



## NATIONAL DISASTER MANAGEMENT AUTHORITY



### TERMS OF REFERENCE

#### NATIONAL INDUSTRIAL HAZARD RISK ASSESSMENT

1. National Disaster Management Authority (NDMA), is an autonomous and constitutionally established Federal Authority mandated to deal with entire spectrum of disasters and their management. The NDMA formulates and enforces National disaster policies, at federal level and collaborates closely with all relevant stakeholders. Industrial disasters are the major concern of NDMA which falls in the realm of man made disasters.
2. With the rapid industrialization and construction of housing societies in close vicinity of industrial zones, the risk to population has increased manifold. To address the given concern, there is a dire need to carry out risk assessment of all industries in Pakistan with a view to formulate pragmatic and effective mitigation strategies at all tiers of response i.e National, Provincial, District and industry level. The assessment to encompass all industries / factories (Public & Private) at macro level.
3. **Scope of Work.** Carry out industrial hazard assessment, exposure analysis, and calculate / assess vulnerabilities and risk based on primary/secondary data and field assessments:-
  - a. The Study will be carried out at National Scale at macro level.
  - b. It will cover multi-dimensional aspects of industrial accident visualized and analyzing their types, magnitude, triggering factors and response requirements.
  - c. The assessment will be based on field sample surveys, field visits of vulnerable industries, collection of primary and secondary data, focused group meetings with relevant stakeholders and ground truthing of secondary data.
  - d. Geo-tagging of Industries along with secondary statistics to include production, storage, transportation, workforce etc.
  - e. Determine likelihood of industrial disaster during processing, storage and transportations of products.
  - f. Vulnerability and Exposure Analysis with identification of all tangible and non-tangible elements at risk to industrial hazards.

- g. Provide a comprehensive risk picture of the study area with clear identification of hotspots / localities that are prone to industrial hazards.
- h. Evaluate the present Disaster Risk Reduction (DRR) Policies and Legislations concerning industrial hazard assessment.
- i. Provide recommendation and propose new interventions & strategies for DRR based on results and findings of the assessment.
- j. Legal aspects of the industry including alignment or otherwise with the Global Framework and national standards / policies on industries.
- k. Safety and security standards including SOPs, policies and procedures for disaster mitigation.

4. **Deliverables**

- a. Macro level industrial hazard, gap analysis (safety protocols), vulnerability and risk assessment at National scale of following industries:-
  - (1) Manufacturing Industries.
  - (2) Arms, Ammunition and Explosive production & storage units.
  - (3) Oil/Gas Fields.
  - (4) Oil Refineries.
  - (5) Flammable Gas Storage Units.
  - (6) Chemical Industries.
  - (7) Pesticide and Fertilizer Industries.
  - (8) Pharmaceutical Industries.
  - (9) and other volatile industrial units.
- b. Inception report covering detailed methodology to be adopted on Industrial hazard assessment as well as format of Final Document.
- c. Ready to print document (designed by an expert) of National Industrial Hazard Risk Assessment study comprising following essential parts:-
  - (1) Hazard Zonation Maps indicating high, moderate, low and no exposure zones and Hotspots (Hazardous Zones) of hazards prone industrial regions in Pakistan on a GIS Format.
  - (2) Multi exposure weighted analysis of disaggregated population (i.e age, gender, physical disability), environment, infrastructure, livelihood and economic activities.

- (3) Gap analysis of existing strategies and policies concerning industrial hazards and its risk management, and with recommendation to improve shortfalls.
  - (4) Based on risk assessment, prioritization of industrial zones / types for Micro level industrial risk assessment studies.
  - (5) Input of each Industry / Factory on Climate Change and contributions towards polluting the environment.
  - (6) NIHRA Atlas - A3 size (Hazard, Exposure, Vulnerability and Risk Maps, Info-graphs and other visual outputs).
  - (7) Technical reports covering assessment methodology and hazard, exposure, risk & vulnerability maps and analysis result.
  - (8) Summary Report describing guidelines concerning how to consult this document (ATLAS and Report) for common users.
  - (9) Recommendations for DRR and Response Strategies.
  - (10) Steps required to bring them in line with Global Framework, National standards and Policies on industries.
- d. Provision of all material study related to Geospatial and conventional data.
- e. Record of Consultative and Focus Group meetings.

## 5. **Schedule**

<b>Sr.</b>	<b>Activities</b>	<b>Timeline/ Duration</b>
a.	Inception and detailed Methodology Report Submission. The report should cover brief outline format of the study document, data to be collected, consultation dialogue schedule and execution methodology.	2 Weeks
b.	Field visits, primary and secondary data collection, development of Geospatial database for NIHRA.	4 Weeks
c.	Hazard Assessment, Development of Hazard Zonation Maps.	3 Weeks
d.	Vulnerability and Exposure Assessment	2 Weeks
e.	Risk Assessment, Recommendation on the basis of gap analysis.	3 Weeks
f.	Draft Submission / Review of NIHRA Atlas and report.	2 Weeks
g.	Final Submission of all deliverables	2 weeks
	<b>Total Weeks</b>	<b>18 weeks</b>

6. **Terms and Conditions**

- a. **Potential Software.** A number of software tools on risk mapping and statistical analysis like SPSS and Arc GIS are available for specific risk assessment and modelling tools along with Arc GIS active support. The Consultant Firm will work closely with NDMA to review the existing software's and adapt tools that suit the activity. In addition, DESINVENTOR and other Global and National level databases which have been applied widely in the South American and Asian regions can be a very useful addition for historical information. The selected firm must have experience in using such soft-wares or better ones in same category.
- b. **Team Composition.** The Consultant Firm should have credible experience of assessment on the risk assessment at National (prerequisite) and International level (desirable) with the mandatory requirement of having following experts on its panel / associated consultants:-
- (1) Chemical Engineering Experts.
  - (2) Industrial Safety Expert.
  - (3) Chemical, Biologic & Nuclear Exposures Expert.
  - (4) Environmentalist.
  - (5) Socio-Economic Expert.
  - (6) GIS & RS Specialist.
  - (7) Medical Specialist.
  - (8) Risk and Vulnerability Analyst.
- c. **Duration of Study**
- (1) Study is expected to start by mid November, 2016.
  - (2) Estimated time of completion of the Assignment is 4½ months from date of award of contract.
- d. **Focal Person.** Director (Response) NDMA will be the focal person on behalf of the NDMA. Project Director (Project Management Unit) of NDMA will be the Technical Focal Person.

7. **Non-Disclosure Agreement.** Data, reports and other associated information collected under the assignment for which consultants were hired, and any data / information which is shared with consultant for analysis by NDMA, will remain the property of NDMA and consultants will be bound to sign Non-Disclosure Agreement.