concept of Certified Volunteers (Certs) has also

been implemented in Punjab where by volunteers are being registered also as per certified skills to be employed in case of emergencies.

Progress of Rescue 1122 Punjab is not comparable with other Provinces and States. Progress of 1122 is very slow in some provinces i.e. in Balochistan.

Table 2.5.2.2 All Staff of Rescue 1122 Source: (Rescue 1122, 2016)

DISTRICTS & TEHSILS	DEO	EO	RSO	CRI	SC	SI	EMT	CTWO	LFR	FR	DR	RD	SG	AS*	Total
Lahore	1	4	9	1	2	41	212	101	39	171	55	241	15	54	946
Rawalpindi	1	3	1	1	5	20	91	51	35	133	10	131	10	32	524
Faisalabad	1	3	1	1	5	18	91	51	35	105	10	107	10	29	467
Multan	1	3	1	1	4	16	77	45	35	105	10	103	10	26	437
Gujranwala	1	3	1	1	4	16	69	37	35	105	10	103	10	35	430
D.G Khan	1	2	1	1	2	8	49	28	21	63	10	64	6	24	280
Bahawalpur	1	2	1	1	2	8	49	27	21	56	10	63	6	23	270
Sargodha	1	2	1	1	2	8	49	28	21	56	10	63	6	22	270
Sahiwal	1	2	0	1	1	7	42	24	10	35	10	45	6	10	194
Sialkot	1	2	0	1	2	8	49	32	21	70	10	68	6	25	295
R.Y Khan	1	2	0	1	1	4	21	21	7	28	10	34	3	17	150
Attock	1	1	1	1	1	3	28	21	7	21	14	32	3	15	149
Bahawalnagar	1	1	1	1	1	3	28	21	7	21	14	32	3	15	149
Gujrat	1	1	1	1	1	3	28	21	7	21	14	32	3	15	149
Jhelum	1	1	1	1	1	3	28	21	7	21	14	32	3	15	149
Jhang	1	1	1	1	1	3	28	21	7	21	14	32	3	15	149
Kasur	1	1	1	1	1	3	28	21	7	21	14	32	3	15	149
Khanewal	1	1	1	1	1	3	28	21	7	21	14	32	3	15	149
Mianwali	1	1	1	1	1	3	28	21	7	21	14	32	3	15	149
Muzaffar Garh	1	1	1	1	1	3	28	21	7	21	14	32	3	15	149
Pakpattan	1	1	1	1	1	3	28	21	7	21	14	32	3	15	149
Rajanpur	1	1	1	1	1	3	28	21	7	21	14	32	3	15	149
Toba Tek Singh	1	1	1	1	1	3	28	21	7	21	14	32	3	15	149
Bhakkar	1	1	1	1	1	3	28	21	7	21	14	32	3	15	149
Chakwal	1	1	1	1	1	3	28	21	7	21	14	32	3	15	149
Hafizabad	1	1	1	1	1	3	28	21	7	21	14	32	3	15	149
Khushab	1	1	1	1	1	3	28	21	7	21	14	32	3	15	149
Layyah	1	1	1	1	1	3	28	21	7	21	14	32	3	15	149
Lodhran	1	1	1	1	1	3	28	21	7	21	14	32	3	15	149
Mandibahaudin	1	1	1	1	1	3	28	21	7	21	14	32	3	15	149
Nankana sahib	1	1	1	1	1	3	28	21	7	21	14	32	3	15	149
Narowal	1	1	1	1	1	3	28	21	7	21	14	32	3	15	149
Okara	1	1	1	1	1	3	28	21	7	21	14	32	3	15	149

Sheikhupura	1	1	1	1	1	3	28	21	7	21	14	32	3	15	149
Vehari	1	1	1	1	1	3	28	21	7	21	14	32	3	15	149
Chiniot	1	1	1	1	1	5	28	21	7	21	14	32	3	15	151
Murree - MRTC	0	1	0	1	3	10	56	30	10	49	10	71	10	44	295
32 Tehsils	0	0	32	0	32	46	336	128	8	86	98	384	0	110	1260
Headquarters	DG, PMC, HR, R&D, Finance, R&M etc. 59							33	0	4	3	25	20	43	187
Academy	Training Staff. 109							5	0	0	0	58	34	136	342
Total	36	54	73	37	90	287	1891	1166	473	1591	616	2360	227	1005	10074

*AS includes Accounts, Stores, Transport Maintenance, Technical and Office Support Staff etc

Table 2.5.2.3 All Resources of Rescue 1122 Source: (Rescue 1122, 2016)

DISTRICTS & TEHSILS	Rescue Stations	Emergency Ambulances	Rescue Vehicles	Rescue Boats	Fire Vehicles	Water Bowzers	Aerial Platforms/ Ladders
Lahore	14	34	4	9	22	2	4
Rawalpindi	5	14	3	5	12	2	2
Faisalabad	4	14	1	2	10	2	2
Multan	4	12	2	16	10	2	1
Gujranwala	4	12	2	7	10	2	1
D.G Khan	2	8	1	9	6	1	0
Bahawalpur	2	8	1	2	6	1	0
Sargodha	2	8	1	4	6	1	0
Sahiwal	1	6	1	4	3	1	0
Sialkot	2	8	1	16	6	1	1
R.Y Khan	1	4	1	10	2	1	0
Attock	1	4	1	0	2	1	0
Kasur	1	4	1	21	2	1	0
Jhelum	1	4	1	5	2	1	0
Chakwal	1	4	1	0	2	1	0
Bhakkar	1	4	1	1	2	1	0
Khushab	1	4	1	20	2	1	0
Mianwali	1	4	1	6	2	1	0
Okara	1	4	1	4	2	1	0
Hafizabad	1	4	1	15	2	1	0
Gujrat	1	4	1	5	2	1	0
Mandi Bahauddin	1	4	1	10	2	1	0
Shiekhpura	1	4	1	7	2	1	0
Nankana Sahib	1	4	1	5	2	1	0
Narowal	1	4	1	11	2	1	0
Jhang	1	4	1	20	2	1	0

Toba Tek Singh	1	4	1	3	2	1	0
Vehari	1	4	1	4	2	1	0
Pakpattan	1	4	1	1	2	1	0
Lodhran	1	4	1	1	2	1	0
Khanewal	1	4	1	7	2	1	0
Rajanpur	1	4	1	12	2	1	0
Layyah	1	4	1	6	2	1	0
Muzaffargarh	1	4	1	17	2	1	0
Bahawalnager	1	4	1	1	2	1	0
Chiniot	1	4	1	3	2	1	0
Murree – MRTC	3	8	4	0	3	1	1
32 Tehsils	32	78	14	0	20	0	0
Academy	1	4	4	11	6	0	3
Total Academy	102	318	65	280	172	42	15

Table 2.5.2.4 Staff for Establishment of a District Emergency Service 1122 Source: (Rescue 1122, 2016)

Staff for a District	BPS	Posts
District Emergency Officer (DEO)	17/18	1
Rescue & Safety Officer (RSO)	16	1
Control Room Incharge (CRI)	16	1
Station Coordinator (SC)	14	1
Shift Incharges (SI)	12	3
Emergency Medical Technicians (EMT)	11	28
Lead Fire Rescuers (LFR)	12	7
Fire Rescuers (FR)	11	21
DEPT Rescuers (DR)	11	7
Computer Telephone Wireless Operators (CTWO)	11	20
Rescue Drivers (RD)	6	32
Admin Staff		
Transport Maintenance Incharge / Technician	12	1
Wireless Technician	12	1
Electrical Technician	8	1
Auto Electrician	8	1

Accountant	14	1
Accounts Assistant	11	1
Senior Store Keeper	8	1
Store Keeper	5	1
Field Worker (Cook)	2	1
Security Guard	1	3
Sweepers	1	2
Total		136

Table 2.5.2.5 Resources for Establishment of a District Emergency Service 1122 Source: (Rescue 1122, 2016)

Vehicles and Equipment for a District	Qty
Purchase of Transport	
Emergency Ambulances with fabrication & equipment	4
Fire Trucks	2
Water Bowser Truck	1
Rescue Vehicle with equipment	1
General Duty Van / Pick up for cylinder filling store, etc.	1
Duty Officer's Jeeps	1
Motorcycle	3
Purchase of Computer Equipment	
Computer (Server)	1
Computers (5 for Control room, DEO, RSO, Admin)	7
Printer (one each for Control room, DEO, Admin)	
Purchase of Plant & Machinery	
Rescue Combi tool	1
Solar System for Control Room (load 2500 to 3000 watts)	1
Vehicle Tracking System for vehicles	9
Installation of Call Monitoring Systems	1
Digital Recorder Cameras	8
LCDs for control Room for vehicle and media monitoring	1
Air Conditioners for control room & DEO Office	3

Fax Machine & Photocopier	1
Uniform & Protective Clothing	1
Foam Compound, Fire Hoses, Hose binding machines etc.	
Self Contained Breathing Apparatus (SCBAs)	7
Extra Cylinders for SCBAs	3
Fire Turnout Gear with Helmet, light, shoes, etc.	35
Wireless Communication Systems	
Base Radio (DHQ, Control & Backup)	3
Mobile Radio (one per vehicle & one backup)	12
Walkie Talkies (for DEO, EO, RSO, SI & Control room & Rescuers)	12

1122 Disaster Response

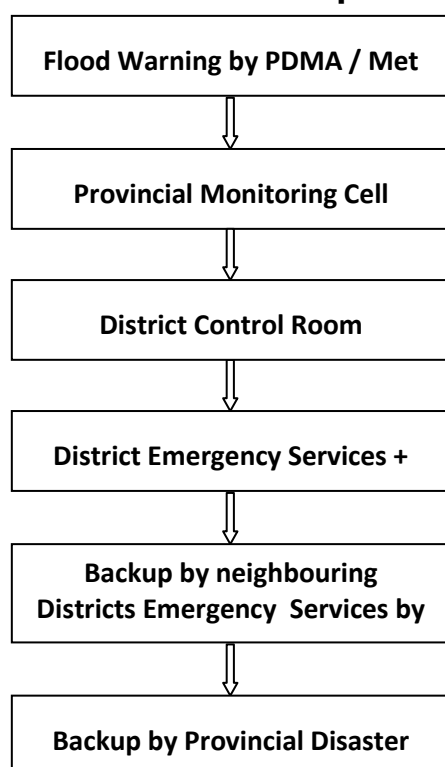


Figure 2.5.2.4 Rescue 1122 Disaster Response Source: (Rescue 1122, 2016)

2.5.3 Police

Security and law enforcement is an important component of DRF. Police force of Pakistan is an important law enforcement agency. Rescue 15 and Dolphin Force of Punjab Police are relevant and effective components to be dovetailed in DRF.

2.6 Interviews Conducted for Research

- i. Dr. Rizwan Naseer, DG 1122 Punjab
- ii. Lieutenant Colonel Khuda Bux, NDMA
- iii. Major Amjad, NDMA
- iv. Mr. Javed Iqbal Khichi, Civil Defence

2.6.1 Interview Questionnaire

- i. Organization - manpower including volunteers and equipment required
- ii. Specialties, skill /expertise required
- iii. Placement - location and time frame
- iv. Financial feasibility / requirement
- v. Legislation requirement
- vi. Coordination / partnerships
- vii. Training requirements
- viii. Future outlook

2.7 NDRF and Disaster Response in Pakistan

Timely and effective countermeasure to a large scale emergency requires a prepared response agency which calls for efficient command, operations, logistics, plans and finance aspects. Time is most precious resource which could be reduced by manipulating quantity/ quality of resources and could be best achieved by a well structured, balanced, well placed and trained response force. NDRF being a specialized DM organization with dedicated staff, equipment and area of responsibility be able to foresee, plan and rehearse different contingencies. Achieve efficiency by coordinating necessary resource through information management, utilizing prior peace time liaison and preparation. With Prime Minister's approval for creating a model National Disaster Response Force (NDRF), Pakistan has joined the ranks of a handful of nations. This likely hub of disaster response is expected to overall improve DM spectrum due to better coordination, information/ resource/ logistics management and preparedness.

2.8 NDRF and Response Agencies

Disaster management is a very complex and demanding task which absorbs all spheres of a people/government. There is a need to make constant preparations in anticipation of a calamity, in light of the Disaster Risk and Vulnerability Atlas. It also requires constant refinement of the plans with requisite ingenuity and innovation. Only dedicated and well-motivated individuals grouped in specialized setups like NDRFs can undertake this sacred task with dedication and pride. Army has its own dedicated role. Present day security environment has already committed army on Eastern and Western fronts and CPEC will stretch it North South all along the routes. It is thus imperative for central coordinating agency NDMA to build capacity of stake holders to be able to function with freedom

allowing initiative to exploit their resourcefulness. It deserves full cooperation by the provincial governments in setting up and functioning of PDRFs and SAR Teams.

2.9 Chapter Summary

In this chapter, a detailed literature review has been discussed. Sources of literature review are indicated and the concepts for the development of NDRF are explained. Research studies conducted by various scholars as well as NDRF models adopted by developed and under developed countries are discussed in details to make them applicable in Pakistan.

RESEARCH METHODOLOGY

3.1 Introduction

In current chapter research methods being used in this study and techniques for data review of books, analysis conceived from documents is being presented. Research methods are reviewed in detail, which includes the use of qualitative research methodology based on content analysis. Important tools and aspects for articles review and data collection techniques are discussed. A number of experts belonging to government administrative/functional institutes at all levels (national, provincial and district/local), international non-government/government organizations (I/NGOs) were consulted and seminar was organized to bring the data into true form.

3.2 Nature of Research

For initial establishment of NDRF in Pakistan, this research is exploratory in its nature because as per objective 3 of the research, there is need to explore and suggest a framework. Being initial research conducted, it will help to clarify the nature of the problem. Exploratory research is useful preliminary step that will help to establish the nature of NDRF. Concept of NDRF being new to the country and not yet having been implemented so far makes the research exploratory. Study of contemporary models in itself points towards the same. But NDRF being a specialized DM organization with dedicated staff, equipment and area of responsibility will make this research explanatory as well. Different details have to be studied for the new framework in question.

3.2.1 Goals of Exploratory Research

- i. Familiarization of facts and concerns
- ii. Develop techniques and research direction
- iii. NDRF requirements
- iv. A force under NDMA having a national reach
- v. Convenient / justified location/locations for timely response
- vi. Capable of specialist response
- vii. Must manage disaster-being ultimate responder (<http://uk.sagepub.com>).

3.3 Research Methods and Design

In coming subsections efforts have been made and methods utilized in this study to generate, collect, compile, utilize and analyze data to reach workable results. The summary of research methodology is described in figure 3.3.1 and way forward for proposed NDRF framework based on extensive literature review and study results extracted through content analysis.

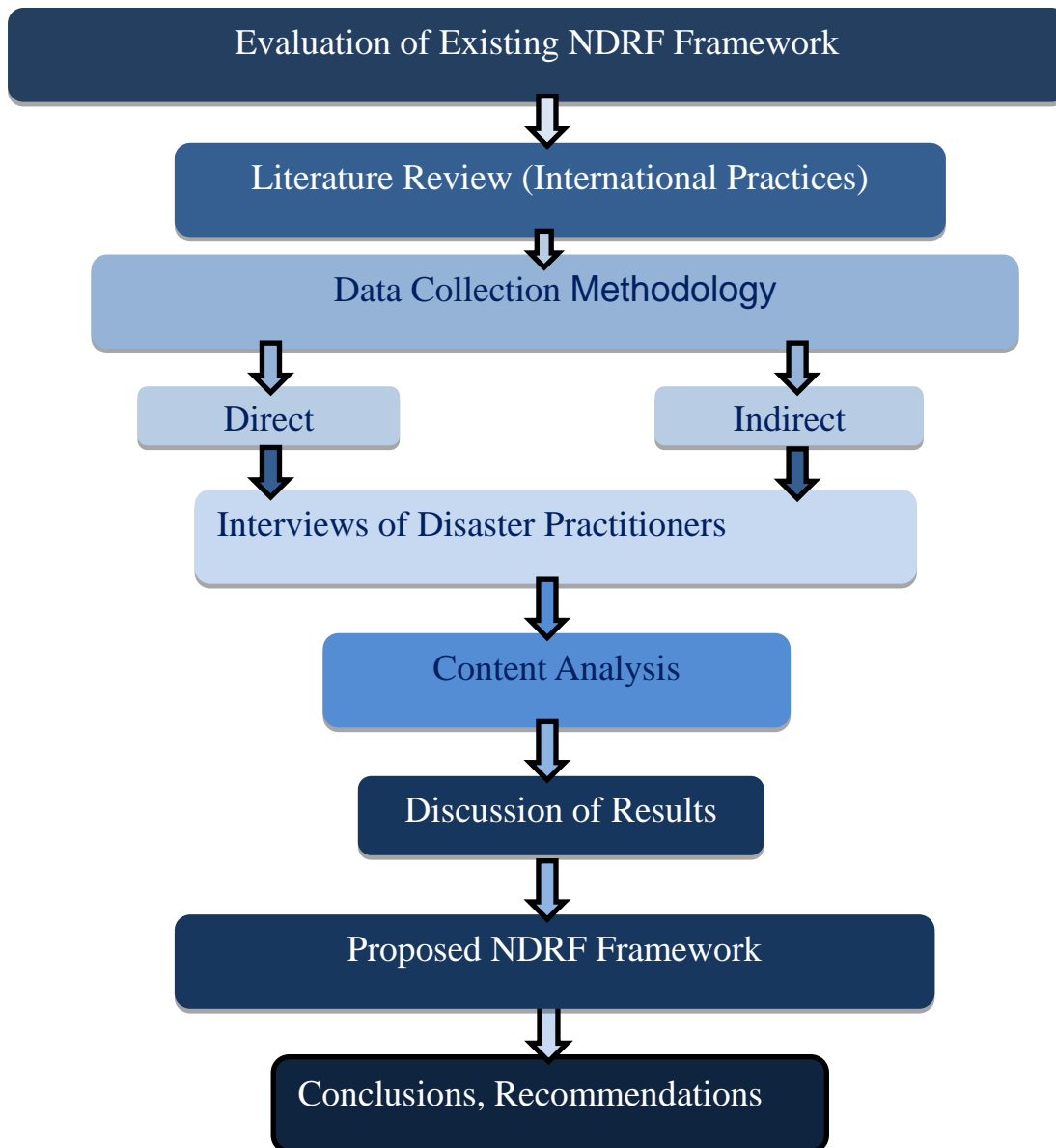


Figure 3.3.1 Research methodology and design

3.3.1 Qualitative Research

It engages evaluating the nature of crisis e.g. variety of difficulties being faced by people. Qualitative research methodology is used to explore different point of views from all stakeholders' observation on the progress required and challenges connected to response agencies in calamities in Pakistan.

Below are the some valuable viewpoints by various researchers/ authors about qualitative research methodology:

- i. *"This qualitative method is for researchers who seek answers for detailed factual summary of particular events"* (Shipman et al., 2014).
- ii. *"One advantage is that the facts collected give insight on 'human' side of the issue".* (Mecket et al., 2005).
- iii. *"Clarified as "Set of tools to pursue the mandate of the philosophies of meaning"* (Johnston et al., 2000).

3.3.2 Qualitative Content Analysis

It is one of the several methodologies used to analyze text. Other methods consists ethnography, grounded hypothesis, phenomenology, and historical research. Followings are some point of views about qualitative content analysis by famous authors.

- i. *"Research using qualitative content analysis focuses on the characteristics of language as communication with attention to the content or contextual meaning of the text".* (Budd, Thorp, and Donohew, 1967; Lindkvist, 1981; McTavish and Pirro, 1990; Tesch, 1990)
- ii. *"Qualitative content analysis goes beyond merely counting words to examining language intensely for the purpose of classifying large amounts of text into an efficient number of categories that represent similar meanings".* (Weber, 1990).

Additionally these classifications can be sorted either unclear or precise communication. The goal of content analysis is *"to provide knowledge and understanding of the phenomenon under study"*. (Downe-Wamboldt, 1992).

3.3.3 Direct Content Analysis

Sometimes, existing research or prior assumption for a phenomenon that is not complete or can be extend by further explanation, the qualitative researcher might want to select to exercise a directed technique for data analysis. However, the basic views of the naturalistic model from the groundwork of general perspective to the analysis and design of study. The objective of selected approach to analysis of content is to authenticate or benefit theoretically to a hypothetical theory or framework.

3.3.4 Content Analysis of Existing Frameworks

Prevailing research or theory might help to spotlight the research query. It can offer predictions for the variables of concern or variables relationships among themselves. “*Content analysis using a directed approach is guided by a more structured process than in a conventional approach*” (Hickey & Kipping, 1996).

3.4 Data Collection and Compilation

This research thesis consist basically data was collected by indirect and direct content extracted from international and national guidelines documents and open ended interviews national level with key practitioners.

3.4.1 Direct Contents

Direct contents are collected through interview of key stakeholders involved indirectly or directly with disaster response practices at national level & locally. This interview indicates a research interview methodology for social sciences by asking a set of triggered questioner to elicit new thoughts by keeping the interviewee’s feedbacks in mind. Face to face communication and fields work with the endanger community mixed up with different activities for emergency response can also be the secondary sources.

- i. To classify key stakeholders, help with disaster relief.
- ii. To justify understanding and observations of key stakeholders on development disaster relief practices and guidelines.
- iii. To identify the correct position of relief capability for mega catastrophes in Pakistan.
- iv. To be updated with grey spots for relief responses guidelines and procedures.
- v. To spotlight the characteristics of the development of relief response in Pakistan successfully.
- vi. To overcome the joint operational relationship among related ministries & all concerned department at national & local level.
- vii. To extract the parallel and unparallel of disaster relief framework at functional level and their efficiency.

3.4.2 Secondary Contents

A complete evaluation of literature has offered the path to collect secondary contents. It includes: National and International papers/journal, books, NDRF policies and frameworks, and national guidelines. It enabled to achieve following goals:-

- i. To study relief response and capability of endanger community to catastrophe in Pakistan.
- ii. To extend the understanding of capability of NDRF in various fields.
- iii. To examine the different conceptual and functional procedures in emergency relief practices & theories

- iv. To offer recommendations which illustrate to reduce the role of basic challenges occurred by community and policy makers in Pakistan for disaster relief.
- v. To contrast the development and to look for the weak points of disaster relief frameworks of Pakistan.

3.4.3 Contents collection through fieldwork

The contents are gathered through surveys in fieldwork. Fieldwork is commenced at three various stages, nationally, provincially, and district wise. On the first stage interviews are taken from important stakeholders including practitioners / experts nationally for content analysis of frameworks.

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Every interviewee had obtained 30-40 minutes for each interview. Almost 5-7 minutes were consumed in demographic situation/ introduction of contributors and about goals of research, cause they were reluctant to reply any query until they became familiar about research goals; further they were at critical posts and were not permitted to share any sort of information either it is classified or not. Afterwards 33-35 minutes were spent in investigation of information by semi organized interviews of contributors deeply about research analysis about NDRF in Pakistan. The import point of interviewer was to obtain optimum information by face to face questionnaire / answers with respondent on his/her personal understandings as practitioners for main research theme and study about NDRF Pakistan.

3.5 Process of Contents Analysis

After collection of data by interviews in which interviewee shared their experiences and comments about the present practices of disaster relief not only locally but also on national level. To sort the data of interviews, first they all noted down in word format but in a well organized form. After that every questionnaire data is sorted out with its all attributes. Afterwards all interviews were deeply examined and grow different themes with their sub themes keeping in view the secondary content collected through literature review. It is worth noting every theme was taken out thoroughly from the reports of each interviewee in regard of questions that had answered. Sub theme were originated from the parent themes and then written down into final transcript for final outcomes.

3.7 Limitations in Content Analysis

The selected technique has produced challenges to the naturalistic paradigm. The use of the theory has number of boundaries, because researchers are aware of the data in a careful manner, but still a strong preliminary. Therefore, researchers are more likely to find potential evidence and not support the theory.

Secondly, some of the participants have replied in a way to the probe question in a way to please the researcher or consent. In one study, some participants agreed with the proposed level of civil defense, despite the fact that they did not survive the disaster. Third, great emphasis is placed on the theory of response to natural disasters has blinded researchers contextual aspects of the disaster phenomenon. In this study, too much emphasis on disaster

management is able to determine the appropriate characteristics that affect the results, clouded. For example, the cross-sectional study design underlines the current emotional reactions.

3.8 Chapter Summary

In this chapter methodology is discussed in detail adopted for the research study in different perspectives. The results and discussions of the study are described in next chapter.

RESULTS AND DISCUSSIONS

4.1 Introduction

As the nature of study is exploratory and focus has been to explore the patterns of institutions, policy formulation, finance mechanism for implementation of policies and coordination among the stakeholders across all the levels in Pakistan. First review of literature was carried out for input from contemporary study of all available NDRF models. Secondly all the material and data available was screened through for review of present stake holder capabilities. In the end all the gaps were filled in by open ended interviews. The data of interviews was compiled in an organized method. However, results are divided into three sections based on their presentation for critical analysis of themes.

4.2 Comparative Analysis of Contemporary NDRF

This section identifies the gaps in existing system of disaster response force in the country in comparison with the international good practices being adopted by other countries as under:-

4.2.1 NDRF India.

NDRF India mainly consist of battalion size Civil Armed Forces units, Concept was conceived as a dedicated well trained agency after 2001 Bhuj and 2005 earthquakes for a systematic response function at State and National level under NDMA/ MoH. It is a manpower heavy organization having 18 self-contained specialist search and rescue teams of 45 personnel each including engineers, technicians, electricians, dog squads and medical/paramedics. Out of total 1149 individuals 810 are working in the field in the 18 teams and remaining 339 individuals are employed in unit headquarters of the NDRF and its company headquarters. Comprehensive response capability requires a lot of finance. Over the last ten years, it has been felt that having one professional response mechanism at national level alone is not enough. What is required is a multi- level response mechanism: the NDRF and the Armed forces at national level; State Disaster Response Forces (SDRF) and Civil Armed forces CAF at state level; Fire & Emergency Services, Civil Defence, Police, Home Guards etc at district level and well aware community at grass root level. Having a multi-level disaster response mechanism at state, district and local levels is all the more important because handling of disasters is primarily the responsibility of state governments.

Indian model is not supported for adoption because besides having similar disasters and response capabilities to that of Pakistan it has certain deficiencies. It lacks upper tier of response for a large scale disaster which could mobilize and sequentially employed in coordination with other tiers to give wholesome response. It lacks all effective lower tiers like F/SDRF, Civil Defence and below also, international INSARAG coordination /

certifications, quality operations centers, relief reserves and resource centers. Lack of legislation for SDRF and below including CD is another sour point.

4.2.2 Homeland Response Force (HRF) of USA

Country has been divided into ten Federal Emergency Management Authority (FEMA) Regions for all 52 states. US response Forces model is comprehensive and has following characteristics:-

- i. Composed of army air guards, these are Not Fenced but virtual Units which will be commissioned in case of Training and Emergency. HRFs can provide:-
 - Command and Control
 - CBRN Assessment
 - Decontamination
 - Medical Triage
 - Communications
 - Security
 - Search and Extraction
 - Logistic Support
- ii. For Comprehensive response to all possible emergencies, different tiers in Response Force catering for different response levels having Sequential employment /reaction times, manning levels and detailed organizations
- iii. Ratio in Provincial and Federal response is 55%:45%
- iv. Response Forces further have Response type and Consequence Management type forces organized from battalion to division level setups
- v. Higher Level Response Forces - Consequent Management Response Level has further Three sub types of units/ setups
- vi. Consequent Management Response Forces further have in next tier available, regular Army/ Joint Services
- vii. HRF Group deployment layout with Response time line and reaction time of advance and Main Groups of different tier.
- viii. For ease in financial planning and requisitioning, complete financial effect or budget requirement down to sub unit level in the form of Mission Ready Packages are notified

4.2.3 Indonesian NDRF Model

Indonesian Rapid Response and Assistance (INDRRA) offers feature of international cooperation & support integration, civil-military cooperation, support team experts & liaison officers and resource organization but it is not recommended as it lacks detailed organization of manpower and equipment, deployment layout and financial details.

4.2.4 Japan

Japanese Response Organizations are mobilized after emergency. This model suits Japan as it is the most affected nation by disasters. From atomic bomb to Great East Japan Earthquake of 2011 they have faced challenges with preparation and experience. Community is well aware and a lot of trained volunteers are available. This model is not recommended and initially dedicated disaster response organizations are recommended for Pakistan. Comparison of seven leading DM systems reveals that Japanese Disaster response is one of the most efficient because of following :-

- i. Dedicated Ministry of DM
- ii. Good organizational structure
- iii. Regular documentation, Yearly white paper
- iv. Just 92 full time employees
- v. Set SOPs following a disaster
- vi. Structure following a disaster is notified for required duration and is de-notified
- vii. All hazard approach and Cross ministerial response
- viii. Minimum budget \$50 million as compared to US budget \$13.6 billion in 2013
- ix. Regular allocation and publication of details of DM budget

4.2.4 Other Countries

Singapore Private industries six men small Company Emergency Response Teams CERTs are a very good model in private sector, will strengthen first responders at community / tehsil level. Singapore Concept of Compulsory National Service in present day national financial crisis is a way forward for nation building at present and volunteer management in future.

Bangladeshi features of contingency planning template, guideline for industrial safety and guideline for international assistance in disaster emergency.

Australian Brisbane Central Business District Emergency Response Plan activation/ alert levels of Normal, Alert, Lean Forward, Stand Up and Stand Down are recommended for NDRF.

INSARAG USAR Team is one of the most suitable international models of Search and Rescue Teams with most progressive model of up gradation. Although it has most elaborate organization, SOPs and up gradation scope and international support, it overall falls in SAR Team domains. It has disadvantages of cost, sanctions, security, strict rules and procedures. Can be used for Training the trainers and recommended at Levels 4 & 5 but its standards could be taught and implemented for developing own SOPs and for training. Although a number of international Crisis Management Disaster Response Teams like NATO Crisis Management Disaster Response and OECD Regional Disaster Response Teams are available but UN OCHA INSARAG international Team Model is recommended to be gradually inducted and increased as part of NDRF.

4.3 Analysis of Current Stake Holders Capabilities

4.3.1 Rescue 1122

It is playing an important role in disaster preparedness, response and prevention except relief and rehabilitation including financial compensation etc. which are managed by PDMA. Government of Punjab has notified Punjab emergency service as DRF and Home Department Government of Punjab has also transferred flood relief function along with resources from CD to Punjab Emergency services on 28 May 2011. Nomination for award of Medium Level INSARAG team has been accepted and in process. Light SAR Teams have been established in 36 districts of Punjab. Concept of Certified Volunteers (Certs) has also been implemented in Punjab where by volunteers are being registered also as per certified skills to be employed in case of emergencies.

Progress of Rescue 1122 Punjab is not comparable with other Provinces and States. Progress of 1122 is very slow in some provinces i.e. in Balochistan.

Security and law enforcement is an important component of DRF. Police force of Pakistan is an important law enforcement agency. Rescue 15 and Dolphin Force of Punjab Police are relevant and effective components to be dovetailed in DRF.

Reviving CD following earlier example of similar work - establishment of Rescue 1122. Rescue 1122 is very well organized in Punjab. In remain provinces where progress is slow, regrouping 1122 in administrative divisions in phase 1&2.

4.3.2 Civil Defence

Civil Defence exists since 1952 under the Civil Defence Act 1952 (amended in 1996). It is a devolved subject assigned to Provinces under 18th Amendment. Civil Defence operates in three tiered system i.e Federal, Provincial and District. The role includes giving service to victims and taking action to minimize damage to human life and property from enemy bombing, land and naval attacks. At Provincial level, it falls under respective Home Department for the purpose of management, training and response. It is mostly present in all districts of the provinces, GB and AJ&K (with variable strength) headed by a Civil Defence Officer. At Federal level it is under Ministry of Interior (MoI).

4.3.3 Emergency Response Departments / Organizations.

Presently, different organizations are assigned the emergency response operations / services at Provincial and Federal level. These are:-

- **USAR Teams.** In the aftermath of Earthquake 2005, NDMA with international assistance raised 3 x USAR teams of approximately 50 individuals each (Karachi Metropolitan Corporation (KMC), Capital Development Authority (CDA) Islamabad and one for Army (45 Engineers Division Rawalpindi). The teams are equipped with state of the art equipment primarily meant for search & rescue operations in collapsed structure. Subsequently, few more teams were raised by provinces The net capability available at Country level is as under:-

Table 4.3.1 SAR Teams The Net Capability available at Country Level Source: (Compiled, 2017)

City	Managed By
Rawalpindi, Punjab	45 Engineers Division
Lahore, Punjab	Rescue 1122
Karachi, Sindh	City District Govt
Mardan, KP	Rescue 1122
GilgitBaltistan	Rescue 1122
Islamabad, ICT	CDA
Chitral / Karachi	FOCUS (NGO)

- Rescue 1122** It was established initially at Punjab in 2006 through Punjab “Emergency Services Act”. The other provinces, are also in the process of its adoption. The capability includes Ambulance Services, Fire Brigade Services, Rescue Services, Water Borne Rescue Services, Community Rescue Teams and Safety Programme. Rescue 1122 has proved its usefulness. The presence in various provinces is as under:-

Table 4.3.2 Rescue 1122 Teams Presence in Provinces Source: (Compiled, 2017)

Province	Total District	Presence In Districts	Remarks
Punjab	36	36 (100%)	Ambulance, Fire & Rescue Services, Water Borne Rescue, Community Rescue & Safety programs
Khyber Pakhtunkhwa	25	5 (20%)	Ambulance, Fire & Rescue Services
Sindh	29	0	
Balochistan	32	1 (3%)	Services being setup
AJ&K	10	7 (70%)	Ambulance, Fire & Rescue Services
Gilgit Baltistan	10	3 (30%)	Ambulance, Fire & Rescue Services, Rapid response team

4.3.4 Major Conclusions

- i. Emergency response capability at district level, being the first responder, is inadequate in all provinces except Punjab. At the onset of a disaster this inadequacy often exercise an immediate pull on armed forces resources hence there is a need to significantly enhance the capacity and capability of emergency response at district level, Countrywide.
- ii. Rescue 1122 Punjab with its concept, organization and role / functions presents the most suitable model for adoption by all provinces.
- iii. Duplication in functions of Rescue 1122, Civil Defense and Municipal fire brigade needs to be addressed.
- iv. Role of Civil Defense needs alignment and reorientation with respect to the National Disaster Management Structure.
- v. Hierarchy of Disaster Management and Emergency response at Provincial level and District level must be different e.g Rescue 1122 under PDMA is not a viable option.
- vi. Urban Search and Rescue Teams being a specialized entity need to be maintained at Provincial/ Division level and not at district / city level.
- vii. Raising of National Disaster Response Force is a cost prohibitive option at the outset, because of following facts:-

- Disposition of Armed forces and Civil Armed forces all over the Country provide unique opportunity of building up response at short notice.
 - Recurring cost of dedicated resources for disaster management is huge.
- viii. Requirement of various components of Urban Search and Rescue Teams vary in different regions of the Country as:-

Table 4.3.3 Requirement of USAR Team Components in Provinces Source: (Compiled, 2017)

Province / Region	USAR Components			
	USAR	Water Rescue	Mountain & Heli Rescue	Hazmat
Punjab	✓	✓	✓	✓
KP	✓	✓	✓	✓
Sindh	✓	✓	-	✓
Balochistan	✓	✓	✓	✓
AJ&K	✓	✓	✓	-
GB	✓	✓	✓	-
ICT	✓	✓	✓	✓

4.3.5 Recommendations

- i. The USAR Team ex CDA should, however, be placed under administrative and operational control of NDMA forthwith alongwith requisite annual budget and permission for deputation of two officers and ten staff members from Armed Forces / Civil Armed Forces to develop this team into a National Rapid Response Force which by default will act as a pilot project in parallel manner.
- ii. District emergency response system needs to be enhanced as a high priority in phases for which following actions are to be taken:-
 - All provinces to raise Rescue 1122 as a high priority project on the model of Punjab starting from division level as per risk profile of districts/ divisions.

- Deficiencies of Civil Defence at all levels to be met. Effective teams be organized at division level in phase 2 by pooling resources from the divisions. In Phase one only 12 teams be pooled up for 36 divisions of the country i.e. one per three divisions initially.
- iii. All existing USAR Teams of provinces should act as PDRFs under PDMA's till their Provincial Rapid Response Force is raised.
- iv. The Rescue 1122 and PDMA's should have separate roles but must be planned under one Ministry at Provincial level.
- v. Long term overall objective should be moving towards having a Virtual organization instead of keeping a full time Force. So new force to be created by reorganizing existing resources and employing reservists. Plan for six years after which registered volunteers will be available for maximum units and strengths will be reduced to a minimum quota like Japan. Minimum units and selected skeleton headquarters with nominal strengths may be kept.
- vi. Number of trained volunteers are a key to success in order to combat disaster in any country. Example of Japan is a case in point reducing need to keeping permanent organization down to a quota of 92 only because of availability of course qualified trained volunteers who when trained as a youngster could serve for next 40 years. It is recommended that a three tier public awareness program starting from introduction of DM in the syllabi of social sciences subject at primary school level, continuing it with effective Boy Scout and Girl Guide programs at middle and matric level and finishing it by reintroducing concept of National Cadet Corps NCC at intermediate level. NDRF immediate starting from its raising stage could contribute in such initiatives
- vii. Getting political support for DM or disaster response and thereby getting due share in budget. Three countries having established NDRF learnt it the hard way, raising it after being hit by a major disaster; India after 2005 earthquake; USA after hurricane Katrina and Indonesia after Tsunami. NDRF starting from its raising stage could play an important role by contributing in national programs of tree plantation, public education, tourism, water management small dams with small electricity projects while performing its primary task in training ie knowing the area of responsibility and extensive mock drills involving through public participation.
- viii. Shades of qualifications and courses for training at NDRF Schools, starting from primary, secondary and expert courses
- ix. Pakistan be divided into two disaster regions i.e. North & South. NDRF HQ under NDMA having two group headquarters, one in each region. Part of NDRF Pakistan must have capability on the lines of INSARAG Heavy Intl Teams in phases having job analysis and skill description of INSARAG standards. Initially one international team for each group.
- x. With Devolution of Powers in 18th amendment, DM in is also restricted by legislative and constitutional hindrances, NFC award and process of devolution under which DM

- became responsibility of provinces without enhancing their capacities and resolving unsettled and transitional issues between center and provinces (<http://www.sdpi.org>).
- xi. Disaster response is the most important stage in disaster management cycle, especially for poor countries. This needs to be reflected at NDMA level by allocation of higher priority to Disaster response and NDRF there by getting its due budget in early time frame. Legislation and documentation like regular yearly white Paper
 - xii. Risk Management combined with multilateral mutual assistance pacts between communities, districts, provinces and countries is a way forward to risk transfer which depends on increased public and Government awareness.
 - xiii. Being a nuclear nation having policy of maintaining minimum credible deterrence with our nuclear adversary having policy of maintaining credible second strike capability, it is imperative to have a comprehensive CBRNE component NDRF with appropriate plans and contingency planning.
 - xiv. International Cooperation is must No country can combat disasters alone, it is a two way commitment, we need to make SOPs for giving and receiving International disaster response
 - xv. Concept of Compulsory National Service as in Singapore in present day national financial crisis is a way forward for nation building combined with volunteer management recommendations.
 - xvi. Another option for NDRF could be a financially self sustaining organization on the lines of National Logistic Cell (NLC). NDRF could also contribute in other important national projects like China Pakistan Economic Corridor (CPEC), Inland water transportation initiative, tourism, tree plantation and education initiatives.

4.4 Suggested Framework for NDRF Formulation

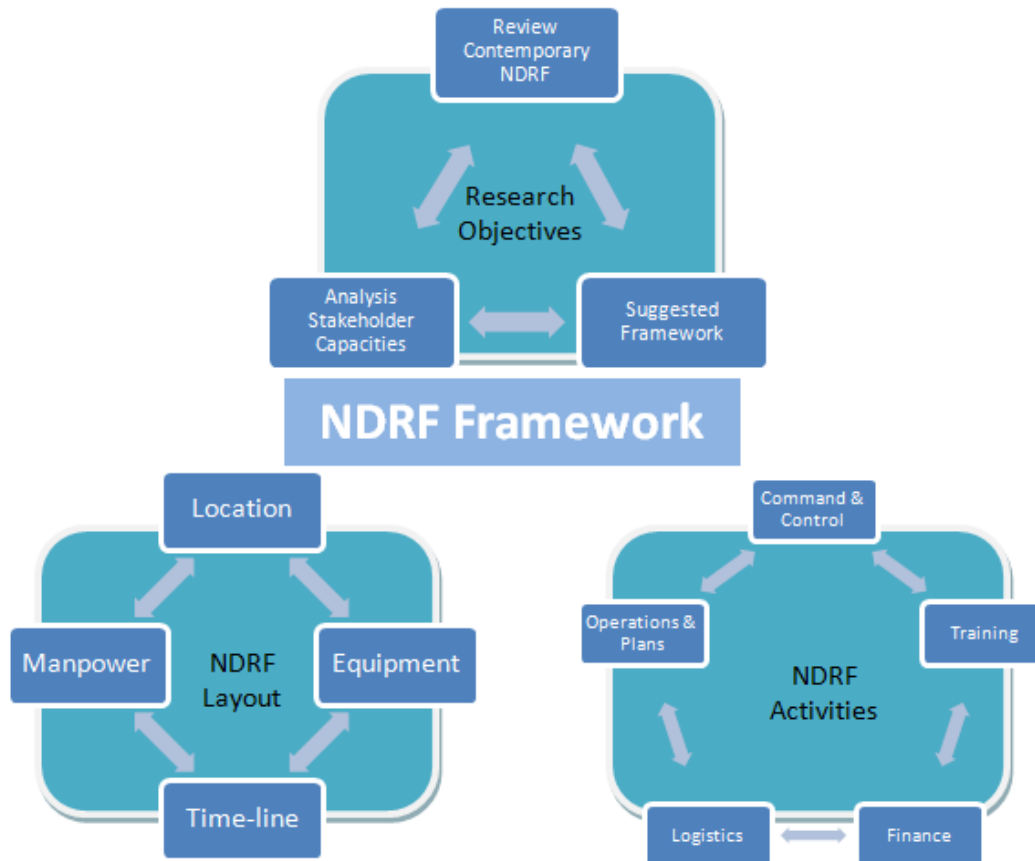


Figure 4.4.1 Suggested NDRF Framework

4.4.1 The Concept of NDRF

Raising of a smart specialised National Disaster Response Force (NDRF) at Federal Level as a Pilot Project for ICT, under overall control (raising, training, administrative and operational) of NDMA, to assist/ back up Provinces/ Regions/ States and deployment overseas (in friendly countries) to mount specialised response to all type of disasters. Important details related to NDRF are as following:-

- i. **Mission of NDRF.** To provide dedicated Specialised Response to all types of disasters/ emergencies within Pakistan or/ and outside Pakistan (in any friendly Countries).
- ii. **Organization.** Apart from Command Centre and Supporting Echelons (Admin, Logistic, Training, Canine and Digital Surveillance detachments), the NDRF will comprise of following four main components:-

- Search and Rescue (SAR) Team.
 - Water Rescue Team.
 - Mountain & Heli Rescue Team.
 - Hazardous Materials (HAZMAT) Rescue Team.
- iii. **Tasks of NDRF.** NDRF is envisaged to perform/ carry out following Tasks.
- Provide specialised disaster/ emergency response for all type of disaster situation primarily within the Capital Territory, not limited to but including following:-
 - Collapsed Structure Search and Rescue (CSSR).
 - Water Rescue.
 - Mountain & Heli Rescue.
 - Hazardous Materials (HAZMAT) Rescue.
 - Provide specialised disaster/ emergency response for all type of disaster situation in any part of the Country; not limited to but including as mentioned para 4c(1a-d) above.
 - Be ready to be employed for specialised disaster/ emergency response for all type of disaster situation in any Friendly Country (in line with international commitments).
 - Conduct general public awareness activities for public safety as desired by NDMA.
 - Conduct capacity building training for general public regarding safe evacuation measures during disaster situations in ICT as well as other Provinces (as desired by NDMA).
 - Act as training and capacity building hub at Federal level for any Provincial Disaster Response Forces.
 - Act as coordination centre for volunteer rescue activities carried out by organised groups, i.e. Boy Scouts / Girl Guides.
 - NDRF will endower for United Nations INSARAG (International Search and Rescue Advisory Group) Certification of NDRF will be sought.
- iii. **Capabilities of NDRF;** The NDRF will comprise of a balanced force to deal with almost all type of disasters being faced (or/and likely to be faced) by Pakistan. All team members will be cross trade trained and proficient / specialised in core skill of Search and Rescue Operations as their basic job; however by virtue of its organization main capabilities of NDRF will be as following:-
- SAR (Search and Rescue) Team will constitute the mainstay/ work horse of NDRF and will provide the flexibility to NDMA to tailor NDRF as per the requirements of situation.
 - SAR Team will provide Collapsed Structure Search and Rescue (CSSR) across the country.
 - Waterborne Rescue Team will provide a built in capability for Waterborne Operations.

- Highly specialised/ trained Mountain & Heli Rescue Team will provide the capability of conducting Mountain and Helicopter-borne rescue operations ranging from Hills to High Mountain Peaks both from ground and helicopter deployment.
- Highly specialised/ trained HAZMAT Rescue Team will provide the capability for rescue of persons and containment of hazardous materials incidents (Chemical, Biological, Radiological and Nuclear).
- With the availability of integral Administration and Logistic Detachments, NDRF will be self-sustained.
- Supporting Echelons (Digital Surveillance and Canine Team) will provide technical support to NDRF for speedy operations.

iv. **Miscellaneous Requirements related to NDRF**

Pooling of Human Resource. Human Resource will be a mix of newly recruited individual (approximately 55) and specialised personals seconded from Armed Forces (approximately 48) and other concerned agencies (approximately 9 from Federal Component of Civil Defence). Details are as following:-

- **Command Centre.** Serving Army Officers (Lieutenant Colonel and a Major) alongwith supporting staff will be seconded to perform the duties of Commander NDRF and 2nd in command of NDRF.
- **SAR Team** (88 individuals). **CDA USAR Team** (88 individuals) **will form SAR component of NDRF** with additional Capacity Support from Armed Forces (10x individuals).
- **Water Rescue Team** (16 individuals). 10x Individuals for Water Rescue Team **will be seconded from Armed Forces** and **6x individuals will be Freshly Recruited.**
- **Mountain & Heliborne Team** (20 individuals). The strength will be pooled as under:-
 - Secondment from Armed Forces (SSG): 10
 - Merger/ Secondment from Civil Defence: 05
 - Fresh Recruitment: 05
- **Hazardous Material (HAZMAT) Rescue Team.** The strength will be pooled as under:-
 - Secondment from Armed Forces (SSG): 08
 - Merger/ Secondment from Civil Defence: 02
- **Master Trainers.** 5x Master Trainers will be seconded from Armed Forces.
- **Administration and Logistic Detachments,** 29 individuals for Administration and Logistic Detachments will be seconded from Armed Forces.
- **Digital Surveillance Team.** 6x technical individuals will be freshly recruited.

- **Selection/ Recruitment Criteria of NDRF.** Selection / recruitment of NDRF Members will be based on stringent requirements in-line with military selection board criteria. However, broad selection parameters/ guidelines are as following:-
 - Age. 25 – 45 year (variable for different appointment holders).
 - Physical Fitness. Individuals must qualify minimums Physical Standards as given in Pakistan Army Physical Fitness instructions.
 - Education. Minimum Matric (10th Pass).
 - Intelligence, Aptitude and Capabilities. As per Selection/ recruitment in Army.
- **Training of NDRF.** All team members will be cross trade trained and proficient/ specialised in core skill of Search and Rescue Operations as their basic job. **Following Training Facilities** will be utilized:-
 - CDA's E&DM Academy (H-11) will be taken over (through MoU) from CDA.
 - Civil Defence's NIF-TECH Academy of will be used (free of cost) for fire related training.
 - Training Facilities of Armed Forces (Para Training School Peshawar, Army High Altitude School Rattu, Musa Company Mangla etc) will be used through liaison with armed forces.
 - Training Facilities of DESTO and Rescue 1122 will also be coordinated.

4.4.2.1 Composition of NDRF Board

A National Committee headed by Ministry of Climate Change with Chairman NDMA. DGs of all PDMAAs, a representative each from Finance Division GoP and Pakistan Army be constituted to finalize the concept paper and present the report to Prime Minister's Secretariat for approval within three months after which it is implemented. It is pertinent to have a dedicated ministry for Disaster Management whilst NDMA should preferably be under ministry of Interior.

4.4.2.2 Phases of NDRF

NDRF be set up in 3 phases. Completing Phase 1 by 2019, phase 2 by 2021 and raising be completed by 2023.

4.4.2.3 Functions of NDRF

Functioning of NDRF at national and provincial level should be under the National Disaster Management Authority, PDMAAs and SDMAAs. Reorganize own DM layout as per response levels and six PDRFs at Provincial level each at four provinces, AJK and GB is also be functioned at early stage. Location / placing of NDRF units in provinces and sates are recognized in phases as per Hazard Vulnerability Assessment profile. NDRF at National level and seven PDRFs at Provincial level each at provinces, AJK, GB and one CBRNE PDRF at Joint services level under SPD is envisaged in phase one. Legislation required for remaining

three levels of DRF; Division to Province and International Response However HAZMAT Teams be incorporated at level 2,3 & 4 as well Specialist CBRNE Response Force at Level 3 & 4 is recommended at Joint Services/ SPD Level. Being a nuclear nation having policy of maintaining minimum credible deterrence with our nuclear power adversary having policy of maintaining credible second strike capability there is a need for comprehensive CBRNE component NDRF with appropriate plans and contingency planning. The deployment of the NDRF is given in Figure 4.3.1.

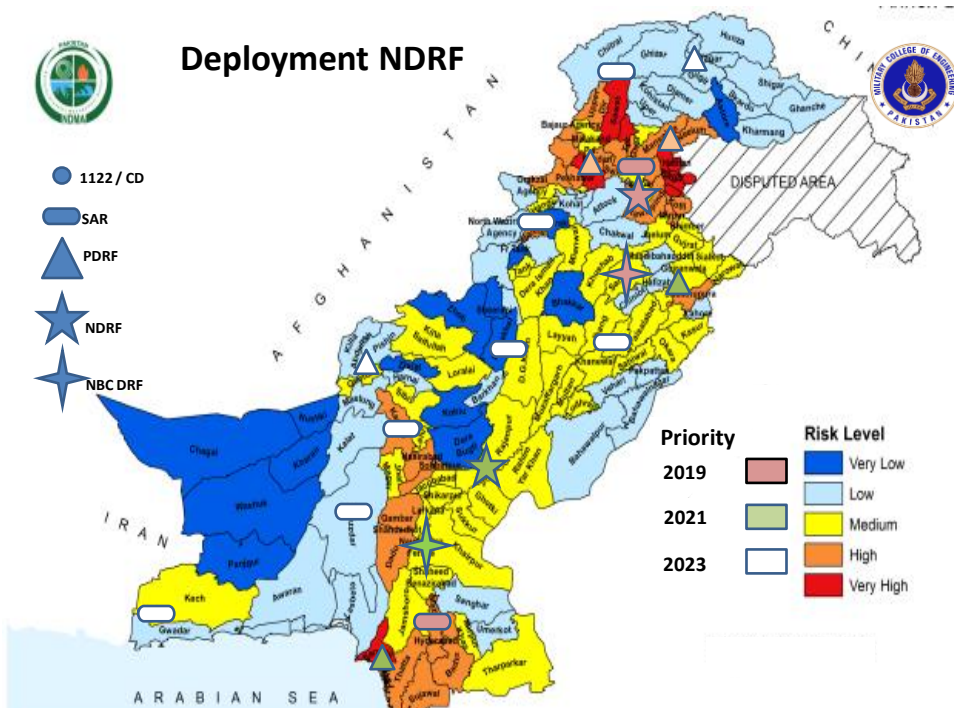


Figure 4.4.1 Deployment of NDRF

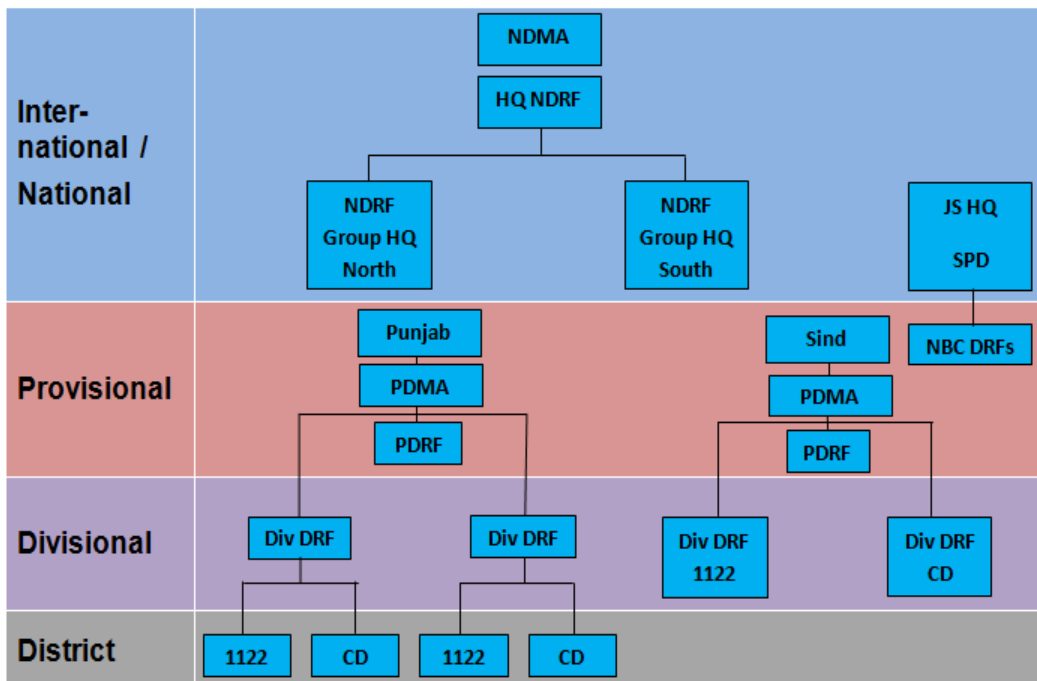


Figure 4.4.2 NDRF Tiers

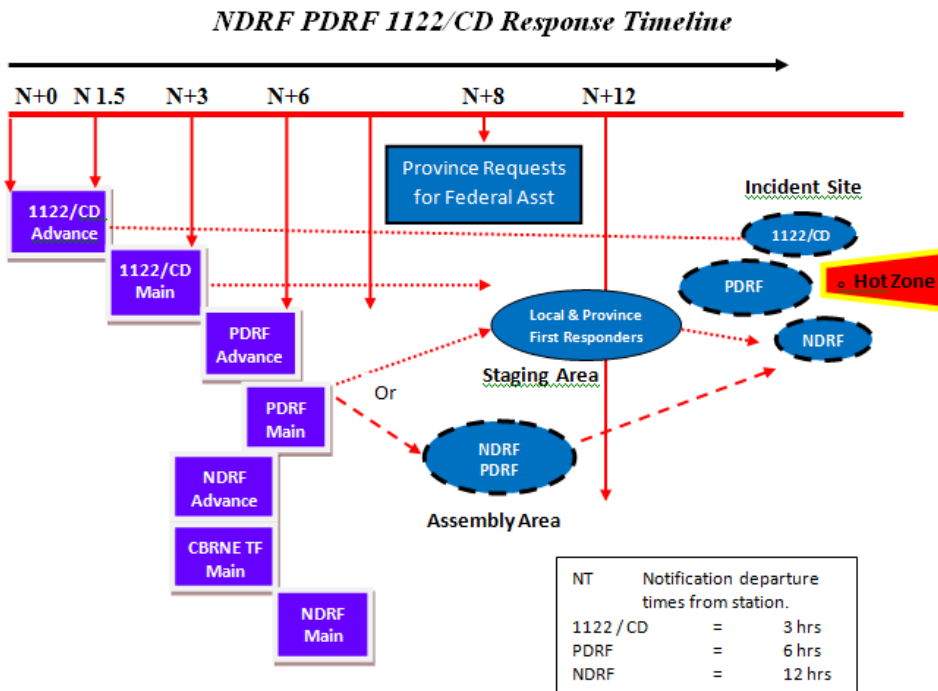


Figure 4.4.3 NDRF PDRF 1122/CD Response timeline

4.4.2.4 Implementation of NDRF

Further legislation is required for implementation of NDRF, PDRFs and SDRFs. NDMA framework to include NDRF, PDRFs and National Disaster Resource Center, while after commissioning of NDRF it is mandatory to be adopted in own DM framework also as it is a vibrant organization which can train and prepare in peace time, plan and coordinate like a unit and its higher Head Quarter can monitor and evaluate performance against already set standards of performance.

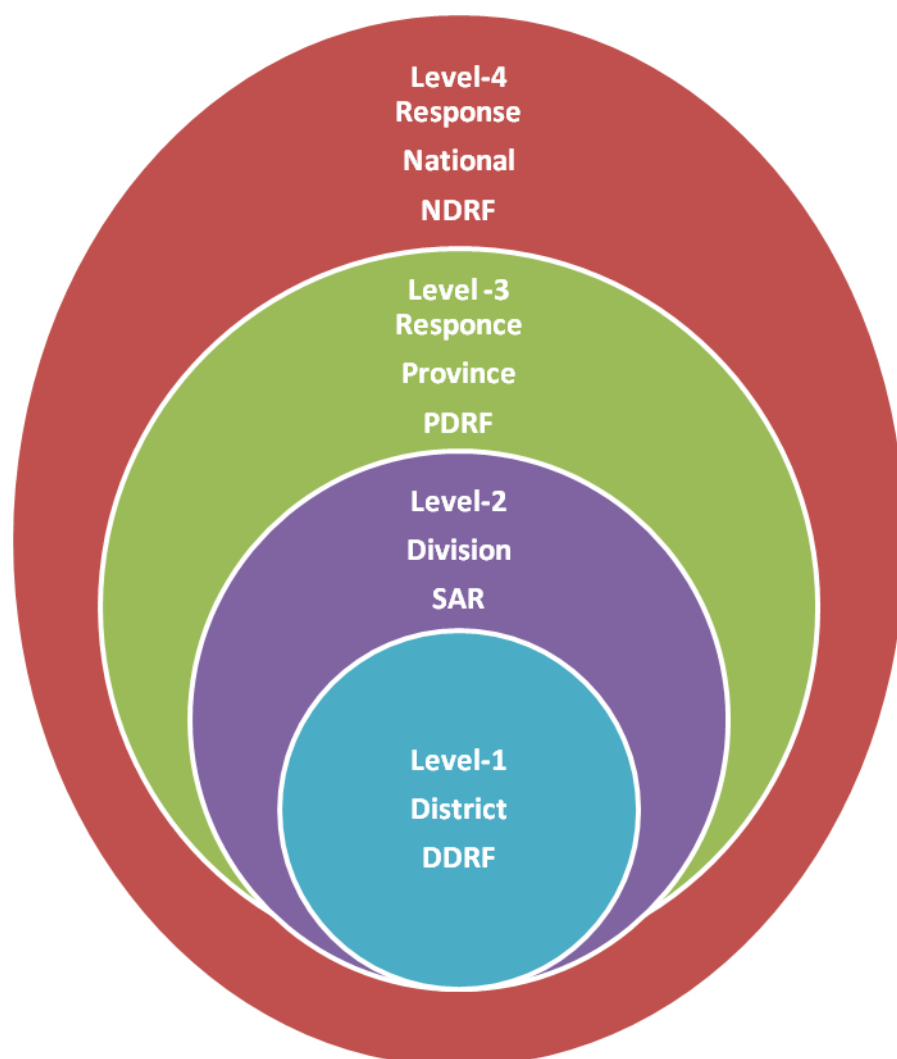


Figure 4.4.2.4 NDRF Response Levels

4.4.2.5 NDRF Emergency Response System Tiers in Pakistan

For Pakistan a five Tier Emergency Response System is recommended having following Levels:-

- i. **Level 0:** Routine Community Emergency Management
- ii. **Level 1:** District Level Emergency Response. More than one community affected, District Authorities Operational Teams operate
- iii. **Level 2:** Division Level Emergency Response. More than one Districts affected or higher response required Divisional SAR Teams operate

- iv. **Level 3:** Provincial Level Emergency Response. More than one division affected or higher response required. PDMA domain.
- v. **Level 4:** National Level Emergency Response. More than one province affected or higher response required. NDMA domain.
- vi. **Level 5:** International Level Emergency. More than one country affected e.g. nuclear accident. International Assistance Joint Services /Strategic domain.

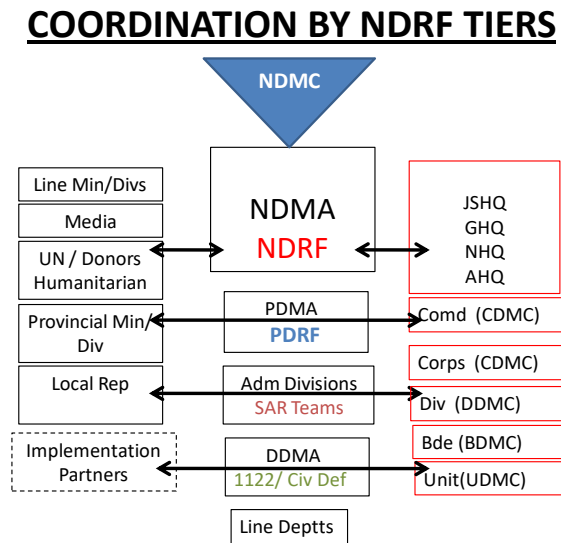
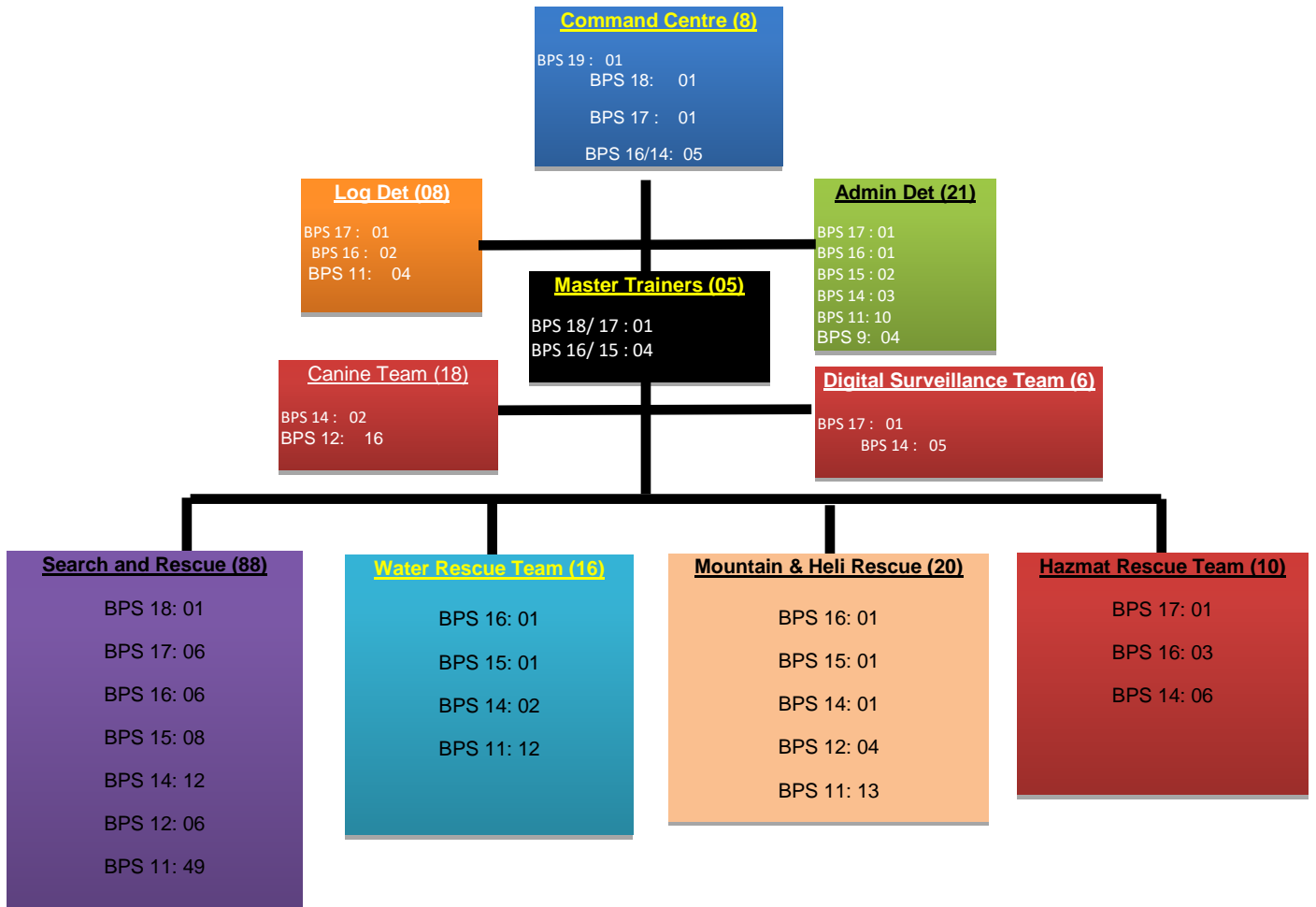


Figure 4.4.3 Coordination by NDRF Tiers

4.4 Organogram of NDRF Pilot Project



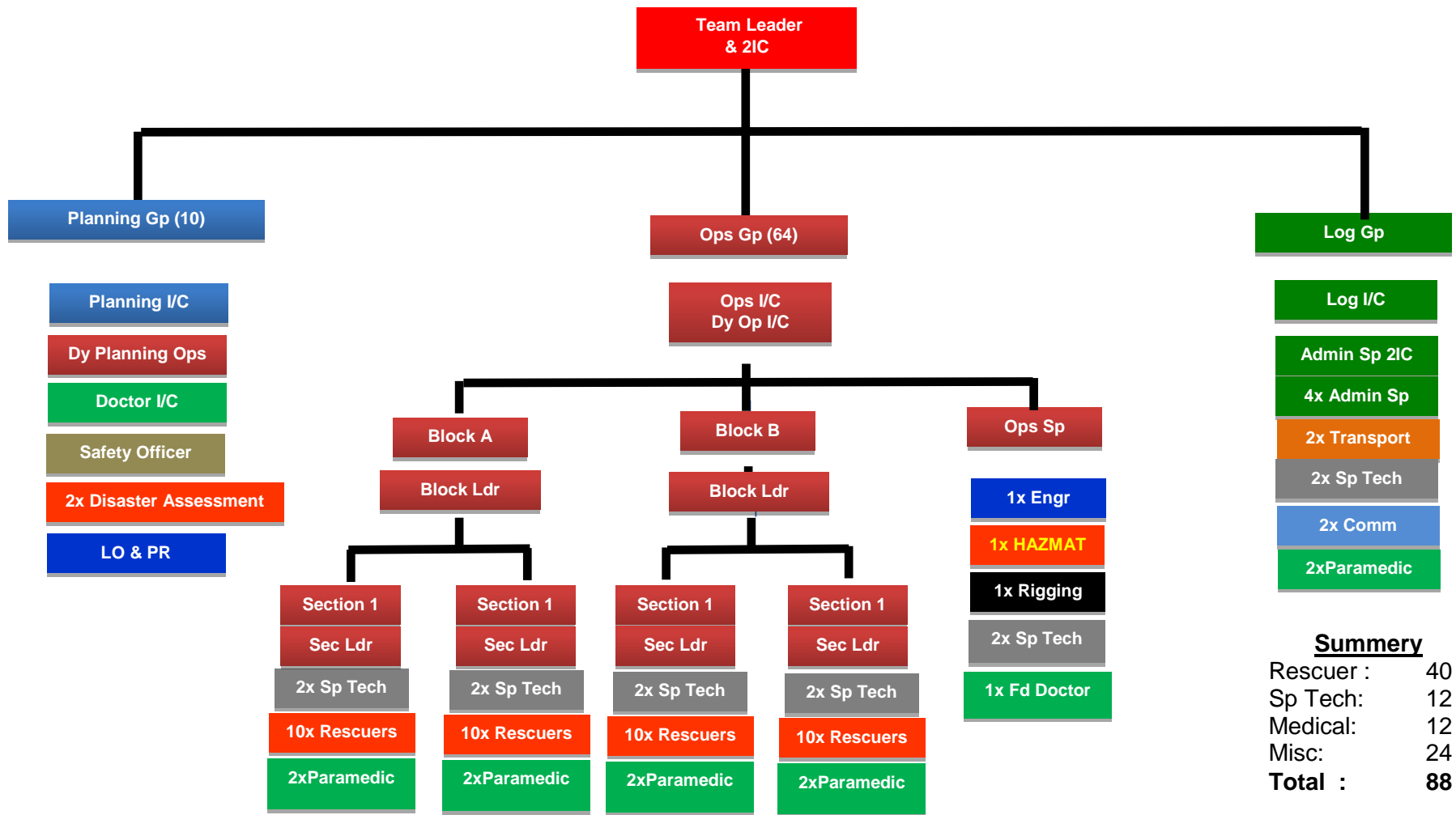
Summary of Manpower

Officers	:	14
Staff	:	186
Total	:	200

Figure 4.4.4.1 Suggested Organization of NDRF Pilot Project Pakistan

Note. Organization/ structure of NDRF is based on international model; however, few additions have been made to tailor for Pakistan's local requirements and realities for best possible performance. Organization of each component of NDRF is as following:--

Organogram of SAR



Summery

Rescuer :	40
Sp Tech:	12
Medical:	12
Misc:	24
Total :	88

Figure 4.4.4.2 Suggested organization of SAR Team NDRF

Organogram of Water Rescue Team

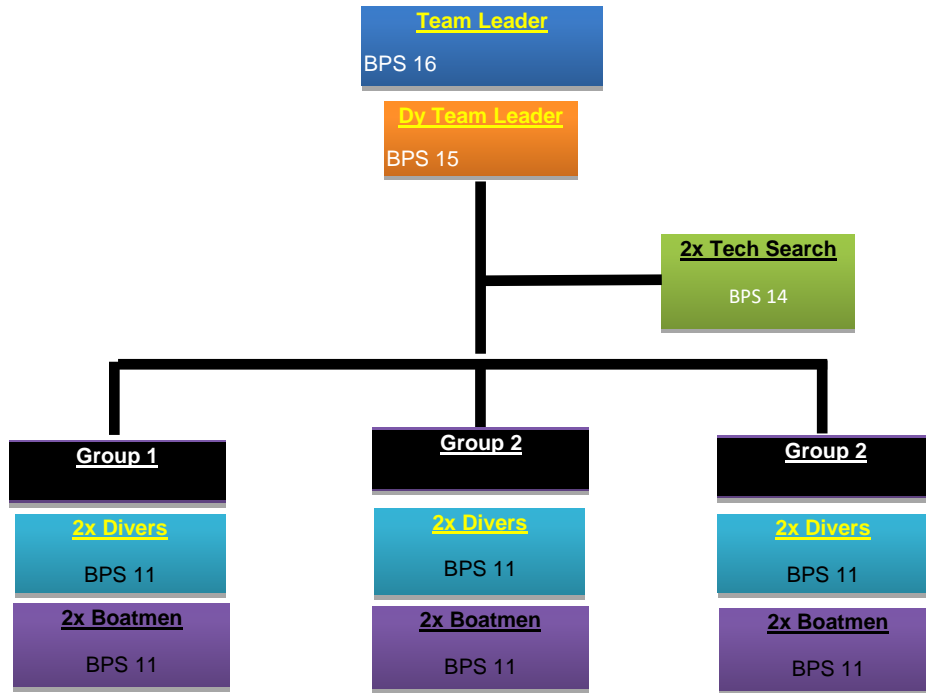


Figure 4.4.4.3 Suggested organization of Water Rescue Team NDRF Pakistan

Organogram of Mountain & Heli Rescue Team

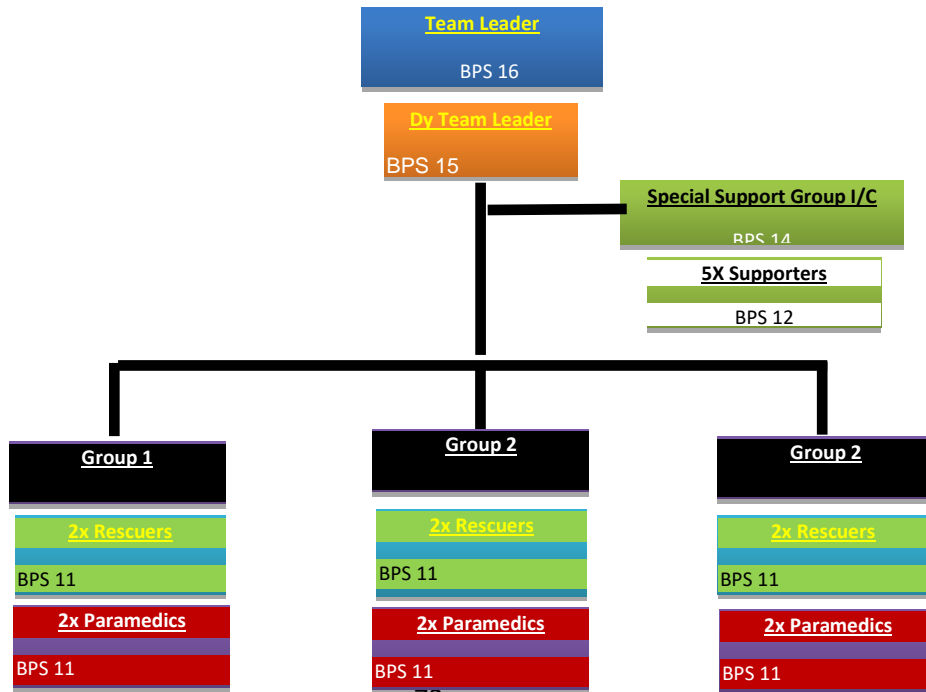


Figure 4.4.4.4 Suggested organization of Mountain & Heli Rescue Team NDRF Pakistan

Organogram of HAZMAT Rescue Team

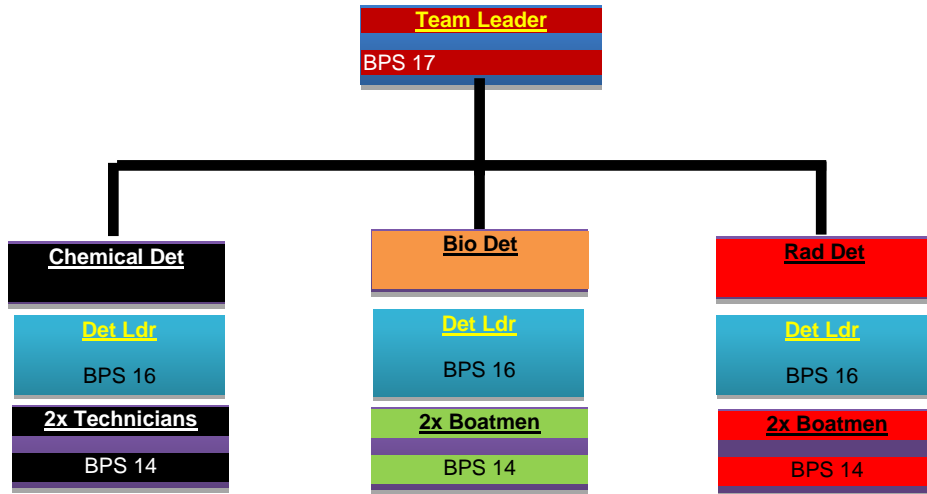


Figure 4.4.4.5 Suggested organization of HAZMAT Rescue Team NDRF Pakistan

Organogram of Admin Detachment

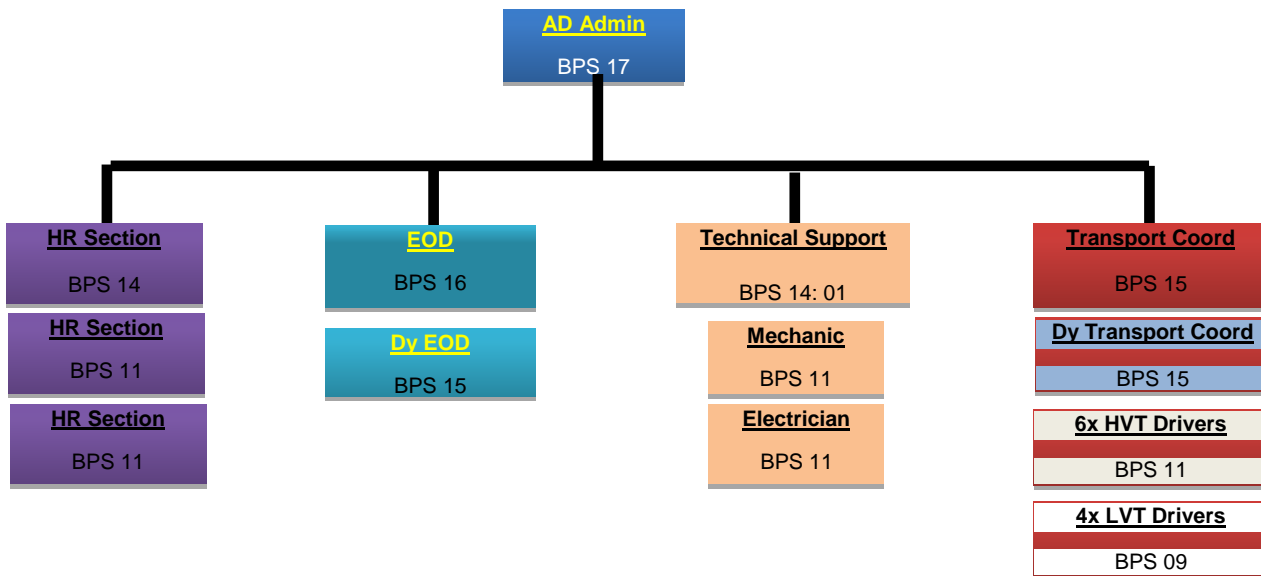


Figure 4.4.4.6 Suggested organization of Administrative Detachment NDRF Pakistan

Organogram of Logistics Detachment

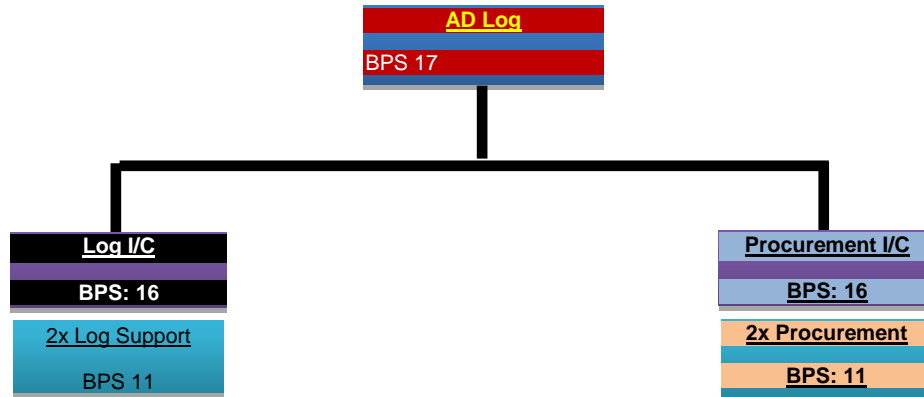


Figure 4.4.4.7 Suggested organization of Logistics Team NDRF Pakistan

4.6 Raising Smart Specialized Force Each at Federal & Provincial Levels

Existing USAR teams be restructured / strengthened to a maximum strength of 164 persons each team. Equipped and trained in specialized operations (mountain rescue, water rescue, building rescue, general rescue, hazard material incidents) as per requirement of province/ region. The teams will be designated as Federal, Provincial and Divisional NDRF.

CONCLUSION AND RECOMMENDATIONS

5.1 Conclusion

This research gives insight to the new concept and frameworks of NDRF in Pakistan aim of to enhance disaster response capacity that would reduce the recurrence effects of disasters. The gaps / loopholes in existing NDRF of contemporary nations have been identified for consumption of future policy designers. Need for an efficient disaster response system has been recognized along with weaknesses of stake holders. NDRF framework cross the multi-tiers through mutual coordination of aliened departments could be benefited if it has been given recognition by the government and political willingness.

Proposed NDRF system will work in three phases of two years each. NDRF pilot project is the beginning of the concept which will take time to develop. Volunteer development and management is the other hallmark of this framework. Once sufficient volunteers are available, size of regular force which is already based on reservists and already employed paramilitary force personnel could start to reduce.

NDRF tiers response level timeframes from community to international level has been well identified and framework is proposed. Due to devolution of DM, major work is to perform by provinces, starting from legislation and setting up organizations down to tehsil and communities. Work required to be done at different levels in different provinces is not similar. In Punjab most of the job is done as for as 1122 is concerned. But in Civil Defence a lot of work is required to be done.

This proposed NDRF framework could play vital role in Pakistan to ensure viable response system incorporating the existing sources of the country without further assistance from the foreign countries. Although different studies have been carried out for conceptual formulation of frameworks for proper NDRF at world level but in this study NDRF through proposed coordination framework could be useful to address the gaps and loopholes identified and bridge the relationships from local/district level to national level. A strong integrated coordination linkage among disaster responding agencies working separately in different tiers could reduce burden of cost being borne due to duplication of efforts. Effectiveness can only be possible if linkage is supported with sincere political and institutional will.

Simultaneous progress is required on all tiers, if resources are less they could be pooled at higher levels. If resources in Tehsils are not sufficient then district and administrative divisions is the level to pool resources and start from that level. Even PDRF could be level to start and slowly we built the capacity down to community. Similarly volunteer management also starts by identifying and dividing job specific requirement, training, and employing from gross root level and senior citizens simultaneously. NDRF could play vital role of trainers and coordinators.

5.2 Recommendations

On the basis of research study findings it is appropriate to suggest some recommendations put forth which are needed to be considered by all stakeholders involved directly or indirectly in various tiers NDRF framework.

- i. Keeping in view the study findings the identified gaps in existing disaster response policies of the country needs to be addressed.
- ii. Parallel working for implementation of NDRF on all tiers of response be ensured in the proposed time frame.
- iii. All the countries have developed their NDRF models after lessons learnt from some major disasters so it is needed to implement the NDRF in PAKISTAN as early as possible.
- iv. NDRF should be given political and institutional recognition and be implemented at priority basis.
- v. The significance of this study is to have micro management of disaster response system in the country at all tiers.
- vi. This research study should be considered by the GoP for establishment of the NDRF.

The next step for further research study could be to further identify and quantify the requirement, stakeholder capacity and further conduct case studies at district /local levels across multi-sectors to assess and to evaluate the performance of proposed NDRF framework for effective and successful disaster response system to reduce disaster losses.

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