GUJARAT INSTITUTE OF DISASTER MANAGEMENT
BUILDING RESILIENCE

TRAINING MODULE

POST DISASTER NEEDS ASSESSMENT

Training Module on

Post Disaster Needs Assessment (PDNA)

Gujarat Institute of Disaster Management

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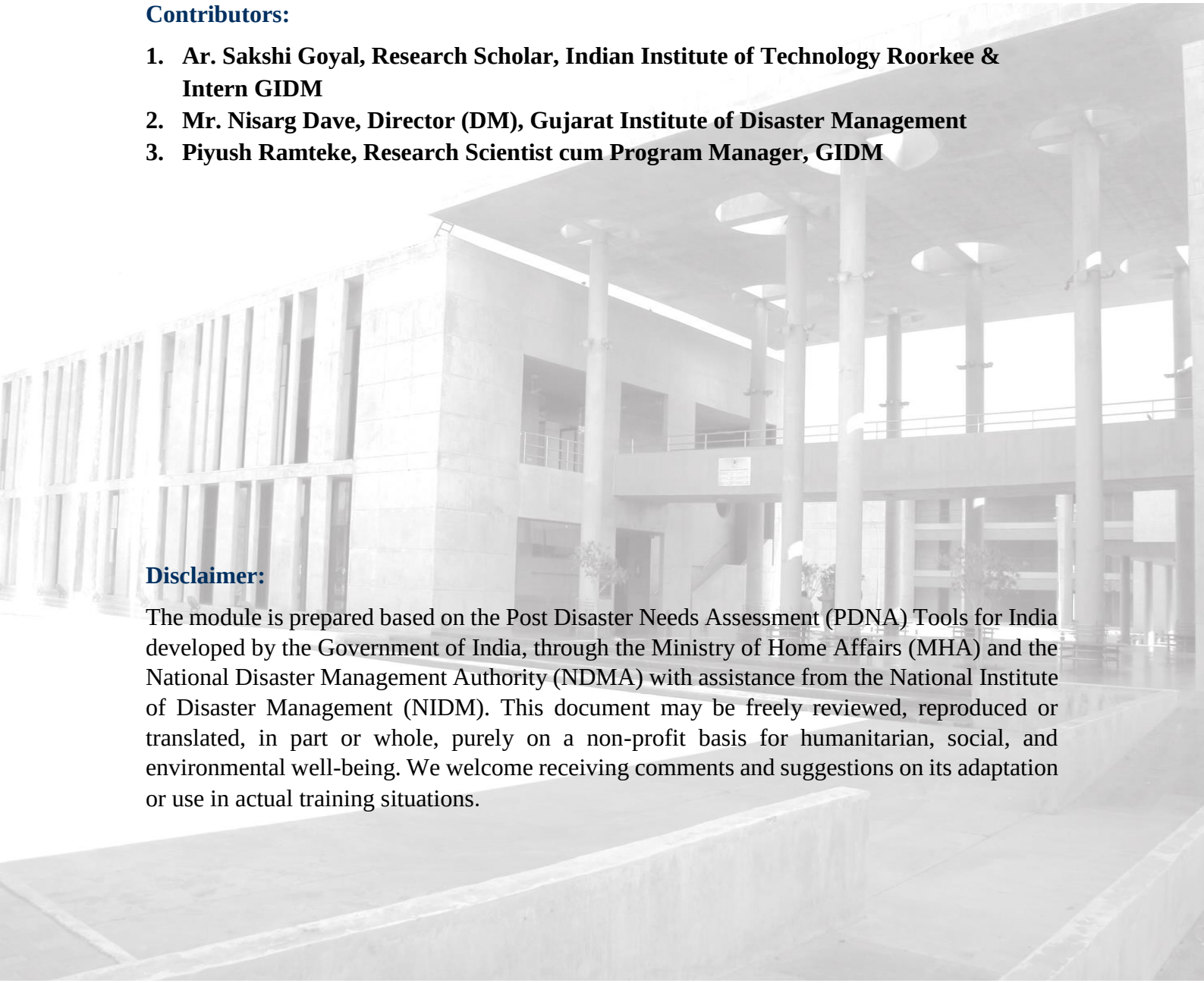

Message

Dear Readers,

Disasters can strike at any time, causing widespread damage and disruption. Official records confirm that their numbers and devastating impacts have witnessed increasing trends, globally as well as in Asia and India. Gujarat, with its diverse geography and growing population, is particularly vulnerable to various hazards. In the aftermath of such events, an effective Post Disaster Needs Assessment (PDNA) is critical to ensure a structured recovery and rebuilding process. This Module on Post Disaster Needs Assessment' has been developed for the state of Gujarat to equip professionals with the necessary skills and knowledge to conduct comprehensive assessments and facilitate effective recovery operations.

The state's commitment to building resilience and enhancing disaster preparedness is evident through its numerous initiatives and policies. This training module is a continuation of these efforts, aimed at fostering a deeper understanding of PDNA processes among professionals involved in disaster response and recovery.

The training module offers a thorough exploration of the PDNA framework, including methodologies for damage, loss, and needs assessment across various sectors such as housing, infrastructure, health, education, and livelihoods. It emphasizes the importance of a coordinated and inclusive approach, ensuring that the needs of all affected communities, including the most vulnerable, are addressed. Participants will engage in interactive sessions, case studies, and practical exercises, providing them with hands-on experience and insights into best practices for conducting PDNA.

We appreciate the sincere efforts put in by Ar. Sakshi Goyal, research scholar from Centre of Excellence in Disaster Mitigation and Management, IIT Roorkee (CoEDMM-IIT Roorkee) and her unwavering support in the development of this training module during her internship at GIDM. We also extend special appreciation to the GIDM team for meticulous proofreading and designing. We are confident that this training module will be a valuable resource for trainees, researchers, and professionals in the disaster management sector. GIDM remains committed to maintaining high standards of excellence and will continue to deliver impactful educational experiences aimed at enhancing disaster resilience in Gujarat.

[Dr. Rajiv Kumar Gupta IAS (Retd.)]
Director General
Gujarat Institute of Disaster Management

Content

About the Training Module

The "Training Module on Post Disaster Needs Assessment (PDNA)" is structured into three detailed technical sessions designed to enhance the competencies of professionals in conducting PDNA and developing effective recovery frameworks.

Technical Session 1: Getting Started with PDNA serves as an introductory foundation for participants. This session provides a comprehensive overview of PDNA, detailing its historical development and significance. Participants are acquainted with post-disaster scenarios, the evolution of PDNA, and its specific objectives. The session delves into the PDNA framework, outlining its deliverables and limitations. A key component of this session is understanding the conceptual framework of PDNA, which covers the disaster effects and their five dimensions, damage, loss, impacts, recovery needs, and the various sectors for assessment. Additionally, the session emphasizes the importance of inter-sectoral linkages and cross-cutting issues, leading to the formulation of a robust recovery strategy. The standard procedures for undertaking PDNA are also covered, including operational activities and protocols specific to the Gujarat state, baseline information, identification and costing of disaster effects, impact analysis, and macro-economic and social impact assessments.

Technical Session 2: Sector-wise Standard Procedures for Undertaking PDNA is divided into three segments, focusing on productive, infrastructure, and social sectors. This session provides detailed guidelines and step-by-step procedures for conducting PDNA across different sectors. For productive sectors such as Agriculture, livestock, fisheries and forestry; Mining and Quarrying; Manufacturing; Trade and Service; and Tourism, participants learn about assembling assessment teams, gathering baseline information, estimating damages and losses, summarizing these damages, and estimating disaster impacts. The session also covers the estimation of recovery and reconstruction needs, prioritization of needs, and the preparation of sector-specific reports. In the infrastructure sectors segment, including Electrical, Water Supply and Sanitation, Transport, and Communication sectors, similar detailed procedures are followed to ensure thorough assessments. The social sectors segment addresses Housing, Education, Health, Culture and Heritage, and Environment sectors, providing a consistent and comprehensive assessment methodology to ensure resilience and effective recovery across all sectors.

Technical Session 3: Development of Recovery Framework focuses on the strategic aspects of disaster recovery. This session guides participants through the process of developing a Disaster Recovery Strategy, which includes the consolidation and analysis of data, setting objectives, and formulating policies and strategies. Participants are taught to transition from PDNA to Disaster Recovery Framework (DRF), linking the findings from PDNA to develop a comprehensive DRF. The session covers key elements of DRF, the optimal timing for initiating DRF, and the critical steps required for developing an effective framework. This session aims

to equip professionals with the necessary skills to formulate and implement recovery strategies that are sustainable and resilient.

Overall, the training module is designed to provide a holistic approach to PDNA, equipping professionals with the knowledge and skills necessary to conduct thorough assessments and develop effective recovery frameworks, thereby enhancing disaster resilience and management capabilities.

Technical Session 1

- Getting started with PDNA (Total - 135 min)
  - Learning Unit 1.1 Introduction to PDNA and its Evolution (30 min)
  - Learning Unit 1.2 Conceptual Framework of PDNA (45 min)
  - Learning Unit 1.3 Standard Procedures in Undertaking a PDNA (50min)
  - Discussion (10 min)

Technical Session 2

- Sector-wise standard procedures for undertaking PDNA
  - Part 1 – Productive Sectors (130 min)
  - Part 2 – Infrastructure Sectors (100 min)
  - Part 3 – Social Sectors (125 min)

Technical Session 3

- Development of Recovery Strategy (50 min)
- Learning Unit 3.1 Development of Disaster Recovery Strategy (25 min)
- Learning Unit 3.2 Transitioning from PDNA to DRF (25 min)

Technical Session 1

Getting Started with PDNA

Introduction, Overview & Perspectives

The first technical session will introduce learners with the background information of the PDNA methodology including its importance, evolution, objectives, and its conceptual framework. This part will make them understand the role of participation and coordination, and past conducting assessment procedures in Gujarat, India. The session will also provide an overview of PDNA standardized procedures for the estimation of damages, losses, and needs, ensuring that state-level officials acquire and sustain essential PDNA knowledge and skills. Further the general concepts like effects, impacts, damage, loss, needs, and recovery, and their interrelation across all sectors along with cross-cutting issues are explained in detail. This part will prepare the participants/ trainees for the next training session on the detailed sector-wise PDNA conducting process. In the final learning unit, standard procedures, and protocols for conducting PDNA in the state of Gujarat will be discussed, highlighting the importance of baseline information and the precautions necessary to avoid double counting within and across sectors. The logical sequence from baseline information gathering up to estimation of needs will be explained to prepare the participants/trainees in the assessment of their sector of expertise.

The primary objectives of this technical session

- To introduce trainees with the post disaster scenarios and different assessment techniques.
- To familiarize with the conceptual framework of PDNA and its objectives.
- To understand the concepts like effects, impacts, damage, loss, needs and recovery.
- To explore different sectors for assessment, inter-sectoral linkages, and cross-cutting issues.
- To understand the standard procedures and protocols in undertaking a PDNA.

Duration: 135 minutes

Methodology

- Lecture-based learning
- Case study-based learning
- Discussion
- Q&A session

The learning units of this technical session

Learning Unit 1.1: Introduction to Post Disaster Needs Assessment (PDNA) and its evolution

1.1.1: Post disaster scenarios

1.1.2: Past post disaster assessment process in Gujarat, India

1.1.3: Post Disaster Needs Assessment (PDNA)

1.1.4: Evolution of PDNA
1.1.5: Objectives of PDNA
1.1.6: PDNA framework
1.1.7: Deliverables of PDNA
1.1.8: Limitations of PDNA

Learning Unit 1.2: Conceptual framework of PDNA
1.2.1: Disaster effects and its five dimensions
1.2.2: Damage
1.2.3: Loss
1.2.4: Disaster impacts
1.2.5: Recovery needs
1.2.6: Sectors for assessment
1.2.7: Inter-sectoral linkages
1.2.8: Cross-cutting issues
1.2.9: Recovery strategy

Learning Unit 1.3: Standard procedures in undertaking a PDNA
1.3.1: Operational activities and protocols for PDNA in Gujarat state
1.3.2: Summary Process of the PDNA methodology
1.3.3: Baseline information
1.3.4: Identification and costing of disaster effects
1.3.5: Impact Analysis
1.3.6: Standard procedures for macro-economic impact assessment
1.3.7: Standard procedures for social impact assessment
1.3.8: Standard procedure for post disaster recovery needs
1.3.9: Group exercise

Trainer's Note

The entire technical session is aimed to help trainees understand the basic terminologies and concepts, followed by a discussion. Post disaster need assessment is one method that can assist the concerned authorities in analyzing the situation and working towards a quick recovery along the lines of Built Back Better (BBB). Trainees should seek understanding through learners' active participation in discussions and question & answer sessions.

Session Plan

Content	Trainer's Note	Time
Introduction to Post Disaster Needs Assessment (PDNA) and its evolution	Focus in explaining the post-disaster scenarios and different assessment methodologies and how PDNA is different from others. Explain its objectives, conceptual framework, limitations, and deliverables.	30 min
Conceptual framework of PDNA	Focus on various concepts like effects, damage, loss, impacts and needs. Explain different sectors for assessment and their inter-linkages, and cross-cutting issues.	45 min
Standard procedures in undertaking a PDNA	Detail out all the steps for conducting PDNA and its standard procedures and guidelines.	50 min
Discussion	A discussion on some of the key learnings focusing on the applications of the PDNA and data collection process.	10 min

Learning Unit 1.1
Introduction to Post Disaster Needs Assessment (PDNA) & its Evolution

Brief Description of the Learning Unit

The first learning unit offers a comprehensive introduction to the Post Disaster Needs Assessment (PDNA), emphasizing its significance and the necessity of this methodology. It covers the objectives, framework, and deliverables of PDNA, while also tracing the evolution from previous methodologies to the current approach. Additionally, it addresses the limitations of PDNA, providing learners with a balanced understanding of its capabilities and constraints. This unit sets the foundation for understanding how PDNA integrates into disaster recovery planning and underscores the importance of accurate and thorough assessments in shaping effective recovery strategies.

Learning Objectives

- To introduce trainees with the post disaster scenarios and the past assessment techniques.
- To familiarize with the basic framework of PDNA and its objectives.
- To understand the deliverables and limitations of PDNA.

Duration: 30 minutes

Methodology

- Lecture-based learning
- Case study-based learning
- Discussion
- Q&A session

Detailed Description

1.1.1 Post disaster Scenarios

The post disaster scenario is complex and difficult. The most urgent task immediately after the disaster is to accurately identify humanitarian needs and deliver life-saving relief aid to individuals affected. The effects and impacts of the disaster will then need to be assessed, followed by an extensive recovery strategy. This recovery plan will lead back to pre-disaster scenario in a sustainable process where risk reduction is extensively considered. Disasters have varying effects on countries' economic levels. Empirical research suggests that the economic consequences of disasters are heavily influenced by the affected country's level of economic development. Countries with lower per capita income experience higher economic loss as a percentage of GDP, while more economically developed countries incur greater absolute economic losses. To address these challenges, affected countries frequently need assistance from both national and international entities. Historically, this assistance involved numerous

parallel assessments and planning efforts by different groups, agencies, and donors, each with varying scope and rigor. This highlighted the necessity of forming robust partnerships and enhancing coordination to achieve better coherence in post disaster situations. Globally, the approach towards post disaster reconstruction and rehabilitation has shifted to building back stronger, smarter, and inclusive to achieve resilience. While disasters result in considerable disruption of normal life, enormous suffering, loss of lives and property, global efforts consider the recovery, rehabilitation, and reconstruction phase as an opportunity to "Build Back Better" (BBB) integrating disaster risk reduction into development measures and making communities resilient to disasters.

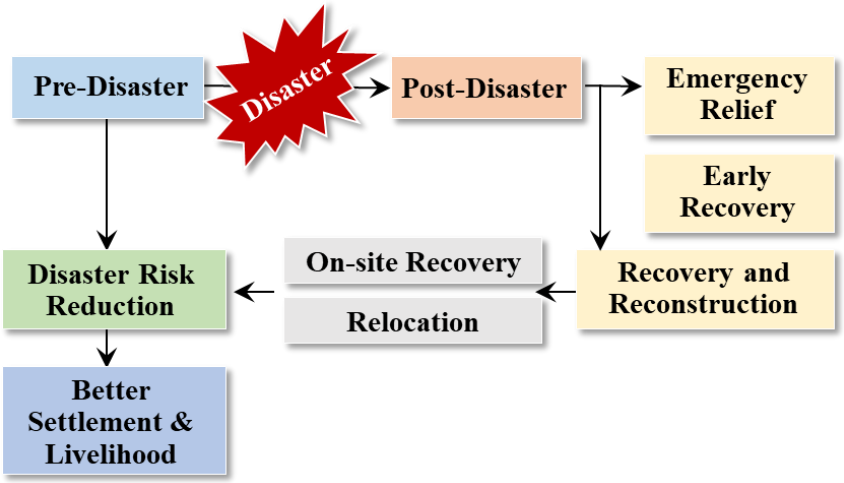

Figure 1 Post disaster scenario

1.1.2 Past Post Disaster Assessment Process in Gujarat, India

India enacted the Disaster Management Act in 2005, establishing a comprehensive framework for disaster management, including the allocation of funds for post disaster relief and recovery. The National Disaster Response Fund (NDRF) and the State Disaster Response Fund (SDRF) are the current sources of post disaster funding support, based on assessments of affected areas. These funds are recent mechanisms, evolving from the long-standing Calamity Relief Fund and National Calamity Contingency Fund (NCCF). In 2013, the Ministry of Home Affairs issued revised norms for assistance from the NDRF and SDRF, applicable for the period 2010-2015. These funds, based on established assessment procedures, are designed to estimate the amount of relief assistance needed for disaster-affected individuals. Additionally, broader post disaster assessments of major events are conducted by affected state authorities with support from international agencies like the Asian Development Bank, the World Bank, and the United Nations, to determine reconstruction and recovery needs beyond immediate relief.

The Office of the Relief Commissioner of each State and Union Territory (UT) has been mandated to collect information on disaster effects after any disaster and to provide the required disaster response thereafter. Based on individual, "**Rapid Assessment**" reports developed by District, Taluka/ Block and Village Revenue Officers as well as of supplementary "**Detailed Assessments**" prepared by sectorial State Department Officials (including the Departments of Agriculture, roads and buildings, etc.), a "**Relief Memorandum**" is prepared by the Relief Commissioner to be sent to the Central Government to obtain additional financial resources from National Disaster Response Fund (NDRF) to meet post disaster demands for assistance.

While the contents and details of the relief Memorandum vary from State to State and from one disaster to another, it normally provides full information on the estimated value of required disaster response assistance based on the estimation of the extent and degree of damage and losses sustained by the affected population. Table 1 shows the type of information collected by different departments in the State of Gujarat as part of the rapid and detailed assessments, and provides a good example of the extent of assessments undertaken.

Table 1 Damage data collected by different Departments in the State of Gujarat as part of the rapid and detailed assessment.

S. No.	Department	Agency/ Organization	Damage data collected
1	Agriculture & Co-Operation Department	Directorate of Agriculture Director of Horticulture Directorate of Animal Husbandry Registrar of Cooperative Society Commissioner of Fisheries Director of Agriculture Marketing & Rural Finance Director of Sugar Chief Executive Officer Supervision & Audit Committee Gujarat State Co-Operative Tribunal	• Damage to public buildings (different administrative offices), damage to key roads, bridges • Damage to crops, farming equipment • Damage to farm animals, fodder • Damage to seeds • Damage to fruits, flowers, cultivation equipment • Damage to food-processing equipment, transporters, raw materials or finished products • Fish, Fish processing industries and equipment of fisher folk, damages to fishing ponds
2	Education Department	Directorate of Primary Education Sarva Shiksha Abhiyan Commissionerate of Schools Commissionerate of Higher Education Commissionerate of Technical Education Director of NCC Director of Literacy & Continuing Education	• Damage to Primary Schools at Jilla Panchayat and Municipal Area, Damage to primary Teachers´ Training Institution, Kitchen Sheds, Staff/Student casualties • Government, Private Schools, Fine Arts Institutions, Sanskrit Pathshalas, Physical Education, Sainik Schools, Staff/Student casualties • Government Colleges, Hostels, Vidyapeeth, Research and Cultural Institutes, Basic Training Colleges, Non-Governmental Colleges (Grant-in aid), Staff/Student casualties • Government Institutions (Engineering Colleges, polytechnics, etc.) and Grant-in-aid Institutions, Staff/Student casualties

S. No.	Department	Agency/ Organization	Damage data collected
3	Health Department	Commissionerate of Health National Health Mission Directorate of Indian Systems of Medicine & Homeopathy	• Damage to equipment and goods in sub-centres, primary health care centres, community care health centres, District hospitals, Medical Colleges and Hospitals, Ayurvedic Colleges, Hospitals, Laboratories, Anganwadi and Prosthetic Workshops
4	Industries & Mines Department	Industries Commissionerate Geology & Mining Commissioner Tourism Printing & Stationary Cottage Industries Director, Civil Aviation Gujarat Pavitra Yatradham Vikas Board	• Damage to small and large industries. Secondary damages. Damage to artisan equipment. Loss of skilled workers • Damage to tourism sites, offices, • Damage to religious & pilgrimage sites
5	Ports & Transport Department	Commissionerate of Transport Gujarat Maritime Board Government Transportation Service Gujarat State Roads Transport Corporation	• Damage to Ports, Jetties, Shipyards, Ship Recycling Yards, Port equipments, cargo, • Damage to RTO Offices, Vehicles, equipments, toll plaza, • Damage to Bus port, bus stations, bus stops, buses, other vehicles & equipments.
6	Narmada, Water Resource, Water Supply and Kalpasar Department	Narmada Department Water Resources Department Water Supply Department Kalpasar Department	• Damage to dams, check dams, irrigation canals of major/minor irrigation schemes, percolation pits, Sardar Sarovar Narmada canals. Large reservoirs. • Damage to tube wells, wells, pumps, pumping equipment/Tankers, civil structures, water supply pipelines, and water tanks
7	Panchayat, Rural Housing & Rural Development Department	Panchayat Department Commissionerate of Rural Development Development Commissioner	• Damage to rural housing, Panchayat property
8	Energy & Petrochemical Department	Energy & Petrochemicals Department Directorate of Petroleum Chief Electrical Inspector and Collector Electricity Duty	• Damage to power plants, power generation units, substations, transformers, supply lines, wind farms, loss of revenue during shutdown, petrol pumps, gas stations,
9	Sports, Youth and Culture Department	Commissioner Youth Services & Cultural Activities Director of Archeology and Museum Director of Abhilekhagar Director of Libraries	• Damage to Archeological sites, Museums, Library, sports complex, cultural event sites

S. No.	Department	Agency/ Organization	Damage data collected
10	Women & Child Development Department	Directorate of ICDS Commissionerate of WCD	• Damage to anganwadis, food,
11	Urban Development & Urban Housing Department	Municipal Corporations (Eight) Town Planning & Valuation Department Commissioner of Municipalities Administration Regional Commissioner of Municipalities Administration Urban Development Authorities Area Development Authorities Director, State Fire Prevention Services	• Damage to urban housing, damage to Municipal Corporation infrastructure • Damage to tube wells, wells, pumps, pumping equipment/Tankers, civil structures, water supply pipelines, and water tanks
12	Home Department	Home Dept. DGP Office Commissioner of Police (All MCs) Police Superintendent Office (All Districts) Gujarat Vigilance Commission Prohibition & Excise Department	• Damage to Police station, vehicles, offices, police beats/chowki,
13	Revenue Department	Revenue Department / Collectorate Gujarat State Disaster Management Authority Director of Relief Settlement Commissioner & Director of Land Records Commissioner of Land Reforms & Ex-Officio Secretary Revenue Inspection Commissioner (RIC) & Ex-Officio Secretary Superintendent of Stamps & Inspector General of Registration	• Damage to collector office, mamlatdar office, control rooms, Govt land, land records, vehicles
14	Forest & Environment Department	Principal Chief Conservator of Forest & Head of the Forest Force	• Forest cover, wild animals, sanctuaries, safaris, nurseries, Zoo, wetlands, mangroves, wildlife habitats
15	Food & Civil Supplies Department	Director of Food and Civil Supplies Food, Civil Supplies & Consumer Affairs Dept. Controller, Legal Metrology & Director, Consumer Affairs State Consumer Disputes Redressal Commission Food Controller, Ahmedabad	• Ration, PDS shops, Godowns, Labs, equipments and vehicles
16	Tribal Development Department	Commissionerate of Tribal Development Gujarat Tribal Development Corporation	• Damage to schools, offices, rest houses, hostels,
17	General Administration Department	Personnel Division Planning Division Administrative Reforms & Training Division NRI Division	• Damage to officers, vehicles, records,

S. No.	Department	Agency/ Organization	Damage data collected
18	Roads & Buildings Department		• Damage to State Highway, Major district roads, Other district roads, circuit house, guest house, bridges, culverts, equipment's & vehicles
18	Information & Broadcasting Department		• Damage to offices, broadcasting equipment
19	Climate Change Department		• Offices and equipment, roof top solar panels, Other renewable energy facilities and installations
20	Science & Technology Department		• Damage to Science Centres, GSWAN Connectivity, equipments, offices, etc.
21	Finance Department		• Damage to offices, vehicles, records
22	Legal Department		• Damage to Penal Buildings, offices, vehicles, records, etc.
23	Legislative & Parliamentary Department		• Damage to secretariat, vehicles, records, etc.

The values included in the Relief Memorandum are, incorrectly, called damage and losses, as they provide the values of disaster response assistance and not the actual amount of disaster losses. The given values are only a fraction of the damage and loss values of recovery and reconstruction needs. The Relief Memorandum is intended to quantify the amounts of additional resources required from the central Government (National Disaster Response Fund) to supplement the funds available at the State level (State Disaster Response Fund). In most cases, field verification missions are carried out by Central level Departments to review the reliability and accuracy of the estimations for response fund assistance submitted by the States.

Damage and Needs Assessments with International Support:

Since the 2001 Gujarat Earthquake, more detailed assessments of disaster impacts have been conducted for selected major events, with international technical and financial support from the Asian Development Bank (ADB), the World Bank (WB), and the United Nations System. This support facilitated recovery and reconstruction activities. However, these assessments have had limitations. For instance, in the case of the Gujarat earthquake, while damage or destruction in all affected sectors of social and economic activity was adequately estimated, production losses were only partially assessed for some sectors, neglecting many social and infrastructure sectors. Consequently, even with external support, the assessments did not provide sufficient information on the disaster's impact, particularly regarding production decline and social impact. This shortfall hindered the comprehensive analysis of the overall macro-economic and macro-social disaster impact and the quantitative estimation of recovery requirements. As a result, the affected population did not achieve full recovery promptly, and there is probability of recreation of risk due to reconstruction of assets without risk reduction features.

National Disaster Management Authority (NDMA) with the assistance of National Institute of Disaster Management, India (NIDM) in 2019, has developed Post disaster Needs Assessment (PDNA) methodology, specifically for Indian post disaster scenarios, which builds on the existing assessment systems in India and an internationally accepted methodology adopted by the United Nations Development Group (UNDG), the European Union (EU) and the World Bank (WB), which signed a joint declaration in 2008.

1.1.3 Post Disaster Needs Assessment (PDNA)

A Post Disaster Needs Assessment (PDNA) is multi-sectorial and multidisciplinary structured approach for assessing disaster effects and impacts to identify recovery needs defined from a human, socio-cultural, economic, physical, and environmental perspective, that will lead to the development of a recovery and reconstruction plan. PDNA is a government-led exercise with integrated support from European Union, the United Nations, The World Bank, and other national and international actors. A PDNA is normally undertaken after the emergency phase or during the time when the post disaster emergency operations are winding down and long-term recovery is about to start. It is a tool for recovery and reconstruction planning and implementation.

A PDNA pulls together a wealth of information into a single, consolidated report that covers the effects of a disaster is terms of damage and loss in each of the one of the affected sectors, macro-economic and human impacts as experienced by the economy and the affected population, the resulting early and long-term recovery needs including its prioritization and disaster recovery strategy.

Important features of PDNA:

1. It should be led and undertaken by the government after a disaster with the collaboration of international development partners and even the private sector.
2. PDNA is intended to identify and/or estimate:
    a. Damages caused by a disaster to physical infrastructure and the losses (changes in economic flows) in the various sectors of the economy, including an assessment of its macro-economic impacts or consequences as well as changes in the social or human development indicators.
    b. Define the framework, strategies and financial requirements of programs and projects to achieve overall post disaster recovery, reconstruction, and risk management.
3. The sectors assessed in a PDNA are those contained in the national accounting system such as agriculture, industry, trade, and services etc. and the corresponding sub-sectors under them.
4. Various experts like engineers, economists, finance specialists, statisticians, etc. who have knowledge on the valuation and estimation of damages, losses and needs in a certain sector should be members of the assessment team for that given sector.

1.1.4 Evolution of PDNA

The PDNA methodology originates from the **Assessment Methodology** developed by the Economic Commission of Latin America and the Caribbean (ECLAC). It was designed to assess the socio-economic consequences of frequent disasters on developing countries in Latin America and the Caribbean, where the disasters impact on national economies was severe. In 2001, after the Gujarat earthquake in India, the World Bank and other international agencies assisted in the assessment of disaster impact, in which the UN-ECLAC methodology was partially applied for the purpose of defining recovery and reconstruction requirements and plans. The methodology was also used to estimate the economic impact of the severe acute respiratory syndrome (SARS) epidemic that occurred in Singapore in 2003.

Damage and Loss Assessment Methodology (DaLa) was adopted by the World Bank in the year 2003, to provide an estimation of the physical damage and loss, as well as an estimation of time required for reconstruction in the recovery phase. To enhance the social and human impact, United Nation Development Group (UNDG) proposed the methodology of **Human Recovery Needs Assessment (HRNA)**. This further adds to DaLa by dealing with additional measures needed to restore people's potential well-being, leading to their productive and creative lives. HRNA is based on a notion that recovery requires a more disaggregated and broader approach. This was the first comprehensive methodology, covering all sectors, included in the System of National Accounts. It estimated the damages and losses as sector level and aggregated the results to identify the cumulative impact of disasters.

The DaLa and HRNA were merged into one methodology, the **Post disaster Needs Assessment (PDNA)**. This integrated tool includes both approaches and builds on them towards a comprehensive disaster recovery framework. The primary objective of PDNA is to promote full Recovery Resilience and Building Back Better (BBB) at both the macro and micro-levels

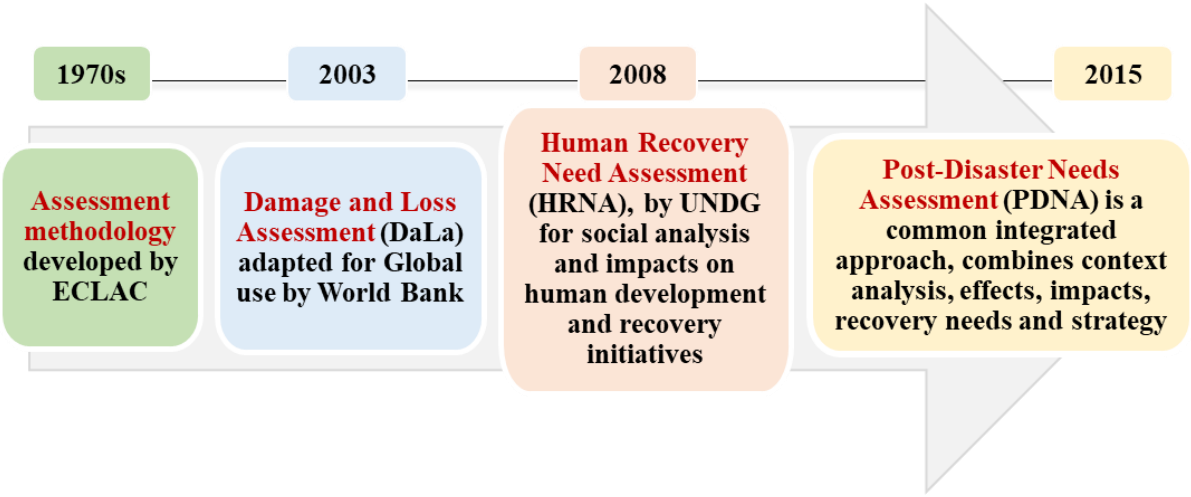

Figure 2 Evolution of PDNA throughout the years

Other International Methodologies for Disaster Related Assessment:

- **Cost-Benefit Analysis Methodology (CBC)** is an economic technique used to organize, appraise, and present the costs and benefits, and inherent trade-offs of public investment projects and policies taken by governments and public authorities to increase public welfare. It used for purposes of planning disaster risk reduction (DRR) and enables the estimation of

disaster risk. The CBA tool has been designed for use in risk prevention and mitigation, and is not a deterministic tool and cannot be used for the actual assessment of disaster effects and impacts.

- **HAZUS Methodology (Hazards in the USA)** is for vulnerability assessment developed for the Federal Emergency Management Agency (FEMA) by the National Institute of Building Sciences (NIBS). which enables the estimation of disaster risk. It estimates the exposure of an area, factors in the intensity of the hazard, and enables an estimation of the potential losses. As it can be seen, the model – whose use has been introduced in other countries as well, including some Asian nations s intended for analyzing disaster risk and estimating potential losses, not for estimating actual values of damage and losses after a disaster. Putting it in different words, HAZUS is not a deterministic tool and produces results required for planning prevention and mitigation only.
- **Advanced Component Method (ACM)** was designed by the Boston-based Applied Insurance Research with sponsorship by United Kingdom Department for International Development (DFID), the United States National Oceanic and Atmospheric Administration (NOAA) and the Canadian International Development Research Centre (IDRC) with a view to estimate the probability and extent of earthquake damage before a disaster occurs. As in the case of the two previous cases, the ACM is intended for estimating disaster risk and not for analyzing the actual effects and impacts of a disaster.
- **Catastrophe Simulation Model (CatSim)** is built and designed to illustrate the trade-offs and choices a country must make in financially managing the economic risks in the anticipation of major disasters. The Internationals Institute for Applied System Analysis (IIASA) developed this tool for natural disaster risk management for delineating the damage and loss probabilities." The model enables policy makers to make ex-ante evaluations of financial instruments such as insurance catastrophe bonds, contingent credit arrangements and other disaster hedge funds and to compare their benefits vis-à-vis investments in loss reduction. Again, this model while it has been extremely useful for providing financial protection against disasters in several regions and countries of the world, including the Caribbean, Mexico and Colombia cannot be used for estimating the actual effects and impacts of a disaster.

1.1.5 Objectives of PDNA

The main goal of conducting a PDNA is to assist governments to assess the full extent of a disaster's effect, impact and recovery needs of the state/country. Based on these findings PDNA aims to develop an actionable and sustainable recovery strategy for mobilizing institutional, financial, and technical resources. More specifically, a PDNA sets out the following objectives:

1. Support country-led assessments and initiate recovery planning process through a coordinated inter-institutional platform.
2. Evaluate the effects of the disaster on:
    a. Infrastructure and physical assets
    b. Production of goods and services and access to goods and services.
    c. Government and social processes
    d. Underlying risks and vulnerabilities

3. Estimate the damage and loss caused by the disaster to physical infrastructure, productive, social, and other sectors of the economy, including an assessment of its macroeconomic and human consequences.
4. Identify all recovery and reconstruction needs.
5. Develop a Recovery Strategy outlining priority needs, recovery interventions, timeline, expected outputs and the cost of recovery and reconstruction. This would form the basis for the formulation and implementation of a comprehensive Disaster Recovery Framework.
6. Provide the basis for mobilizing resources for recovery and reconstruction through local, national, and international sources.

1.1.6 PDNA framework

There are four main elements of PDNA:

1. Pre-Disaster context and baseline information.
2. The assessment of disaster effects.
3. The assessment of disaster impacts.
4. The Recovery Strategy and determining sector recovery needs.

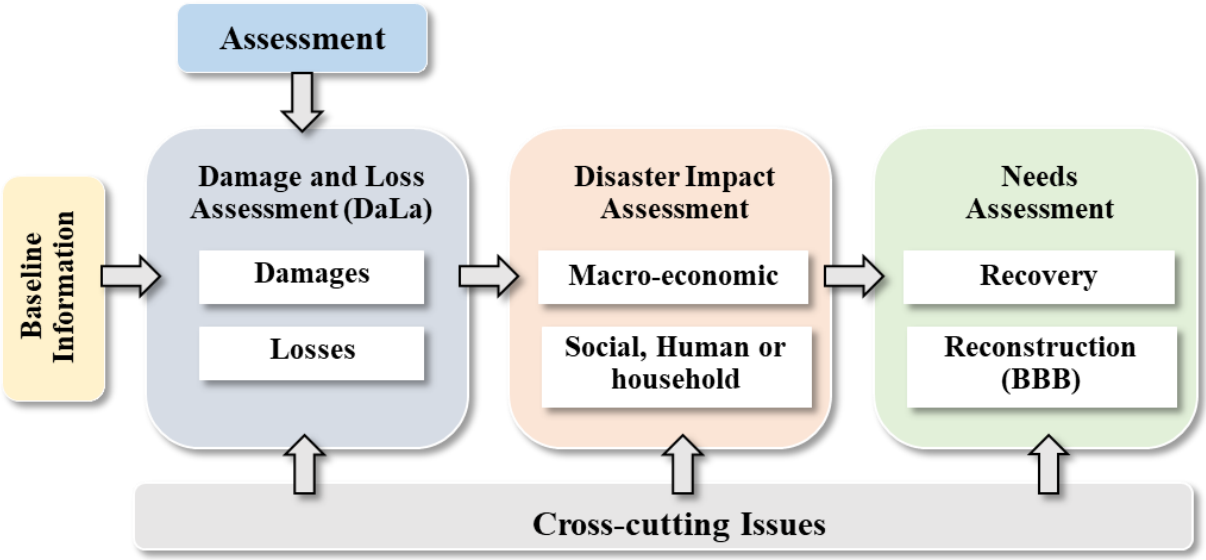

Figure 3 Conceptual framework of PDNA (source: PDNA Vol. 1, NIDM)

1.1.7 Deliverables of a PDNA

The PDNA produces following four core deliverables:

1. A consolidated assessment report presenting the overall effects and impacts of the disaster, and the recovery needs for each sector.
2. A recovery strategy providing guidance for recovery planning and interventions with timeframe and cost for recovery.
3. The basis for resource mobilization in support of the country's recovery.
4. An outline for a state/country-led implementation mechanism for recovery.

PDNA assessment report should show the following:

1. Total value of destroyed physical assets (damages) and of changes in the flows of production of goods and services (financial losses).

2. Ownership of the above, whether public or private in nature.
3. Identification of most affected sectors.
4. Spatial or geographical distribution of disaster effects.
5. Impact of disaster at macro-economic, sectorial, personal/household levels (social impacts) and cross-cutting issues/concerns.
6. Estimation of post disaster needs for recovery, reconstruction and other cross-cutting issues like disaster risk reduction measures, environment, etc.
7. Suggested framework and strategies in implementing the recovery and reconstruction activities.

1.1.8 Limitations of the PDNA methodology

The Post Disaster Needs Assessment:

- Does not replace in-depth sectoral analysis.
- Does not provide detailed recovery projects.
- Requires an elaboration into a disaster recovery framework.
- Time constraint: Has a tight timeline which places limitations on data collection.
- Data constraint: A PDNA uses “the best data available at the time of the assessment.”

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Learning Unit 1.2
Conceptual Framework of PDNA

Brief Description of the Learning Unit

The second learning unit provides learners with a comprehensive understanding of the conceptual framework of Post Disaster Needs Assessments (PDNA). It introduces fundamental concepts such as effects, damage, loss, impacts, recovery needs, and recovery strategies. This unit delves into the 14 sectors covered by the PDNA methodology, highlighting their interconnections and the importance of considering these linkages during assessments. Additionally, it addresses cross-cutting issues, emphasizing the need to consider these factors individually within each sector to ensure a holistic and effective assessment. Through this unit, learners will gain a thorough understanding of the complex dynamics involved in PDNA, equipping them with the knowledge to conduct detailed and integrated post disaster assessments.

Learning Objectives

- To understand the concepts like effects, impacts, damage, loss, needs and recovery.
- To explore different sectors for assessment, inter-sectoral linkages, and cross-cutting issues.

Duration: 45 minutes

Methodology

- Lecture-based learning
- Case study-based learning
- Discussion
- Q&A session

Detailed Description

1.2.1 Disaster effects and its five dimensions

Disaster Effects refers to the immediate results of the event that is going to be assessed and, is normally reported just after the disaster. It is expressed in quantitative and qualitative terms, by sector, geographic divisions, gender, age, and ethnicity. Effects are evaluated at the personal/household level and at the sector level in a monetary value, expressed as the repair or replacement costs according to the market price prevailing just before the disaster. Aggregation of total effects follows a bottom-up approach, for example from the village level to the state and to the national level.

Effects of disaster is analyzed through five main dimensions:

1. **Damage to infrastructure and physical assets:** PDNA evaluates the total or partial destruction of infrastructure and physical assets in the affected areas, in measures of physical units, for all sectors with classification into public or private ownership.
2. **Economic losses:** The estimation of losses in terms of economic flows; measuring the changes in the output of the economy's productive sectors (Agriculture, Industry and Commerce, Tourism) the partial or destruction of infrastructure and physical assets, and the impact, if any, on the operating and cost structure of delivery of goods and services.
3. **Disruption of access to goods and services:** PDNA evaluates the disaster effects on service delivery across all relevant social sectors and population groups, in particular the availability and quality of basic services that are required to support lives and livelihoods.
4. **Disruption of governance and social processes:** Assessment of the disaster effects on governance and decision-making processes of each sector. This includes the effects on sectoral administrative, policy and planning functions and its capacity to lead recovery process. It also looks at people's ability to exercise their citizenship.
5. **Increased risks and vulnerabilities:** The PDNA examines the risks and vulnerabilities underlying the effects of the disaster – pre-existing risks that become apparent during the disaster, and new vulnerabilities and risks enhanced by the disaster. Both will be considered to determine elements needed to ensure a resilient recovery.

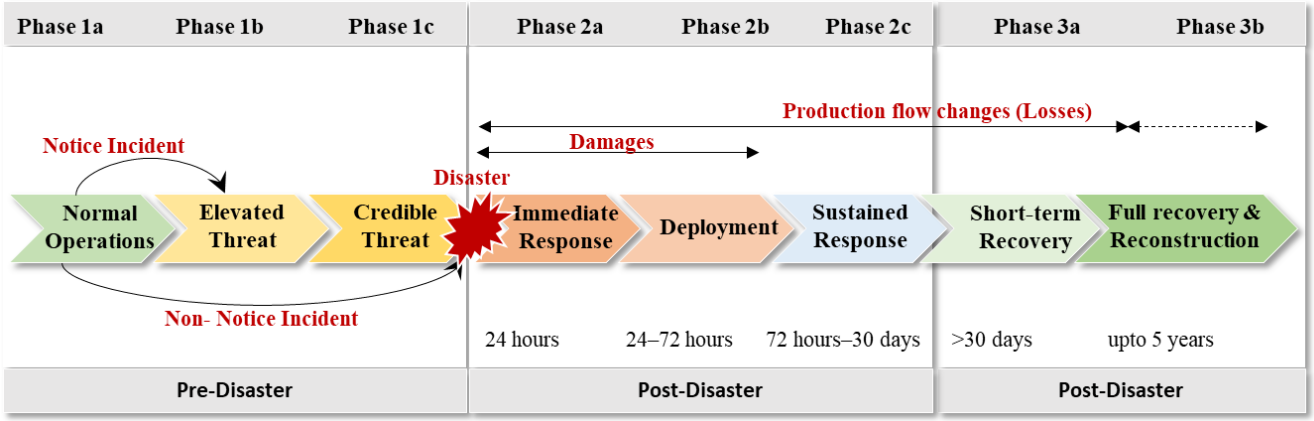

Figure 4 Timeline of Disaster Effects

1.2.2 Damage

Damage is defined as the partial or destruction of physical infrastructure, assets, equipment, stocks, and capital, built or natural. These assets may be public, private, or communal, and can be further distinguished by the characteristics of ownership – that is, private assets and public assets. Its cost is estimated at the replacing or repairing market prices prevailing just before the disaster. Damage is valued first in physical terms (units, meters, tons, hectares and so on) and then in terms of their monetary value, using current market prices prevailing just before the disaster.

Damage to infrastructure includes:

a) Social infrastructure such as the number of homes, education and health facilities, government buildings, community infrastructure, cultural and religious centres.

b) Basic infrastructure such as transport and communications (roads, bridges, ports, airports, and train lines, among others), water and sanitation systems, power or energy supply.
c) Assets in the productive sectors such as agricultural infrastructure, irrigation systems, industrial and commercial installations, and businesses including tourism and service-based industries.
d) In addition, damages include the physical assets damaged or destroyed in those buildings and infrastructures, such as furnishings and equipment, farm machinery and tools, among others.

Damages are estimated from:

1. Repairment cost of partially destroyed structures, equipment, and other physical assets.
2. Replacement cost of totally destroyed structures, equipment and other physical assets, valued at pre-disaster levels.
3. Cost of reconstructing the affected structures, equipment, machinery and other assets up to their pre-disaster state. (Not the cost of improved ones).

The recovery and reconstruction costs would consider post disaster price alterations and improvements associated with risk reduction and the concept of Build Back Better (BBB) in the preparation of the Recovery Framework.

1.2.3 Loss

Loss is defined as the alteration or change of economic flows and refer to the gap between the pre-event performance and the post-event conditions. Economic loss refers to changes in economic flows arising from the disaster. This continues until the achievement of full economic recovery and reconstruction – in some cases, lasting for upto several years.

Typical loss includes:

1. Decline in output in productive sectors (agriculture, livestock, fisheries; industry, commerce, and services, including tourism) associated with the total or partial destruction of infrastructure and assets.
2. Lower revenues associated with demand reduction due to the disaster, higher production, and operational costs, including higher costs in the provision of services (education, health, water and sanitation, electricity, transport, and communications). These combined with increased demand for social services by the affected population in the recovery period.
3. Increased expenditure for management of new risks arising from the disaster.

Loss is expressed in current monetary values. In some sectors or areas, the actual variations of flows may not be negative; in the construction sector, for instance, the immediate repairs, removal of debris and full-scale repair and reconstruction would increase this sector's activities. Conversely, these extraordinary expenses represent the unplanned (not budgeted) costs for the affected sector, arising from unexpected expenditures needed to address emergency needs.

To calculate loss, it is necessary to measure pre-disaster minus post disaster estimates in:

1. Forgone business opportunities

a. Private
    - Total loss of crops or reduction in farm outputs.
    - Revenue reduction from income, rent and so on.
b. Public
    - Revenue loss from public facilities and firms like airports, ports, state-owned enterprise and so on.

2. Higher operating costs (are the additional expenses to produce same output of goods and/or services during recovery phase)
    a. Cost of replacing new crops.
    b. Higher prices of inputs, labour etc.
    c. Cost of temporary power and/ or water supply.
    d. Rent of temporary offices/ firms.
3. Unexpected expenses
    a. Cleaning up debris
    b. Unexpected expenses on temporary shelters, water supply, medicines, food supply, and so on for the government.

> ***Note:*** *Historically, disaster costs were assessed solely based on damages due to the urgency of securing reconstruction financing and the challenges of estimating losses. This approach resulted in underestimating the total impact of disasters, as losses were not accounted for, leaving many social needs unmet*

1.2.4 Disaster Impacts

The assessment of the impacts of the event on the overall socio-economic development in the affected country or geographic area is estimated through two main components:

1. Economic impact at macro and micro levels: The estimation of the disaster's likely effects on economic performance and the temporary macro-economic imbalances that may arise from it, as well as its varied impacts on personal /household income and employment in all sectors. It looks post disaster performance of three key indicators, Gross Domestic Product (GDP), Balance Of Payment (BOP), and Fiscal Sector.
2. Human development impact: This represents the disruption of population's normal livelihood and income, and impact on their living conditions, in the medium and long term. Some such indicators are measure by:
    a. Changes in living condition
    b. Livelihoods and employment opportunities
    c. Food security and access to basic services
    d. Gender equality or women participation in decision-making process
    e. Social inclusion

> ***Note:*** *It is therefore essential the impact on the lives and livelihoods of people be accurately assessed, so the recovery strategies can put in place to support their full recovery. Recovery efforts should continue as long as necessary until human development is restored or enhanced*

1.2.5 Needs

Needs are the estimated values of activities required for post disaster recovery and reconstruction. Assessing disaster effects and impacts together determines the recovery needs, which must be identified from human, sociocultural, economic, and environmental perspectives. This comprehensive approach helps formulate strategies for addressing recovery and reconstruction in a sustainable manner. It involves evidence-based estimates of the financial requirements necessary for the recovery and reconstruction of affected areas and populations, based on a quantitative assessment of disaster effects and impacts.

Recovery needs include various activities that aims to restore economic and living conditions back to the pre-disaster state, including:

- Restoring personal and household income.
- Rehabilitating access to and the supply of basic services (such as health, education, food availability, water supply and sanitation, electricity, transport, and communication).
- Reviving production in sectors like agriculture, fishery, livestock, industry, and commerce.

Reconstruction needs refers to as physical recovery needs, involve the financing required to rebuild or replace all destroyed physical assets using disaster-resilient standards. This approach aims to reduce the disaster risk for the population and mitigate the impact of future disasters. These needs are long-term activities and includes:

- New infrastructure like relocation of buildings, airports, houses; new road diversions, etc.
- Preparedness and mitigation like dikes, weather forecasting, development of new building codes, land use plans, etc.

1.2.6 Sectors for Assessment

The PDNA categorizes the economic and human activity of a country into three main sectors: Productive, Social, and Infrastructure. Each of the sectors has sub-sectors, closely aligned to the system of national accounts. The sectors considered in the PDNA methodology are defined based on the national accounting system.

Figure 5 Total 14 sectors for PDNA assessment

1.2.7 Inter-Sectoral Linkages

Linkages across sectors should clarify the interdependencies between various sectors in terms of impacts. For example,

- Manufacturing firms reliant on agricultural products will see a drop in production if the agriculture sector is devastated by droughts.
- Tourist arrivals will decrease if cyclones damage major airports.
- Access to social services like health (hospitals) and education (schools) will be hindered if roads and bridges connecting people to these facilities are destroyed.

Therefore, trainees must understand how damages in their respective sectors can affect other sectors, even in areas not directly impacted by the disaster.

1.2.8 Cross-cutting Issues

PDNA include the several cross-cutting sectors and themes that must be considered. These include gender, governance, culture, environment, disaster risk reduction, and employment & livelihoods. These cross-cutting issues are concerns are relevant to all sectors assessed in the PDNA and must be considered when collecting data on the effects and formulating recovery interventions in each sector. However, these issues have a relevance of their own and demands an individual assessment to understand the specific consequences of the disaster for each of them. When such analysis is conducted, the cross-cutting issues are conventionally defined as "sectors" and have an individual chapter in the PDNA report. The environment and culture are assessed separately while gender, livelihood, poverty/quality of life are embedded in the social impact assessment.

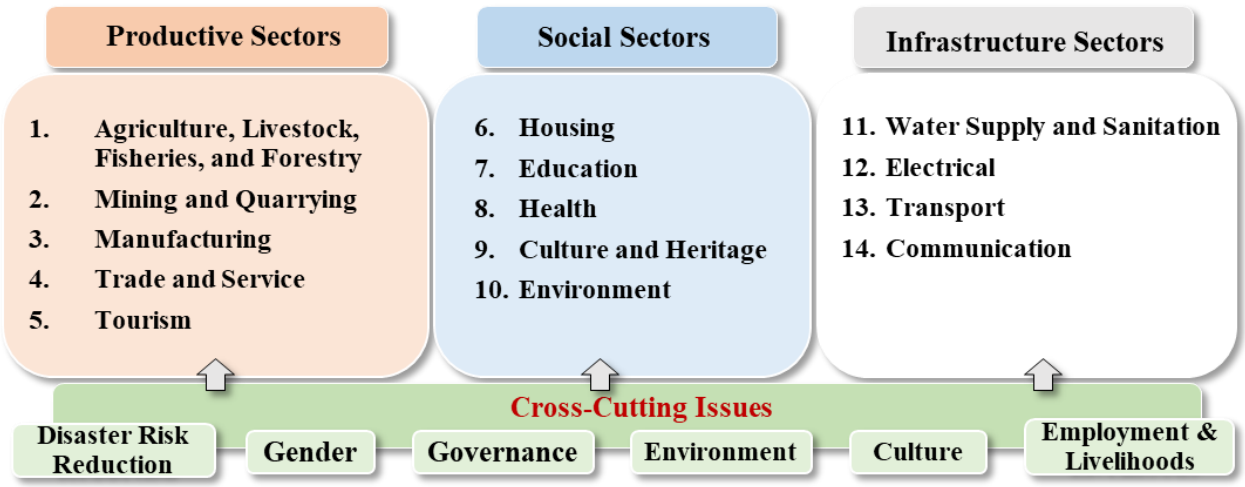

Figure 6 Major Cross-cutting Issues included in PDNA assessment

1.2.9 Recovery Strategy

The Recovery Strategy defines the vision for recovery, identifying priority interventions, results, and costs within a given timeframe. It provides a critical link between assessment results and a comprehensive Recovery Framework, offering information on policy and institutional arrangements, financial mechanisms, and monitoring and evaluation systems for recovery. All activities undertaken as part of the recovery strategy must adhere to the principle of building back better (BBB). The Recovery Strategy addresses the following questions:

- What are the priority recovery needs of the affected population?
- What measures and capacities are necessary to restore people's ability to lead productive, creative lives, and ensure protection against risk?
- What recovery interventions will fulfil these needs, and what broad resources are required?
- What are the intended outcomes, and what is the necessary staging and timing to achieve them?

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Learning Unit 1.3
Standard Procedures in Undertaking a PDNA

Brief Description of the Learning Unit

The final learning unit provides learners with a thorough understanding of the operational activities and protocols for conducting PDNA in the state of Gujarat. It delves into the methodological framework of PDNA, detailing the standard procedures for estimating damage and losses. This unit also explores the methodologies for macro-economic impact assessment and social impact assessment, ensuring that learners are equipped to evaluate the broad and varied impacts of disasters comprehensively. By the end of this unit, participants will have a solid grasp of the practical steps and protocols necessary for conducting PDNA, enabling them to effectively contribute to disaster recovery efforts.

Learning Objectives

- To understand the protocols for PDNA in Gujarat State
- To understand the standard procedures in undertaking a PDNA.

Duration: 60 minutes

Methodology

- Lecture-based learning
- Case study-based learning
- Discussion
- Q&A session

Detailed Description

1.3.1 Operational Activities and Protocols for PDNA in Gujarat State

Planning for PDNA:

1. The Gujarat State Disaster Management Authority (GSDMA) / R & R branch of Revenue department, based on the initial assessment and in consultation with National Disaster Management Authority (NDMA) will recommend for PDNA exercise after a week of the disaster event.
2. As per the approval by the Honorable Chief minister (Chairman, Governing Board of GSDMA) on requirement of PDNA, the State will inform the national nodal ministries and invite the other government departments and technical agencies such as Central Water Commission (CWC), India Meteorological Department (IMD), Indian Space Research Agency (ISRO) etc. to participate in the PDNA activities. The GSDMA/ R & R branch of the Revenue Department will lead the PDNA in cooperation and coordination.

3. The PDNA should be a well-coordinated inter-agency mechanism. Agreement on the management structure of the PDNA is important: The management structure will comprise of the following:
    a. **PDNA management team**: The assessment team is normally led by the CEO, GSDMA / Secretary (R & R). The management team will meet regularly to oversee the process of assessment, provide strategic guidance, take decisions, and will ensure that the necessary resources are available for undertaking the assessment.
    b. **Coordination team**: The members can be from national ministries or state departments. The team will be responsible for managing day-to-day planning, coordinating with the sector team members as well as state government and donors in conducting the assessment, analyzing the data, preparing the reports, and the development of the recovery and reconstruction framework under the guidance on the PDNA management team. The Coordination team will have the principal responsibility in organizing the conduct of the assessment and in ensuring that all logistic arrangements are in place.
    c. **Sector teams**: The sector teams will be composed of designated technical representatives from line departments at national, state and district offices, as well as with representatives from development partner agencies. The sector team will be responsible for collecting sector specific baseline data, damage, and loss data, undertaking field visits to validate the data collected, analyzing the data, and writing the sectoral assessment report on damage and loss and propose sector priorities for recovery and reconstruction.
    d. **Report Preparation Secretariat**: The coordination team, with technical support from development partners (if required), will be responsible for coordinating with the sectoral team members for the sector report based on data analysis for their sector. The coordination team will then compile and summarize the individual sectoral report into consolidated report.
4. The CEO, GSDMA/ Secretary (R & R) as the leader of the PDNA management team will brief the Chairman, GSDMA and State Crisis Group on the conduct of the PDNA and recommend appropriate actions to be taken, including timeframe for completing the assessment and delivering the report.
5. The CEO, GSDMA / Secretary (R & R) will also decide if assistance from development partners, in the conduct of the PDNA, is needed. If required, the nodal ministry at national level will coordinate with the Ministry of External Affairs (MEA), to issue a formal letter requesting for assistance from development partners in the conduct of PDNA.
6. Once the formal request is made by the MEA to development partners, the Ministry of Home Affairs (MHA) will call for an internal meeting – called "**Stakeholder Consultation**" between the international agencies and development partners. The cost of the assessment will be borne by the GSDMA / Revenue Department.
7. Prior to starting the assessment, an ―Orientation Training will be organized to refresh the designated PDNA team members on the broad concept of the damage, loss and needs as well as methodology for undertaking the assessments for each sector/sub-sector and issues to be aware when the team is in the field for individual sector members.
8. Finally, Sector teams will initiate collection of baseline data as per the templates prescribed in the sector specific Guidance Notes (GOI) on undertaking damage, loss and needs

assessment. The Central Statistical Organization (CSO) as well as the line departments will maintain and update key baseline date of sectors.

1.3.2 Summary Process of the PDNA Methodology

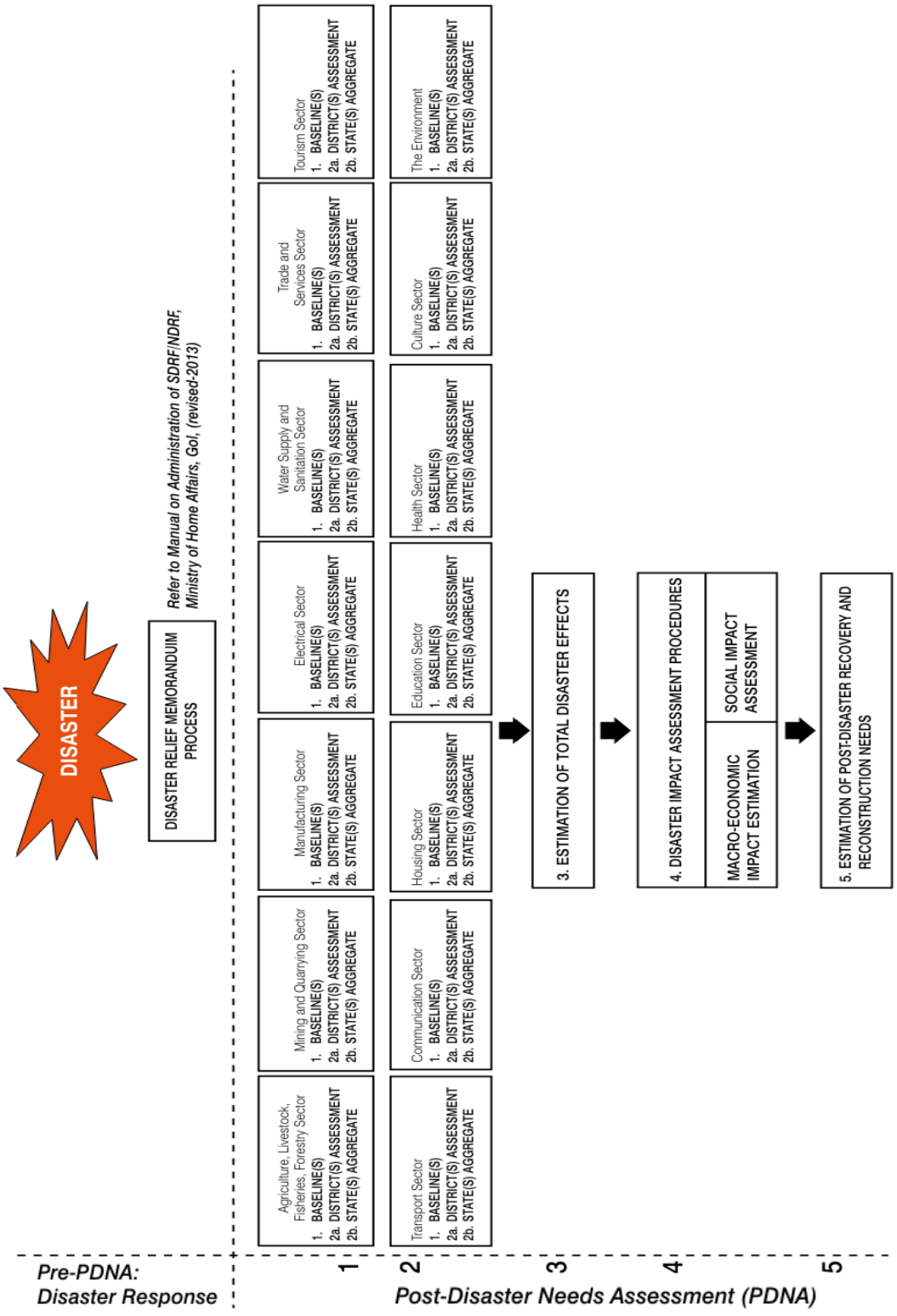

Figure 7 Summary process of the PDNA methodology (Source: PDNA Vol. 1, NIDM)

1.3.3 Baseline Information

The first step in a PDNA is to examine the general pre-disaster conditions—social, economic, cultural, environmental, infrastructural, financial, and political status. All these serve as a baseline to compare with post disaster conditions in the affected country. This phase of gathering baseline data is known as Context Analysis.

Baseline data is of two types:

1. **Generic data**: that relates to the entire country and affected geographical regions.
2. **Sector data**: that relates to specific sectors of analysis.

Baseline data helps compare the pre-disaster context to the post disaster conditions. It also contributes to understand the underlying causes of the disaster, which in turn, contributes to planning an effective and resilient recovery.

Collection of baseline data: Sector teams gather data on pre-disaster baseline pertinent to their sector. In situations where baseline data is unavailable from the census, sector or local surveys, or sector-specific and disaggregated reports, it may be necessary to estimate baseline data through discussions with key informants. It could also be feasible to arrive at baseline data based on visual impressions of unaffected areas and comparison with the affected areas. This requires that there are geo-referenced data corresponding to the images. In certain situations, where satellite imagery of pre-disaster situations is available, these images could be interpreted to develop sector-wise baseline data. Additionally, baseline data is sometimes stored in vulnerable conditions. Therefore, it may not be available after a disaster. Use of aerial photographs, drones, and other remote sensing instruments are a complement to ground inspection. Thus, these maybe used, if available.

> ***Note:*** *Where possible, all relevant data should be disaggregated by region, sex, age, ethnic and cultural characteristics. We need to identify specific vulnerabilities and opportunities that women, girls, boys, men, disabled, and older people may encounter, and which require to be acted upon post-disaster. A gender analysis across all sectors should also be part of the context analysis*

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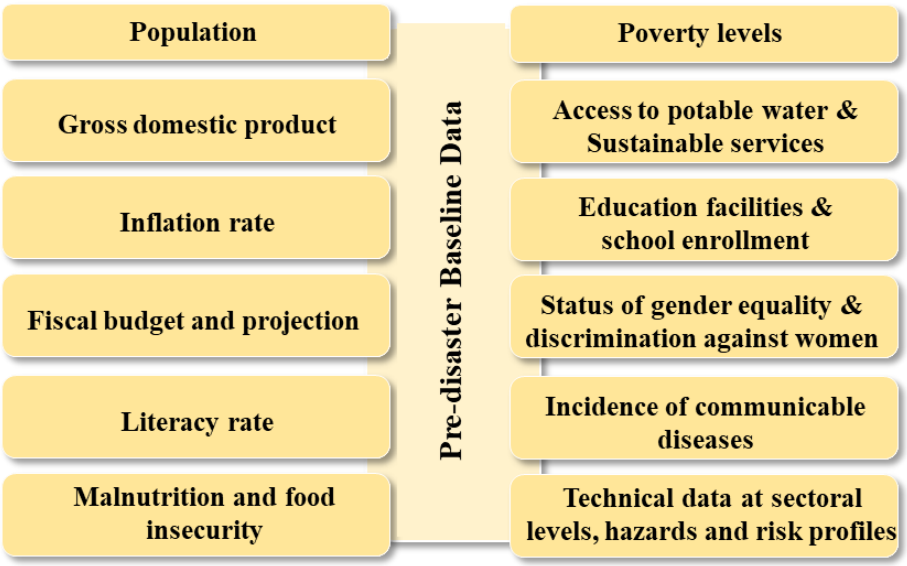

Figure 8 Checklist of pre-disaster baseline information

1.3.4 Identification and Costing of Disaster Effects

The assessment of disaster effects includes the following:

a. Damage to infrastructure and physical assets in all sectors, productive and social.

Under the first dimension of analysis, the PDNA assesses the effects of the total or partial destruction of physical assets and infrastructure in the affected areas, in measures of physical units for all sectors. This comprises:

1. Social infrastructure—such as the number of homes, education and health facilities, government buildings, community infrastructure and cultural and religious centres and sites.
2. Basic infrastructure—such as transport and communications (roads, bridges, ports, airports and train lines), water and sanitation systems, irrigation systems, energy generation and distribution and supply lines.
3. Productive sectors—such as agricultural infrastructure, industrial and commercial installations, and businesses.
4. In addition, it quantifies the physical assets damaged or destroyed in those buildings and infrastructures. For example, it quantifies furnishings and equipment, farm machinery and tools, and stocks of inputs among others.

How are these effects valued?

Total or partial destruction of infrastructure and physical assets are valued first in physical terms and then in terms of its monetary value. This value is expressed as the replacement costs according to the market price prevailing just before the disaster.

Note: *This is to be seen as the baseline cost, for the calculation of reconstruction costs would consider post disaster price alterations and improvements associated with risk reduction and the concept of build back better in the preparation of the Recovery Framework*

b. Losses across sectors regarding production flows, supply of all sectors as well as demand constraints.

1. Decline in output in productive sectors such as agriculture, livestock, fisheries, industry, commerce, and services (including tourism) due to infrastructure and asset damage.
2. Reduced revenues linked to a drop in demand caused by the disaster, increased production and operational costs, and higher costs in providing services (education, health, water and sanitation, electricity, transport, and communications). This is coupled with a heightened demand for social services by the affected population during the recovery period.
3. Increased fiscal expenditures contrast with reduced tax revenues as the need for government spending related to the disaster rises, while revenues decline due to damage in productive sectors.

4. Losses are calculated in current monetary values. In some sectors, the actual variation in economic activity may not be negative. For instance, the construction sector may see increased activity due to immediate repairs, debris removal, and reconstruction. However, these extraordinary expenses represent unplanned costs for the affected sector, arising from unexpected expenditures needed to address emergency needs.

How are these effects valued?
These effects are valued in terms of forgone income opportunities and higher operating costs to restore production of goods and services or accessing services, for as long as necessary to get back to the same pre-disaster situation or better.

c. Disruption of social service delivery and access to goods and services.

The disaster's impact on service delivery across all relevant social sectors and population groups, particularly the availability and quality of basic services, must be evaluated. This includes education, social security, housing, healthcare, culture, access to safe drinking water and sanitation, and public administration services, provided by either the public or private sector. New demands for services or goods resulting from the disaster also need to be considered. Key considerations when assessing changes from pre-disaster conditions, especially regarding the availability and quality of basic services, include:

1. Sector-wise assessment of destroyed equipment, supplies, information systems, and technology.
2. Availability of basic supplies and commodities in markets, ensuring no duplication of quantified effects from agricultural, industrial, or commercial damages and losses.
3. Focus on population group particularly affected by the lack of available services.
4. Assessment of temporary infrastructure needs such as shelter, education centers, water and energy supply, health facilities, religious and cultural centers, and additional services required due to the disaster, like emergency energy supply, temporary shelters, disease control, income generation, and sanitation.
5. Re-adaptation of service delivery programs such as education or healthcare programs.
6. Availability of human resources to ensure adequate service delivery, including wage compensation for service delivery staff, such as teachers and nurses, and the need for additional technical expertise.

Table 2 Example: What should be considered while assessing changes from pre-disaster conditions?

Example in the Agriculture sector	
Availability	The availability and quality of goods and services needed for agricultural, livestock, fishery/ aquaculture and forestry production.
Access	Household access to basic goods and services essential to agriculture-based livelihoods and food security (livelihood opportunities, value chains and markets, agricultural services, inputs, credit and loans and so on.

Example in the Health Sector	
Service delivery and access	▪ Treating increased number of patients because of new and/ or increased health risks. ▪ Additional cost per patient treated in alternative and temporary medical facilities ▪ Long-term medical treatment for disabilities and psychological care of affected people.
Loss of revenues	▪ Interrupted service delivery in damaged facilities during the period of rehabilitation and/ or reconstruction. ▪ Temporary suspension of user fees for affected population.

Example: Effects on Service Delivery, Access and Demand

The following questions need to be answered for the assess the effects of the disaster on service delivery, access, and demand:

1. To what extent did the damage to infrastructure affect the functionality of the facilities and decrease.
2. Availability of health service delivery?
3. What is the effect of the disaster on morbidity patterns, in particular injuries, mental health and incidences and nature of SGBV (Sexual and Gender-Based Violence)?
4. How are health facilities in unaffected areas able to deal with trauma, SGBV and injuries, including capacity for transport and medical evacuations?
5. How do population movements influence the caseload for health facilities in unaffected areas that host displaced populations?
6. What are the direct effects on health workers (including displacement, deaths and disabilities) and indirect effects on the capacity to train health workers to address new and/ or increased morbidity?
7. What are the effects on the availability of pharmaceutical products?
8. How does the disaster affect the access to health service of women and men of all ages and subgroups of the affected population?
9. How did the disaster affect the 'ability to pay' for access to health services for affected households and those that lost their livelihoods?
10. Are there new geographic barriers to access functional health facilities?
11. As a result of death, injury, displacement and migration caused by the disaster, household composition may change. As women and men may have different mobility and levels o access to and control over income, specific attention must be paid to access to services of households newly headed by women, older people or children.

Note: *While assessing changes from pre-disaster conditions, it is useful to consider:*

1. *Population groups that are particularly affected by the lack of available services.*
2. *How service delivery programs such as education and healthcare, need to be re-adapted.*
3. *Assessment of the temporary infrastructure required such as shelters and sanitation.*
4. *Different obstacles to access encountered by women and girls.*

d. Disruption of governance and social processes.

PDNA evaluates the key governance and decision-making processes of each sector that may be affected by a disaster. These include:

1. The effects of the disaster on government functions and on the capacity of civil servants to provide sector-based administrative processes.
2. The disruption of basic community functions, social services provided by community-based organizations, and disruption of cultural and community life.
3. The effects of disasters on the management and organization of sectoral services that support life and livelihoods.
4. The assessment of sectoral, national, and local capacities to lead and manage the recovery process itself.

How are the cost estimated?

Costs of these effects are estimated as the increased costs for coordination, provision of temporary facilities and staff, resources to restore government capacities and service delivery over time.

Capacity Assessments:

Capacity assessments form part of the social governance processes evaluated during the PDNA. They are particularly important for restoring governance functions and processes, and providing access to basic services. A good understanding of capacities is also critical for developing a plan to enhance the capacity of a country or sector to recover from disaster, and thereby, advance their development goals.

Capacity assessment has two broad objectives:

1. To know the existing capacity to lead and implement the recovery processes.
2. To know the existing capacity to deliver service and improve governance functions.

Existing pre-disaster capacities should serve as baseline for a capacity assessment and subsequent capacity development plan. The assessment should review capacities on the basis how they were altered by the disaster or new capacity needs created by the disaster. Assessment and planning that has already been done by humanitarian and early recovery actors provides useful inputs to the post disaster capacity assessment.

Capacities are examined in two broad categories:

1. *Functional Capacities* necessary for the successful creation and management of policies, legislations, strategies, and programs. They generate a platform for implementation and are central to effective institutions.
2. *Technical Capacities* are based on specific professional knowledge and need to be assessed as well. Critical technical capacities in disaster recovery contexts include knowledge about service delivery in particular sectors, for example, health, education, infrastructure, housing and so on.

Based on the changes the disaster brings to functional and technical capacities, capacity assessment would look at the following five broad categories:

1. Knowledge and skills lost or now required.

2. Resources, human, financial and material lost or now required, given new demands.
3. Systems of information, management and communication required, given the new demands or destruction of previously existing systems.
4. Legal authority, policies, and regulations, as they may need amendments or changes due to the disaster.
5. Accountability, monitoring, and reporting, specifically made for the recovery and reconstruction processes, given that under the emergency phase, some of these systems are not applied as they would be under normal circumstances. This may be due to special legal provisions allowing for fast-track authorization. This includes tender and contract allocation in emergency situations or due to the disruption of the institutions in charge of these processes in normal circumstances.

e. Increased risks and vulnerabilities, and environmental impact

PDNA examines how the risks and vulnerabilities are exacerbated by the disaster to determine the key elements needed to ensure a resilient recovery. It assesses:

- Immediate disaster risks to avoid emerging threats and/or deteriorating conditions
- Pre-existing or underlying vulnerabilities that became apparent in the sector during the disaster.

How are these effects valued?
Its economic value is estimated based on the increased expenditure for managing new risks arising from the disaster.

i. Increased Risks and Vulnerabilities

This relates to and assessment of what risks increase because of the disaster, and how and what additional threats or deteriorating conditions increase the vulnerabilities of people. Some examples are provided below:

- Assess potential disease outbreaks or chronic malnutrition.
- Assess risks including possible exposure to sexual and gender-based violence, child labour, human trafficking and risks to conflicts, which can increase after disasters and during the crisis.
- Assess increased risks of water borne disease and epidemics.

ii. Immediate Disaster Risks

Immediate risk assessment can also comprise the following:

- The probability of affected people being hit by additional floods or hurricanes within the same rainy or hurricane season.
- The movement of Internally Displaced Persons (IDPs) to areas of greater risk.
- The increased instability of slopes or elevated flood hazard along river basins and low coastal areas.
- Continuing heavy rains in the already flooded areas or aftershocks following an earthquake with the potential to affect more lives and livelihoods.
- Landslides after an earthquake.

iii. Pre-existing Vulnerabilities Exacerbated by the Disaster

Below are some elements of pre-existing vulnerabilities that could be exacerbated after a disaster:

- Unplanned and unsafe settlements.
- Ill-designed and built sector assets and infrastructure
- Poor construction practices
- Built neighbourhoods in at risk areas
- Poor information systems and lack of technical expertise (human resources).

In addition, multi-hazard risk mapping needs to inform recovery planning.

Example: The effects of Gujarat Earthquake 2001 on Environment

The major direct environmental effect include:

- Debris and rubble removal and disposal, which has been estimated at 10 to 20 million metric tons (MT) in urban areas and 15 to 30 million MT in rural areas.
- Impacts and residual risks from damage to industrial facilities.
- Impact to water and water management resources.
- Impacts to municipal and industrial environmental infrastructures such as sewage and wastewater treatment. Several indirect environmental effects are also anticipated and, where appropriate, should be monitored and mitigated. The more significant indirect impacts include.
- Poorer sanitation and waste management practices
- Increase in industrial pollution due to reconstruction activities requiring millions of tons of construction materials.
- Changes in land use due to need for rubble disposal sites and potential relocation of villages.

As all environmental effects and impact cannot yet be assessed, the development of a comprehensive environmental monitoring program becomes an important priority. Key sectors with yet unknown environmental impacts include: Potential impact of the earthquake on aquifers and groundwater movement, and Potential impact on ecosystems. (Source: GoG et al, 2001)

1.3.5 Impact Analysis

Disaster impact is determined through the analysis of two main elements:

1. The Economic Impact
2. The Social Impact

The Economic Impact is further evaluated at two levels:

a. Macro-Economic impact: It is defined as the consequences of the effects of a disaster on the overall economic performance of the affected country or state.

b. Microeconomic impact: It refers to the analysis of impact or personal or household wellbeing and it normally includes an estimate of the decline on employment and income due to the losses sustained in the productive and service sectors, as well as higher than normal family or personal expenditures. These aspects are discussed in detail in the Human Impact Assessment.

The Social Impact assesses the consequences of the disaster on individuals, households, and communities. This is done by looking at the impacts on livelihoods, impact on living conditions, psychosocial needs, coping mechanisms and the quality of life.

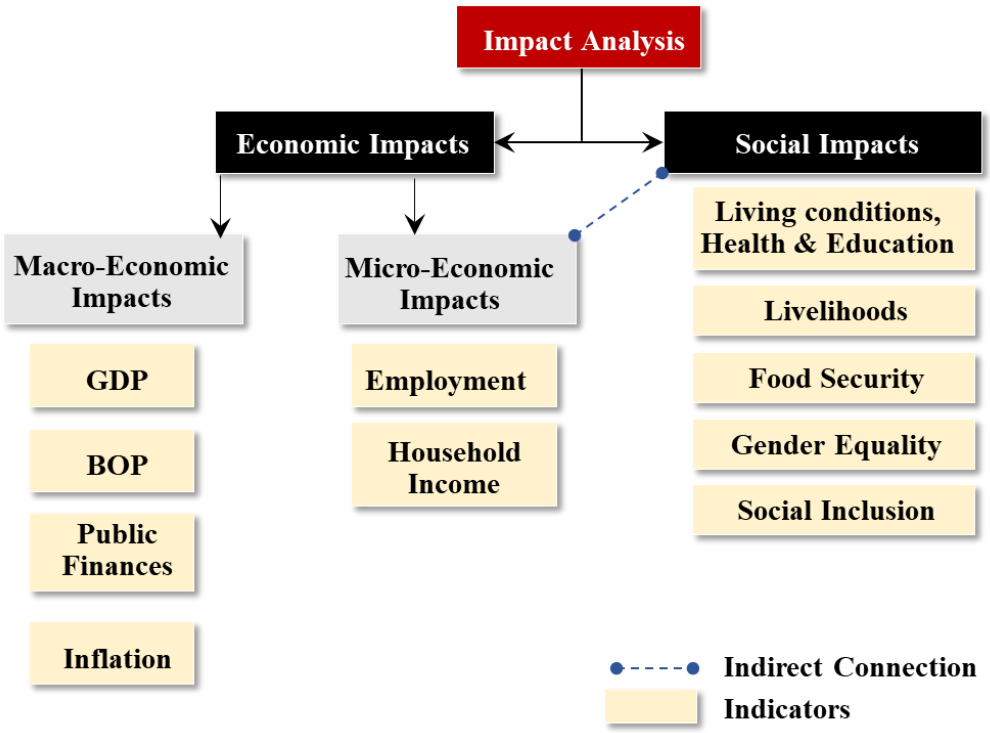

Figure 9 Impact analysis types and indicators

1.3.6 Standard Procedures for Macro-Economic Impact Assessment

The following steps should be implemented to assess the macroeconomic impacts:

1. Collection of baseline data on sector assets and production flows.
2. Estimation of Gross State Domestic Product (GSDP).
3. Estimation of the impacts on other economic indicators & summarizing the results.
4. Summarize the macroeconomic impacts in the State.
5. Draft the macroeconomic impacts assessment report

Table 3 Recommended Assessment Team

Organization and Personnel	Role in the Sector Assessment

Personnel from:
• **General Administration Department (Directorate of Economics & Statistics)**
• **Finance Department**
• **Other personnel of offices in the disaster-affected area who are:**
  ◦ Macroeconomists
  ◦ Statisticians
  ◦ Finance officers
  ◦ Budget specialists
	Lead and coordinate

Organization and Personnel	Role in the Sector Assessment
Personnel from: ▪ **Ministry of Economic Planning** ▪ **Ministry of Finance** ▪ **Central Statistics Office** ▪ **Central Bank of India** o Macroeconomists o Budget and finance specialists o Economic planning specialists o Statisticians	Provide baseline information and facilitate the field assessment of damages and losses
Development partners (if active in the sector)	Participate and provide technical advice

Step 1: Collection of Baseline Data

Table 4 Checklist for Baseline Data

National and State levels					
Indicators	**(Value in Current Prices, Rupees)**				
	Past Year	**Projection for the Present Year**	**Projections for the Next Years**		
			Year 1	**Year 2**	**Year 3**
GDP					
Total Government Expenditures					
Government Revenues					
a. VAT					
b. Income Taxes					
c. Duties					
d. Others					
Total Government Revenues					
Budget Deficit					
Balance of Payments					
Sectors/Sub-sectors	**(Output in Current Prices, Rupees)**				
Agriculture					
Crops					
Livestock					
Fisheries					
Forestry					
Trade, Hotels and Restaurants					
Tourism					
Trade/Commerce					
Transportation and Communications					
Air					
Sea					
Rail					
Telecommunications					
Community, Social and Personal Services					

National and State levels					
Indicators	**(Value in Current Prices, Rupees)**				
	Past Year	**Projection for the Present Year**	**Projections for the Next Years**		
			Year 1	**Year 2**	**Year 3**
Health					
Education					
Culture					
Financing, Insurance, Real Estate and Business Services					
Housing					
Services					
Mining and Quarrying					
Manufacturing					
Electricity and Gas					
Water Supply, Sewerage, Waste Management					
Other Indicators					
Employment (Number)					
Unemployment (in %)					
Headline Inflation (in %)					
US$ - Indian Rupee Exchange Rate					

Sources of Information**:**

The sources of baseline information may vary by state. However, the critical list of the likely sources of information is provided below.

- Information from the Ministry/ Department in charge of economic planning, finance and budgeting
- Central and State Statistical Offices
- Sector reports conducted by other ministries, department and development partners
- Reports of private research institutions and the academic research
- Annual performance reports of the states
- Project evaluation reports of related sectors
- Field visits or interviews
- Newspaper articles

Step 2: Estimation of Gross State Domestic Product (GSDP)

To estimate the impacts on the GSDP, the losses of the sectors should be transformed into value-added terms. Based on the data gathered from the sectors, the table below shows the consolidated value-added losses in the sectors/sub-sectors in current prices. Value-added prices are the value of foregone production multiplied by the value-added coefficient or ratio.

Table 5 Pre-Disaster and Post disaster Estimated Value-Added Production Losses (and Gains)

State:						
Sector / Sub-sector	**Production Losses Within the Year the Disaster Occurred (in R)**					
	Pre-disaster Estimates		**Estimated Losses**		**Revised Post Disaster Estimate**	
	Gross Value	**Gross Value-added**	**Gross Value**	**Gross Value-added**	**Gross Value-added**	**Constant Price**
A	**B**	**C**	**D**	**E**	**F**	**G**
Agriculture						
Crops						
Livestock						
Fisheries						
Forestry						
Trade, Hotels and Restaurants						
Tourism						
Trade/Commerce						
Transportation and Communications						
Air						
Land						
Sea						
Rail						
Telecommunications						
Community, Social and Personal Services						
Housing						
Services						
Mining and Quarrying						
Manufacturing						
Electricity and Gas						
Water Supply, Sewerage, Waste Management						
TOTAL						

Notes for filling Table 5

- Column A is for the sectors/sub-sectors that were assessed after the disaster.
- Column B is for the gross value of the estimated pre-disaster output.
- Column D is for the gross value of the post disaster losses of the sectors/sub-sectors.
- Column C is for the gross value added of Column B, which is **Column B x Gross value-added ratio or coefficient**
- Column E is for the gross-value added of Column D, which is **Column D x Gross value-added ratio or coefficient**
- Column F is for the revised gross value-added estimate (Column C minus Column E).
- Column G is for the revised post disaster production estimates in value-added constant prices for the sectors/sub-sectors. This is derived by multiplying the gross value-added value by the price deflater. In formula, this is: **Column F x Price deflater = Column G**

Table 6 Estimated Value-Added Production Losses (and Gains) Beyond the Year the Disaster

State:						
Sector / Sub-sector	**In Value-Added Constant Values (Rupees)**					
	Year 1		**Year 2**		**Year 3**	
	Pre-disaster Estimates	**New Estimate**	**Pre-disaster Estimates**	**New Estimate**	**Pre-disaster Estimates**	**New Estimate**
A	**B**	**C**	**D**	**E**	**F**	**G**
Agriculture						
Crops						
Livestock						
Fisheries						
Forestry						
Trade, Hotels and Restaurants						
Tourism						
Trade/Commerce						
Transportation and Communications						
Air						
Land						
Sea						
Rail						
Telecommunications						
Community, Social and Personal Services						
Housing						
Services						
Mining and Quarrying						
Manufacturing						
Electricity and Gas						
Water Supply, Sewerage, Waste Management						
TOTAL						

Notes for filling Table 6

- It should be noted that during the succeeding years when recovery activities are on-going, there may be some sectors which will experience increase in output on a national scale.
- The sectors, which are 'losers' and 'winners' should be considered in this table. For example, increase in production costs in agriculture (loss) may be a gain to the fertilizer producers (manufacturing). Also, the services sector (construction) may experience a higher output if reconstruction activities will be implemented in the transport sector

Step 3: Estimation of the impacts on other economic indicators & summarizing the results

- The state must analyze the immediate impacts on other economic indicators as well as the future impacts of the recovery and reconstruction activities identified by the various ministries.
- The macroeconomic impacts of recovery and reconstruction will depend mostly on the amount, coverage, scope, and implementation schedules of the activities that the government will undertake. For instance, the contribution to the GDP or GSDP and employment of the reconstruction of infrastructure may be high but it may have repercussions on the budget deficit and the balance of payments, among others.
- The following economic indicators should likewise be assessed or considered:

    1. **Budget and budget deficit**
        a. If the government decides to maintain or increase the budget after the disaster despite lower expected tax revenues, the budget deficit will rise.
        b. If the government will contract loans to fund recovery and reconstruction projects under a lower tax revenue scenario, budget deficit will be expected to rise for the year or years to come.
    2. **Balance of payments (BOP)**

    The State must be able to quantify the following based on the submitted reports of the various sectors and/ or sub-sectors to estimate the adverse impact on the BOP.

        a. The expected reduction of exports due to the disaster will reduce foreign currency earnings.
        b. Whatever expected increase in imports that will be needed, such as food supply, medicines, construction materials and other equipment and machinery, will increase foreign currency demand.
        c. Foreign currency coming in from foreign donors and remittance or donations from nationals outside the country will contribute to the foreign currency receipts after a disaster. The inflow of foreign currency from foreign donors and citizens abroad may offset a portion of lost export earnings.

    3. **Taxes, unemployment, and inflation**

    The impact on taxes, unemployment and inflation can be estimated using the information gathered from the district and regional assessment.

        a. The number of earnings from businesses will lower down tax collection.
        b. The closure of businesses will increase inflation.
        c. The lower capacity of production of some important sectors will increase demand, which can result into inflation. For instance, damages to agriculture may lower the supply of food items, which will result in increase in prices.

To account for the macroeconomic impacts of massive recovery and reconstruction, the State can undertake a scenario-building analyses with the estimated amount needed for recovery.

Step 4: Summarize the macro-economic impacts in the State

Table 7 Summary table of macroeconomic impacts in the State

State:								
Indicators	**Money Value in Rupees**							
	Disaster Year Estimates		**Projections of the Next Years**					
			Year 1		**Year 2**		**Year 3**	
	Pre-disaster	**Post- disaster**	**Pre-disaster**	**Post- disaster**	**Pre-disaster**	**Post- disaster**	**Pre-disaster**	**Post- disaster**
Real GSDP								
Nominal GSDP								
Tax Revenues	**Money Value in Rupees**							
VAT								
Income Taxes								
Duties								
Others								
State Government Expenditure								
Sectors / Sub-sectors	**Output in Money Value in Rupees**							
Agriculture								
Crops								
Livestock								
Fisheries								
Forestry								
Trade, Hotels and Restaurants								
Tourism								
Trade/Commerce								
Transportation and Communications								
Air								
Land								
Sea								
Rail								
Telecommunications								
Community, Social and Personal Services								
Housing								
Services								
Mining and Quarrying								
Manufacturing								
Electricity and Gas								
Water Supply, Sewerage, Waste Management								
Other Indicators	**(in %)**							
Unemployment								
Inflation								

The following important points must be remembered in consolidating the macroeconomic impacts at the national level:

1. States/Regions that were not damaged by the disaster may also incur losses. For example, if and when there is massive death of cattle in the disaster-affected region, there can be huge losses to the meat processing industry in another region if the source of meat for processing comes from the affected region.
2. On the other hand, it must be noted that for the unexpected expenditures of some sectors, there will be some sectors that will gain from such expenditures, especially those businesses that are not within the disaster-affected areas. For example:
    a. The cement industry in the other regions may experience gains due to the increase in demand for cement from the damage-affected sector.
    b. Cleaning of debris may cause unexpected expenditures for some sectors but it will be a "gain" or increase in income from the services sector.
    c. The unexpected expenditures in the procurement of electricity generators as sources of temporary electricity while the power company is under repair will increase the sales in the trade sector.
    d. The procurement of fertilizers for those will replant their farms will increase the income of the chemical manufacturing sector.
3. It must be noted that it is possible that a disaster may have a negligible impact on the GDP if the region/s affected do not contribute much to the national economic output. However, it may have huge GSDP impact and greater social impacts on the affected people.
   (The social impacts will be reflected in the social impact assessment report).

Step 5: Draft the State macro-economic impacts assessment report

- The macroeconomic impact report should be drafted by the State Economic Planning Office, emphasizing the summary of damages and losses by sector and by sub-sectors and their impacts on the macroeconomic indicators.
- The macroeconomic impact assessment report should be submitted to the Disaster Management Office and be consolidated to form part of the overall PDNA report, which will in turn be one of the bases of the recovery plan that will be drafted by the State.
- In cases of major disasters where several states are severely affected, the various macroeconomic assessment reports from the States affected will be used by the national economic planning office to summarize the impacts of the disaster on the national economy.

1.3.7 Standard Procedures for Social Impact Assessment

The following steps should be implemented to assess the macroeconomic impacts:

1. Collection of baseline data on sector assets and production flows (including demography; sources of income; savings, insurance and sources of credit; medical services, education, power and water supply)
2. Assess the social impacts of disaster.
3. Summarize the social impacts in the district.

Table 8 Recommended assessment team

Organization and Personnel	Role in the Sector Assessment
Personnel from: • **Social Justice & Empowerment Department** • **General Administration Department (Directorate of Economics & Statistics)** • **Local personnel of offices in the disaster affected area who are:** o Social Science Specialists o Social Researchers o Social Welfare Officers o Statisticians	Lead and coordinate
Personnel from: ▪ **Ministry of Social Welfare** ▪ **Central Statistics Office who are:** o Social Scientists o Social researchers o Macroeconomists o Socio-economic planning analysts	Provide baseline information and facilitate the field assessment of damages and losses
Development partners (if active in the sector)	Participate and provide technical advice

Step 1: Collection of Baseline Data

Table 9 Demography baseline data (Information about the District)

Name of District			
Poverty incidence (%)			
Maternal mortality rate:			
Infant mortality rate			
Demography	**Male**	**Female**	**Total**
Total Population			
Total Number of Those Below 5 years old			
Total Number of Those Above 60 years old			
Total Number of Differently-Abled			
Household Description	**Male**	**Female**	**Total**
Average size			
Average Number of Children			
Average Number of Those Below 5 years old			
Average Number of Children in School			
Average Number of Those Above 60 years old			
Land ownership			
Prevalence of malnutrition (%)			
Total Number of Families/Households	**% of Total**	**Total Number**	
Headed by Male			
Headed by Female			
With sanitary toilets			
Without sanitary toilets			
With electricity			
Without electricity			
Belonging to ethnic minority group			

Table 10 Main sources of income of households

Name of District					
Main sources of income	**Number of Households**	**Average Monthly Income (Rs.)**	**Average Value of Assets per Household (Rs.)**	**Number of People**	
				Male	**Female**
Self-employed					
1. Farming					
2. Fishing					
3. Livestock Growing					
4. Poultry Growing					
5. Microenterprises					
6. Trading (Shops and Stores)					
7. Services					
8. Transport Workers					
9. Others					
Employed					
1. Daily wage labourers					
2. Skilled workers					
3. Professionals					
4. Others					
Other sources					
1. Pension					
2. Outside Remittance					

Notes for filling Table 10

- The total number of people categorized by sources of income can be more than the total population since many people can have multiple sources of income.
- Outside remittance refers to the monthly amount of money sent to the family whether from within or outside the country.
- However, the "average monthly income" must be the total income per month of a family corresponding to their "main source of income." For example, the "average monthly income" of a family, which earns 80% of their income from farming and 20% from livestock, must be reflected in the row of "farming," since it is their main source of income

Table 11 Possession of Savings and Insurance Coverage of Households

Name of the District					
Number of Households and Amount of Insurance	**Type of Insurance**				
	Health	**Life**	**Crop**	**Property**	**Others**
Savings					
	Number of Households		**Average Amount per Household (Rupees)**		
Possession of Savings					

Table 12 Social services in the district

Name of the District									
Public Basic Services	**Quantity**	**Capacity**	**Power Source**		**Source of Potable Water Supply**				
		Persons	**Electricity**	**Others**	**type 1**	**type 2**	**type 3**	**type 4**	**type 5**
Primary School									
High School									
University									
Health Centres									
Hospitals									
Others									

Notes for filling Table 12

- Capacity of basic services refers to enrolment in schools and the number of patients per day at the medical facilities.
- For water supply source:
  a. Type 1 is sourced from a spring;
  b. Type 2 is individual well with hand pump;
  c. Type 3 is shared community well;
  d. Type 4 is community faucet;
  e. Type 5 is piped-in faucet

Sources of Information

- The sources of baseline information may vary by state. However, the critical list of the likely sources of information is provided below.
- Information from the Ministry/ Department in charge of social welfare, social planning, poverty alleviation; etc.
- Central and State Statistical Offices
- Sector reports conducted by other ministries, departments, and development partners
- Reports of private research institutions and the academic research
- Annual performance reports of the states
- Project evaluation reports of related sectors
- Field visits or interviews
- Newspaper articles

Step 2: Assess the Social Impacts of Disasters

Estimating the social impacts in terms of the overall quality of life, especially of the poor, after a disaster requires the knowledge of pre-disaster conditions, post disaster field visits to the affected population and comparing the post disaster findings including the data collected by the other sectors. Normally, the most affected people are those in the poverty groups whose livelihoods are vulnerable to shocks, women, children, the elderly and the disabled. With the baseline information, the SIA team should conduct field assessment in collaboration with the local officials especially during the direct interviews, Focus Group Discussions or whatever assessment tools to be used by the team (as enumerated earlier).

To cover the social impacts caused by disasters, it is recommended that the assessment team should determine which areas should be visited. It is very possible that not all areas can be visited especially in instances where the scope and extent of the disaster are widespread. The areas that will be visited must represent the pre-disaster conditions of the affected communities or districts. Examples are poor farming communities, coastal fishing villages, upland dwellers, industrial areas, informal settlers, etc. These selected areas must represent the other similar areas, which will not be visited by the team. After determining which areas will be visited, the team must evaluate the most appropriate tools to be used in generating the information required. Assessment can be also done in evacuation centres as well as in areas outside evacuation centres.

The field visit, together with the data from the reports of the other sectors, will provide the social impact assessment team information that will enable them to assess the conditions of the affected population, which will enable decision-makers to identify activities for recovery. The following are the issues that should be covered during the field visits.

1. The number of people affected by the disaster and their present situation, such as:
    a. The number of people living in evacuation centres and the expected duration of their stay;
    b. Adequacy of food supply and potable water as well as physical security;
    c. Prevalence of diseases and availability of medical care;
    d. The coping mechanisms of the affected people;
    e. The situation of women and children;
    f. The vulnerabilities of the people due to the disaster.
2. The impacts on families in terms of:
    a. Loss of livelihood and income;
    b. Health and nutrition especially the vulnerable groups like pregnant women, lactating mothers, children, the elderly, etc;
    c. Education of children;
    d. Indebtedness;
    e. Family cohesion;
    f. Social institutions including effects on indigenous peoples;
    g. Safety and security especially of the most vulnerable.
3. People's perceptions on:
    a. The appropriateness of aid/assistance extended in terms of the goods provided, the process of distribution, etc.

b. Post disaster leadership and governance;
c. Post disaster income, quality of life, poverty and future of children, among others.

4. The people's plans and aspirations on:
   a. Governments and outsiders' assistance;
   b. Employment and livelihood;
   c. Duration before their lives will return to normal.

Table 13 Questionnaire on the post disaster conditions of the people

Name of District:									
People Affected	**Total Number**		**Children**		**Elderly**		**Indigenous Peoples**		**Remarks**
	Male	**Female**	**Male**	**Female**	**Male**	**Female**	**Male**	**Female**	
Total Number of Affected People									
Number of People Living in Evacuation Centres									
TOTAL									
Living Conditions of the People									
Adequate Supply and Facility?			**Food**		**Water**		**Sanitation**		**Remarks**
			Yes	**No**	**Yes**	**No**	**Yes**	**No**	
Health Conditions									
			Yes	**No**	**Remarks**				
Prevalence of Disease?									
Adequate Medical Services?									
Education									
			Yes	**No**	**Remarks**				
Are Students Attending School?									
Vulnerable Groups					**Remarks**				
How is the Condition of Women?									
How is the Condition of children?									
How is the Condition of the elderly?									
Are People Safe at the Evacuation Centres?									
Are People Safe Outside the Evacuation Centres?									
Are there Displaced Ethnic Minority Groups?									
Livelihood and Income					**Remarks**				
What are the Types of Livelihood or Main Sources of Income of the Disaster-Affected People?									
Did the People Lose their Livelihood? Temporarily or Permanently?									
How Much Income per Month is Reduced or Lost?									
How Long Before Income and Livelihood will be Regained?									

Name of District:									
People Affected	**Total Number**		**Children**		**Elderly**		**Indigenous Peoples**		**Remarks**
	Male	**Female**	**Male**	**Female**	**Male**	**Female**	**Male**	**Female**	
Coping Mechanisms					**Remarks**				
a. Missing Meals									
b. Migration									
c. Quit Schooling of Children									
d. Allowing Children to Work									
e. Borrow Money									
f. Move in with Relatives									
g. Ask for Assistance from Relatives									
h. Look for Temporary Job									
i. Others									
Family and Community Relations					**Remarks**				
How are Family Relations Affected by the Disaster?									
How are Community Relations Affected by the Disaster?									
People's Perceptions					**Remarks**				
Is the type of Aid/Assistance extended Appropriate? (Food Aid, Tents, Medicines, etc.)									
Is the Distribution of Aid/Assistance Equitable? (Reaching those in need most)									
How Long do they Think their Lives will Return to Normal?									
How is Local Governance affected by the Disaster?									
What added Vulnerabilities do you foresee as a result of the disaster?									
The People's Plans and Aspirations					**Remarks**				
What are your personal plans to speed up the return to normalcy?									
What do you wish or hope that the government and aid agencies would do to enable your family to regain your pre-disaster situation?									
Other wish or hope on how they can be assisted to return to normalcy.									

Note: *Different groups may have different perceptions, plans and aspirations. The assessment team must be able to note these differences during the Focus Group Discussions and interviews during the field visit*

Step 3: Summarize the Social Impacts of Disasters

Before summarizing the social impacts in the State, the assessment team must ensure that:
1. The survey results were properly processed.
2. The inputs from the other sector teams are considered.

Based on this information, the findings can be consolidated at the district level and eventually at the state and the national level, if necessary. The following issues should be considered in the consolidated social impact assessment in the district.

1. **Livelihood and Income**: Loss of livelihoods and employment is one of the main factors, which reduce the capacity to cope of the disaster victims and recover their normal lives after a disaster. The assessment team must be able to identify the types of livelihoods lost and estimate the number of people who lost their sources of income and livelihood. This information can be sourced from the sectoral assessments of the other agencies. A special focus should be given to the impacts on the poor informal sector workers to provide the necessary information on how they can be assisted by the government. The damages and losses in the informal sector, which are part of the assessments in the Manufacturing, and Trade and services sectors, should be used in assessing the impacts.
    a. What will be the impacts on families whose earners have lost their sources of income or worse lost their lives?
    b. When will the formal and informal workers regain their levels of income?
    c. How will indebtedness affect their recovery?
    d. How will indebtedness affect their recovery?

2. **Security**: The conditions of the affected people can be assessed by the adequacy of food supply and potable water as well as physical security in and outside the community and evacuation centres.
    a. Are the supplies of food and water enough to keep the people nourished?
    b. On the other hand, criminality may also increase if there is massive food shortage. Are there enough precautions to prevent criminality including violence against women and children, human trafficking, among others?

3. **Health and sanitation:** This should describe the present situation and health risks the people face.
    a. Did the post disaster conditions cause the outbreak of diseases? If so, what are these diseases and how are they being addressed?
    b. Is there any possibility of long-term effects on the health of people? Adverse health impacts can extend on the longer-term in cases where:
        - There are several people affected with post-traumatic stress disorder (PTSD), 'disaster syndrome' and other psycho-social illnesses. The social impact assessment should identify the services that may be required to support persons suffering from some level of PTSD over a period and the impact of such services on the recovery and reconstruction of the community.
        - Toxic wastes from industries, mines, fuel containers, etc. are leaked into the natural environment, which can cause illnesses that may become detectable only over a longer period of time.

4. **Education**: Some of the possible causes of disrupted education will be the destruction of schools; loss of family, migration and/or students may be forced to quit schooling to look for temporary jobs to augment family income. What will be the effects on the education of children in the areas?

5. **Coping mechanisms:** Coping mechanisms may vary from family to family. Some may have relatives to assist them through financial remittance. Others may choose to relocate. Among poorer families, some possible options are the reduction of expenditures for food, sending children to find work, living with relatives or extended stay at evacuation centers, incurring debts or the use of savings and insurance if they have any.
   With all the effects of the disaster, what activities do people undertake in order to adjust to their present situation?

6. **Vulnerabilities:** Disasters can cause new physical and social vulnerabilities among the members of the community. For instance, houses near the river-banks may be exposed to flooding due to erosion. Bridges that may have been weakened by floods and strong winds may pose a danger to the people using them. On the other hand, people may become more vulnerable to exploitation such as being source of cheap labour, victim of human trafficking, prostitution, etc.
   What are the new vulnerabilities that the people are confronted with due to the disaster?

Special Concerns

Considering the above circumstances, a more specific assessment should discuss the following special concerns:

1. **The situation of women, children, and the elderly**: With the damages and losses in the community, what are the obvious impacts on women, children and the elderly? Are women having double the burden in terms of work? Do women, children and the elderly receive equal assistance as men? Do more girls drop out of school compared to boys?

2. **Family cohesion and social institutions**: Are there instances where families broke up due to the disaster? What were the main causes? Are religion, traditions and norms respected in post disaster activities? What are the possible effects on family relations and traditions?

3. **Impact on indigenous peoples and/or other special groups:** There may be some special issues that affect only the indigenous peoples or cultural minorities. For instance, some groups of indigenous peoples consider the mountains or the sea where they stay as sacred. Adverse effects on these areas may have negative social impacts on these special groups. Moreover, the assessment team must be able to discern whether the disaster can affect the traditions and culture of these special groups.

4. **People's perceptions**: The perceptions of the people affected should be reported and include the following:
   a. Appropriateness of aid/assistance extended. Are the goods provided acceptable to the norms and traditions of the people? Is the process of distribution equitable?
   b. The perception on leadership and post disaster governance. Is the local leadership capable of handling emergency operations? Were the people consulted on major decisions? Are there power struggles between and among the government, international development partners, the rich and the poor in the community?
   c. People's perception of their present status. How do people think of their present conditions? Do feel that they will regain their pre-disaster quality of life and pursue their plans for their family and children?
   d. The people's plans and aspirations. Even in the worst situation, disaster victims have some plans and aspirations for the future. For instance, how do they plan to regain their normal lives? What are their intended actions in order to recover their sources of income and livelihood? What immediate assistance do they hope from the government and other development partners to help them achieve their plans? Is relocation acceptable?

Conclusion and recommendations

Base on the above issues and concern, the assessment team can make a general conclusion and recommendations emphasizing not only the adverse social impacts of the disaster but also on the potential risks and vulnerabilities that may exacerbate the present situation of

the people if the concerns are not addressed immediately. The following can be highlighted in the recommendations:

1. The existing immediate needs of the people which were not fully met during the emergency phase like continuous food supply, improved safety, prevention of human trafficking, etc.
2. The type of recovery activities that should be prioritized like water supply, those that are related to livelihood restoration, health, education, etc.
3. Other activities that will prevent further deterioration of the existing situation in the disaster-affected areas like preventive health care, disaster mitigation, etc.

These recommendations should be considered as inputs in the greater identification and prioritization of recovery and reconstruction projects across the various sectors. The social impact assessment of the district affected should be consolidated into a state assessment report both quantitatively and qualitatively. If there are several states affected, a consolidated report for all the states should be the national social impact assessment report. The same outline is recommended for the national SIA report.

1.3.8 Standard Procedures for Estimating Post disaster Recovery and Reconstruction Needs

The post disaster recovery activities should be grouped around the following themes or components:

1. **Recovery of production** levels in the productive sectors of agriculture, livestock, fishery, forestry, industry, trade or commerce, mining, and tourism;
2. **Recovery of supply and access to basic services** of education, health, housing, transport and communications, water supply and sanitation, and electricity;
3. **Recovery of personal or household income**; and
4. **Recovery of physical assets or reconstruction** with introduction of disaster-resilient standards.

The following steps should be implemented to assess the macroeconomic impacts:

1. Identify recovery and reconstruction strategies.
2. Estimate recovery needs.
3. Estimate reconstruction needs.
4. Prioritize identified projects for recovery.
5. Summarize the estimated recovery and reconstruction needs.

Note:
Reconstruction needs are calculated as:
Value of damage + Cost of (quality improvement + technological modernization + Relocation, when needed + Disaster risk reduction features + multi-annual inflation)

Prioritization of Sector Recovery Needs

Once recovery needs are determined, it is important to prioritize and sequence the needs at the sector level. Post-disaster settings are characterized by multiple needs across every sector and limited resources. Thus, recovery needs and their associated interventions must be addressed in phases, with the most critical needs being accorded priority.

Inter-sectoral and intra-sectoral linkages need to be considered to identify synergies, complementariness, and an integrated cross-cutting approach.

It is recognized that the prioritization of needs is a political process determined by different factors. These are national and local government priorities, technical feasibility of the interventions, and the availability of human and financial resources, among others.

The process to be followed for prioritization and sequencing of needs includes

1. identification of Government priorities,
2. regular stakeholder and partners consultations,
3. recourse to expert opinion.
4. donor consultation
5. close consultation at all levels of government and close cooperation between policy makers, planning and financial ministries or authorities.

Sectoral teams conduct their own needs analysis and prioritize their options according to their distinctive areas of competence and mandate. The teams take into consideration the capacity and resource availability, and the established country-specific prioritization criteria.

The prioritization of needs should consider the gap between the pre-disaster and post disaster conditions. It should recommend interventions required to restore the socio-economic conditions of community in a way that improves their capacities to mitigate impacts of future risks and prevent relapses. Prioritization of needs should be consistent and harmonized with pre-disaster long term development goals.

Note that additional costs and capacities to reduce disaster risks and to build back-included in a recovery budget – should be consistent to the size and effects and impacts arising from disaster, and not necessarily long-term development gaps and deficits.

Priority setting should always reflect the unique conditions and needs of the country concerned. They should be based on prioritization criteria specific to the country context. Below are some key considerations to help facilitate prioritization:

- The most urgent needs expressed by the affected population (women and men of all ages and sub-groups)
- Population sub-groups in vulnerable situations or those who are at particular risk
- Sequencing of needs, from the short-term to the medium and long-term
- Restoring to pre-disaster levels, followed by improvements
- Actions that can yield early results effectively (within 18 months)
- Comparative advantages
- Opportunities for greater impact
- Institutional and technical capacity
- Geographic areas with urgent needs
- Current or near future milestones (for example, elections)
- Addressing key obstacles associated with sectors, and
- Recovery initiatives that contribute to peace where relevant

1.3.9 Group Exercise

Damage to Internet Café: Baseline Information

You are the owner of an internet café in some city. After a week of heavy rainfall, a river in your neighbourhood broke through its dam and flooded all houses and shops, including your internet café. You must evacuate the area and are not able to access your internet café for four days.

On the fifth day, you go back to your business with a friend from a local construction company to assess the effects of the floods on your internet café.

Disaster Effects

Here is what you and your friend find:

- The internet café has been partially destroyed; 5square meters of your walls need to be repainted; and 6 cubic meters of debris has to be removed.
- The computer has been totally destroyed.
- Your annual business license has been washed away.
- According to the latest weather forecast, it might rain again. The river's dam is still broken and you therefore secede to install a temporary flood protection wall with 40 sandbags.
- Luckily, your friend is able to help you and you do not need to hire additional workers to handle the situation.
- You expect to re-open your internet café in 15 days (including days when you could not access the café).

Relevant Baseline Data

- Before the flood your monthly revenue was Rs 13,000
- Your computer costs Rs 50,000
- Cost of paint: Rs 10/ square meter
- Cost of debris removal: Rs 8/ cubic meter
- Cost of renewing business license at local municipality: Rs 3000
- Cost of sandbag: Rs 10

Application Activity

- Familiarize yourself with the case study.
- Identify the different dimensions of the disaster effects.
- Estimate the economic value of the disaster effect, using the following table:

Disaster Effects	Damage	Loss

Solution:

Disaster Effects	Damage (in Rs)	Loss (in Rs)
Partially destroyed building (repainting of the walls)	(5m2 x Rs10/m2) = 50	
Totally destroyed computer	50000	
Debris removal		(6m3 x Rs8/m3) = 48
Destroyed business license		3000
Temporary flood risk (sandbags for protection)		(40 bags x Rs 10/bag) = 400
Business interruption (income not received)		Rs 13000/2 = 6500
Total	**50,050**	**9948**

Total damage is Rs 50,050; Total loss is Rs 9,948; and Sum Total is Rs 59,998.

Recovery Needs

With the information on disaster effects in mind, define and cost your recovery needs.
Here is some additional information that you might find useful.

- A new computer costs Rs 1,50,000
- The owner of the Café Net wants to provide the building with a long-term solution to avoid this business to be flooded again. He hires an Engineer who has submitted a proposal to repair the roof, windows, doors and provides external permanent protection to avoid floods. The total cost to upgrade the building is Rs 50,000 all inclusive.

Disaster Effects	Damages (Rs)	Losses (Rs)	Recovery Needs	Recovery Costs
Total				

Solution:

Disaster Effects	Damages (Rs)	Losses (Rs)	Recovery Needs	Recovery Costs
Partially destroyed building (repainting of the walls)	50		Repair the building and improve the flood protection	50 +50000 = 50,050
Totally destroyed computer	50000		Replace the computer with improved technology	1,50,000
Debris removal		48	Clean up the shop by collecting and disposing debris	48
Destroyed business license		3000	Renew the business license to be able to operate again	3000
Temporary flood risk (sandbags for protection)		400	Reduce the risk of floods in the short run	400
Business interruption (income not received)		6500	This is direct loss to the owner that could be reduced if it was insured	
Total	**50,050**	**9948**		**2,03,498**

References

- National Institute of Disaster Management. (n.d.). Post Disaster Needs Assessment Manual Volume I. Retrieved from https://nidm.gov.in/PDF/pubs/pdna_manual_vol1.pdf
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Technical Session 2
Sector-wise Standard Procedures for Undertaking PDNA

Introduction, Overview & Perspectives

This technical session will guide learners through the process of completing Post Disaster Needs Assessments (PDNA) for fourteen distinct sectors in the state of Gujarat. These 14 sectors are classified into three categories: production, infrastructure, and social sectors. Technical sessions either 2a or 2b, or 2c, together with technical sessions 1 and 3, can be conducted independently. This was done to cut the number of hours and provide the audience with significant information. The session will provide a comprehensive roadmap, outlining eight critical steps for the successful implementation of PDNA. These phases cover the entire procedure, beginning with the formation of the recommended assessment team responsible for conducting the PDNA and concluding with the compilation of the sector report. Throughout the training, learners will be given specific instructions and best practices for each of the eight processes, ensuring that they fully understand the PDNA process.

The primary objectives of this technical session

- To introduce general steps in conducting a PDNA.
- To understand the required baseline information for each sector and its importance.
- To understand the requirements of field assessment.
- To understand the assessment of disaster effects and impacts on each sector.
- To determine and prioritize the recovery needs.
- To understand the general guidelines to consider while compiling the sector report.

Methodology

- Lecture-based learning
- Case study-based learning
- Discussion
- Q&A session

Trainer’s Note

The entire technical sessions are aimed at helping trainees apply the concepts learned in the previous sessions to their respective sectors. There is a total of fourteen sectors and each sector has different guidelines to consider for successful conduction of PDNA. Trainees should seek understanding through learners' active participation in discussions and question-and-answer sessions.

Session Plan

Content	Trainer's Note	Time
Technical Session 2a	The focus is on production sectors.	130 min
Technical Session 2b	The focus is on infrastructure sectors.	100 min
Technical Session 2c	The focus is on social sectors.	125 min

Technical Session 2a
Sector-wise Standard Procedures for Undertaking PDNA (Part 1 Productive Sectors)

Introduction, Overview & Perspectives

This technical session is designed to guide learners through the process of conducting Post Disaster Needs Assessments (PDNA) for productive sectors in the state of Gujarat. The session will provide a comprehensive guide, detailing eight crucial steps that ensure the successful execution of PDNA. These steps encompass the entire process, starting from the formation of the recommended assessment team responsible for conducting the PDNA, to the final stage of compiling the sector report. Throughout the training, participants will receive detailed instructions and best practices for each of the eight steps, ensuring they have a thorough understanding of the entire PDNA process.

The primary objectives of this technical session

- To introduce general step in conducting a PDNA.
- To understand required baseline information for each sector and its importance.
- To understand the requirements of field assessment.
- To understand assessment of disaster effects and impacts on each sector.
- To determine and prioritize the recovery needs.
- To understand the general guidelines to consider while compiling the sector report.

Duration: 130 minutes

Methodology

- Lecture-based learning
- Case study-based learning
- Discussion
- Q&A session

Trainer's Note

The entire technical session is aimed to help trainees to apply the concepts learned in the previous session. There are total of five productive sectors and each sector has different guidelines to consider. Trainees should seek understanding through learners' active participation in discussions and question & answer sessions.

The learning units of this technical session

Learning Unit 2.1: Agriculture, Livestock, Fisheries and Forestry Sector
- 2.1.1: Step 1 -Recommended assessment team and sub-sectors
- 2.1.2: Step 2 - Baseline information and sources
- 2.1.3: Step 3 - Estimation of damages and losses (disaster effects)
- 2.1.4: Step 4 - Summarization of damages and losses in the state
- 2.1.5: Step 5 - Estimation of disaster impacts
- 2.1.6: Step 6 - Estimation of recovery and reconstruction needs
- 2.1.7: Step 7 - Prioritization of Needs
- 2.1.8: Step 8 - Sector Report

Learning Unit 2.2: Mining and Quarrying Sector
- 2.2.1: Step 1 -Recommended assessment team and sub-sectors
- 2.2.2: Step 2 - Baseline information and sources
- 2.2.3: Step 3 - Estimation of damages and losses (disaster effects)
- 2.2.4: Step 4 - Summarization of damages and losses in the state
- 2.2.5: Step 5 - Estimation of disaster impacts
- 2.2.6: Step 6 - Estimation of recovery and reconstruction needs
- 2.2.7: Step 7 - Prioritization of Needs
- 2.2.8: Step 8 - Sector Report

Learning Unit 2.3: Manufacturing Sector
- 2.3.1: Step 1 -Recommended assessment team
- 2.3.2: Step 2 - Baseline information and sources
- 2.3.3: Step 3 - Estimation of damages and losses (disaster effects)
- 2.3.4: Step 4 - Summarization of damages and losses in the state
- 2.3.5: Step 5 - Estimation of disaster impacts
- 2.3.6: Step 6 - Estimation of recovery and reconstruction needs
- 2.3.7: Step 7 - Prioritization of Needs
- 2.3.8: Step 8 - Sector Report

Learning Unit 2.4: Trade and Service Sector
- 2.4.1: Step 1 - Recommended assessment team and sub-sectors
- 2.4.2: Step 2 - Baseline information and sources
- 2.4.3: Step 3 - Estimation of damages and losses (disaster effects)
- 2.4.4: Step 4 - Summarization of damages and losses in the state
- 2.4.5: Step 5 - Estimation of disaster impacts
- 2.4.6: Step 6 - Estimation of recovery and reconstruction needs
- 2.4.7: Step 7 - Prioritization of Needs
- 2.4.8: Step 8 - Sector Report

Learning Unit 2.5: Tourism Sector
- 2.5.1: Step 1 -Recommended assessment team
- 2.5.2: Step 2 - Baseline information and sources
- 2.5.3: Step 3 - Estimation of damages and losses (disaster effects)
- 2.5.4: Step 4 - Summarization of damages and losses in the state
- 2.5.5: Step 5 - Estimation of disaster impacts
- 2.5.6: Step 6 - Estimation of recovery and reconstruction needs
- 2.5.7: Step 7 - Prioritization of Needs
- 2.5.8: Step 8 - Sector Report

Session Plan

Content	Trainer's Note	Time
Agriculture, Livestock, Fisheries and Forestry Sector	Focus in explaining the eight steps and elaborate the methodology and calculation at each step. Explain guidelines to prepare the sector report.	30 min
Mining and Quarrying Sector		25 min
Manufacturing Sector		25 min
Trade and Service Sector		25 min
Tourism Sector		25 min

Learning Unit 2.1
Agriculture, Livestock, Fisheries & Forestry Sector

Brief Description of the Learning Unit

The first learning unit is designed to guide learners through conducting Post Disaster Needs Assessments (PDNA) specifically for the agriculture, livestock, fisheries, and forestry sectors in Gujarat. The session will provide a comprehensive guide detailing eight crucial steps that ensure the successful execution of PDNA. Throughout the training, participants will receive detailed instructions and best practices for each of the eight steps, ensuring they thoroughly understand the entire PDNA process. This focused approach will address the unique challenges and needs of assessing related impacts and recovery requirements. By the end of this session, participants will be equipped with the necessary knowledge and skills to effectively conduct PDNA for agriculture, livestock, fisheries, and forestry sectors, ensuring comprehensive and reliable assessments that can inform recovery and reconstruction efforts in Gujarat.

Learning Objectives

- To introduce general step in conducting a PDNA.
- To understand required baseline information for each sector and its importance.
- To understand the requirements of field assessment.
- To understand assessment of disaster effects and impacts on each sector.
- To determine and prioritize the recovery needs.
- To understand the general guidelines to consider while compiling the sector report

Duration: 30 minutes

Methodology

- Lecture-based learning
- Case study-based learning
- Discussion
- Q&A session

Detailed Description

2.1.1 Step 1 - Recommended assessment team and sub-sectors

The sector is divided into seven sub-sectors as shown in figure 10. Each sub-sector is evaluated separately and then compiled together in the sector report. The composition of the sector assessment team, who will conduct the PDNA process, may vary by the type of disaster and the extent of the likely damage and production flow changes. The ideal team is shown in the table 14. This tailored team ensures a thorough and accurate assessment of the disaster's impact on all agricultural sub-sectors.

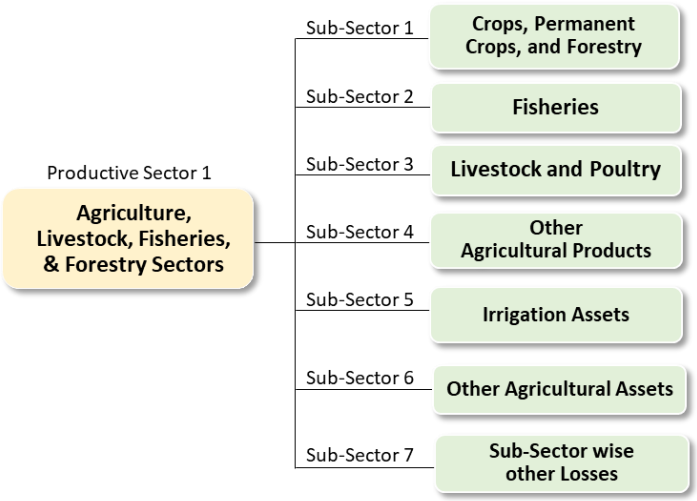


Figure 10 Sub-sector division of Agriculture, Livestock, Fisheries & Forestry Sectors

Table 14 Recommended assessment team for agriculture, livestock, fisheries & forestry sectors

Organization and Personnel	Role in the Sector Assessment
State Personnel from: • **Directorate of Agriculture** • **Director of Horticulture** • **Directorate of Animal Husbandry** • **Commissioner of Fisheries** • **Director of Agriculture Marketing & Rural Finance** • **Director of Sugar** • **Gujarat State Warehousing Corporation** • **Gujarat State Agricultural Marketing Board** • **Gujarat Sheep & Wool Development Corporation Limited** • **Gujarat Green Revolution Company Limited** • **Local departments and offices in the disaster-affected**	Lead and coordinate
Personnel from: ▪ **Ministry of Agriculture** ▪ **Department of Agricultural Research and Education (DARE)** ▪ **Department of Agriculture and Co-operation** ▪ **Directorate of Extension, New Delhi** o Statisticians Agricultural Economist o Civil and Agricultural Engineer o Agricultural Extension Specialist o Agronomist o Husbandry/ Livestock Specialist o Veterinarian o Fisheries Specialist o Forest Specialist	Provide baseline information and facilitate the field assessment of damages and losses
Development partners (if active in the sector)	Participate and provide technical advice

2.1.2 Step 2 - Baseline Information and Sources

- The information requirements for assessing disaster effects can be grouped into three categories.
  a. Baseline information (possibly up to 5 years, including the most recent year prior to the disaster) on all the physical assets and production activities for all the agricultural sub-sectors;
  b. Any existing damage and production loss information (however partial or preliminary) for each of the agricultural sub-sectors and related activities following the disaster;
  c. Information related to the forecasts for agricultural production and the physical assets for the future, including the year of the disaster.
- All this information must be at the state level as well as disaggregated to the lowest administrative unit possible, District and Taluka. This information should deal with, but not be limited to, the following activities:
- **Crops:** Area, yield and production of various crops (annual and perennial), use of agricultural inputs, availability of physical assets and agricultural infrastructure, including irrigation system;
- **Livestock:** Number, yield and production of livestock, use of livestock inputs, availability of physical assets and livestock infrastructure;
- **Fisheries:** Area, yield and production of various types of fisheries, use of fisheries inputs, availability of physical assets and fisheries infrastructure;
- **Forestry:** Area, yield and production of exploited forestry, production of forest non-timber goods and services, availability of physical assets and infrastructure area;
- **Macroeconomics:** Agricultural GDP, overall GDP, value added coefficients, balance of payments in agriculture, revenue and expenditure in agriculture and inflation;
- **Socio-economics:** Population, labour supply, wage rates, employment, livelihood opportunities, level of rural household income and role of women in agriculture;
- **Food Security:** Production, imports, exports, stocks, social safety net, food for work programs, nutrition, hunger, role of dairy, poultry, fisheries;
- **Rural Poverty:** National and regional poverty levels over time and by rural and urban sectors as well as the criteria for poverty;
- **Environment:** Status of environmental assets over time and location, levels of land degradation, desertification, and deforestation;
- **Agricultural Inputs:** Production, consumption, distribution, imports and exports by type of inputs and location, levels of productivity of various inputs;
- **Agricultural Prices:** Farm gate, procurement, guaranteed, wholesale, retail, export and import prices for all agricultural inputs and outputs as well as marketing; and
- **Agricultural Trade:** Exports and imports of agricultural inputs, outputs and related products by country and mode of transport. Every effort must be made to make sure that there is no double accounting, no gaps in critical information and that information is cross checked to ensure its quality. Information on macro-economic and socioeconomic variables related to agriculture is generally collected by the agriculture team and given to the respective macro-

Table 15 Sources of information for collecting baseline data

1	Ministry of Statistics and Programme Implementation	http://www.mospi.gov.in
2	Indian Council of Agricultural Research	http://www.icar.org.in
3	The Registrar General & Census Commissioner, India	http://censusindia.gov.in
4	Agriculture Census Commissioner	
5	Department of Agriculture, Cooperation and Farmers Welfare	http://agcensus.nic.in
6	Department of Agriculture Cooperation & Farmers Welfare	http://agricoop.nic.in
7	National Bank for Agriculture and Rural Development	https://www.nabard.org
8	Department of Animal Husbandry, Dairying & Fisheries	http://dahd.nic.in
9	Fishery Survey of India	http://fsi.gov.in
10	National Fisheries Development Board	http://nfdb.gov.in
11	Ministry of Finance	http://finmin.nic.in
12	National Institution for Transforming India	http://niti.gov.in
13	National Dairy Development Board	http://www.nddb.org/information/stats
14	National Horticulture Board	http://nhb.gov.in
15	India Brand Equity Foundation	http://www.ibef.org/
16	Open Government Data (OGD) Platform India	https://data.gov.in
17	Bhuvan, Indian Geo-Platform of ISRO	http://bhuvan.nrsc.gov.in
18	Directorate of Agriculture	https://dag.gujarat.gov.in/
19	Director of Horticulture	https://doh.gujarat.gov.in/
20	Directorate of Animal Husbandry	https://doah.gujarat.gov.in/
21	Commissioner of Fisheries	https://cof.gujarat.gov.in/
22	Director of Agriculture Marketing & Rural Finance	https://doamrf.gujarat.gov.in/
23	Director of Sugar	https://dos.gujarat.gov.in/
24	Gujarat State Warehousing Corporation	https://gswc.gujarat.gov.in/
25	Gujarat State Agricultural Marketing Board	https://gsamb.gujarat.gov.in/
26	Gujarat Sheep & Wool Development Corporation Limited	https://gusheel.gujarat.gov.in/
27	Gujarat Green Revolution Company Limited	https://ggrc.co.in/

Table 16 Baseline information for sub-sector 1 agricultural crops and forest products (source: National Database for Emergency Management, Gujarat specific)

Name of District:								
Assets	**Area planted (Hectares)**	**Average yield for the year (Kg/Hectare/Yr)**	**Farm gate price (Rs/unit)**	**MSP (Rs/unit)**	**Production cost (Rs/Hectare)**	**Number of farmers or growers**		
						Families	**Male**	**Female**
Crops								
Rice								
Millet								
Maize								
Wheat								
Barley								
Lentil								
Oilseed crops								

Name of District:								
Assets	Area planted (Hectares)	Average yield for the year (Kg/Hectare/Yr)	Farm gate price (Rs/unit)	MSP (Rs/unit)	Production cost (Rs/Hectare)	Number of farmers or growers		
						Families	Male	Female
Culinary crops								
Vegetables								
Others								
Permanent Crops								
Coconut								
Coffee								
Rubber								
Sugarcane								
Cotton								
Tea								
Mango								
Cashew								
Dates								
Fruit tree crops								
Others								
Forestry								
Timber								
Rattan								
Charcoal								
Others								

Table 17 Baseline information for sub-sector 2 fisheries

Name of District:							
Assets	Area (Hectares)	Average yield/ catch for the year (Kg/Hectare/Yr)	Average price paid to fisher (Rs/Kg)	Production cost (Rs/Hectare)	Number of farmers or fishers		
					Families	Male	Female
Inland fisheries							
Commercial							
Artisan							
Aquaculture							
Commercial							
Artisan							
Others							
Marine / Open-sea fishing							
Commercial							
Artisan							

Table 18 Baseline information for sub-sector 3 livestock and poultry

Name of District:							
Assets	**Number**	**Average yield for the year**	**Farm gate price**	**Production cost**	**Number of farmers or growers**		
	Heads	**(Kg/Yr)**	**(Rs/Kg)**	**(Rs/Unit)**	**Families**	**Male**	**Female**
Livestock for meat							
Goats							
Pigs							
Others							
Livestock for milk							
Dairy cattle, local							
Dairy cattle, imported							
Draft animals							
Bullocks							
Horses							
Camels							
Others							
Breeding stock							
Others							
Poultry							
Chicken							
Ducks							
Others							

Table 19 Baseline information for sub-sector 4 agricultural products

Name of District:						
Assets	**Average yield for the year**	**Farm gate price**	**Production cost**	**Number of farmers or growers**		
	(Units/Yr)	**(Rs/Unit)**	**(Rs/Unit)**	**Families**	**Male**	**Female**
Agricultural Products						
Milled Rice						
Processed Vegetables						
Fruit Syrup, Jam, Cordial						
Eggs						
Milk						
Honey						
Value-added products						
Wool						
Leather						
Others						

Notes of filling Tables 16 -19:

- Agricultural products are those that are produced in the farm, by the farmers. Those that are produced by formal manufacturers should be included in the industry sector to avoid double counting.
- Major vegetables or other value-added cash crops grown should be enumerated.
- The major types of fisheries should be enumerated.
- Estimated average yield per hectare per year should be based on past-established productivity and farm gate prices.
- The assessment team must be aware which types of products are exported.

Table 20 Baseline information for sub-sector 5 irrigation assets

Name of District:							
Name of Irrigation Facility	**Type of Irrigation**	**Areas Irrigated (Hectares)**	**Length (Meters)**	**Ownership**		**Cost per Meter (Rs/m)**	**Monthly Income from Fees (Rs)**
				Public	**Private**		

Table 21 Baseline information for sub-sector 6 other agricultural assets

Name of District:						
Assets	**Quantity**	**Average Replacement Value**	**Ownership**		**Number of private owners**	
		(Rs)	**Private**	**Public**	**Male**	**Female**
Physical Assets						
Agriculture Land						
Storage Buildings (Warehouse / Silos)						
Livestock Sheds						
Poultry Sheds						
Milking Sheds for Dairy Cattle						
Rice Mills						
Fencing						
In-farm Roads						
Others						
Equipment and Machinery						
Tractor						
Hand Tractor						
Thresher						
Inter-cultivator						
Reaper						
Plow						
Combine Harvesters						
Dryers						
Seed Processing Plants						
Others						

Name of District:						
Assets	Quantity	Average Replacement Value	Ownership		Number of private owners	
		(Rs)	Private	Public	Male	Female
Inputs and Raw Material						
Seeds						
Fertilizer						
Pesticides						
Veterinary Supplies						
Stored Production (Enumerate)						
Others						
Forestry and Plantations						
Trees (enumerate)						
Orchards						
Others						
Other Equipment						
Honey Production						
Milk Production						
Egg Production						
Others						
Fisheries						
Boats						
Engines						
Nets						
Fishing Tools and Supporting Materials						
Traps and Cages						
Ponds						
Fish Feed						
Fries						
Fingerlings						
Others						

Notes of filling Tables 20 & 21:

- The first column of the table includes the type of agricultural assets in the area.
- The average replacement value refers to the average pre-disaster market price, in Rs. of the concerned asset.

2.1.3 Step 3 - Estimation of Damages and Losses (Disaster Effects)

- With the baseline information, field assessment should be undertaken in the affected Districts after a disaster. The assessment team from the State must work with their local counterparts in the districts to ensure that the estimates for the damages and losses in the sector are accurate to the extent possible.
- Direct interviews with private contractors or government officials involved in the construction and repair of facilities can also be conducted during the field trip in order to

validate unit costs of repair and reconstruction (which is already contained in the baseline data).

- The estimated losses in agriculture are the differences between the expected pre-disaster and post disaster production or income levels of various agricultural products within the year that the disaster occurred and the succeeding years. The following table below can show the estimated reduction in production and/or income levels for agricultural products.

Table 22 Damages and Losses to sub-sector 1 agricultural crops and forest products

Name of District:										
Assets	**Damage Information**				**Loss Information**					
	Event	Building Collapse/ Building fire/ Cyclone/ flood			**Estimated Reduction in the Value of Production (Rs.)**					**Total Estimated Losses (Rs)**
	Event Date				**Disaster Year**			**Year After the Disaster**		
	Quantity of Affected Areas (Hectares)	**Number of Totally Destroyed (Kilograms or**	**Average Replacement Cost (Rs.)**	**Total Value of Damages (Rs.)**	**Estimated Value of Production**		**Estimated Losses**	**Year 1**	**Year 2**	
					Pre - disaster	**Post - disaster**				
	A	**B**	**C**	**D**	**E**	**F**	**G**	**H**	**I**	**J**
Crops										
Rice										
Millet										
Maize										
Wheat										
Barley										
Lentil										
Oilseed crops										
Culinary crops										
Vegetables										
Others										
Permanent Crops										
Coconut										
Coffee										
Rubber										
Sugarcane										
Cotton										
Tea										
Mango										
Cashew										
Dates										
Fruit tree crops										
Others										
Forestry										
Timber										
Rattan										
Charcoal										

Others										
TOTAL										

Notes of filling Table 22:

- Damaged crops are those that are to be harvested just before the disaster occurred.
- The "total value of damages" (Column D) is (column B) multiplied by the "average replacement cost" (Column C).
  Column D = Column B x Column C
- The average replacement cost will be the amount required to replant each of the totally destroyed crops, permanent crops and trees due to the disaster.
- The number of trees can also be estimated by the average number of trees per hectare.
- The "Estimated Losses" for the year that the disaster occurred is the difference between the pre and post disaster estimated production levels.
- In formula, **Column G = Column E – Column F**
- The "Estimated Reduction in the Value of Production" for Year 1 and Year 2 after the disaster year shall serve as the initial estimate of the assessment team. That can be calculated, based on the production estimates in the agricultural development plan less the new estimated production after the disaster.

Table 23 Damages and Losses to sub-sector 2 fisheries

Name of District:									
Assets	**Damage Information**			**Loss Information**					
	Event	Building Collapse/ Building fire/ Cyclone/ flood		**Estimated Reduction in the Value of Production (Rs.)**					**Total Estimated Losses (Rs.)**
	Event Date			**Disaster Year**			**Year After the Disaster**		
	Number of Totally Destroyed (Hectares)	**Average Replacement Cost (Kilograms or Trees)**	**Total Value of Damages (Rs.)**	**Estimated Value of Production**		**Estimated Losses**	**Year 1**	**Year 2**	
				Pre - disaster	**Post - disaster**				
	A	**B**	**C**	**D**	**E**	**F**	**G**	**H**	**I**
Inland fisheries									
Commercial									
Artisan									
Aquaculture									
Commercial									
Artisan									
Others									
Marine / Open-sea fishing									
Commercial									
Artisan									
TOTAL									

Table 24 Damages and Losses to sub-sector 3 livestock and poultry

Name of District:									
Assets	Damage Information			Loss Information					
	Event	Building Collapse/ Building fire/ Cyclone/ flood		Estimated Reduction in the Value of Production (Rs.)					Total Estimated Losses (Rs.)
	Event Date			Disaster Year			Year After the Disaster		
	Quantity of Dead Animals (nos.)	Average Replacement Cost (Rs.)	Total Value of Damages (Rs.)	Estimated Value of Production		Estimated Losses	Year 1	Year 2	
				Pre - disaster	Post - disaster				
	A	B	C	D	E	F	G	H	I
Livestock for meat									
Goats									
Pigs									
Others									
Livestock for milk									
Dairy cattle, local									
Dairy cattle, imported									
Draft animals									
Bullocks									
Horses									
Camels									
Others									
Breeding stock									
Others									
Poultry									
Chicken									
Ducks									
Others									
TOTAL									

Table 25 Damages and Losses to sub-sector 4 other agricultural products

Name of District:									
Assets	Damage Information			Loss Information					
	Event	Building Collapse/ Building fire/ Cyclone/ flood		Estimated Reduction in the Value of Production (Rs.)					Total Estimated Losses (Rs.)
	Event Date			Disaster Year			Year After the Disaster		
	Number of Totally Destroyed (Kilograms/ litters/	Average Replacement Cost (Rs.)	Total Value of Damages (Rs.)	Estimated Value of Production		Estimated Losses	Year 1	Year 2	
				Pre - disaster	Post - disaster				
	A	B	C	D	E	F	G	H	I
Agricultural Products									
Milled Rice									
Processed Vegetables									
Fruit Syrup, Jam, Cordial									
Eggs									
Milk									
Honey									
Value-added products									
Wool									
Leather									
Others									
TOTAL									

Notes of filling Tables 23 to 25:

- The value of damages will be the quantity of animals multiplied by the average replacement costs at current prices.
- In formula, **Column C = Column A x Column B**
- The "Estimated Losses" for the year that the disaster occurred is the difference between the pre and post disaster estimated production levels.
- In formula, **Column G = Column E – Column F**
- The "Estimated Reduction in the Value of Production" for Year 1 and Year 2 after the disaster year shall serve as the initial estimate of the assessment team. That can be calculated, based on the production estimates in the agricultural development plan less the new estimated production after the disaster.

Table 26 Damages and Losses to sub-sector 5 irrigation facilities

Name of District:											
Assets	**Damage Information**					**Loss Information**					
	Event	Building Collapse/ Building fire/ Cyclone/ flood				**Estimated Reduction in the Value of Production (Rs.)**					**Total Estimated Losses (Rs.)**
	Event Date					**Disaster Year**			**Year After Disaster**		
	Partially Damaged (Meres)	**Totally Destroyed (Meres)**	**Repair cost (Rs.)**	**Average Replacement Cost (Rs.)**	**Total Value of Damages (Rs.)**	**Estimated Value of Production**		**Estimated Losses**	**Year 1**	**Year 2**	
						Pre - disaster	**Post - disaster**				
	A	**B**	**C**	**D**	**E**	**F**	**G**	**H**	**I**	**J**	**K**
Name of Irrigation Facility:											
Areas Irrigated (Hectares)											
Ownership - Public (Hectares)											
Ownership - Private (Hectares)											
Length (Meters)											
Cost per Meter (Rs/m)											
Monthly Income from Fees (Rs)											
Monthly Income from Fees (Rs)											
TOTAL											

Notes of filling Table 26:

- An irrigation facility can either be partially damaged or totally destroyed and should be indicated in the number of meters.
- The value of damage is equal to the repair cost if partially damaged or the replacement cost of the asset if totally destroyed. The repair cost can be estimated by visiting the irrigation system after the disaster. In formula, the value of damages is either
  Column E = Column A x Column C or Column E = Column B x Column D
- The "Estimated Losses" for the year that the disaster occurred is the difference between the pre and post disaster estimated production levels.
- In formula, **Column G = Column E – Column F**
- The "Estimated Reduction in the Value of Production" for Year 1 and Year 2 after the disaster year shall serve as the initial estimate of the assessment team. That can be calculated, based on the production estimates in the agricultural development plan less the new estimated production after the disaster.

Table 27 Damages and Losses to sub-sector 6 other agricultural assets

Name of District:					
Assets	**Damage Information**				
	Event	Building Collapse/ Building fire/ Cyclone/ flood			
	Event Date				
	Number of Totally Destroyed	**Average Replacement Cost**	**Number of Partially Damaged**	**Average Repair Cost per Unit**	**Total Value of Damages**
	(Hectares or Kilograms or units)	**(Rs.)**	**(Hectares or kilograms or units)**	**(Rs.)**	**(Rs.)**
	A	**B**	**C**	**D**	**E**
Physical Assets					
Agriculture Land					
Storage Buildings (Warehouse / Silos)					
Livestock Sheds					
Poultry Sheds					
Milking Sheds for Dairy Cattle					
Rice Mills					
Fencing					
In-farm Roads					
Forestry and Plantation					
Others					
Tractor					
Hand Tractor					
Thresher					
Inter-cultivator					
Reaper					
Plow					
Combine Harvesters					
Dryers					
Seed Processing Plants					
Others					
Other Equipment					
Seeds					
Pesticides					
Fertilizer					
Veterinary Supplies					
Stored Production (Enumerate)					
Others					
Trees (enumerate)					
Orchards					
Others					

Honey Production						
Milk Production						
Egg Production						
Others						
Fisheries						
	Commercial Fisheries (Co.)	**Artesian Fisheries (Ar.)**				
Boats						
Engines						
Nets						
Fishing Tools and Supporting Materials						
Traps and Cages						
Ponds						
Fish Feed						
Fries						
Fingerlings						
Others						
TOTAL						

Notes of filling Table 27:

- Agricultural lands can be totally damaged like when they become permanently submerged in water after a disaster making them unavailable for farming. Land can also be partially damaged by landslides, which may need "repair" to be restored to its original productivity. They should be measured in hectares.
- For fisheries, "Co." means commercial fisheries and "Ar." refers to artisan fishing.
- Column A is for the number or quantity of totally destroyed assets. Land is in hectares, fencing and in-farm roads in kilometres.
- Column B refers to the estimated average cost of replacement of each of the totally destroyed assets.
- Column C is for the number or quantity of partially damaged assets.
- Column D refers to the estimated average cost of repair of each the partially damaged assets.
- The total value of damages in Column E will be the quantity of totally destroyed assets multiplied by their average cost of replacement plus the quantity of partially damaged assets multiplied by their average cost of repair.
- In formula, **Column E = (Column A x Column B) + (Column C x Column D)**
- The table can be expanded if there are other important assets that were damaged, as may be determined by the assessment team.
- No loss information is collected for sub-sector 6 other agricultural assets

Notes of filling Table 28:

- Other losses can include the cost of additional veterinary medicines if poultry suffered some forms of injuries, more fertilizer requirement, etc. Add losses for Year 1 and Year 2 if it is estimated that the other losses will go beyond the disaster that the disaster occurred.

Table 28 Damages and Losses to sub-sector wise other Losses

Name of District:							
Assets	Loss Information						
	Estimated Reduction in the Value of Production (Rs.)						Total Estimated Losses (Rs.)
	Disaster Year				Year After the Disaster		
	Investment Losses	Cleaning Operations	Other expenses	Total	Year 1	Year 2	
	A	B	C	D	E	F	G
Crops							
Forestry							
Fisheries							
Livestock							
Poultry							
Other Products							
Irrigation							
TOTAL							

2.1.4 Step 4 - Summarizing of Damages and Losses in the State

Table 29 Summarizing of Damages and Losses in Agriculture Sector of the State

Name of State:							
Assets	Loss Information						
	Estimated Reduction in the Value of Production (Rs.)						Total Estimated Losses (Rs.)
	Disaster Year				Year After the Disaster		
	Investment Losses	Cleaning Operations	Other expenses	Total	Year 1	Year 2	
	A	B	C	D	E	F	G
District 1:							
Crops							
Permanent Crops							
Forestry and Timber							
Fisheries							
a. Commercial							
b. Artisan							
Livestock							
Poultry							
Other Products							
Irrigation							
Total							
District 2:							
Crops							
Permanent Crops							

Forestry and Timber							
Fisheries							
a. commercial							
b. artisan							
Livestock							
Poultry							
Other Products							
Irrigation							
Total							
GRAND TOTAL							

Special Case on Droughts:

- Droughts can cause more losses than damages. Structures and equipment are seldom affected by droughts but losses in production happen.
- In cases of drought, the following should be noted in the agriculture sector
  a. The damages that will occur due to drought are generally in the livestock, fisheries, and poultry subsector where animals can perish due to the lack of water supply
  b. Losses will be observable in the reduction in volume and/or value of production of crops, permanent crops, livestock, poultry, and fisheries
  c. If the disaster that will be assessed is due to drought, the assessment team should be more concerned of losses than damages
- However, since drought can be predicted and does not occur suddenly (slow-onset phenomenon), its effects can be mitigated by advising farmers and growers beforehand to:
  a. temporarily stop planting for the duration of the drought
  b. use drought resistant variety of seeds
  c. temporarily stop the growing of livestock
  d. relocating livestock
  e. discontinue the operation of inland fisheries for the expected duration of the drought.
- Nevertheless, if and when drought occurs, the impacts to the people and the larger community and economy as enumerated and explained below, can be expected.

2.1.5 Step 5 - Estimation of Disaster Impacts

The assessment team of each of the sub-sectors must be able to analyze the broad impacts of the damages and losses and must answer the following issues, among others:

1. **Poverty:** More people are engaged in agriculture and the poorest groups are dependent on this sector. What will be the socio-economic impact on the people if there will be delays in assisting these groups?

2. **Out migration:** In some instances, the diminished capacity of farmers to replant and recover their livelihoods can cause the farmers and their families to migrate to the cities and other areas where they can earn a living. This phenomenon is more pronounced in cases of severe and prolonged droughts where the absence of water renders the land unproductive for crops and livestock.

3. **Indebtedness:** Poor farmers usually incur debts for their production inputs. What will be the impacts if the farmers will be unable to meet their financial obligations? Will they be more in debt?

4. **Effects on other sectors:** There are agricultural products, which are major inputs for other sectors (industries, tourism, commerce, etc.). For instance, if corn is the basic ingredient for animal feed, its reduction in supply will also increase the price of feed, which will eventually inflate the prices of poultry products affecting a greater number of people. Is there a possibility that other sectors will suffer if the agriculture sector is not rehabilitated immediately?

5. **Disaster risk reduction**: There may be some hazards that may have been created by the past disaster. Are there hazards created like landslide threats caused by extensive rains? Or potential flooding of rice and corn lands brought about by destroyed irrigation systems or dikes?

6. **Environment:** Some environmentally sensitive areas within the sector may have been affected. Are there sensitive areas' water sources that may have been put at risk by landslides or the destruction of the forest that sustains them?

7. **Women:** The condition of women may be severely affected by a disaster event. What are the potential adverse impacts on women? (This should be looked into in consideration of their possible new roles as breadwinners for their families; double burden or additional work in the farms and in the house; potential abuse; health hazards; etc.)

8. **Food supply:** The destruction of crops, livestock and other agricultural outputs due to the disaster may adversely affect the balance of food supply within and outside the areas affected. Without assistance, a planting season may be missed by the farmers which will result in the scarcity of basic food supply that can cause inflation not only in the disaster-affected areas but also in other districts or even nationwide. The assessment team must be able to assess the gaps in food supply within the disaster year and beyond to enable the government to stabilize the food supply and their prices. Will food supply be enough in the short and longer-term?

If there are perceived supply shortfalls, the cost of stabilizing food supply should be estimated. The value of the supply gaps can be estimated by multiplying the unit costs of the respective food items over a specified period. It should be noted, however, that in estimating the food requirements, the donations of food aid donors should be factored in including those that are integrated with food-for-work schemes. The overall food requirements, needed to stabilize food supply.

Table 30 Pre- and Post Disaster Estimated Food Requirements Per Year in the Area, in Kilograms

Name of District:									
Food items	**Pre-disaster quantity**			**Disaster Year (Quantity)**		**Year 1 (Quantity)**		**Year 1 (Quantity)**	
	Output	**Consumption**	**Gap**	**Output**	**Gap**	**Output**	**Gap**	**Output**	**Gap**
	A	**B**	**C**	**D**	**E**	**F**	**G**	**H**	**I**
Rice									
Corn									
Beef									
Pork									
Poultry									
Fish									
Vegetables									
Root crops									
Others									
TOTAL									

Notes of filling Table 30:

- Column 1 is for the food items normally consumed in the area under consideration.
- Columns A, B and C are for the pre-disaster (without disaster scenario) output (production) and consumption of the food's items by the population in the area.
- "Gap" in column C refers to the difference between production and consumption of food items. The gap must come from outside the country to augment or fill the food requirements of the population. In formula, **Column C = Column A – Column B**.
- Columns D and E are for the post disaster estimated output or production of the food items for the year that the disaster occurred. The 'Gap" refers to the difference between the pre- and post disaster gaps. The post disaster gap will be the post disaster output (Column D) less the pre-disaster consumption (Column B).
- In formula, **Column E = Column D - Column B**.
- The same will apply for the years after the disaster.
  Year 1 gap, **Column G = Column F – Column B**
  while year 2 gap, **Column I = Column H – Column B**.
- The above table assumes that pre-disaster consumption will not change and that no mass outmigration will occur.
- The estimated food supply gaps will enable recovery planners to design measures, like food importation, to maintain the food requirements and health conditions of the affected population.
- The cost of stabilizing food supply will be the value of the supply gaps multiplied by the unit costs of the respective food items over a specified time period.

Notes of filling Table 31:

- The impacts can be briefly described under the column "Brief Description of Impacts". For example, a brief description of a severe "impact on hunger and malnutrition" can be due to the loss of food supplies produced by farmers; the "increase in indebtedness" can happen if farmers are dependent on loans for their planting needs; while the impact on "employment on other sectors" can be due to the inability of agriculture to provide raw materials to other industries.
- The impacts on women and children may be different from the general population. For instance, women and children may suffer more from malnutrition than the men.

Table 31 Social Impacts of the Damages and Losses to the Agriculture Sector

Areas of Impacts	Expected Impacts						Brief description of Impacts
	General Population			Women and Children			
	Severe	Moderate	Low	Severe	Moderate	Low	
	A	B	C	D	E	F	G
Increased poverty of farmers							
Increase in food prices							
Hunger and Malnutrition							
Increase Indebtedness							
Employment losses in other sectors							
Other (specify)							

2.1.6 Step 6 - Estimation of Recovery and Reconstruction Needs

2.1.6.1 Estimation of Recovery Needs

Recovery needs are intended to bring back normalcy to all affected areas and sectors as soon as possible and the agriculture sector is one of the very important sectors that will expedite a quick recovery. Considering that a greater number of people, especially the poor, are engaged in agriculture, it is one of the sectors that should be prioritized. Some of the possible recovery related activities are:

- Food-for-work or a combination of cash-for-work to rehabilitate/reconstruct damaged irrigation systems, town halls, public schools, health centres, and other off-farm sources of income that can provide temporary employment while farmers are waiting to plant and harvest.
- Additional production credit to enable farmers to buy inputs and enable them to re-plant.
- Direct subsidy on fertilizers, seeds and pesticides to farmers.
- Dispersal of livestock and poultry to replace the depleted stocks of growers.
- Urgent repairs of agriculture-related facilities such as irrigation, storage, markets, etc. and access to such facilities.

2.1.6.2 Estimation of Reconstruction Needs

Reconstruction needs are generally long-term in nature (3 years or more) and are intended to ‘build back better’ from the ruins of a disaster. The possible reconstruction related activities in the agriculture sector could include the following:

- Reconstruction and repair of irrigation systems, post-harvest facilities, markets and other structures under a building-back-better strategy to ensure future disaster resilience through the adoption and enforcement of improved construction standards.

- Structural retrofitting of undamaged or partially damaged farm facilities so that they are not affected by disaster event in the future.
- Relocation of vital agricultural facilities to safe areas, as necessary. In this case, the additional costs on land acquisition, and basic services provision (water, sanitation, electricity, etc.) should be included.
- Soft-term credit for reconstruction and repair of private businesses. Such schemes can be accompanied by technical assistance for improved disaster resilient standards of construction.
- Other mitigation measures such as construction of support infrastructure to prevent serious landslides and floods to farms; common storage facilities where farmers can stock their produce safely etc.

2.1.7 Step 7 – Prioritization of Needs

Among the projects identified, relative priorities can be set in order to determine which among them are the more important. Based on the broad strategies for recovery, the assessment team should select the priority projects/activities among the identified needs. The prioritization can be made by using a set of impact indicators and the level by which the projects can achieve said impacts. Examples of the criteria that can be used are the following, among others:

1. Economic impact, which can be evaluated in terms of the relative cost to the government of not undertaking reconstruction or rehabilitation.
2. Equity and social impact, which can be in terms of the number of beneficiaries who are poor and destitute and who could not afford to rebuild on their own without outside support.
3. Sustainability, which can be in terms of the reduction of risks and vulnerability of the people and other economic assets to future disasters.

Table 32 Impacts of identified post disaster projects

Name of proposed project	Expected Impacts and their levels of impact on recovery								
	Economic Impact			Equity and social impact			Sustainability		
	High	Medium	Low	High	Medium	Low	High	Medium	Low
	A	B	C	D	E	F	G	H	I

Based on the prioritized recovery and reconstruction needs, a summary should be created by the assessment team enumerating the post disaster projects for the recovery and reconstruction. The identified needs should have a rough schedule of implementation outlining at the very least the activities, timing and budget required for all the programs and projects. The following techniques can be considered:

- Identify the specific projects according to their relative urgency or priority in relation to recovery.
- Plot the timeline of activities of all the projects, with the urgent ones on top, in a Gantt chart, with the corresponding funding requirement on an annual basis. This will assist the national government in programming the necessary funds over a certain time period, like on a quarterly or annual basis.
- Identify and include in the list of projects that need further feasibility studies, which may be funded by foreign grants.
- To the extent possible, a logical framework (log-frame) should be created for each of the project proposed for inclusion in the recovery plan. Log-frames are normally required by foreign donors to consider project proposals.

Table 33 Summary of recovery and reconstruction projects in the agriculture sector

Name of Specific project	Annual Needed Amount of Assistance (Rs.)			Total Needs (Rs.)
	Disaster Year	Year 1	Year 2	
	A	B	C	D
Recovery Needs (Examples)				
Food-for-work				
Cash-for-work				
Production credit				
Food stabilization				
Dispersal of livestock and poultry				
Distribution of inputs				
Re-stocking of fingerlings				
Direct subsidy (specify)				
Urgent repairs/ provision of machinery/ equipment (specify)				
Others (specify)				
Total				
Reconstruction Needs (Examples)				
Reconstruction of structures (specify)				
Structural retro-fitting				
Soft-term credit for reconstruction				
Mitigation measures (specify)				
Others (specify)				
Total				
GRAND TOTAL				

Notes of filling Table 33:
- Project titles can be inserted under the column on recovery and reconstruction needs.
- Columns can be added to accommodate any additional reconstruction needs beyond Year 2.

Step 8 – Sector Report

With all the information gathered using the previous steps, a report can be drafted by the assessment team, which will provide the inputs for a particular sector in the overall recovery and reconstruction plan. The following format may be considered:

1. Brief description of the sector in the disaster-affected areas.
2. Damages in the sector by areas and by types of assets affected.
3. Losses in the sector emphasizing the losses in income, increase in expenditures, estimated period before normalcy will be attained, etc.
4. Impact on the livelihood, individual households, vulnerable groups and the consequences to the greater community if no assistance for recovery will be provided.
5. Proposed strategies for recovery and reconstruction of the sector.
6. Needs of the sector, by priority, and the draft schedule of implementation with the estimated funds required for each project over time.

The draft sector report should be submitted to the State Disaster Management Authorities/ Secretary (R&R) for consolidation.

References

- National Institute of Disaster Management. (n.d.). Post Disaster Needs Assessment Manual Volume I. Retrieved from https://nidm.gov.in/PDF/pubs/pdna_manual_vol1.pdf
- National Institute of Disaster Management. (n.d.). Post Disaster Needs Assessment Manual Volume I. Retrieved from https://nidm.gov.in/PDF/pubs/pdna_manual_vol2.pdf
- National Database for Emergency Database, Gujarat Specific. Retrived from: https://ndem.nrsc.gov.in/login.php

Learning Unit 2.2
Mining and Quarrying Sector

Brief Description of the Learning Unit

The second learning unit is designed to guide learners through conducting Post Disaster Needs Assessments (PDNA) specifically for the mining and quarrying sectors in Gujarat. The session will provide a comprehensive guide detailing eight crucial steps that ensure the successful execution of PDNA. Throughout the training, participants will receive detailed instructions and best practices for each of the eight steps, ensuring they thoroughly understand the entire PDNA process. This focused approach will address the unique challenges and needs of assessing related impacts and recovery requirements. By the end of this session, participants will be equipped with the necessary knowledge and skills to effectively conduct PDNA for mining and quarrying sectors, ensuring comprehensive and reliable assessments that can inform recovery and reconstruction efforts in Gujarat.

Learning Objectives

- To introduce general step in conducting a PDNA.
- To understand required baseline information for each sector and its importance.
- To understand the requirements of field assessment.
- To understand assessment of disaster effects and impacts on each sector.
- To determine and prioritize the recovery needs.
- To understand the general guidelines to consider while compiling the sector report

Duration: 25 minutes

Methodology

- Lecture-based learning
- Case study-based learning
- Discussion
- Q&A session

Detailed Description

2.2.1 Step 1 - Recommended assessment team

Table 34 Recommended assessment team for mining and quarrying sector

Organization and Personnel	Role in the Sector Assessment

State Personnel from:
• **Commissioner of Geology & Mining**
• **Directorate of Petroleum**
• **Gujarat State Petroleum Corporation Limited**
• **Local departments and offices in the disaster-affected area:**
  ○ Mining Engineer
  ○ Petroleum Engineer
  ○ Geologist
  ○ Mechanical Engineer
  ○ Electrical Engineer
  ○ Mining Economist
  ○ Mining Investment Specialist
  ○ Procurement Specialist
	Lead and coordinate

Personnel from:
• **Ministry of Mines**
• **Geologist Survey of India (GSI)**
• **Indian Bureau of Mines (IBM)**
• **Directorate General of Mine Safety (DGMS)who are:**
  ○ Mining Engineer
  ○ Petroleum Engineer
  ○ Geologist
  ○ Mechanical Engineer
  ○ Electrical Engineer
  ○ Mining Economist
  ○ Mining Investment Specialist
  ○ Goods/ Equipment Buyer
	Provide baseline information and facilitate the field assessment of damages and losses

Development partners (if active in the sector)	Participate and provide technical advice

2.2.2 Step 2 - Baseline Information and Sources

Baseline information must be compiled before the field assessment or, if possible, prior to the occurrence of disaster. The baseline data should be validated before the field visit to serve as the basis for the estimation of damages and losses for the disaster-affected area/s. This data can be compiled at the State/Region office or at the District levels. The tables below can be used for the baseline information.

Notes of filling Table 35:

- Other minerals mined in the area like chromite, dolomite, granites, etc. should be specified, using the accepted units e.g. tons, cubic meters, kilograms.
- If a mining company is a joint venture between the government and a private corporation, it can be considered public for the purpose of PDNA

Table 35 Baseline information for mining company/ companies

Name of District:																	
Company Name	**Ownership**	**Employees**		**Production (Average Output/ year or Tons)**													
				Fuel Minerals					**Metallic Minerals**						**Non-Metallic minerals**		
	Public/ Private	**Male**	**Female**	**Coal**	**Lignite**	**Petroleum**	**Natural Gas**	**Others**	**Iron**	**Manganese**	**Bauxite**	**Copper**	**Gold**	**Others**	**Limestone**	**Mica Stone**	**Others**

Table 36 Sources of information for collecting baseline data

1	Ministry of Statistics and Programme Implementation	http://www.mospi.gov.in
2	National Institution for Transforming India	http://niti.gov.in
3	The Registrar General & Census Commissioner, India	http://censusindia.gov.in
4	Ministry of Mines	http://mines.nic.in
5	Make in India Initiatives	http://agcensus.nic.in
6	Indian Bureau of Mines	http://agricoop.nic.in
7	Ministry of Coal	https://www.nabard.org
8	Open Government Data (OGD) Platform India	http://dahd.nic.in
9	India Brand Equity Foundation	http://fsi.gov.in
10	Bhuvan, Indian Geo-Platform of ISRO	http://bhuvan.nrsc.gov.in
11	Commissioner of Geology & Mining	https://cgm.gujarat.gov.in/
12	Directorate of Petroleum	https://www.dopgujarat.in
13	Gujarat State Petroleum Corporation Limited	https://www.gspcgroup.com

Note 1: Please use similar institutions at State level for baseline Information
Note 2: For non-government information sources, please search suitably

2.2.3 Step 3 - Estimation of Damages and Losses (Disaster Effects)

- With the baseline information in hand, field assessment should be undertaken in the affected districts after a disaster. The assessment team from the State must work with their local counterparts in the districts to ensure that the estimates for the damages and losses in the sector are accurate to the maximum possible extent.
- Direct interviews with private contractors or government officials involved in the construction and repair of facilities can also be conducted during the field trip in order to validate unit costs of repair and reconstruction (which is already contained in the baseline data).

- It should be noted that since there is a possibility that only one company operates or provides the service to a number of districts; caution should be exercised to avoid double counting.
- It is recommended that the assessment of damages and losses of the company should be accounted for in the district where the main office of the company is located. However, if the main office is located outside the disaster area, the assessment team must account for the damages and losses of the company with an indication as to where such damages and losses occurred.
- Repair and replacement costs should be estimated for the damaged components of the company/s.
- The time needed to reconstruct the damages should also be estimated.
- Aside from field visits to the disaster sites, the assessment team should interview the officers of the company/s to ascertain the extent and value of the damages and the estimated period before operations can be fully restored to the pre-disaster level.
- The officials and experts in the company/s can estimate their respective damages more accurately. Moreover, considering that some of the damages may cover a wide area that may be inaccessible to the assessment team, the people in the company/s can get the data quicker from their colleagues in the field.

Table 37 Damages and Losses to mining companies

Name of District:						
Company Name:						
Ownership: Public ( ) Private ( )						
Employees: Male – Female –						
Production: Fuel Minerals ( ) Metallic Minerals ( ) Non-Metallic Minerals ( )						
Assets	**Damage Information**					
	Event	Building Collapse/ Building fire/ Cyclone/ flood				
	Event Date					
	Totally Destroyed		**Partially Damaged**		**Total Value of Damages**	**Average Time to Replace or Repair (Days)**
	Number of Totally Destroyed	**Average Replacement Cost (Rs)**	**Number of Partially Damaged**	**Average Replacement Cost (Rs)**		
	A	**B**	**C**	**D**	**E**	**F**
Structures						
Tunnels/Underground Mines						
Office Buildings						
Pipelines						
Drilling Rigs						
Storage Facilities						
Others (Specify)						
Equipment						
Trucks						

Computers						
Others (Specify)						
Machinery						
Generators						
Pumping Equipment						
Others (specify)						
Vehicles						
Others						
TOTAL						

Types of Losses	**Loss Information**			
	Disaster Year	**Year 1**	**Year 2**	**Total Estimated Losses (Rs.)**
Foregone Income				
Cleaning up of Debris				
Higher Operating Costs				
Other Unexpected Expenses				
TOTAL				

Notes of filling Table 37:

- The company/ies should fill out information appropriate to their assets. There are various machineries and equipment in the sector, which should be assessed especially those that are vital to the operation.
- 'Average Replacement Cost' will be the average pre-disaster value of the structures and assets that were totally destroyed.
- 'Average Repair Cost' will be the average cost of repair of the structures and assets that were partially damaged.
- In formula, the total damages will be
  (Column E) = (Column A) x (Column B) + (Column C) x (Column D)

- Losses in the mining sector will include the following:
  1. Foregone income or lower revenues from mining operations after the infrastructure if the sites (tunnels, etc.) and assets (equipment and machineries) were destroyed by disasters reducing the productive capacity of the company.
  2. Possible higher cost of operation that may arise after the disaster, such as higher rates of electricity from alternative sources, or acquiring goods and services from alternative sources, or renting temporary premises while repairing or rebuilding the original premises.
  3. Other unexpected expenditure such as demolition and removal of debris and other rehabilitation works for the site after destruction.
- Losses can continue during the entire period of recovery and reconstruction. It is expresses in monetary values at current prices.

2.2.4 Step – 4 Summarizing of Damages and Losses in the State

Table 38 Summarizing of Damages and Losses in mining sector

Name of State:									
Number of Employees: Male – Female –									
Name of Mining Company	**Estimated Reduction in the Value of Production**								**Total Estimated Losses (Rs.)**
	Within the Disaster Year				**Losses beyond Disaster Year**				
	Damages		**Losses**		**Year 1**		**Year 2**		
	Public	**Private**	**Public**	**Private**	**Public**	**Private**	**Public**	**Private**	
District 1:									
Company 1									
Company 2									
Company N									
Total									
District 2:									
Company 1									
Company 2									
Company N									
Total									
Grand Total									

Notes of filling Table 38:

- Public' and 'private' refers to the ownership of the mining company.
- The damages and losses should be accounted for under the type of ownership of the company.

2.2.5 Step 5 - Estimation of Disaster Impacts

The assessment team should analyse all potential impacts of the damages and losses of the mining and quarrying sector and must answer the following questions:

- Did the companies lay off workers that have causes massive unemployment?
- Will there be substantial reduction in foreign currency earnings due to the reduction of output, which are exported?
- Are there potential adverse environmental impacts due to the damages in the sector?
- Are there additional vulnerabilities and risks created by the damages to the sector?

Table 39 Social Impacts of the Damages and Losses

Areas of Impacts	**Expected Impacts**						**Brief description of Impacts**
	General Population			**Women and Children**			
	Severe	**Moderate**	**Low**	**Severe**	**Moderate**	**Low**	
	A	**B**	**C**	**D**	**E**	**F**	**G**
Employment							
Environment							
Foreign currency earnings							
Vulnerabilities							
Others (Specify)							

Notes of filling Table 39:

- Severe impacts are very distinct and extensive change in the situation for more than 50% of the people in the sector, which will require outside assistance for more than 6 months to enable them to cope and recover.
- Moderate impacts are distinct changes in the situation affecting 20% to 50% of the people in the sector, which may require 3 to 6 months outside assistance to enable the people to cope and recover.
- Low impacts are distinct changes but less than 20% of the people are affected and may not be widespread or only in limited areas which may require less than 3 months of outside assistance before the people recover.
- The impacts can be briefly described under the column "Brief Description of Impacts". For example, a brief description of a severe "environment" can happen if toxic chemicals and materials used in mining are spilled due to the disaster; the "vulnerabilities" can be described as the natural hazards that may be caused by the damages to tunnels or open pit mines; while "employment" will refer to those who might lose employment in the sector.
- The impacts on women and children may be different from the general population. The assessment team must be able to observe any special issues or concerns that may affect women.

2.2.6 Step 6 - Estimation of Recovery and Reconstruction Needs

2.2.6.1 Estimation of Recovery Needs

Recovery needs are intended to bring back normalcy in the sector as quickly as possible. Recovery activities should include those that will enable companies to resume their normal operations. Some of the possible recovery-related activities in the sector can include:

- Repairs of the damages to structures, which are normally affected by strong winds and floods.
- Emergency procurement of vital equipment necessary to normalize operations.
- Clearing of debris that may have affected the sector.

2.2.6.2 Estimation of Reconstruction Needs

Reconstruction needs are generally long-term in nature (3 years and more) and are intended to 'build back better' from the ruins of a disaster. It is to be noted that reconstruction activities should include both public as well as private facilities and may require different types of financing strategies. It is to be noted that since the companies in this sector are revenue-generating enterprises, financing their needs can come through soft-term credit schemes for the reconstruction and repair of their damaged assets. Such schemes can be accompanied by technical assistance for improved disaster resilient standards of construction. Some possible reconstruction related activities in the sector could include the following:

- Soft-term credit for the replacement or reconstruction of affected structures under a building back better strategy to ensure future disaster resilience through the adoption and enforcement of improved construction standards
- Procurement of equipment and machinery
- Structural retro-fitting of undamaged or partially damaged structures so that they are not affected by disaster event in the future

- Relocation of facilities to safer areas
- Other mitigation measures such as construction of support infrastructure to prevent serious landslides and floods to energy facilities.

2.2.7 Step 7 – Prioritization of Needs

Among the projects identified, relative priorities can be set in order to determine which among them are the more important. Based on the broad strategies for recovery, the assessment team should select the priority projects/activities among the identified needs.
The prioritization can be made by using a set of impact indicators and the level by which the projects can achieve said impacts. Examples of the criteria that can be used are the following, among others:

- Economic impact, which can be evaluated in terms of the relative cost to the government of not undertaking reconstruction or rehabilitation.
- Equity and social impact, which can be in terms of the number of beneficiaries who are poor and destitute and who could not afford to rebuild on their own without outside support.
- Sustainability, which can be in terms of the reduction of risks and vulnerability of the people and other economic assets to future disasters.

Table 40 Impacts of identified post disaster projects

Name of proposed project	Expected Impacts and their levels of impact on recovery								
	Economic Impact			Equity and social impact			Sustainability		
	High	Medium	Low	High	Medium	Low	High	Medium	Low
	A	B	C	D	E	F	G	H	I

Based on the prioritized recovery and reconstruction needs, a summary should be created by the assessment team enumerating the post disaster projects for the recovery and reconstruction. The identified needs should have a rough schedule of implementation outlining at the very least the activities, timing and budget required for all the programs and projects. The following techniques can be considered:

- Identify the specific projects according to their relative urgency or priority in relation to recovery.
- Plot the timeline of activities of all the projects, with the urgent ones on top, in a Gantt chart, with the corresponding funding requirement on an annual basis. This will assist the national government in programming the necessary funds over a certain time period, like on a quarterly or annual basis.

- Identify and include in the list of projects that need further feasibility studies, which may be funded by foreign grants.
- To the extent possible, a logical framework (log-frame) should be created for each of the project proposed for inclusion in the recovery plan. Log-frames are normally required by foreign donors to consider project proposals.

Table 41 Summary of recovery and reconstruction projects in the mining sector

Name of Specific project	Annual Needed Amount of Assistance (Rs.)			Total Needs (Rs.)
	Disaster Year	Year 1	Year 2	
	A	B	C	D
Recovery Projects				
a.				
b.				
c.				
Total				
Reconstruction Projects				
a.				
b.				
c.				
Total				
Grand Total				

Notes of filling Table 41:
- Project titles can be inserted under the column on recovery and reconstruction needs.
- Columns can be added to accommodate any additional reconstruction needs beyond Year 2.

2.2.8 Step 8 – Sector Report

With all the information gathered using the previous steps, a report can be drafted by the assessment team, which will provide the inputs for a particular sector in the overall recovery and reconstruction plan. The following format may be considered:

- Brief description of the sector in the disaster-affected areas.
- Damages in the sector by areas and by types of assets affected.
- Losses in the sector emphasizing the losses in income, increase in expenditures, estimated period before normalcy will be attained, etc.
- Impact on the livelihood, individual households, vulnerable groups and the consequences to the greater community if no assistance for recovery will be provided.
- Proposed strategies for recovery and reconstruction of the sector.
- Needs of the sector, by priority, and the draft schedule of implementation with the estimated funds required for each project over time.

The draft sector report should be submitted to the Gujarat State Disaster Management Authority/ Secretary (R&R) for consolidation.

References

- National Institute of Disaster Management. (n.d.). Post Disaster Needs Assessment Manual Volume I. Retrieved from https://nidm.gov.in/PDF/pubs/pdna_manual_vol1.pdf
- National Institute of Disaster Management. (n.d.). Post Disaster Needs Assessment Manual Volume I. Retrieved from https://nidm.gov.in/PDF/pubs/pdna_manual_vol2.pdf
- National Database for Emergency Database, Gujarat Specific. Retrived from: https://ndem.nrsc.gov.in/login.php

Learning Unit 2.3
Manufacturing Sector

Brief Description of the Learning Unit

The third learning unit is designed to guide learners through conducting Post Disaster Needs Assessments (PDNA) specifically for the manufacturing sector in Gujarat. The session will provide a comprehensive guide detailing eight crucial steps that ensure the successful execution of PDNA. Throughout the training, participants will receive detailed instructions and best practices for each of the eight steps, ensuring they thoroughly understand the entire PDNA process. This focused approach will address the unique challenges and needs of assessing related impacts and recovery requirements. By the end of this session, participants will be equipped with the necessary knowledge and skills to effectively conduct PDNA for manufacturing sector, ensuring comprehensive and reliable assessments that can inform recovery and reconstruction efforts in Gujarat.

Learning Objectives

- To introduce general step in conducting a PDNA.
- To understand required baseline information for each sector and its importance.
- To understand the requirements of field assessment.
- To understand assessment of disaster effects and impacts on each sector.
- To determine and prioritize the recovery needs.
- To understand the general guidelines to consider while compiling the sector report

Duration: 25 minutes

Methodology

- Lecture-based learning
- Case study-based learning
- Discussion
- Q&A session

Detailed Description

2.3.1 Step 1 - Recommended assessment team

The composition of the sector assessment team may vary by the type of disaster and the extent of the likely damage and production flow changes.

Table 42 Recommended assessment team for manufacturing sector

Organization and Personnel	Role in the Sector Assessment

State Personnel from:
• **Industries Comissionerate**
• **Gujarat Industrial Investment Corporation Limited**
• **Gujarat Industrial Development Corporation**
• **Gujarat State Handloom & Handicrafts Development Corporation Ltd.**
• **Commissioner, Cottage & Rural Industries**
• **Gujarat Narmada Valley Fertilizers & Chemicals Limited**
• **Gujarat Alkalies and Chemicals Limited**
• **Local departments and offices in the disaster-affected area:**
  ○ Civil Engineering (Manufacturing)
  ○ Industrial Engineer
  ○ Mechanical Engineer
  ○ Manufacturing Investment Specialist
  ○ Industrial Economist
  ○ Manufacturing Operations Specialist
  ○ Goods/ Equipment Buyer
	Lead and coordinate

Personnel from:
• **Ministry of Heavy Industries and Public Enterprises**
• **Department of Public Enterprises (DPE)**
• **Ministry of MSM Enterprises**
• **Ministry of Corporate Affairs**
• **National Small Industries Corporation Limited (NSIC)**
  ○ Civil Engineer (Manufacturing)
  ○ Industrial Engineer
  ○ Mechanical Engineer
  ○ Manufacturing Investment Specialist
  ○ Industrial Economist
  ○ Manufacturing Operations Specialist
  ○ Goods/ Equipment Buyer
  ○ Logistics/ supply chain expert
	Provide baseline information and facilitate the field assessment of damages and losses

Development partners (if active in the sector)	Participate and provide technical advice

2.3.2 Step 2 - Baseline Information and Sources

Baseline information must be compiled before the field assessment or, if possible, prior to the occurrence of disaster. The baseline data should be validated before the field visit to serve as the basis for the estimation of damages and losses for the disaster-affected area/s. This data can

be compiled at the State/Region office or at the district levels. The tables below can be used for the baseline information.

Table 43 Baseline information for manufacturing facilities

Name of District:								
Type of company in the Formal Sector	**Number**							
	Micro		**Small**		**Medium**		**Large**	
	Public	**Private**	**Public**	**Private**	**Public**	**Private**	**Public**	**Private**
Manufacturing								
Food (Meat, Fish, Fruits, Vegetables and Oils)								
Dairy Products								
Grain Mills Products								
Other Food Products								
Beverages								
Tobacco Products								
Spinning, Weaving and Finishing of Textiles								
Wearing Apparel								
Leather and Fur Products								
Wood and Wood Products								
Furniture								
Paper and Printing								
Rubber, Petroleum Products								
Chemicals and Chemical Products								
Non-metallic Products								
Basic Metals								
Metal Products and Machinery								
Electrical Machinery								
Other Manufacturing								
Transport Equipment Manufacturing								
Others								
Total								

Type of company in the Informal Sector	**Micro**		**Small**	
	Number of Businesses	**Number of People Employed**	**Number of Businesses**	**Number of People Employed**
Food Processing				
Handicrafts				
Others (Enumerate)				
Total				

Notes of filling Table 43:

- The businesses included in the above table are those that are not included in the assessment of the other sectors. For example, airlines, buses, taxis etc. should not be included here since they are subsumed in the assessment of the transport sector. To avoid double counting, the assessment team must have knowledge of the coverage of the other sectors.
- The businesses in the informal sector must be included in the list.
- In the manufacturing sector, most of the companies are private in nature.

Table 44 Sources of information for collecting baseline data

1	Ministry of Statistics and Programme Implementation	http://www.mospi.gov.in
2	National Institution for Transforming India	http://niti.gov.in
3	The Registrar General & Census Commissioner, India	http://censusindia.gov.in
4	Ministry of Food Processing Industries	http://mofpi.nic.in
5	Ministry of Micro, Small & Medium Enterprises	http://msme.gov.in/mob/home.aspx
6	Society of India Automobile Manufacturers	http://www.siamindia.com
7	Make in India Initiatives	http://www.makeinindia.com
8	Open Government Data (OGD) Platform India	http://dahd.nic.in
9	India Brand Equity Foundation	http://fsi.gov.in
10	Bhuvan, Indian Geo-Platform of ISRO	http://bhuvan.nrsc.gov.in
11	Industries Comissionerate	http://ic.gujarat.gov.in/
12	Gujarat Industrial Investment Corporation Limited	http://giic.gujarat.gov.in/
13	Gujarat Industrial Development Corporation	http://gidc.gov.in/
14	Gujarat State Handloom & Handicrafts Development Corporation Ltd.	http://gurjari.co.in/
15	Commissioner, Cottage & Rural Industries	http://www.cottage.gujarat.gov.in/
16	Gujarat Narmada Valley Fertilizers & Chemicals Limited	http://gnfc.in
17	Gujarat Alkalies and Chemicals Limited	http://gacl.com

2.3.3 Step 3 - Estimation of Damages and Losses (Disaster Effects)

- With the baseline information, field assessment should be undertaken in the affected Districts after a disaster. The assessment team from the State must work with their local counterparts in the districts to ensure that the estimates for the damages and losses in the sector are accurate to the extent possible.
- Direct interviews with private contractors or government officials involved in the construction and repair of facilities can also be conducted during the field trip in order to validate unit costs of repair and reconstruction (which is already contained in the baseline data).

- It should be noted that since there is a possibility that only one company provides the service to a number of Districts and Talukas; caution should be exercised to avoid double counting.
- It is recommended that the assessment of damages and losses of the company should be accounted for in the district where the main office of the company is located. However, if the main office is located outside the disaster area, the assessment team must account for the damages and losses of the company with an indication as to where such damages and losses occurred.
- Repair and replacement costs should be estimated for the damages of the sector. The time needed to reconstruct the damages should also be estimated.
- During the field visits to the disaster sites, the assessment team should interview the officers of the company/ies to ascertain the extent and value of the damages and the estimated period before operations can be fully restored to the pre-disaster level.
- To assess the value of damages and losses the assessment team can arrange a meeting with the owners of manufacturing companies and require them to fill out the questionnaire below.

Table 45 Damages and Losses to manufacturing formal sector

Name of District:						
Company Name:						
Line of Business: Manufacturing ( ) Others ( )						
Category: Micro ( ) Small ( ) Medium ( ) Large ( )						
Ownership: Public ( ) Private ( ) Public-Private Joint Venture ( ) Public-Foreign Joint Venture ( ) Private-Foreign Joint Venture ( )						
Employees: Male – Female –						
Assets	**Damage Information**					
	Event	Building Collapse/ Building fire/ Cyclone/ flood				
	Event Date					
	Totally Destroyed		**Partially Damaged**		**Total Value of Damages**	**Average Time to Replace or Repair (Days)**
	Number of Totally Destroyed	**Average Replacement Cost (Rs)**	**Number of Partially Damaged**	**Average Replacement Cost (Rs)**		
	A	**B**	**C**	**D**	**E**	**F**
Structures						
Equipment						
Stocks/ Inventories						
Others (Specify)						
TOTAL						
Types of Losses	**Loss Information**					
	Disaster Year		**Year 1**	**Year 2**		**Total Estimated Losses (Rs.)**

Foregone Income				
Cleaning up of Debris				
Higher Operating Costs				
Other Unexpected Expenses				
TOTAL				

Table 46 Damages and Losses to manufacturing informal sector

Name of District:						
Company Name:						
Line of Business: Food Processing ( ) Handicrafts ( ) Others ( )						
Category: Micro ( ) Small ( )						
Ownership: Private ( )						
Employees: Male – Female –						
Assets	**Damage Information**					
	Event	Building Collapse/ Building fire/ Cyclone/ flood				
	Event Date					
	Totally Destroyed		**Partially Damaged**		**Total Value of Damages**	**Average Time to Replace or Repair (Days)**
	Number of Totally Destroyed	**Average Replacement Cost (Rs)**	**Number of Partially Damaged**	**Average Replacement Cost (Rs)**		
	A	**B**	**C**	**D**	**E**	**F**
Structures						
Equipment						
Stocks/ Inventories						
Others (Specify)						
TOTAL						

Types of Losses	**Loss Information**			
	Disaster Year	**Year 1**	**Year 2**	**Total Estimated Losses (Rs.)**
Foregone Income				
Cleaning up of Debris				
Higher Operating Costs				
Other Unexpected Expenses				
TOTAL				

Notes of filling Tables 45 - 46:

- The assessment team must specify the assets of the company that is being assessed. For instance, in the agro-industry sub-sector, assets can include:
  1. Structures: office buildings, factory buildings, warehouses
  2. Equipment: production equipment, machineries, and generators
  3. Stocks/Inventories: raw agricultural produce (input), product packaging, final products (output)
  4. Others: vehicles, forklifts, and other assets
- 'Average Replacement Cost' will be the average pre-disaster value of the structures and assets that were totally destroyed while 'average repair cost' will be the estimated cost of repair of the partially damaged assets.
- In formula, the total damages of the companies surveyed will be **(Column E) = (Column A) x (Column B) + (Column C) x (Column D)**
- Years 1 to 2 are the years after the disaster.
- Foregone income after the structures, equipment and machineries of factories were damaged or destroyed by disasters.
- Additional expenses to clean and rehabilitate the factory site after destruction.
- Possible higher cost of operation that may arise after the disaster, such as payment of higher rates of electricity from alternative sources, or acquiring raw materials from alternative sources, or renting temporary premises while repairing or rebuilding the original premises
- These losses would continue during the entire period of reconstruction and recovery and are expressed in monetary values at current prices.

2.3.4 Step – 4 Summarizing of Damages and Losses in the State

Table 47 Summarizing of Damages and Losses in manufacturing sector

Name of State:																	
Total number of employees affected in the Formal sector: Male- Female-																	
Total number of employees affected in the Informal sector: Male- Female-																	
Sector Company	**Estimated Reduction in the Value of Production**																**Total Estimated Losses (Rs.)**
	Within the Disaster Year								**Losses beyond Disaster Year**								
	Damages				**Losses**				**Year 1**				**Year 2**				
	Micro	**Small**	**Medium**	**Large**	**Micro**	**Small**	**Medium**	**Large**	**Micro**	**Small**	**Medium**	**Large**	**Micro**	**Small**	**Medium**	**Large**	
District 1:																	
Formal Sector																	
Construction Materials																	
Beverages																	
Chemicals																	
Agro-Industry																	
Others																	
Informal Sector																	

Food Processing																	
Handicrafts																	
Others (Enumerate)																	
Total																	
District 2:																	
Formal Sector																	
Construction Materials																	
Beverages																	
Chemicals																	
Agro-Industry																	
Others																	
Informal Sector																	
Food Processing																	
Handicrafts																	
Others (Enumerate)																	
Total																	
Grand Total																	

2.3.5 Step 5 - Estimation of Disaster Impacts

The assessment team should analyze all potential impacts of the damages and losses of the manufacturing sector and must answer the following questions:

- Are there potential losses of employment in the formal sector?
- Is there a possible reduction in foreign currency earnings if the industry affected is exporting its products like cement, etc.
- Are there potential losses of livelihood in the informal sector?
- What are the impacts on the quality of life of the affected population, especially the poor?

Table 48 Social Impacts of the Damage and Losses to the Manufacturing Sector

Areas of Impacts	Expected Impacts						Brief description of Impacts
	General Population			Women and Children			
	Severe	Moderate	Low	Severe	Moderate	Low	
	A	B	C	D	E	F	G
Employment							
Environment							
Foreign currency earnings							
Vulnerabilities							
Others (Specify)							

2.3.6 Step 6 - Estimation of Recovery and Reconstruction Needs

2.3.6.1 Estimation of Recovery Needs

Recovery needs are intended to bring back normalcy in the sector as quickly as possible. Recovery activities should include those that will enable companies to resume their normal operations. Some of the possible recovery-related activities in the sector can include:

- Repairs of the damages to structures, which are normally affected by strong winds and floods.
- Emergency procurement of vital equipment necessary to normalize operations.
- Clearing of debris that may have affected the sector.
- Emergency credit for re-capitalization.

2.3.6.2 Estimation of Reconstruction Needs

Reconstruction needs are generally long-term in nature (3 years and more) and are intended to 'build back better' from the ruins of a disaster. It is to be noted that reconstruction activities should include both public as well as private facilities and may require different types of financing strategies. It is to be noted that since the companies in this sector are revenue-generating enterprises, financing their needs can come through soft-term credit schemes for the reconstruction and repair of their damaged assets. Such schemes can be accompanied by technical assistance for improved disaster resilient standards of construction. Some possible reconstruction related activities in the sector could include the following:

- Soft-term credit for the replacement or reconstruction of affected structures under a building back better strategy to ensure future disaster resilience through the adoption and enforcement of improved construction standards
- Procurement of equipment and machinery;
- Structural retro-fitting of undamaged or partially damaged structures so that they are not affected by disaster event in the future
- Relocation of facilities to safer areas
- Other mitigation measures such as construction of support infrastructure to prevent serious landslides and floods to energy facilities.

2.3.7 Step 7 – Prioritization of Needs

Among the projects identified, relative priorities can be set in order to determine which among them are the more important. Based on the broad strategies for recovery, the assessment team should select the priority projects/activities among the identified needs.

The prioritization can be made by using a set of impact indicators and the level by which the projects can achieve said impacts. Examples of the criteria that can be used are the following, among others:

- Economic impact, which can be evaluated in terms of the relative cost to the government of not undertaking reconstruction or rehabilitation.
- Equity and social impact, which can be in terms of the number of beneficiaries who are poor and destitute and who could not afford to rebuild on their own without outside support.

- Sustainability, which can be in terms of the reduction of risks and vulnerability of the people and other economic assets to future disasters.

Table 49 Impacts of identified post disaster projects

Name of proposed project	Expected Impacts and their levels of impact on recovery								
	Economic Impact			Equity and social impact			Sustainability		
	High	Medium	Low	High	Medium	Low	High	Medium	Low
	A	B	C	D	E	F	G	H	I

Based on the prioritized recovery and reconstruction needs, a summary should be created by the assessment team enumerating the post disaster projects for the recovery and reconstruction. The identified needs should have a rough schedule of implementation outlining at the very least the activities, timing and budget required for all the programs and projects. The following techniques can be considered:

- Identify the specific projects according to their relative urgency or priority in relation to recovery.
- Plot the timeline of activities of all the projects, with the urgent ones on top, in a Gantt chart, with the corresponding funding requirement on an annual basis. This will assist the national government in programming the necessary funds over a certain time period, like on a quarterly or annual basis.
- Identify and include in the list of projects that need further feasibility studies, which may be funded by foreign grants.
- To the extent possible, a logical framework (log-frame) should be created for each of the project proposed for inclusion in the recovery plan. Log-frames are normally required by foreign donors to consider project proposals.

Notes of filling Table 49:

- Project titles can be inserted under the column on recovery and reconstruction needs.

Table 50 Summary of recovery and reconstruction projects in the manufacturing sector

Name of Specific project	Annual Needed Amount of Assistance (Rs.)						Total Needs (Rs.)
	Disaster Year	Year 1	Year 2	Year 3	Year 4	Year 5	
	A	B	C	D	E	F	G
Recovery Projects							
Formal Sector							
a.							
b.							
Informal Sector							
a.							
b.							
Total							
Reconstruction Projects							
Formal Sector							
a.							
b.							
Informal Sector							
a.							
b.							
Total							
GRAND TOTAL							

2.3.8 Step 8 – Sector Report

With all the information gathered using the previous steps, a report can be drafted by the assessment team, which will provide the inputs for a particular sector in the overall recovery and reconstruction plan. The following format may be considered:

1. Brief description of the sector in the disaster-affected areas.
2. Damages in the sector by areas and by types of assets affected.
3. Losses in the sector emphasizing the losses in income, increase in expenditures, estimated period before normalcy will be attained, etc.
4. Impact on the livelihood, individual households, vulnerable groups and the consequences to the greater community if no assistance for recovery will be provided.
5. Proposed strategies for recovery and reconstruction of the sector.\
6. Needs of the sector, by priority, and the draft schedule of implementation with the estimated funds required for each project over time.

The draft sector report should be submitted to the State Disaster Management Authorities/ Secretary (R&R) for consolidation.

References

- National Institute of Disaster Management. (n.d.). Post Disaster Needs Assessment Manual Volume I. Retrieved from https://nidm.gov.in/PDF/pubs/pdna_manual_vol1.pdf
- National Institute of Disaster Management. (n.d.). Post Disaster Needs Assessment Manual Volume I. Retrieved from https://nidm.gov.in/PDF/pubs/pdna_manual_vol2.pdf
- National Database for Emergency Database, Gujarat Specific. Retrived from: https://ndem.nrsc.gov.in/login.php

Learning Unit 2.4
Trade and Service Sector

Brief Description of the Learning Unit

This learning unit is designed to guide learners through conducting Post Disaster Needs Assessments (PDNA) specifically for the trade and service sectors in Gujarat. The session will provide a comprehensive guide detailing eight crucial steps that ensure the successful execution of PDNA. Throughout the training, participants will receive detailed instructions and best practices for each of the eight steps, ensuring they thoroughly understand the entire PDNA process. This focused approach will address the unique challenges and needs of assessing related impacts and recovery requirements. By the end of this session, participants will be equipped with the necessary knowledge and skills to effectively conduct PDNA for trade and service sectors, ensuring comprehensive and reliable assessments that can inform recovery and reconstruction efforts in Gujarat.

Learning Objectives

- To introduce general step in conducting a PDNA.
- To understand required baseline information for each sector and its importance.
- To understand the requirements of field assessment.
- To understand assessment of disaster effects and impacts on each sector.
- To determine and prioritize the recovery needs.
- To understand the general guidelines to consider while compiling the sector report

Duration: 25 minutes

Methodology

- Lecture-based learning
- Case study-based learning
- Discussion
- Q&A session

Detailed Description

2.4.1 Step 1 - Recommended assessment team

The composition of the sector assessment team may vary by the type of disaster and the extent of the likely damage and production flow changes.

Table 51 Recommended assessment team for trade and service sector

Organization and Personnel	Role in the Sector Assessment
State Personnel from: • **Vibrant Gujarat Summit 2015** • **Industrial Extension Bureau** • **Local departments and offices in the disaster-affected area:** ○ Civil Engineer ○ Architect ○ Private Sector Development Specialist ○ Commercial Insurance Advisor ○ Retail Specialist ○ Real Estate Specialist ○ Informal Sector Specialist ○ Business Finance Specialist ○ Commerce/ Trade Economist	Lead and coordinate
Personnel from: • **Ministry of Heavy Industries and Public Enterprises** • **Department of Public Enterprises (DPE)** • **Ministry of MSM Enterprises** • **Ministry of Corporate Affairs** • **National Small Industries Corporation Limited (NSIC)** ○ Civil Engineer ○ Architect ○ Private Sector Development Specialist ○ Commercial Insurance Advisor ○ Retail Specialist ○ Real Estate Specialist ○ Informal Sector Specialist ○ Business Finance Specialist ○ Commerce/ Trade Economist	Provide baseline information and facilitate the field assessment of damages and losses
Development partners (if active in the sector)	Participate and provide technical advice

2.4.2 Step 2 - Baseline Information and Sources

Baseline information must be compiled before the field assessment or, if possible, prior to the occurrence of disaster. The baseline data should be validated before the field visit to serve as the basis for the estimation of damages and losses for the disaster-affected area/s. This data can be compiled at the State/Region office or at the district levels. The tables below can be used for the baseline information.

Table 52 Baseline information for trade and service facilities

Name of District:								
Type of company in the Formal Sector	Number							
	Micro		Small		Medium		Large	
	Public	Private	Public	Private	Public	Private	Public	Private
Wholesale Trade								
Agricultural Products								
Food, Beverages, Tobacco								
Household Goods								
Machinery, Equipment, and Supplies								
Others (e.g. Fuels)								
Retail Trade								
Non-specialized Shops								
Food, Beverages, Tobacco								
Automotive Fuels								
ICT Equipment								
Household Equipment								
Recreation, Reading, Games								
Others								
Trade and Repair of Motor Vehicles								
Motor Vehicle Sale								
Motor Vehicle Repair/ Maintenance								
Others								
Other Services								
Financial Services								
Construction								
Restaurants								
Others								
Total								

Type of company in the Informal Sector	Micro		Small	
	Number of Businesses	Number of People Employed	Number of Businesses	Number of People Employed
Retail Trade				
Repairs				
Restaurants				
Others				
Total				

Notes of filling Table 52:

- The businesses included in the above table are those that are not included in the assessment of the other sectors. For example, airlines, buses, taxis etc. should not be included here since they are subsumed in the assessment of the transport sector. The restaurants included here are those that are not included in the Tourism sector. To avoid double counting, the assessment team must have knowledge of the coverage of the other sectors.
- Financial services will include businesses like banks, insurance, etc.
- The businesses in the informal sector must be included in the list.

Table 53 Sources of information for collecting baseline data

1	Ministry of Statistics and Programme Implementation	http://www.mospi.gov.in
2	National Institution for Transforming India	http://niti.gov.in
3	The Registrar General & Census Commissioner, India	http://censusindia.gov.in
4	Ministry of Commerce and Industry	http://www.commerce.gov.in/DOC/index.aspx
5	Ministry of Micro, Small & Medium Enterprises	http://msme.gov.in/mob/home.aspx
6	Department Commissioner, Ministry of Micro, Small & Medium Enterprises	http://dcmsme.gov.in
7	Make in India Initiatives	http://www.makeinindia.com
8	Open Government Data (OGD) Platform India	http://dahd.nic.in
9	India Brand Equity Foundation	http://fsi.gov.in
10	Bhuvan, Indian Geo-Platform of ISRO	http://bhuvan.nrsc.gov.in
11	Ministry of Statistics and Programme Implementation	http://mospi.nic.in
12	An Analysis of the Informal Labour Market in India, Confederation of Indian Industry	http://www.ies.gov.in
13	Vibrant Gujarat Summit 2015	http://www.indextb.com/
14	Industrial Extension Bureau	http://www.indextb.com/

2.4.3 Step 3 - Estimation of Damages and Losses (Disaster Effects)

- With the baseline information, field assessment should be undertaken in the affected Districts after a disaster. The assessment team from the State must work with their local counterparts in the districts to ensure that the estimates for the damages and losses in the sector are accurate to the extent possible.
- Direct interviews with private contractors or government officials involved in the construction and repair of facilities can also be conducted during the field trip in order to validate unit costs of repair and reconstruction (which is already contained in the baseline data).
- It should be noted that since there is a possibility that only one company provides the service to a number of Districts and Talukas; caution should be exercised to avoid double counting.
- It is recommended that the assessment of damages and losses of the company should be accounted for in the district where the main office of the company is located. However, if the main office is located outside the disaster area, the assessment team must account for the damages and losses of the company with an indication as to where such damages and losses occurred.
- Repair and replacement costs should be estimated for the damages of the sector. The time needed to reconstruct the damages should also be estimated.
- During the field visits to the disaster sites, the assessment team should interview the officers of the company/ies to ascertain the extent and value of the damages and the estimated period before operations can be fully restored to the pre-disaster level.
- To assess the value of damages and losses the assessment team can arrange a meeting with the owners of trading and services companies and require them to fill out the questionnaire below; consult with representatives from chambers of commerce and other organizations of specific businesses; and consult with representatives of the informal sector in the trade and services sectors.

Table 54 Damages and Losses to trade and service formal sector

Name of District:						
Company Name:						
Line of Business: Wholesale ( ) Retail ( ) Services ( ) Others ( )						
Description of business:						
Category: Micro ( ) Small ( ) Medium ( ) Large ( )						
Ownership: Public ( ) Private ( ) Public-Private Joint Venture ( ) Public-Foreign Joint Venture ( ) Private-Foreign Joint Venture ( )						
Employees: Male – **Female –**						
Assets	**Damage Information**					
	Event	**Building Collapse/ Building fire/ Cyclone/ flood**				
	Event Date					
	Totally Destroyed		**Partially Damaged**		**Total Value of Damages**	**Average Time to Replace or Repair (Days)**
	Number of Totally Destroyed	**Average Replacement Cost (Rs)**	**Number of Partially Damaged**	**Average Replacement Cost (Rs)**		
	A	**B**	**C**	**D**	**E**	**F**
Structures						
Equipment						
Stocks/ Inventories						
Others (Specify)						
TOTAL						
Types of Losses	**Loss Information**					
	Disaster Year		**Year 1**	**Year 2**		**Total Estimated Losses (Rs.)**
Foregone Income						
Cleaning up of Debris						
Higher Operating Costs						
Other Unexpected Expenses						
TOTAL						

Table 55 Damages and Losses to trade and service informal sector

Name of District:						
Company Name:						
Line of Business: Retail ( ) Services ( ) Others ( )						
Description of business:						
Category: Micro ( ) Small ( )						
Ownership: Public ( ) Private ( )						
Employees: Male – Female –						
Assets	**Damage Information**					
	Event	**Building Collapse/ Building fire/ Cyclone/ flood**				
	Event Date:					
	Totally Destroyed		**Partially Damaged**		**Total Value of Damages**	**Average Time to Replace or Repair (Days)**
	Number of Totally Destroyed	**Average Replacement Cost (Rs)**	**Number of Partially Damaged**	**Average Replacement Cost (Rs)**		
	A	**B**	**C**	**D**	**E**	**F**
Structures						
Equipment						
Stocks/ Inventories						
Others (Specify)						
TOTAL						
Types of Losses	**Loss Information**					
	Disaster Year		**Year 1**	**Year 2**		**Total Estimated Losses (Rs.)**
Foregone Income						
Cleaning up of Debris						
Higher Operating Costs						
Other Unexpected Expenses						
TOTAL						

Notes of filling Tables 54 - 55:

- 'Average Replacement Cost' will be the average pre-disaster value of the structures and assets that were totally destroyed while 'average repair cost' will be the estimated cost of repair of the partially damaged assets.
- In formula, the total damages of the companies surveyed will be
  (Column E) = (Column A) x (Column B) + (Column C) x (Column D)
- Years 1 to 2 are the years after the disaster.
- Foregone income after the structures, equipment and machineries of factories were damaged or destroyed by disasters.
- Additional expenses to clean and rehabilitate the factory site after destruction.
- Possible higher cost of operation that may arise after the disaster, such as payment of higher rates of electricity from alternative sources, or acquiring raw materials from alternative sources, or renting temporary premises while repairing or rebuilding the original premises
- These losses would continue during the entire period of reconstruction and recovery and are expressed in monetary values at current prices.

2.4.4 Step – 4 Summarizing of Damages and Losses in the State

Table 56 Summarizing of Damages and Losses in trade and service sector

Name of State:																	
Total number of employees affected in the Formal sector: Male- Female-																	
Total number of employees affected in the Informal sector: Male- Female-																	
Sector Company	**Estimated Reduction in the Value of Production**																**Total Estimated Losses (Rs.)**
	Within the Disaster Year								**Losses beyond Disaster Year**								
	Damages				**Losses**				**Year 1**				**Year 2**				
	Mi	**S**	**Me**	**L**	**Mi**	**S**	**Me**	**L**	**Mi**	**S**	**Me**	**L**	**Mi**	**S**	**Me**	**L**	
District 1:																	
A. Formal Sector																	
Wholesale trade																	
Agricultural Products																	
Food, Beverages, Tobacco																	
Household Goods																	
Machinery, Equipment, and Supplies																	
Others (e.g. Fuels)																	
Retail Trade																	
Non-specialized Shops																	
Food, Beverages, Tobacco																	
Automotive Fuels																	
ICT Equipment																	
Household Equipment																	
Recreation, Reading, Games																	
Others																	
Trade and Repair of Motor Vehicles																	
Motor Vehicle Sale																	
Motor Vehicle Repair/ Maintenance																	
Others																	

Other Services																	
Financial Services																	
Construction																	
Restaurants																	
Others																	
B. Informal Sector																	
Retail Trade																	
Repairs																	
Restaurants																	
Others																	
Total																	
District 2:																	
A. Formal Sector																	
Wholesale trade																	
Agricultural Products																	
Total																	
Grand Total																	

Notes of filling Table 56:

- Mi is Micro; S is small; Me is medium; and L is large.

2.4.5 Step 5 - Estimation of Disaster Impacts

The assessment team should analyse all potential impacts of the damages and losses of the Trade and Service sector and must answer the following questions:

- Are there potential losses of employment in the formal sector?
- What will be the impacts on families, whose earners have lost their sources of income or worse, lost their lives?
- Is there a possible reduction in foreign currency earnings if the industry affected is exporting its products like cement, etc.
- Are there potential losses of livelihood in the informal sector?
- When will the formal and informal workers regain their levels of income?
- How will indebtedness affect their recovery?
- What are the impacts on the quality of life of the affected population, especially the poor?

Table 57 Social Impacts of the Damages and Losses to the trade and service Sector

Areas of Impacts	Expected Impacts						Brief description of Impacts
	General Population			Women and Children			
	Severe	Moderate	Low	Severe	Moderate	Low	
	A	B	C	D	E	F	G
Employment							
Environment							
Foreign currency earnings							
Vulnerabilities							
Others (Specify)							

Notes of filling Table 57:

- Severe impacts are very distinct and extensive change in the situation for more than 50% of the people in the sector, which will require outside assistance for more than 6 months to enable them to cope and recover.
- Moderate impacts are distinct changes in the situation affecting 20% to 50% of the people in the sector, which may require 3 to 6 months outside assistance to enable the people to cope and recover.
- Low impacts are distinct changes but less than 20% of the people are affected and may not be widespread or only in limited areas which may require less than 3 months of outside assistance before the people recover.
- The impacts can be briefly described under the column "Brief Description of Impacts". For example, a brief description of a severe "environment" can happen if toxic chemicals and materials used in mining are spilled due to the disaster; the "vulnerabilities" can be described as the natural hazards that may be caused by the damages to tunnels or open pit mines; while "employment" will refer to those who might lose employment in the sector.
- The impacts on women and children may be different from the general population. The assessment team must be able to observe any special issues or concerns that may affect women.

2.4.6 Step 6 - Estimation of Recovery and Reconstruction Needs

2.4.6.1 Estimation of Recovery Needs

Recovery needs are intended to bring back normalcy in the sector as quickly as possible. Recovery activities should include those that will enable companies to resume their normal operations. Some of the possible recovery-related activities in the sector can include:

- Repairs of the damages to structures, which are normally affected by strong winds and floods.
- Emergency procurement of vital equipment necessary to normalize operations.
- Clearing of debris that may have affected the sector.
- Emergency credit for re-capitalization.

2.4.6.2 Estimation of Reconstruction Needs

Reconstruction needs are generally long-term in nature (3 years and more) and are intended to 'build back better' from the ruins of a disaster. It is to be noted that reconstruction activities should include both public as well as private facilities and may require different types of financing strategies. It is to be noted that since the companies in this sector are revenue-

generating enterprises, financing their needs can come through soft-term credit schemes for the reconstruction and repair of their damaged assets. Such schemes can be accompanied by technical assistance for improved disaster resilient standards of construction. Some possible reconstruction related activities in the sector could include the following:

- Soft-term credit for the replacement or reconstruction of affected structures under a building back better strategy to ensure future disaster resilience through the adoption and enforcement of improved construction standards
- Procurement of equipment and machinery;
- Structural retro-fitting of undamaged or partially damaged structures so that they are not affected by disaster event in the future
- Relocation of facilities to safer areas
- Other mitigation measures such as construction of support infrastructure to prevent serious landslides and floods to energy facilities.

2.4.7 Step 7 – Prioritization of Needs

Among the projects identified, relative priorities can be set in order to determine which among them are the more important. Based on the broad strategies for recovery, the assessment team should select the priority projects/activities among the identified needs.

The prioritization can be made by using a set of impact indicators and the level by which the projects can achieve said impacts. Examples of the criteria that can be used are the following, among others:

- Economic impact, which can be evaluated in terms of the relative cost to the government of not undertaking reconstruction or rehabilitation.
- Equity and social impact, which can be in terms of the number of beneficiaries who are poor and destitute and who could not afford to rebuild on their own without outside support.
- Sustainability, which can be in terms of the reduction of risks and vulnerability of the people and other economic assets to future disasters.

Table 58 Impacts of identified post disaster projects

Name of proposed project	Expected Impacts and their levels of impact on recovery								
	Economic Impact			Equity and social impact			Sustainability		
	High	Medium	Low	High	Medium	Low	High	Medium	Low
	A	B	C	D	E	F	G	H	I

Based on the prioritized recovery and reconstruction needs, a summary should be created by the assessment team enumerating the post disaster projects for the recovery and reconstruction. The identified needs should have a rough schedule of implementation outlining at the very least the activities, timing and budget required for all the programs and projects. The following techniques can be considered:

- Identify the specific projects according to their relative urgency or priority in relation to recovery.
- Plot the timeline of activities of all the projects, with the urgent ones on top, in a Gantt chart, with the corresponding funding requirement on an annual basis. This will assist the national government in programming the necessary funds over a certain time period, like on a quarterly or annual basis.
- Identify and include in the list of projects that need further feasibility studies, which may be funded by foreign grants.
- To the extent possible, a logical framework (log-frame) should be created for each of the project proposed for inclusion in the recovery plan. Log-frames are normally required by foreign donors to consider project proposals.

Table 59 Summary of recovery and reconstruction projects in the trade and service sector

Name of Specific project	Annual Needed Amount of Assistance (Rs.)						Total Needs (Rs.)
	Disaster Year	Year 1	Year 2	Year 3	Year 4	Year 5	
	A	B	C	D	E	F	G
Recovery Projects							
Formal Sector							
c.							
d.							
Informal Sector							
c.							
d.							
Total							
Reconstruction Projects							
Formal Sector							
b.							
b.							
Informal Sector							
c.							
d.							
Total							
Grand Total							

Notes of filling Table 59:

- Project titles can be inserted under the column on recovery and reconstruction needs.

2.4.8 Step 8 – Sector Report

With all the information gathered using the previous steps, a report can be drafted by the assessment team, which will provide the inputs for a particular sector in the overall recovery and reconstruction plan. The following format may be considered:

- Brief description of the sector in the disaster-affected areas.
- Damages in the sector by areas and by types of assets affected.
- Losses in the sector emphasizing the losses in income, increase in expenditures, estimated period before normalcy will be attained, etc.
- Impact on the livelihood, individual households, vulnerable groups and the consequences to the greater community if no assistance for recovery will be provided.
- Proposed strategies for recovery and reconstruction of the sector.
- Needs of the sector, by priority, and the draft schedule of implementation with the estimated funds required for each project over time.

The draft sector report should be submitted to the Gujarat State Disaster Management Authority / Secretary (R&R) for consolidation.

References

- National Institute of Disaster Management. (n.d.). Post Disaster Needs Assessment Manual Volume I. Retrieved from https://nidm.gov.in/PDF/pubs/pdna_manual_vol1.pdf
- National Institute of Disaster Management. (n.d.). Post Disaster Needs Assessment Manual Volume I. Retrieved from https://nidm.gov.in/PDF/pubs/pdna_manual_vol2.pdf
- National Database for Emergency Database, Gujarat Specific. Retrived from: https://ndem.nrsc.gov.in/login.php

Learning Unit 2.5
Tourism Sector

Brief Description of the Learning Unit

The second learning unit is designed to guide learners through conducting Post Disaster Needs Assessments (PDNA) specifically for the tourism sector in Gujarat. The session will provide a comprehensive guide detailing eight crucial steps that ensure the successful execution of PDNA. Throughout the training, participants will receive detailed instructions and best practices for each of the eight steps, ensuring they thoroughly understand the entire PDNA process. This focused approach will address the unique challenges and needs of assessing related impacts and recovery requirements. By the end of this session, participants will be equipped with the necessary knowledge and skills to effectively conduct PDNA for tourism sector, ensuring comprehensive and reliable assessments that can inform recovery and reconstruction efforts in Gujarat.

Learning Objectives

- To introduce general step in conducting a PDNA.
- To understand required baseline information for each sector and its importance.
- To understand the requirements of field assessment.
- To understand assessment of disaster effects and impacts on each sector.
- To determine and prioritize the recovery needs.
- To understand the general guidelines to consider while compiling the sector report

Duration: 25 minutes

Methodology

- Lecture-based learning
- Case study-based learning
- Discussion
- Q&A session

Detailed Description

2.5.1 Step 1 - Recommended assessment team

The composition of the sector assessment team may vary by the type of disaster and the extent of the likely damage and production flow changes.

Table 60 Recommended assessment team for tourism sector

Organization and Personnel	Role in the Sector Assessment

State Personnel from:
• **Tourism Corporation of Gujarat Limited (TCGL)**
• **Gujarat Pavitra Yatradham Vikas Board**
• **Statute of Unity**
• **Gujarat Council on Science and Technology**
• **Gujarat Council of Science City**
• **Local departments and offices in the disaster-affected area:**
  ○ Civil Engineer (Tourism)
  ○ Architect (Tourism)
  ○ Tourism Promotion/ Development Specialist
  ○ Tourism Economist
  ○ Tourism Finance Specialist
	Lead and coordinate

Personnel from:
• **Ministry of Tourism**
• **Indian Tourism Development Specialist**
  ○ Civil Engineer (Tourism)
  ○ Architect (Tourism)
  ○ Tourism Promotion/ Development Specialist
  ○ Tourism Economist
  ○ Tourism Finance Specialist
	Provide baseline information and facilitate the field assessment of damages and losses

Development partners (if active in the sector)	Participate and provide technical advice

2.5.2 Step 2 - Baseline Information and Sources

Baseline information must be compiled before the field assessment or, if possible, prior to the occurrence of disaster. The baseline data should be validated before the field visit to serve as the basis for the estimation of damages and losses for the disaster-affected area/s. This data can be compiled at the State/Region office or at the District levels. The tables below can be used for the baseline information.

Table 61 Baseline information on tourist arrival and expenses

Name of District:												
Tourist Arrivals and expenses	**Month**											
	Jan	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**
Number of tourists												
International												
Local												
Total												
Average expense per tourist												
International ($)												
Local (Rs.)												
Total												

Table 62 Baseline information for tourism facilities

Name of District:									
Establishment	**Number of Establishment by ownership**		**Types of structures (in numbers)**						
			1 to 4 floors			**5 and more floors**			
	Public	**Private**	**All concrete Public**	**Concrete and wood**	**Wood and bamboo**	**All concrete**	**Concrete and Wood**	**Others**
Accommodation									
Hotels									
Heritage Hotels									
Apartment Hotels									
Guest Houses									
Home Stay / Bed & Breakfast									
Spas									
Others									
Tourist Restaurants									
Restaurants									
Mobile Food Service									
Event Catering									
Beverage Serving Service									
Others									
Total									

Notes of filling Table 62:

- The above table will provide the assessment team with an overall picture of the tourism sector in the area – the location where tourists go, the number of accommodations available, restaurants, etc. - which they can use in post disaster damage and loss assessment.
- Restaurants that are not catering to tourists (especially those in the informal sector) should be included in the trade and services sector.
- Note that natural and cultural sites are estimated in the Culture Sector assessment.

Table 63 Sources of information for collecting baseline data

1	Ministry of Statistics and Programme Implementation	http://www.mospi.gov.in
2	National Institution for Transforming India	http://niti.gov.in
3	The Registrar General & Census Commissioner, India	http://censusindia.gov.in
4	Ministry of Tourism	http://tourism.gov.in
5	Ministry of Micro, Small & Medium Enterprises	http://msme.gov.in/mob/home.aspx
6	Make in India Initiatives	http://www.makeinindia.com
7	Open Government Data (OGD) Platform India	http://dahd.nic.in
8	India Brand Equity Foundation	http://fsi.gov.in
9	Bhuvan, Indian Geo-Platform of ISRO	http://bhuvan.nrsc.gov.in
10	Tourism Corporation of Gujarat Limited (TCGL)	http://www.gujarattourism.com/
11	Gujarat Pavitra Yatradham Vikas Board	http://yatradham.gujarat.gov.in/
12	Statute of Unity	http://www.statueofunity.in/
13	Gujarat Council on Science and Technology	https://gujcost.gujarat.gov.in/Index
14	Gujarat Council of Science City	http://sciencecity.gujarat.gov.in/

2.5.3 Step 3 - Estimation of Damages and Losses (Disaster Effects)

- With the baseline information, field assessment should be undertaken in the affected Districts after a disaster. The assessment team from the State must work with their local counterparts in the districts to ensure that the estimates for the damages and losses in the sector are accurate to the extent possible.
- Direct interviews with private contractors or government officials involved in the construction and repair of facilities can also be conducted during the field trip in order to validate unit costs of repair and reconstruction (which is already contained in the baseline data).
- Repair and replacement costs should be estimated for the damages of the sector. The time needed to reconstruct the damages should also be estimated.
- During the field visits to the disaster sites, the assessment team should interview the officers of the company/ies to ascertain the extent and value of the damages and the estimated period before operations can be fully restored to the pre-disaster level.
- To assess the value of damages and losses the assessment team can arrange a meeting with the officials of tourism companies and require them to fill out the questionnaire below.

Table 64 Damages and Losses to tourism sector

Name of District:						
Company Name:						
Category: Hotels ( ) Heritage Hotels ( ) Apartment Hotels ( ) Guest Houses ( ) Homestay /Bed & Breakfast ( ) Spas ( ) Others (specify)_____ Restaurants ( ) Mobile Food Service ( ) Event Catering ( ) Beverage Serving Service ( ) Others (Specify) _____ _____						
Capacity: Beds (Accommodation) - Seats (Restaurant)-						
Ownership: Public ( ) Private ( )						
Employees: Male – Female –						
Assets	**Damage Information**					
	Event	**Building Collapse/ Building fire/ Cyclone/ flood**				
	Event Date					
	Totally Destroyed		**Partially Damaged**		**Total Value of Damages**	**Average Time to Replace or Repair (Days)**
	Number of Totally Destroyed	**Average Replacement Cost (Rs)**	**Number of Partially Damaged**	**Average Replacement Cost (Rs)**		
	A	**B**	**C**	**D**	**E**	**F**
Structures						
Equipment						
Stocks/ Inventories						
Others (Specify)						
TOTAL						

Types of Losses	Loss Information			
	Disaster Year	Year 1	Year 2	Total Estimated Losses (Rs.)
Foregone Income				
Cleaning up of Debris				
Higher Operating Costs				
Other Unexpected Expenses				
TOTAL				

Notes of filling Table 64:

- 'Average Replacement Cost' will be the average pre-disaster value of the structures and assets that were totally destroyed while 'average repair cost' will be the estimated cost of repair of the partially damaged assets.
- In formula, the total damages of the companies surveyed will be **(Column E) = (Column A) x (Column B) + (Column C) x (Column D)**
- Years 1 to 2 are the years after the disaster.
- Losses in the sector will include the following:
  1. Foregone income after the structures, equipment and machineries of factories were damaged or destroyed by disasters.
  2. Additional expenses to clean and rehabilitate the factory site after destruction.
  3. Possible higher cost of operation that may arise after the disaster, such as payment of higher rates of electricity from alternative sources, or acquiring raw materials from alternative sources, or renting temporary premises while repairing or rebuilding the original premises
- These losses would continue during the entire period of reconstruction and recovery and are expressed in monetary values at current prices.

2.5.4 Step – 4 Summarizing of Damages and Losses in the State

Table 65 Summarizing of Damages and Losses in tourism sector

Name of State:									
Total number of employees affected in the Tourism sector: Male- Female-									
Assets	Estimated Reduction in the Value								Total Estimated Losses (Rs.)
	Within the Disaster Year				Losses beyond Disaster Year				
	Damages		Losses		Year 1		Year 2		
	Public	Private	Public	Private	Public	Private	Public	Private	
District 1:									
Accommodation									
Hotels									
Heritage Hotels									
Apartment Hotels									
Guest Houses									
Home Stay / Bed & Breakfast									
Spas									

Name of State:									
Total number of employees affected in the Tourism sector: Male- Female-									
Assets	Estimated Reduction in the Value								Total Estimated Losses (Rs.)
	Within the Disaster Year				Losses beyond Disaster Year				
	Damages		Losses		Year 1		Year 2		
	Public	Private	Public	Private	Public	Private	Public	Private	
Others									
Tourist Restaurants									
Restaurants									
Mobile Food Service									
Event Catering									
Beverage Serving Service									
Others									
Total									
District 2:									
Accommodation									
Hotels									
Heritage Hotels									
Apartment Hotels									
Guest Houses									
Home Stay / Bed & Breakfast									
Spas									
Others									
Tourist Restaurants									
Restaurants									
Mobile Food Service									
Event Catering									
Beverage Serving Service									
Others									
Total									
Grand Total									

2.5.5 Step 5 - Estimation of Disaster Impacts

The assessment team should analyse all potential impacts of the damages and losses of the tourism sector and must answer the following questions:

- Did the companies lay off workers, which has lead to massive unemployment?
- Were livelihoods lost, especially those who depend on the arrival of tourists like tourist guides and microentrepreneurs engaged in handicrafts for souvenirs?

- Will there be substantial reduction in foreign currency earnings due to the reduction of foreign tourist arrivals?
- What are the impacts of loss of cultural and historical sites?
- What are the impacts on the quality of life of the affected population, especially the poor?

Table 66 Social Impacts of the Damages and Losses to the tourism Sector

Areas of Impacts	Expected Impacts						Brief description of Impacts
	General Population			Women and Children			
	Severe	Moderate	Low	Severe	Moderate	Low	
	A	B	C	D	E	F	G
Employment							
Livelihoods							
Foreign currency earnings							
Culture							
Others (Specify)							

Notes of filling Table 66:

- Severe impacts are very distinct and extensive change in the situation for more than 50% of the people in the sector, which will require outside assistance for more than 6 months to enable them to cope and recover.
- Moderate impacts are distinct changes in the situation affecting 20% to 50% of the people in the sector, which may require 3 to 6 months outside assistance to enable the people to cope and recover.
- Low impacts are distinct changes but less than 20% of the people are affected and may not be widespread or only in limited areas which may require less than 3 months of outside assistance before the people recover.
- The impacts can be briefly described under the column "Brief Description of Impacts". For example, a brief description of a severe "environment" can happen if toxic chemicals and materials used in mining are spilled due to the disaster; the "vulnerabilities" can be described as the natural hazards that may be caused by the damages to tunnels or open pit mines; while "employment" will refer to those who might lose employment in the sector.
- The impacts on women and children may be different from the general population. The assessment team must be able to observe any special issues or concerns that may affect women.

2.5.6 Step 6 - Estimation of Recovery and Reconstruction Needs

2.5.6.1 Estimation of Recovery Needs

Recovery needs are intended to bring back normalcy in the sector as quickly as possible. Recovery activities should include those that will enable companies to resume their normal operations. Some of the possible recovery-related activities in the sector can include:

- Repairs of the damages to structures, which are normally affected by strong winds and floods.
- Emergency procurement of vital equipment necessary to normalize operations.
- Clearing of debris that may have affected the sector.

2.5.6.2 Estimation of Reconstruction Needs

Reconstruction needs are generally long-term in nature (3 years and more) and are intended to 'build back better' from the ruins of a disaster. It is to be noted that reconstruction activities should include both public as well as private facilities and may require different types of financing strategies. It is to be noted that since the companies in this sector are revenue-generating enterprises, financing their needs can come through soft-term credit schemes for the reconstruction and repair of their damaged assets. Such schemes can be accompanied by technical assistance for improved disaster resilient standards of construction. Some possible reconstruction related activities in the sector could include the following:

- Soft-term credit for the replacement or reconstruction of affected structures under a building back better strategy to ensure future disaster resilience through the adoption and enforcement of improved construction standards
- Procurement of equipment and machinery;
- Structural retro-fitting of undamaged or partially damaged structures so that they are not affected by disaster event in the future
- Relocation of facilities to safer area
- Other mitigation measures such as construction of support infrastructure to prevent serious landslides and floods.

2.5.7 Step 7 – Prioritization of Needs

Among the projects identified, relative priorities can be set in order to determine which among them are the more important. Based on the broad strategies for recovery, the assessment team should select the priority projects/activities among the identified needs.

The prioritization can be made by using a set of impact indicators and the level by which the projects can achieve said impacts. Examples of the criteria that can be used are the following, among others:

- Economic impact, which can be evaluated in terms of the relative cost to the government of not undertaking reconstruction or rehabilitation.
- Equity and social impact, which can be in terms of the number of beneficiaries who are poor and destitute and who could not afford to rebuild on their own without outside support.
- Sustainability, which can be in terms of the reduction of risks and vulnerability of the people and other economic assets to future disasters.

Table 67 Impacts of identified post disaster projects

Name of proposed project	Expected Impacts and their levels of impact on recovery								
	Economic Impact			Equity and social impact			Sustainability		
	High	Medium	Low	High	Medium	Low	High	Medium	Low
	A	B	C	D	E	F	G	H	I

Based on the prioritized recovery and reconstruction needs, a summary should be created by the assessment team enumerating the post disaster projects for the recovery and reconstruction. The identified needs should have a rough schedule of implementation outlining at the very least the activities, timing and budget required for all the programs and projects. The following techniques can be considered:

- Identify the specific projects according to their relative urgency or priority in relation to recovery.
- Plot the timeline of activities of all the projects, with the urgent ones on top, in a Gantt chart, with the corresponding funding requirement on an annual basis. This will assist the national government in programming the necessary funds over a certain time period, like on a quarterly or annual basis.
- Identify and include in the list of projects that need further feasibility studies, which may be funded by foreign grants.
- To the extent possible, a logical framework (log-frame) should be created for each of the project proposed for inclusion in the recovery plan. Log-frames are normally required by foreign donors to consider project proposals.

Table 68 Summary of recovery and reconstruction projects in the tourism sector

Name of Specific project	Annual Needed Amount of Assistance (Rs.)			Total Needs (Rs.)
	Disaster Year	Year 1	Year 2	
	A	B	C	D
Recovery Projects				
d.				
e.				
f.				
Total				
Reconstruction Projects				
d.				
e.				
f.				
Total				
Grand Total				

Notes of filling Table 68:

- Project titles can be inserted under the column on recovery and reconstruction needs.
- Columns can be added to accommodate any additional reconstruction needs beyond Year 2.

2.5.8 Step 8 – Sector Report

With all the information gathered using the previous steps, a report can be drafted by the assessment team, which will provide the inputs for a particular sector in the overall recovery and reconstruction plan. The following format may be considered:

- Brief description of the sector in the disaster-affected areas.
- Damages in the sector by areas and by types of assets affected.
- Losses in the sector emphasizing the losses in income, increase in expenditures, estimated period before normalcy will be attained, etc.
- Impact on the livelihood, individual households, vulnerable groups and the consequences to the greater community if no assistance for recovery will be provided.
- Proposed strategies for recovery and reconstruction of the sector.
- Needs of the sector, by priority, and the draft schedule of implementation with the estimated funds required for each project over time.

The draft sector report should be submitted to the Gujarat State Disaster Management Authority/ Secretary (R&R) for consolidation.

References

- National Institute of Disaster Management. (n.d.). Post Disaster Needs Assessment Manual Volume I. Retrieved from https://nidm.gov.in/PDF/pubs/pdna_manual_vol1.pdf
- National Institute of Disaster Management. (n.d.). Post Disaster Needs Assessment Manual Volume I. Retrieved from https://nidm.gov.in/PDF/pubs/pdna_manual_vol2.pdf
- National Database for Emergency Database, Gujarat Specific. Retrieved from: https://ndem.nrsc.gov.in/login.php

Technical Session 2b
Sector-wise Standard Procedures for Undertaking PDNA (Part 2 Infrastructure Sectors)

Introduction, Overview & Perspectives

This technical session is designed to guide learners through the process of conducting Post Disaster Needs Assessments (PDNA) for infrastructure sectors in the state of Gujarat. The session will provide a comprehensive guide, detailing eight crucial steps that ensure the successful execution of PDNA. These steps encompass the entire process, starting from the formation of the recommended assessment team responsible for conducting the PDNA, to the final stage of compiling the sector report. Throughout the training, participants will receive detailed instructions and best practices for each of the eight steps, ensuring they have a thorough understanding of the entire PDNA process.

The primary objectives of this technical session

- To introduce general step in conducting a PDNA.
- To understand required baseline information for each sector and its importance.
- To understand the requirements of field assessment.
- To understand assessment of disaster effects and impacts on each sector.
- To determine and prioritize the recovery needs.
- To understand the general guidelines to consider while compiling the sector report.

Duration: 100 minutes

Methodology

- Lecture-based learning
- Case study-based learning
- Discussion
- Q&A session

Trainer's Note

The entire technical session is aimed to help trainees to apply the concepts learned in the previous session. There are total of four infrastructure sectors and each sector has different guidelines to consider. Trainees should seek understanding through learners' active participation in discussions and question & answer sessions.

The learning units of this technical session

Learning Unit 2.6: Electrical Sector

- 2.6.1: Step 1 -Recommended assessment team and sub-sectors
- 2.6.2: Step 2 - Baseline information and sources
- 2.6.3: Step 3 - Estimation of damages and losses (disaster effects)
- 2.6.4: Step 4 - Summarization of damages and losses in the state
- 2.6.5: Step 5 - Estimation of disaster impacts
- 2.6.6: Step 6 - Estimation of recovery and reconstruction needs
- 2.6.7: Step 7 - Prioritization of Needs
- 2.6.8: Step 8 - Sector Report

Learning Unit 2.7: Water Supply and Sanitation Sector

- 2.7.1: Step 1 -Recommended assessment team and sub-sectors
- 2.7.2: Step 2 - Baseline information and sources
- 2.7.3: Step 3 - Estimation of damages and losses (disaster effects)
- 2.7.4: Step 4 - Summarization of damages and losses in the state
- 2.7.5: Step 5 - Estimation of disaster impacts
- 2.7.6: Step 6 - Estimation of recovery and reconstruction needs
- 2.7.7: Step 7 - Prioritization of Needs
- 2.7.8: Step 8 - Sector Report

Learning Unit 2.8: Transport Sector

- 2.8.1: Step 1 -Recommended assessment team and sub-sectors
- 2.8.2: Step 2 - Baseline information and sources
- 2.8.3: Step 3 - Estimation of damages and losses (disaster effects)
- 2.8.4: Step 4 - Summarization of damages and losses in the state
- 2.8.5: Step 5 - Estimation of disaster impacts
- 2.8.6: Step 6 - Estimation of recovery and reconstruction needs
- 2.8.7: Step 7 - Prioritization of Needs
- 2.8.8: Step 8 - Sector Report

Learning Unit 2.9: Communication Sector

- 2.9.1: Step 1 -Recommended assessment team
- 2.9.2: Step 2 - Baseline information and sources
- 2.9.3: Step 3 - Estimation of damages and losses (disaster effects)
- 2.9.4: Step 4 - Summarization of damages and losses in the state
- 2.9.5: Step 5 - Estimation of disaster impacts
- 2.9.6: Step 6 - Estimation of recovery and reconstruction needs
- 2.9.7: Step 7 - Prioritization of Needs
- 2.9.8: Step 8 - Sector Report

Session

Content	Trainer's Note	Time
Electrical Sector	Focus in explaining the eight steps and elaborate the methodology and calculation at each step. Explain guidelines to prepare the sector report.	25 min
Water Supply and Sanitation Sector		25 min
Transport Sector		25 min
Communication Sector		25 min

Learning Unit 2.6
Power Sector

Brief Description of the Learning Unit

The second learning unit is designed to guide learners through conducting Post Disaster Needs Assessments (PDNA) specifically for the power sector in Gujarat. The session will provide a comprehensive guide detailing eight crucial steps that ensure the successful execution of PDNA. Throughout the training, participants will receive detailed instructions and best practices for each of the eight steps, ensuring they thoroughly understand the entire PDNA process. This focused approach will address the unique challenges and needs of assessing related impacts and recovery requirements. By the end of this session, participants will be equipped with the necessary knowledge and skills to effectively conduct PDNA power sector, ensuring comprehensive and reliable assessments that can inform recovery and reconstruction efforts in Gujarat.

Learning Objectives

- To introduce general step in conducting a PDNA.
- To understand required baseline information for each sector and its importance.
- To understand the requirements of field assessment.
- To understand assessment of disaster effects and impacts on each sector.
- To determine and prioritize the recovery needs.
- To understand the general guidelines to consider while compiling the sector report

Duration: 25 minutes

Methodology

- Lecture-based learning
- Case study-based learning
- Discussion
- Q&A session

Detailed Description

2.6.1 Step 1 - Recommended assessment team

The composition of the sector assessment team may vary by the type of disaster and the extent of the likely damage and production flow changes.

Table 69 Recommended assessment team for power sector

Organization and Personnel	Role in the Sector Assessment

State Personnel from:
• **Gujarat Electricity Regulatory Commission (GERC)**
• **Gujarat Urja Vikal Nigam Limited (GUVNL)**
• **Gujarat Energy Transmission Corporation Ltd. (GSECL)**
• **Gujarat Energy Transmission Company Limited (GETCO)**
• **Paschim Gujarat Vij Company Limited (PGVCL)**
• **Uttar Gujarat Vij Company Limited (UGVCL)**
• **Madhya Gujarat Vij Company Limited (MGVCL)**
• **Dakshin Gujarat Vij Company Limited (DGVCL)**
• **Gujarat Industries Power Company Ltd (GIPCL)**
• **Private companies**
• **Local departments and offices in the disaster-affected area:**
  ○ Electrical Engineer
  ○ Civil Engineer (Power Generation)
  ○ Power Generation Investment Specialist
  ○ Power Operations Specialist
  ○ Power Generation Economist
  ○ Power Generation Accountant
  ○ Goods/ Equipment Buyer
	Lead and coordinate

Personnel from:
• **Ministry of Power**
• **Ministry of Petroleum and Natural Gas**
  ○ Electrical Engineer
  ○ Civil Engineer (Power Generation)
  ○ Power Generation Investment Specialist
  ○ Power Operations Specialist
  ○ Poer Generation Economist
  ○ Power Generation Accountant
  ○ Goods/ Equipment Buyer
	Provide baseline information and facilitate the field assessment of damages and losses

Development partners (if active in the sector)	Participate and provide technical advice

2.6.2 Step 2 - Baseline Information and Sources

Baseline information must be compiled before the field assessment or, if possible, prior to the occurrence of disaster. The baseline data should be validated before the field visit to serve as the basis for the estimation of damages and losses for the disaster-affected area/s. This data can be compiled at the State/Region office or at the district levels.

Table 70 Baseline information for power companies

Name of District:								
Population Connected to Power Grid (%):								
Name of Power Company by Activity	**Power Source**				**Ownership**		**Capacity (KW)**	**Unit cost of operation (Rs/KW-hr)**
	Hydro	**Coal**	**Diesel**	**Others**	**Public**	**Private**		
Power Generation								
Company 1								
Company N								
Power Distribution								
Company 1								
Company N								

Table 71 Baseline information for power costs and demand

Name of District:					
Population Connected to Power Grid (%):					
Name of Power Company	**Power Demand Forecast (KW-Hr)**				**Rate**
	Current Year	**Year 1**	**Year 2**	**Year 3**	**(Rs/KW-Hr)**
Company 1:					
Residential					
Commercial					
Industrial					
Others					
Company 2:					
Residential					
Commercial					
Industrial					
Others					
Company N:					
Residential					
Commercial					
Industrial					
Others					

Notes of filling Tables 70 - 71:

- It is possible that a power company located in one area serves the needs of other districts or even the whole state. In such a case, the assets of the company may be located in several areas. The assessment team must be cautious about the possibility of double counting. If the power company/ies cover more than one area, they should only be assessed once as part of the area where their main offices are located.
- It is possible too that a single power company owns both the generation and distribution components. In such a case, they should be assessed as a single company or unit.
- If a power company is a joint venture between the government and a private corporation, it can be considered as a public company for the purpose of PDNA.

Table 72 Sources of information for collecting baseline data

1	Ministry of Statistics and Programme Implementation	http://www.mospi.gov.in
2	National Institution for Transforming India	http://niti.gov.in
3	The Registrar General & Census Commissioner, India	http://censusindia.gov.in
4	Ministry of New and Renewable Energy	http://www.mnre.gov.in
5	Ministry of Power	http://powermin.nic.in
6	Make in India Initiatives	http://www.makeinindia.com
7	Open Government Data (OGD) Platform India	http://dahd.nic.in
8	Central Electricity Authority	http://www.cea.nic.in
9	Gujarat Electricity Regulatory Commission	https://gercin.org/
10	Gujarat Energy Transmission Corporation Ltd.(GETCO)	https://www.getcogujarat.com/getco_newsite/index.php
11	Gujarat Urja Vikas Nigam Limited (GUVNL)	http://www.gseb.com
12	Gujarat State Electricity Corporation Limited (GSECL)	http://www.gsecl.in
13	Paschim Gujarat Vij Company Limited (PGVCL)	http://www.pgvcl.com
14	Uttar Gujarat Vij Company Limited (UGVCL)	http://www.ugvcl.com
15	Madhya Gujarat Vij Company Limited (MGVCL)	http://www.mgvcl.com
16	Dakshin Gujarat Vij Company Limited (DGVCL)	http://www.dgvcl.com
17	Gujarat Industries Power Company Ltd (GIPCL)	http://www.gipcl.com

Step 3 - Estimation of Damages and Losses (Disaster Effects)

- With the baseline information, field assessment should be undertaken in the affected Districts after a disaster. The assessment team from the State must work with their local counterparts in the districts to ensure that the estimates for the damages and losses in the sector are accurate to the extent possible.
- Direct interviews with private contractors or government officials involved in the construction and repair of facilities can also be conducted during the field trip in order to

validate unit costs of repair and reconstruction (which is already contained in the baseline data).

- Repair and replacement costs should be estimated for the damages of the sector. The time needed to reconstruct the damages should also be estimated.
- During the field visits to the disaster sites, the assessment team should interview the officers of the company/ies to ascertain the extent and value of the damages and the estimated period before operations can be fully restored to the pre-disaster level.
- To assess the value of damages and losses the assessment team can arrange a meeting with the officials of power companies and require them to fill out the questionnaire below.

Table 73 Damages and Losses to power sector

Name of District:						
Company Name:						
Category: Power Generation: Hydropower ( ) Coal ( ) Diesel ( ) Others ( ) **Power Distribution:** Corporation ( )						
Ownership: Public ( ) Private ( )						
Number of Clients affected: **1. Residential –** **2. Commercial –** **3. Industrial –** **4. Others –**						
Assets	**Damage Information**					
	Event	**Building Collapse/ Building fire/ Cyclone/ flood**				
	Event Date					
	Totally Destroyed		**Partially Damaged**		**Total Value of Damages**	**Average Time to Replace or Repair (Days)**
	Number of Totally Destroyed	**Average Replacement Cost (Rs)**	**Number of Partially Damaged**	**Average Replacement Cost (Rs)**		
	A	**B**	**C**	**D**	**E**	**F**
Power Generation						
Structures						
Equipment						
Others						
Transmission System						
Structures						
Equipment						
Vehicles						
Others						
Distribution Grids						
Structures						
Equipment						
Power Stations						
Sub-stations						

Power cables						
Others						
Main Office						
Structures						
Equipment						
Inventories						
Others						
TOTAL						

Types of Losses	**Loss Information**			
	Disaster Year	**Year 1**	**Year 2**	**Total Estimated Losses (Rs.)**
Foregone Income				
Cleaning up of Debris				
Higher Operating Costs				
Other Unexpected Expenses				
TOTAL				

Notes of filling Table 73:

- The power company/ies should fill out information appropriate to their assets. Structures will include dams, field offices, etc.
- There are various machineries and equipment in the power systems like turbines, computers, vehicles, etc. Inventories will include power lines, posts, spare parts, etc. They should all be assessed especially those that are vital to the operation. • 'Average Replacement Cost' will be the average pre-disaster value of the structures and assets that were totally destroyed.
- 'Average Repair Cost' will be the average cost of repair of the structures and assets that were partially damaged.
- In formula, the total damages will be
  (Column E) = (Column A) x (Column B) + (Column C) x (Column D)
- Foregone sales in electricity due to the shutdown of the power system while the system is under repair or reconstructed after a disaster. This can include both short-term shutdown for repairs and longer-term shut-down due to reconstruction.
- Lower sales in electricity due to the decline in demand from consumers (households or companies) that have been affected by the disaster.
- Higher cost of operation which occurs when damaged power electricity are substituted by alternative stand-by plants that have a higher unit cost of production or when electricity has to be imported from a different system that has higher operating costs.
- Additional expenses to clean up the debris.
  In the electricity sector losses occur until full capacity and supply have been re-established in all system components and user demand (in all sectors) has been restored to pre-disaster levels. Losses are expressed in monetary terms at current values

2.6.3 Step 4 - Summarizing of Damages and Losses in the State

Table 74 Summarizing of Damages and Losses in power sector

Name of State:									
Total number of employees affected in the power sector: • **Residential** • **Commercial** • **Industrial** • **Others**									
Name of Power Company	**Estimated Reduction in the Value of Production**								**Total Estimated Losses (Rs.)**
	Within the Disaster Year				**Losses beyond Disaster Year**				
	Damages		**Losses**		**Year 1**		**Year 2**		
	Public	**Private**	**Public**	**Private**	**Public**	**Private**	**Public**	**Private**	
District 1:									
Company 1									
Company N									
Total									
District 2:									
Company 1									
Company N									
Total									
Grand Total									

2.6.4 Step 5 - Estimation of Disaster Impacts

The assessment team should analyze all potential impacts of the damages and losses of the power sector and must answer the following questions:

- The possible effects on hospital operations, productivity, government services, etc. if power supply is not restored immediately.
- The additional costs to families if they will have to procure other sources of power.
- Possible losses of employment if the power sector will have to lay off workers.
- Potential adverse environmental impacts like if and when fuel leaks to ecologically sensitive areas.

Table 75 Social Impacts of the Damages and Losses to the power Sector

Areas of Impacts	Expected Impacts						Brief description of Impacts
	General Population			Women and Children			
	Severe	Moderate	Low	Severe	Moderate	Low	
	A	B	C	D	E	F	G
Employment							
Health							
Education							
Government Services							
Added Cost to Households							
Economic Productivity							
Others (Specify)							

Notes of filling Table 75:

- The impacts can be briefly described under the column "Brief Description of Impacts". For example, a brief description of a severe "impact on health" and "education" can be the inability of hospitals to conduct medical procedures and the suspension of classes over a longer period; the "added cost to households" can be described as the higher cost of fuel for lighting and cooking; while the impact to "government services" can be the inability or lesser capacity of the government to render vital services like the police or administrative matters due to the absence of power supply. Employment and economic productivity can occur too if big industries (factories, tourism, etc.) are unable to resume normal operations due to power outage.
- The impacts on women and children may be different from the general population. For instance, pregnant women and small children who need more of medical care may be adversely affected if power supply will hamper the operations of medical clinics. Hospitals may not be able to provide pre-natal care or immunization to infants without power supply

2.6.5 Step 6 - Estimation of Recovery and Reconstruction Needs

2.6.6.1 Estimation of Recovery Needs

Recovery needs are intended to bring back normalcy in the sector as quickly as possible. Recovery activities should include those that will enable companies to resume their normal operations. Recovery activities should include those that will enable companies to resume their normal operations. Some of the possible recovery-related activities in the power sector can include:

- Urgent repair of the damages to the generation, transmission and distribution system, which are normally affected by strong winds and floods. Among the repairs that may be required are cable wires, transformers and others.
- Emergency procurement of alternate generators or connecting to other existing power grids to supply the needs of basic lifelines like hospitals, police and military needs, transportation, etc.

- Clearing of debris that may have affected the various sub-systems of the power sector. In some cases, this may be part of repairs like the clearing of trees that fell off the power lines.
- Assistance to electricity users in checking or repairing their individual electrical installations to assure safety after the disaster.
- Freezing of electricity billings can be adopted as a recovery measure at least in those cases where no metering exists and where a fixed rate is charged to users, until full recovery of the service is achieved.

2.6.6.2 Estimation of Reconstruction Needs

Reconstruction needs are generally long-term in nature (3 years and more) and are intended to 'build back better' from the ruins of a disaster. It is to be noted that reconstruction activities should include both public as well as private facilities and may require different types of financing strategies. It is to be noted that since the companies in this sector are revenue-generating enterprises, financing their needs can come through soft-term credit schemes for the reconstruction and repair of their damaged assets. Such schemes can be accompanied by technical assistance for improved disaster resilient standards of construction. Some possible reconstruction related activities in the sector could include the following:

- Soft-term credit for the replacement or reconstruction of affected structures under a building back better strategy to ensure future disaster resilience through the adoption and enforcement of improved construction standards
- Procurement of equipment and machinery;
- Structural retro-fitting of undamaged or partially damaged structures so that they are not affected by disaster event in the future
- Relocation of facilities to safer area
- Other mitigation measures such as construction of support infrastructure to prevent serious landslides and floods.

2.6.6 Step 7 – Prioritization of Needs

Among the projects identified, relative priorities can be set in order to determine which among them are the more important. Based on the broad strategies for recovery, the assessment team should select the priority projects/activities among the identified needs.

The prioritization can be made by using a set of impact indicators and the level by which the projects can achieve said impacts. Examples of the criteria that can be used are the following, among others:

- Economic impact, which can be evaluated in terms of the relative cost to the government of not undertaking reconstruction or rehabilitation.
- Equity and social impact, which can be in terms of the number of beneficiaries who are poor and destitute and who could not afford to rebuild on their own without outside support.
- Sustainability, which can be in terms of the reduction of risks and vulnerability of the people and other economic assets to future disasters.

Table 76 Impacts of identified post disaster projects

Name of proposed project	Expected Impacts and their levels of impact on recovery								
	Economic Impact			Equity and social impact			Sustainability		
	High	Medium	Low	High	Medium	Low	High	Medium	Low
	A	B	C	D	E	F	G	H	I

Based on the prioritized recovery and reconstruction needs, a summary should be created by the assessment team enumerating the post disaster projects for the recovery and reconstruction. The identified needs should have a rough schedule of implementation outlining at the very least the activities, timing and budget required for all the programs and projects. The following techniques can be considered:

- Identify the specific projects according to their relative urgency or priority in relation to recovery.
- Plot the timeline of activities of all the projects, with the urgent ones on top, in a Gantt chart, with the corresponding funding requirement on an annual basis. This will assist the national government in programming the necessary funds over a certain time period, like on a quarterly or annual basis.
- Identify and include in the list of projects that need further feasibility studies, which may be funded by foreign grants.
- To the extent possible, a logical framework (log-frame) should be created for each of the project proposed for inclusion in the recovery plan. Log-frames are normally required by foreign donors to consider project proposals.

Table 77 Summary of recovery and reconstruction projects in the power sector

Name of Specific project	Annual Needed Amount of Assistance (Rs.)			Total Needs (Rs.)
	Disaster Year	Year 1	Year 2	
	A	B	C	D
Recovery Projects				
g.				
h.				
i.				
Total				
Reconstruction Projects				
g.				
h.				
i.				
Total				
Grand Total				

Notes of filling Table 77:

- Project titles can be inserted under the column on recovery and reconstruction needs.
- Columns can be added to accommodate any additional reconstruction needs beyond Year 2.

2.6.7 Step 8 – Sector Report

With all the information gathered using the previous steps, a report can be drafted by the assessment team, which will provide the inputs for a particular sector in the overall recovery and reconstruction plan. The following format may be considered:

- Brief description of the sector in the disaster-affected areas.
- Damages in the sector by areas and by types of assets affected.
- Losses in the sector emphasizing the losses in income, increase in expenditures, estimated period before normalcy will be attained, etc.
- Impact on the livelihood, individual households, vulnerable groups and the consequences to the greater community if no assistance for recovery will be provided.
- Proposed strategies for recovery and reconstruction of the sector.
- Needs of the sector, by priority, and the draft schedule of implementation with the estimated funds required for each project over time.

The draft sector report should be submitted to the State Disaster Management Authorities/ Secretary (R&R) for consolidation.

References

- National Institute of Disaster Management. (n.d.). Post Disaster Needs Assessment Manual Volume I. Retrieved from https://nidm.gov.in/PDF/pubs/pdna_manual_vol1.pdf
- National Institute of Disaster Management. (n.d.). Post Disaster Needs Assessment Manual Volume I. Retrieved from https://nidm.gov.in/PDF/pubs/pdna_manual_vol2.pdf
- National Database for Emergency Database, Gujarat Specific. Retrived from: https://ndem.nrsc.gov.in/login.php

Learning Unit 2.7
Water Supply and Sanitation Sector

Brief Description of the Learning Unit

The second learning unit is designed to guide learners through conducting Post Disaster Needs Assessments (PDNA) specifically for the water supply and sanitation sectors in Gujarat. The session will provide a comprehensive guide detailing eight crucial steps that ensure the successful execution of PDNA. Throughout the training, participants will receive detailed instructions and best practices for each of the eight steps, ensuring they thoroughly understand the entire PDNA process. This focused approach will address the unique challenges and needs of assessing related impacts and recovery requirements. By the end of this session, participants will be equipped with the necessary knowledge and skills to effectively conduct PDNA for supply and sanitation sectors, ensuring comprehensive and reliable assessments that can inform recovery and reconstruction efforts in Gujarat.

Learning Objectives

- To introduce general step in conducting a PDNA.
- To understand required baseline information for each sector and its importance.
- To understand the requirements of field assessment.
- To understand assessment of disaster effects and impacts on each sector.
- To determine and prioritize the recovery needs.
- To understand the general guidelines to consider while compiling the sector report

Duration: 25 minutes

Methodology

- Lecture-based learning
- Case study-based learning
- Discussion
- Q&A session

Detailed Description

2.7.1 Step 1 - Recommended assessment team

The sector is divided into four sub-sectors including water collection, treatment, and supply; sewerage systems; waste collection, treatment and disposal, materials recovery; and rural water and sanitation systems. Each sub-sector is evaluated separately and then compiled together in the sector report. The composition of the sector assessment team, who will conduct the PDNA process, may vary by the type of disaster and the extent of the likely damage and production flow changes. This tailored team ensures a thorough and accurate assessment of the disaster's impact on all agricultural sub-sectors.

Table 78 Recommended assessment team for water supply and sanitation sector

Organization and Personnel	Role in the Sector Assessment
State Personnel from: • **Narmada Department** • **Sardar Sarovar Narmada Nigam Limited (SSNNL)** • **Water Resources Department** • **Gujarat Water Resources Development Corporation** • **Water Supply Department** • **Gujarat Water Infrastructure Limited (GWIL)** • **Gujarat Water Supply & Sewerage Board (GWSSB)** • **Water and Sanitation Management Organisation (WASMO)** • **Kalpsar Department** • **Local departments and offices in the disaster-affected area:** o Civil Engineer (Water/ Waste) o Sanitary Engineer o Water Resources Engineer o Hydrologist o Water Supply Investment Specialist o Water Supply Economist o Water Supply Accountant o Goods/ Equipment Buyer	Lead and coordinate
Personnel from: • **Ministry of Water Resources** • **Central Water Commission (CWC)** • **Ministry of Drinking Water Supply and Sanitation** o Civil Engineer (Water/ Waste) o Sanitary Engineer o Water Resources Engineer o Hydrologist o Water Supply Investment Specialist o Water Supply Economist o Water Supply Accountant o Goods/ Equipment Buyer	Provide baseline information and facilitate the field assessment of damages and losses
Development partners (if active in the sector)	Participate and provide technical advice

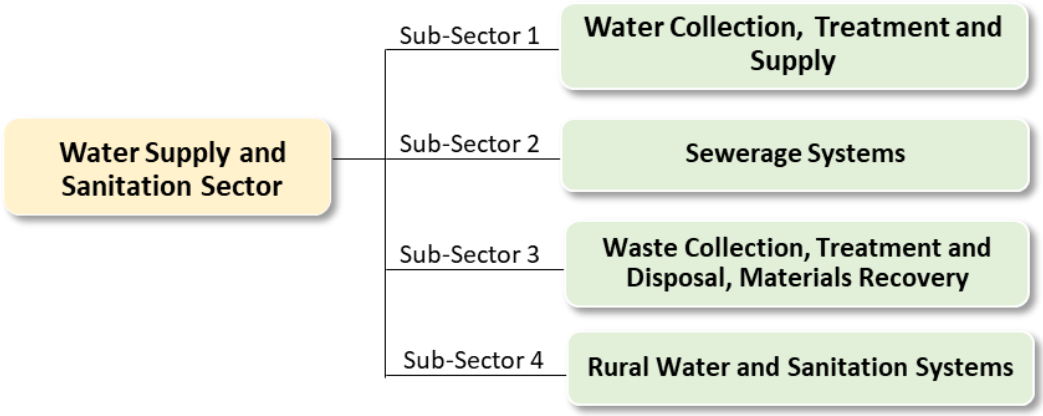


Figure 11 Sub-sector of water supply and sanitation sector

2.7.2 Step 2 - Baseline Information and Sources

Baseline information must be compiled before the field assessment or, if possible, prior to the occurrence of disaster. The baseline data should be validated before the field visit to serve as the basis for the estimation of damages and losses for the disaster-affected area/s. This data can be compiled at the State/Region office or at the district levels.

Table 79 Baseline information for Sub-sector 1 water collection, treatment, and supply

Name of District:									
Name of Water Supply System:									
Population Connected to system (%):									
Ownership: Public ( ) Private ( )									
Water Users and supply	**Water Demand Forecast (Liters per year) and Rates (Rs. Per liter)**								
	Current year			**Year 1**			**Year 2**		
	Users	**Volume (L/yr)**	**Rate (Rs./L)**	**Users**	**Volume (L/yr)**	**Rate (Rs./L)**	**Users**	**Volume (L/yr)**	**Rate (Rs./L)**
Residential									
Commercial									
Industrial									
Others									

Water supply structures	**Water Supply Structures: Capacities and Costs**			
	Total capacity (L)	**Operating cost (Rs./L)**	**Average Repair cost (Rs.)**	**Average Replacement Cost (Rs.)**
Treatment plants				
Storage				
Distribution				
Other sub-systems				

Equipment	**Equipment Costs**	
	Average Replacement Cost (Rs.)	**Unit Costs off Repair (Rs./equipment)**

Table 80 Baseline information for Sub-sector 2 sewerage systems

Name of District:									
Name of Sewerage System:									
Population Connected to system (%):									
Ownership: Public ( ) Private ( )									
Sewerage Demands	**Sewerage Processing (Liters per year) and Rates (Rs. Per liter)**								
	Current year			**Year 1**			**Year 2**		
	Users	**Volume (L/yr)**	**Rate (Rs./L)**	**Users**	**Volume (L/yr)**	**Rate (Rs./L)**	**Users**	**Volume (L/yr)**	**Rate (Rs./L)**
Residential									
Commercial									
Industrial									
Others									

Sewerage structures	**Sewerage Structures: Capacities and Costs**			
	Total capacity (L)	**Operating cost (Rs./L)**	**Average Repair cost (Rs.)**	**Average Replacement Cost (Rs.)**
Sewerage collection system				
Sewerage treatment plant				
Sewerage disposal				
Other Sub-systems				

Equipment	**Equipment Costs**	
	Average Replacement Cost (Rs.)	**Unit Costs off Repair (Rs./equipment)**

Table 81 Baseline information for Sub-sector 3 waste collection, treatment and disposal, and materials recovery

Name of District:									
Name of Solid Waste System:									
Population Connected to system (%):									
Ownership: Public ( ) Private ( )									
Solid Waste Demands	**Solid waste processing (Tons per year) and Rates (Rs. Per ton)**								
	Current year			**Year 1**			**Year 2**		
	Users	**Volume (tons/yr)**	**Rate (Rs./ton)**	**Users**	**Volume (tons/yr)**	**Rate (Rs./tons)**	**Users**	**Volume (tnns/yr)**	**Rate (Rs./tons)**
Residential									
Commercial									
Industrial									
Others									

Solid Waste Assets	Solid Waste: Capacities and Costs			
	Total capacity (tons)	Operating cost (Rs./tons)	Average Repair cost (Rs.)	Average Replacement Cost (Rs.)
Waste collection trucks				
Individual waste containers				
Solid waste disposal sites				
Other sub-systems				
Equipment	Equipment Costs			
	Average Replacement Cost (Rs.)		Unit Costs off Repair (Rs./equipment)	

Table 82 Baseline information for Sub-sector 4 rural water and sanitation systems

Name of District:					
Rural water sanitation systems	Water Demand Forecast (Liters per year) and Rates (Rs. Per liter)				
	Number of Ownerships		Number of Users	Average construction cost	Average Repair cost
	Public	Private	Families	(Rs./ unit)	(Rs./ unit)
Type of water supply systems					
Open Well					
Closed Well with Hand Pump					
Closed Well with Storage & Electric Water Pump & Tap Stands					
Others					
Type of Sewerage System					
Septic Tanks					
Latrines					
Others					
Type of Solid Waste System					
Solid Waste Disposal Site					
Others					

Notes of filling Tables 79 - 82:

- It is possible that a water supply system located in one area serves the needs of other Districts or even the whole State. In such a case, the assets of the water supply system may be located in several Districts. The assessment team must be cautious about the possibility of double counting.
- For the structures and equipment, the table can be expanded to include all the types of structures or buildings and equipment, especially those that are vital in the operation of the water supply system.
- Year 1 and Year 2 refer to the estimated water demand after the current year.
- For table 82, the number of each type of rural water supply, sewerage, and solid waste in a District should be identified whether public or private in ownership.

Table 83 Sources of information for collecting baseline data

1	Ministry of Statistics and Programme Implementation	http://www.mospi.gov.in
2	National Institution for Transforming India	http://niti.gov.in
3	The Registrar General & Census Commissioner, India	http://censusindia.gov.in
4	Central Water Commission	http://www.cwc.nic.in
5	Ministry of Drinking Water and Sanitation	http://www.mdws.gov.in
6	India Sanitation Portal	http://www.indiasanitationportal.org
7	Open Government Data (OGD) Platform India	http://dahd.nic.in
8	Bhuvan, Indian Geo-Platform of ISRO	http://bhuvan.nrsc.gov.in
9	Sardar Sarovar Narmada Nigam Ltd.	http://www.sardarsarovardam.org/
10	Gujarat Water Resources Development Corporation	http://gwrdc.gujarat.gov.in/
11	Gujarat Water Supply and Sewerage Board	https://watersupply.gujarat.gov.in/
12	Kalpasar Department	https://kalpasar.gujarat.gov.in/
13	Gujarat Water Infrastructure Limited	https://gwilws.gujarat.gov.in/
14	Water and Sanitation Management Organization (WASMO)	https://wasmows.gujarat.gov.in/

Step 3 - Estimation of Damages and Losses (Disaster Effects)

- With the baseline information, field assessment should be undertaken in the affected Districts after a disaster. The assessment team from the State must work with their local counterparts in the Districts to ensure that the estimates for the damages and losses in the sector are accurate to the extent possible.
- Direct interviews with private contractors or government officials involved in the construction and repair of facilities can also be conducted during the field trip in order to validate unit costs of repair and reconstruction (which is already contained in the baseline data).
- It should be noted that since there is a possibility that only one water/sanitation company provides services to a number of districts, caution should be exercised to avoid double counting. It is recommended that the assessment of damages and losses of the company should be accounted for in the district where the main office is located. However, if the main office is located outside the disaster area, the assessment team must account for the damages and losses of the company with an indication as to where such damages and losses occurred.
- Repair and replacement costs should be estimated for the damages of the sector. The time needed to reconstruct the damages should also be estimated.
- During the field visits to the disaster sites, the assessment team should interview the officers of the company/ies to ascertain the extent and value of the damages and the estimated period before operations can be fully restored to the pre-disaster level.

- To assess the value of damages and losses the assessment team can arrange a meeting with the officials of companies and require them to fill out the questionnaire below.

Notes of filling Table 84 - 86:

- The company/ies should fill out information appropriate to their assets. There are various machineries and equipment in the water supply systems. They should be assessed especially those that are vital to the operation.
- 'Average Replacement Cost' will be the average pre-disaster value of the structures and assets that were totally destroyed.
- 'Average Repair Cost' will be the average cost of repair of the structures and assets that were partially damaged.
- In formula, the total damages will be
  (Column E) = (Column A) x (Column B) + (Column C) x (Column D)
- Losses in revenues due to non-provision of water to the users during the period of rehabilitation and reconstruction.
- Foregone sales in water due to the decline in demand from consumers that have been affected by the disaster.
- Higher cost of chemicals and other inputs in ensuring the quality of drinking water.
- Higher water distribution costs when using tanker trucks to reach users.
- Higher cost due to more intensive operation of systems to compensate for water losses in damaged system components.
- Cost of cleaning of treatment plants and other sub-systems after flooding and removal of debris.

Table 84 Damages and Losses to sub-sector sector 1 water collection, treatment and supply

Name of District:						
Company Name:						
Ownership: Public ( ) Private ( )						
Number of Clients affected: **1. Residential –** **2. Commercial –** **3. Industrial –** **4. Others –**						
Assets	**Damage Information**					
	Event	**Building Collapse/ Building fire/ Cyclone/ flood**				
	Event Date					
	Totally Destroyed		**Partially Damaged**		**Total Value of Damages**	**Average Time to Replace or Repair (Days)**
	Number of Totally Destroyed	**Average Replacement Cost (Rs)**	**Number of Partially Damaged**	**Average Replacement Cost (Rs)**		
	A	**B**	**C**	**D**	**E**	**F**
Water treatment						
Buildings						
Treatment plants						
Equipment						
Machinery						

Others						
Storage						
Buildings						
Treatment plants						
Equipment						
Machinery						
Others						
Distribution						
Buildings						
Treatment plants						
Equipment						
Machinery						
Others						
TOTAL						

Types of Losses	**Loss Information**			
	Disaster Year	**Year 1**	**Year 2**	**Total Estimated Losses (Rs.)**
Foregone Income				
Cleaning up of Debris				
Higher Operating Costs				
Other Unexpected Expenses				
TOTAL				

Table 85 Damages and Losses to sub-sector sector 2 sewerage systems

Name of District:						
Company Name:						
Ownership: Public ( ) Private ( )						
Number of Clients affected: **1. Residential –** **2. Commercial –** **3. Industrial –** **4. Others –**						
Assets	**Damage Information**					
	Event	**Building Collapse/ Building fire/ Cyclone/ flood**				
	Event Date					
	Totally Destroyed		**Partially Damaged**		**Total Value of Damages**	**Average Time to Replace or Repair (Days)**
	Number of Totally Destroyed	**Average Replacement Cost (Rs)**	**Number of Partially Damaged**	**Average Replacement Cost (Rs)**		
	A	**B**	**C**	**D**	**E**	**F**
Sewerage collection system						
Buildings						
Pipe systems						
Equipment						
Machinery						

Others						
Storage treatment plants						
Buildings						
Storage tanks						
Equipment						
Machinery						
Others						
Sewerage disposal						
Buildings						
Disposal sites						
Equipment						
Machinery						
Others						
TOTAL						

Types of Losses	**Loss Information**			
	Disaster Year	**Year 1**	**Year 2**	**Total Estimated Losses (Rs.)**
Foregone Income				
Cleaning up of Debris				
Higher Operating Costs				
Other Unexpected Expenses				
TOTAL				

Table 86 Damages and Losses to sub-sector sector 3 waste collection, treatment and disposal, materials recovery

Name of District:						
Company Name:						
Ownership: Public ( ) Private ( )						
Number of Clients affected: **1. Residential –** **2. Commercial –** **3. Industrial –** **4. Others –**						
Assets	**Damage Information**					
	Event	**Building Collapse/ Building fire/ Cyclone/ flood**				
	Event Date					
	Totally Destroyed		**Partially Damaged**		**Total Value of Damages**	**Average Time to Replace or Repair (Days)**
	Number of Totally Destroyed	**Average Replacement Cost (Rs)**	**Number of Partially Damaged**	**Average Replacement Cost (Rs)**		
	A	**B**	**C**	**D**	**E**	**F**
Solid waste disposal						
Buildings						
Treatment plants						
Waste collection trucks						

Equipment							
Machinery							
Others							
Others							
Buildings							
Storage tanks							
Equipment							
Machinery							
Others							
TOTAL							

Types of Losses	**Loss Information**			
	Disaster Year	**Year 1**	**Year 2**	**Total Estimated Losses (Rs.)**
Foregone Income				
Cleaning up of Debris				
Higher Operating Costs				
Other Unexpected Expenses				
TOTAL				

Table 87 Damages and Losses to sub-sector sector 4 rural water and sanitation systems

Name of District:									
Assets	**Event**		**Building Collapse/ Building fire/ Cyclone/ flood**						
	Event Date								
	Damage Information							**Loss Information**	
	Totally Destroyed			**Partially Damaged**			**Total Value of Damages (Rs.)**	**Total Losses (Rs.)**	**Number of affected users (families)**
	Number of Totally Destroyed		**Average Replacement Cost (Rs)**	**Number of Partially Damaged**		**Average Replacement Cost (Rs)**			
	Public	**Private**		**Public**	**Private**				
	A	**B**	**C**	**D**	**E**	**F**	**G**	**H**	**I**
Types of water supply systems									
Open Well									
Closed Well with Hand Pump									
Closed Well with Storage & Electric Water Pump & Tap Stands									
Others									
Type of Sewerage System									
Septic Tanks									

Latrines									
Others									
Type of Solid Waste System									
Solid Waste Disposal Site									
Others									
TOTAL									

Notes of filling Table 87:

- The 'Average Replacement Cost' and the 'Average Repair Cost' are in the baseline information.
- In formula, the total damages will be
  (Column G) = [(Column A +Column B) X (Column C)] + [(Column D + Column E) X (Column F)].
- Losses will be the additional cost of water that will be supplied by the government to the rural people. • It must be noted that the losses may extend beyond the year that the disaster occurred.

2.7.3 Step – 4 Summarizing of Damages and Losses in the State

Table 88 Summarizing of Damages and Losses

Name of State:									
Total number of employees affected: • **Residential –** • **Commercial –** • **Industrial –** • **Others –**									
Number of affected rural water supply users: (families) • **Open well –** • **Closed well and hand pump –** • **Closed well with storage and electrical water pump and tap stands –** • **Others –**									
Type of system	**Damage and losses (Rs.)**								**Total Estimated Losses (Rs.)**
	Within the Disaster Year				**Losses beyond Disaster Year**				
	Damages		**Losses**		**Year 1**		**Year 2**		
	Public	**Private**	**Public**	**Private**	**Public**	**Private**	**Public**	**Private**	
District 1:									
A. Water Supply system									
Commercial water supply									
Company 1									
Company N									
Total									

Rural water supply									
Open Well									
Closed Well with Hand Pump									
Closed Well with Storage & Electric Water Pump & Tap Stands									
Others									
Total									
B. Sewerage									
Commercial sewerage system									
Company 1									
Company N									
Total									
Rural sewerage									
Septic tanks									
Latrines									
Others									
Total									
C. Solid waste									
Commercial water disposal system									
Company 1									
Company N									
Total									
Rural water disposal									
Solid waste disposal site									
Others									
Total									
Grand Total									
Commercial Systems									
Water collection, treatment and supply									
Sewerage									
Solid waste									
Rural systems									
Water supply									
Sewerage									
Solid waste									

2.7.4 Step 5 - Estimation of Disaster Impacts

The assessment team should analyse all potential impacts of the damages and losses of the water and sanitation sector and must answer the following questions:

- What are the possible effects on the health and sanitation of the people, social services (like hospital and school operations), productivity, government services, etc. if water supply is not restored immediately?
- Are there added costs to families if they will have to procure water from other sources?
- Will there be losses in employment from the water supply companies?
- What are the potential adverse impacts to the production and employment of other industries if water supply is not restored?

Notes of filling Table 89:

- The impacts can be briefly described under the column "Brief Description of Impacts". For example, a brief description of a severe "impact on health" and "education" can be the inability of hospitals to conduct medical procedures and the suspension of classes over a longer period; the "added cost to households" can be described as the higher cost of fuel for lighting and cooking; while the impact to "government services" can be the inability or lesser capacity of the government to render vital services like the police or administrative matters due to the absence of power supply. Employment and economic productivity can occur too if big industries (factories, tourism, etc.) are unable to resume normal operations due to power outage.
- The impacts on women and children may be different from the general population. For instance, women and children who collect water may have to walk longer distances if the available water supply is farther from home. On the other hand, if clinics or hospitals cannot provide pre-natal care or immunization, women and children will be more adversely affected.

Table 89 Social Impacts of the Damages and Losses

Areas of Impacts	Expected Impacts						Brief description of Impacts
	General Population			Women and Children			
	Severe	Moderate	Low	Severe	Moderate	Low	
	A	B	C	D	E	F	G
Employment							
Health and sanitation							
Government Services							
Added Cost to Households							
Economic Productivity							
Others (Specify)							

2.7.5 Step 6 - Estimation of Recovery and Reconstruction Needs

2.7.6.1 Estimation of Recovery Needs

Recovery needs are intended to bring back normalcy in the sector as quickly as possible. Recovery activities should include those that will enable companies to resume their normal

operations. Recovery activities should include those that will enable companies to resume their normal operations. Some of the possible recovery-related activities in the power sector can include:

- Soft-term credit for the repairs of the damages to the storage and distribution systems of commercial water supply systems, which are normally affected by strong winds and floods. Among the repairs that may be required are clogged or busted pipes among others.
- Clearing of debris that may have affected the various sub-systems of the sector.
- Assistance to water users in checking or repairing their individual installations to assure safety after the disaster.
- Urgent repairs of the damages to the rural water supply sector especially those that are used by the poor people in remote areas. This will prevent the spread of water-borne diseases and lessen the cost to the government of providing temporary water supply

2.7.6.2 Estimation of Reconstruction Needs

Reconstruction needs are generally long-term in nature (3 years and more) and are intended to 'build back better' from the ruins of a disaster. It is to be noted that reconstruction activities should include both public as well as private facilities and may require different types of financing strategies. It is to be noted that since the companies in this sector are revenue-generating enterprises, financing their needs can come through soft-term credit schemes for the reconstruction and repair of their damaged assets. Such schemes can be accompanied by technical assistance for improved disaster resilient standards of construction. Some possible reconstruction related activities in the sector could include the following:

- Long-term credit for the replacement or reconstruction of affected structures under a building back better strategy to ensure future disaster resilience through the adoption and enforcement of improved construction standards
- Procurement of equipment and machinery;
- Structural retro-fitting of undamaged or partially damaged structures so that they are not affected by disaster event in the future
- Relocation of facilities to safer area
- Other mitigation measures such as construction of support infrastructure to prevent serious landslides and floods.

2.7.6 Step 7 – Prioritization of Needs

Among the projects identified, relative priorities can be set in order to determine which among them are the more important. Based on the broad strategies for recovery, the assessment team should select the priority projects/activities among the identified needs.

The prioritization can be made by using a set of impact indicators and the level by which the projects can achieve said impacts. Examples of the criteria that can be used are the following, among others:

- Economic impact, which can be evaluated in terms of the relative cost to the government of not undertaking reconstruction or rehabilitation.

- Equity and social impact, which can be in terms of the number of beneficiaries who are poor and destitute and who could not afford to rebuild on their own without outside support.
- Sustainability, which can be in terms of the reduction of risks and vulnerability of the people and other economic assets to future disasters.

Table 90 Impacts of identified post disaster projects

Name of proposed project	Expected Impacts and their levels of impact on recovery								
	Economic Impact			Equity and social impact			Sustainability		
	High	Medium	Low	High	Medium	Low	High	Medium	Low
	A	B	C	D	E	F	G	H	I

Based on the prioritized recovery and reconstruction needs, a summary should be created by the assessment team enumerating the post disaster projects for the recovery and reconstruction. The identified needs should have a rough schedule of implementation outlining at the very least the activities, timing and budget required for all the programs and projects. The following techniques can be considered:

- Identify the specific projects according to their relative urgency or priority in relation to recovery.
- Plot the timeline of activities of all the projects, with the urgent ones on top, in a Gantt chart, with the corresponding funding requirement on an annual basis. This will assist the national government in programming the necessary funds over a certain time period, like on a quarterly or annual basis.
- Identify and include in the list of projects that need further feasibility studies, which may be funded by foreign grants.
- To the extent possible, a logical framework (log-frame) should be created for each of the project proposed for inclusion in the recovery plan. Log-frames are normally required by foreign donors to consider project proposals.

Table 91 Summary of recovery and reconstruction projects

Name of Specific project	Annual Needed Amount of Assistance (Rs.)			Total Needs (Rs.)
	Disaster Year	Year 1	Year 2	
	A	B	C	D
Recovery Projects				
j.				
k.				
l.				
Total				

Reconstruction Projects				
j.				
k.				
l.				
Total				
Grand Total				

Notes of filling Table 91:

- Project titles can be inserted under the column on recovery and reconstruction needs.
- Columns can be added to accommodate any additional reconstruction needs beyond Year 2.

2.7.7 Step 8 – Sector Report

With all the information gathered using the previous steps, a report can be drafted by the assessment team, which will provide the inputs for a particular sector in the overall recovery and reconstruction plan. The following format may be considered:

- Brief description of the sector in the disaster-affected areas.
- Damages in the sector by areas and by types of assets affected.
- Losses in the sector emphasizing the losses in income, increase in expenditures, estimated period before normalcy will be attained, etc.
- Impact on the livelihood, individual households, vulnerable groups and the consequences to the greater community if no assistance for recovery will be provided.
- Proposed strategies for recovery and reconstruction of the sector.
- Needs of the sector, by priority, and the draft schedule of implementation with the estimated funds required for each project over time.

The draft sector report should be submitted to the Gujarat State Disaster Management Authority/ Secretary (R&R) for consolidation.

References

- National Institute of Disaster Management. (n.d.). Post Disaster Needs Assessment Manual Volume I. Retrieved from https://nidm.gov.in/PDF/pubs/pdna_manual_vol1.pdf
- National Institute of Disaster Management. (n.d.). Post Disaster Needs Assessment Manual Volume I. Retrieved from https://nidm.gov.in/PDF/pubs/pdna_manual_vol2.pdf
- National Database for Emergency Database, Gujarat Specific. Retrived from: https://ndem.nrsc.gov.in/login.php

Learning Unit 2.8
Transport Sector

Brief Description of the Learning Unit

The second learning unit is designed to guide learners through conducting Post Disaster Needs Assessments (PDNA) specifically for the transport sector in Gujarat. The session will provide a comprehensive guide detailing eight crucial steps that ensure the successful execution of PDNA. Throughout the training, participants will receive detailed instructions and best practices for each of the eight steps, ensuring they thoroughly understand the entire PDNA process. This focused approach will address the unique challenges and needs of assessing related impacts and recovery requirements. By the end of this session, participants will be equipped with the necessary knowledge and skills to effectively conduct PDNA for transport sector, ensuring comprehensive and reliable assessments that can inform recovery and reconstruction efforts in Gujarat.

Learning Objectives

- To introduce general step in conducting a PDNA.
- To understand required baseline information for each sector and its importance.
- To understand the requirements of field assessment.
- To understand assessment of disaster effects and impacts on each sector.
- To determine and prioritize the recovery needs.
- To understand the general guidelines to consider while compiling the sector report

Duration: 25 minutes

Methodology

- Lecture-based learning
- Case study-based learning
- Discussion
- Q&A session

Detailed Description

2.8.1 Step 1 - Recommended assessment team and sub-sectors

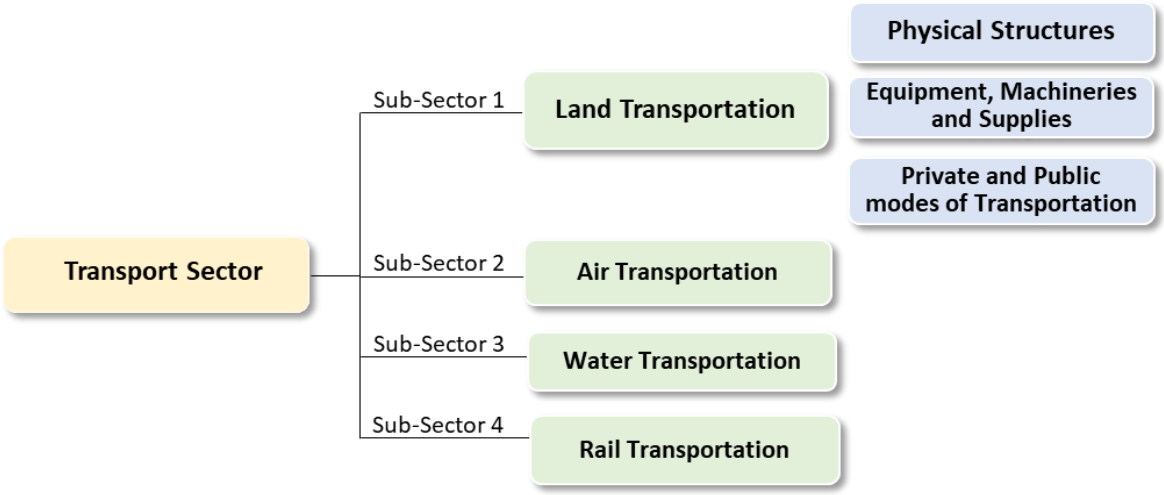


Figure 12 Sub-sectors of transport sector

The composition of the sector assessment team may vary by the type of disaster and the extent of the likely damage and production flow changes

Table 92 Recommended assessment team for transport sectors

Organization and Personnel	Role in the Sector Assessment
State Personnel from: • **Commissionerate of Transport** • **Gujarat Maritime Board** • **Gujarat State Road Transport Corporation (GSRTC)** • **Gujarat State Aviation Infrastructure Company Limited** • **Local departments and other related offices in the disaster-affected area:** ○ Civil Engineer (Roads// bridge/ airport/ports) ○ Transport Engineer ○ Structural Engineer ○ Quantity Surveyor ○ Transport Economist ○ Goods/ Equipment Buyer	Lead and coordinate
Personnel from: ▪ **Ministry of Railways** ▪ **Ministry of Road Transport and Highways** ▪ **Ministry of Shipping** ▪ **Ministry of Civil Aviation** ○ Civil Engineer (Roads// bridge/ airport/ports) ○ Transport Engineer ○ Structural Engineer ○ Quantity Surveyor ○ Transport Economist ○ Goods/ Equipment Buyer	Provide baseline information and facilitate the field assessment of damages and losses
Development partners (if active in the sector)	Participate and provide technical advice

2.8.2 Step 2 - Baseline Information and Sources

Table 93 Sources of information for collecting baseline data

1	Ministry of Statistics and Programme Implementation	http://www.mospi.gov.in
2	Indian Council of Agricultural Research	http://www.icar.org.in
3	The Registrar General & Census Commissioner, India	http://censusindia.gov.in
4	Make in India Initiatives	http://www.makeinindia.com
5	Open Government Data (OGD) Platform India	https://data.gov.in
6	Ministry of Road Transport & Highway	http://morth.nic.in
7	Inland Waterways Authority of India	http://iwai.nic.in
8	India Brand Equity Foundation	http://www.ibef.org/
9	Open Government Data (OGD) Platform India	https://data.gov.in
10	Bhuvan, Indian Geo-Platform of ISRO	http://bhuvan.nrsc.gov.in
11	Commissionerate of Transport	https://commissionertourism.gujarat.gov.in/home
12	Gujarat Maritime Board	http://gmbports.org/
13	Gujarat State Road Transport Corporation	https://gsrtc.in/site/
14	Gujarat State Aviation Infrastructure Company Limited	http://gujsail.gujarat.gov.in/

Table 94 Baseline information for roads and bridges

Name of District:									
Assets	**Area planted (Hectares)**		**Average yield for the year (Kg/Hectare/Yr)**		**Farm gate price (Rs/unit)**	**Average Replacement Cost**	**Average Repair cost**	**Average number of users per month**	
	1º		**2º**		**3º**				
	Exp.	**N.H.**	**S.H.**	**M.D.R.**	**Rural**	**(Rs/km)**	**(Rs/km)**	**Persons**	**Vehicles**
Type of Roads									
Water-Bound Macadam									
Black Top									
Cement Concrete									
Motorable									
Non-motorable									
Others									
Type of Bridges									
Steel									
Concrete									
Wood									
Others									

Notes for filling Table 94:

- The following are the types of roads/bridges:
  - Exp. means express road or bridge.
  - N.H. means National Highway or bridge.
  - S.H. means State Highway or bridge.
  - M.D.R. means Major District Road or bridge.
  - Rural means rural or other road or bridge.
- Replacement costs are the actual costs if and when a similar road or bridge will be reconstructed while repair costs are the average normal costs of repairs.

Notes for filling Table 95:

- Structures may include offices of the responsible agency like office buildings, warehouses, garages, etc. The responsible agency can specify their own structures.
- The average construction and repair costs of roofs, walls, and floors are expressed on a per square meter basis (Rs/SqM).
- The 'average repair cost' refers the value in Rs normally spent to repair the various parts of the structures. 'Others' may include the average repair cost of electrical and plumbing, etc. which can be based on previous costs.
- All costs should be based on the pre-disaster values.

Notes for filling Table 96:

- The agencies must fill out the above table according to what they own.
- The average acquisition cost is the mean value when the assets were purchased.
- The average replacement cost is the mean value of the assets immediately before the disaster.
- The average repair cost is the mean value when the assets are repaired.

Notes of filling Table 97:

- The 'Average replacement cost', 'Average repair cost' and 'Average Operating Costs' refer to the types of assets at pre-disaster prices or values.

Table 95 Baseline information for physical structures

Name of District:						
Types	**Number of buildings or structures**	**Average Replacement Cost (Rs/sqM)**	**Average Repair Cost (Rs/ SqM)**			
			Roof	**Wall**	**Floor**	**Others**
Single floor						
2 to 5 floors						
6 to 10 floors						
Over 10 floors						
Other structures						

Table 96 Baseline information on the equipment and supplies

Name of District:			
Equipment and supplies	**Average Acquisition Value per Unit (Rs)**	**Average Replacement Cost per Unit (Rs)**	**Average Repair Cost (Rs)**
Heavy Equipment			
Bulldozers			
Graders			
Loaders			
Trucks			
Others (Specify)			
Others Equipment			
Communication			
Security			
Others (Specify)			
Materials and Supplies			
Furniture			
Computers			
Others (Specify)			

Table 97 Baseline information on the land transportation assets

Name of District:					
Land Transportation	**Number (Units)**		**Average Replacement Cost per Unit (Rs/ unit)**	**Average Repair Cost (Rs/ unit)**	**Average Operating Cost (Rs/km)**
	Public	**Private**			
Private Transport					
Cars					
Motorcycles					
Bicycles					
Others					
Public Transport					
Buses					
Company 1					
Company 2					
Taxis					
Company 1					
Company 2					
Trucks					
Company 1					
Company 2					
Other Vehicles					

Table 98 Baseline information on the air transportation assets

Name of District:					
Air Transportation	**Number (Units)**		**Average Replacement Cost per Unit (Rs/ unit)**	**Average Repair Cost (Rs/ unit)**	**Average Operating Cost (Rs/km)**
	Public	**Private**			
Aircrafts					
Airplanes					
Helicopters					
Others					
Runway (m)					
Runway					
Others					
Structures					
Single floor					
2 to 5 floors					
6 to 10 floors					
Over 10 floors					
Other structures					
Equipment and Machinery					
Furniture					
Computers					
Others (Specify)					
Other Assets					
Others (Specify)					

Table 99 Baseline information on the water transportation assets

Name of District:					
Water Transportation	**Number (Units)**		**Average Replacement Cost per Unit (Rs/ unit)**	**Average Repair Cost (Rs/ unit)**	**Average Operating Cost (Rs/km)**
	Public	**Private**			
Watercrafts					
Ships					
Passenger Ferries					
Others					
Ports					
Ports					
Others (Specify)					
Approach Channels (km)					
Approach Channels					
Others					
Structures					
Single floor					
2 to 5 floors					
6 to 10 floors					
Over 10 floors					

Other structures					
Equipment and Machinery					
Furniture					
Computers					
Others (Specify)					
Other Assets					
Others (Specify)					

Table 100 Baseline information on the rail transportation assets

Name of District:					
Rail Transportation	**Number (Units)**		**Average Replacement Cost per Unit (Rs/ unit)**	**Average Repair Cost (Rs/ unit)**	**Average Operating Cost (Rs/km)**
	Public	**Private**			
Rolling Stock					
Locomotive					
Passenger Carriage					
Cargo Wagon					
Others Rolling Stock					
Tracks (km)					
Tracks					
Others (Specify)					
Structures					
Single floor					
2 to 5 floors					
6 to 10 floors					
Over 10 floors					
Other structures					
Equipment and Machinery					
Navigation Equipment					
Baggage Handling					
Security Equipment					
Others (Specify)					
Other Assets					
Others (Specify)					

2.8.3 Step 3 - Estimation of Damages and Losses (Disaster Effects)

- With the baseline information, field assessment should be undertaken in the affected Districts after a disaster. The assessment team from the State must work with their local counterparts in the districts to ensure that the estimates for the damages and losses in the sector are accurate to the extent possible.
- Direct interviews with private contractors or government officials involved in the construction and repair of facilities can also be conducted during the field trip in order to validate unit costs of repair and reconstruction (which is already contained in the baseline data).

- The estimated losses in agriculture are the differences between the expected pre-disaster and post disaster production or income levels of various agricultural products within the year that the disaster occurred and the succeeding years.
- The following important points must be remembered in assessing the damages and losses in the transportation sector:
  - Assets in the sector like roads, aircrafts, sea crafts, trains and tracks usually cross geographical boundaries. Care must be exercised by the assessment team to avoid double counting.
  - Damages and losses of foreign-owned assets should not be included in the assessment. Only damages and losses that will accrue to national citizens and businesses should be included. For example, damages to foreign airlines should not be included but the loss of income of local employees of the airlines whose jobs were suspended due to the disaster should be considered.
  - It is normally difficult to assess the damages and losses of private businesses. As such, direct interviews with the owners of private companies can be conducted to determine their damages and losses.

Table 101 Damages and Losses to land transport sector

Name of District:						
Assets	**Damage Information**					
	Event	**Building Collapse/ Building fire/ Cyclone/ flood**				
	Event Date					
	Totally Destroyed		**Partially Damaged**		**Total Value of Damages**	**Average Time to Replace or Repair (Days)**
	Number of Totally Destroyed	**Average Replacement Cost (Rs)**	**Number of Partially Damaged**	**Average Replacement Cost (Rs)**		
	A	**B**	**C**	**D**	**E**	**F**
1. Public Assets						
Roads (km)						
Water-bound macadam						
Black top						
Cement concrete						
Motorable						
Non-motorable						
Others						
Bridges (m)						
Steel						
Concrete						
Wood						
Others						
Structures (units)						
Buildings						
Others						

Heavy Equipment (units)						
Bulldozers						
Graders						
Loaders						
Trucks						
Others (specify)						
Other Equipment (units)						
Communication						
Security						
Others (specify)						
Materials and supplies (units)						
Furniture						
Computers						
Others (specify)						
Modes of Transport (units)						
Cars						
Motorcycles						
Bicycles						
Taxis						
Buses						
Trucks						
Others						
TOTAL						
2. Private assets						
Structures (units)						
Buildings						
Others						
Heavy Equipment (units)						
Bulldozers						
Graders						
Loaders						
Trucks						
Others (specify)						
Other Equipment (units)						
Communication						
Security						
Others (specify)						
Materials and supplies (units)						
Furniture						
Computers						
Others (specify)						
Modes of Transport (units)						
Cars						
Motorcycles						
Bicycles						
Taxis						

Buses						
Trucks						
Others						
TOTAL						
GRAND TOTAL						
Types of Losses	**Loss Information**					
	Disaster Year		**Year 1**	**Year 2**		**Total Estimated Losses (Rs.)**
1. Public Assets						
Foregone Income						
Cleaning up of Debris						
Higher Operating Costs						
Other Unexpected Expenses						
TOTAL						
2. Private Assets						
Foregone Income						
Cleaning up of Debris						
Higher Operating Costs						
Other Unexpected Expenses						
TOTAL						
GRAND TOTAL						

Table 102 Damages and Losses to air transport sector

Name of District:						
Assets	**Damage Information**					
	Event	**Building Collapse/ Building fire/ Cyclone/ flood**				
	Event Date					
	Totally Destroyed		**Partially Damaged**		**Total Value of Damages**	**Average Time to Replace or Repair (Days)**
	Number of Totally Destroyed	**Average Replacement Cost (Rs)**	**Number of Partially Damaged**	**Average Replacement Cost (Rs)**		
	A	**B**	**C**	**D**	**E**	**F**
Aircrafts						
Airplanes						
Helicopters						
Others						

Other Assets						
Others (Specify)						
TOTAL						

Types of Losses	**Loss Information**			
	Disaster Year	**Year 1**	**Year 2**	**Total Estimated Losses (Rs.)**
Foregone Income				
Cleaning up of Debris				
Higher Operating Costs				
Other Unexpected Expenses				
TOTAL				

Notes of filling Tables 100 - 104:

- The values in the baseline information should be used in estimating damages. For example, if 20 square meters of the roof are damaged, the repair cost will be the cost of roofing per square meter multiplied by 20 square meters. On the other hand, if the whole structure is totally destroyed, the value of damage will be its replacement cost at post disaster prices.
- The total for the totally destroyed (or partially damaged) assets will be the total number multiplied by the replacement cost (or average repair cost). The average replacement and repair costs are in the baseline information.
- **Column B = (Column A) x replacement cost**
- **Column D = (Column C) x repair cost**
- In formula, 'Total damages' **Column E = (Column B) + (Column D)**
- The average time to repair refers to the time to restore the affected structures to their pre-disaster levels. This will give an indication on the number of days before normal services will be restored.
- The estimated losses will apply to the agencies which are revenue-generating like airports and ports.
- In the transport sector, losses will include the following:
  - Urgent expenditures to re-establish traffic flows after transport assets have been affected like the cost of temporary Bailey-type bridges, detours, etc.
  - Higher cost of transport due to the use of alternative, longer and lower quality roads over the recovery and reconstruction period
  - Losses in revenue of the enterprises – public and private – that operate the transport services like bus companies, airlines, shipping lines, trains as well as airports and ports, among others.
  - The cost of dredging river channels to enable vessels to dock
  - Other unexpected expenditures that may arise due to the disaster like clearing of debris. Losses will take place during the entire period of recovery and reconstruction of the sector and may stretch even beyond the year that the disaster occurred. It is expressed in monetary value at current prices.

Table 103 Damages and Losses to water transport sector

Name of District:						
Assets	Damage Information					
	Event	Building Collapse/ Building fire/ Cyclone/ flood				
	Event Date					
	Totally Destroyed		Partially Damaged		Total Value of Damages	Average Time to Replace or Repair (Days)
	Number of Totally Destroyed	Average Replacement Cost (Rs)	Number of Partially Damaged	Average Replacement Cost (Rs)		
	A	B	C	D	E	F
Watercrafts						
Ships						
Passenger Ferries						
Others						
Ports						
Ports						
Others (Specify)						
Approach Channels (km)						
Approach Channels						
Others						
Structures						
Single floor						
2 to 5 floors						
6 to 10 floors						
Over 10 floors						
Other structures						
Equipment and Machinery						
Furniture						
Computers						
Others (Specify)						
Other Assets						
Others (Specify)						
Private Assets						
Ships						
Ferries						
Others						
TOTAL						

Types of Losses	Loss Information			
	Disaster Year	Year 1	Year 2	Total Estimated Losses (Rs.)
Foregone Income				
Cleaning up of Debris				
Higher Operating Costs				
Other Unexpected Expenses				
TOTAL				

Table 104 Damages and Losses to railways transport sector

Name of District:						
Assets	Damage Information					
	Event	Building Collapse/ Building fire/ Cyclone/ flood				
	Event Date					
	Totally Destroyed		Partially Damaged		Total Value of Damages	Average Time to Replace or Repair (Days)
	Number of Totally Destroyed	Average Replacement Cost (Rs)	Number of Partially Damaged	Average Replacement Cost (Rs)		
	A	B	C	D	E	F
Rolling Stock						
Locomotive						
Passenger Carriage						
Cargo Wagon						
Others Rolling Stock						
Tracks (km)						
Tracks						
Others (Specify)						
Structures						
Single floor						
2 to 5 floors						
6 to 10 floors						
Over 10 floors						
Other structures						
Equipment and Machinery						
Navigation Equipment						
Baggage Handling						
Security Equipment						
Others (Specify)						
Other Assets						
Others (Specify)						
TOTAL						

Types of Losses	Loss Information							
	Disaster Year		Year 1		Year 2		Total Estimated Losses (Rs.)	
	Public	Private	Public	Private	Public	Private	Public	Private
Foregone Income								
Cleaning up of Debris								
Higher Operating Costs								
Other Unexpected Expenses								
TOTAL								

2.8.4 Step -4 Summarizing of Damages and Losses in the State

Table 105 Summarizing of Damages in transport sector in the state

Name of District:						
Assets	Totally Destroyed		Partially Damaged		Total Value of Damages	Average Time to Replace or Repair (Days)
	Number of Totally Destroyed	Average Replacement Cost (Rs)	Number of Partially Damaged	Average Replacement Cost (Rs)		
	A	B	C	D	E	F
District 1:						
Land Transport						
Air Transport						
Water Transport						
Railway Transport						
Total						
District 2:						
Land Transport						
Air Transport						
Water Transport						
Railway Transport						
Total						
GRAND TOTAL						

Table 106 Summarizing of Losses in transport sector in the state

Name of State:									
Type of Assets	Estimated Reduction in the Value								Total Estimated Losses (Rs.)
	Within the Disaster Year				Losses beyond Disaster Year				
	Damages		Losses		Year 1		Year 2		
	Public	Private	Public	Private	Public	Private	Public	Private	
District 1:									
Land Transport									
Foregone Income									
Cleaning up of Debris									
Higher Operating Costs									
Other Unexpected Expenses									
Air Transport									
Foregone Income									
Cleaning up of Debris									
Higher Operating Costs									
Other Unexpected Expenses									
Water Transport									
Foregone Income									
Cleaning up of Debris									
Higher Operating Costs									
Other Unexpected Expenses									
Railway Transport									
Foregone Income									
Cleaning up of Debris									
Higher Operating Costs									
Other Unexpected Expenses									
Total									
District 2:									
Land Transport									
Foregone Income									
Cleaning up of Debris									
Higher Operating Costs									
Total									
Grand Total									

2.8.5 Step 5 - Estimation of Disaster Impacts

The assessment team should analyze all potential impacts of the damages and losses of the transport sector and must answer the following questions:

- What are the possible effects on the productivity, government services, on the people, etc. if transportation services are not restored immediately? Will people be able to access health and educational services? Will there be hardships and increased dangers in commuting for persons with disabilities, women, children and the elderly, etc.?
- Are there added transportation costs to families if they will have to travel using alternative routes?
- Will food supply be affected if transport services are not restored immediately? What will be the potential impacts to vulnerable groups (women, children, elderly, etc.) if food supply will be affected?
- Are there expected reductions in employment (whether temporary or permanent) if transportation services are not restored immediately?

Notes of filling Table 107:

- Severe impacts are very distinct and extensive change in the situation for more than 50% of the people in the sector, which will require outside assistance for more than 6 months to enable them to cope and recover.
- Moderate impacts are distinct changes in the situation affecting 20% to 50% of the people in the sector, which may require 3 to 6 months outside assistance to enable the people to cope and recover.
- Low impacts are distinct changes but less than 20% of the people are affected and may not be widespread or only in limited areas which may require less than 3 months of outside assistance before the people recover.
- The impacts can be briefly described under the column "Brief Description of Impacts". For example, a brief description of a severe "environment" can happen if toxic chemicals and materials used in mining are spilled due to the disaster; the "vulnerabilities" can be described as the natural hazards that may be caused by the damages to tunnels or open pit mines; while "employment" will refer to those who might lose employment in the sector.
- The impacts on women and children may be different from the general population. The assessment team must be able to observe any special issues or concerns that may affect women.

Table 107 Social Impacts of the Damages and Losses

Areas of Impacts	Expected Impacts						Brief description of Impacts
	General Population			Women and Children			
	Severe	Moderate	Low	Severe	Moderate	Low	
	A	B	C	D	E	F	G
Employment							
Environment							
Foreign currency earnings							
Vulnerabilities							
Others (Specify)							

2.8.6 Step 6 - Estimation of Recovery and Reconstruction Needs

2.8.6.1 Estimation of Recovery Needs

Recovery needs are intended to bring back normalcy in the sector as quickly as possible. Recovery activities should include those that will enable companies to resume their normal operations. Some of the possible recovery-related activities in the sector can include:

- Urgent restoration of at least minimum traffic flows through destroyed road sections and the acquisition and installation of Bailey-type bridges, in which cash-for-work schemes may play a very important role.
- Dredging of port and river navigation channels, to ensure a minimum of access and traffic flow after floods or other similar disasters.
- Urgent repairs of airports and the provision of vital needs like navigational aids and other safety-related equipment, among others.
- Procurement of important equipment and machinery needed for urgent repairs and restorations.
- Cash assistance for clearing of debris and for overtime pay, as necessary.

2.8.6.2 Estimation of Reconstruction Needs

Reconstruction needs are generally long-term in nature (3 years and more) and are intended to 'build back better' from the ruins of a disaster. It is to be noted that reconstruction activities should include both public as well as private facilities and may require different types of financing strategies. It is to be noted that since the companies in this sector are revenue-generating enterprises, financing their needs can come through soft-term credit schemes for the reconstruction and repair of their damaged assets. Such schemes can be accompanied by technical assistance for improved disaster resilient standards of construction. Some possible reconstruction related activities in the sector could include the following:

- Reconstruction and repair of public roads, bridges, airports, ports and land transport stations under a building-back-better strategy to ensure future disaster resilience through the adoption and enforcement of improved construction standards.
- Structural retro-fitting of undamaged or partially damaged transport facilities to improve or restore their structural integrity to mitigate disaster effects in the future.
- Relocation of vital transport facilities to safe areas, as necessary. In this case, the additional costs land acquisition, and basic services provision (water, sanitation, electricity, etc.) should be included.
- Soft-term credit for reconstruction and repair of private transport businesses. Such schemes can be accompanied by technical assistance for improved disaster resilient standards of construction.

2.8.7 Step 7 – Prioritization of Needs

Among the projects identified, relative priorities can be set in order to determine which among them are the more important. Based on the broad strategies for recovery, the assessment team should select the priority projects/activities among the identified needs.

The prioritization can be made by using a set of impact indicators and the level by which the projects can achieve said impacts. Examples of the criteria that can be used are the following, among others:

- Economic impact, which can be evaluated in terms of the relative cost to the government of not undertaking reconstruction or rehabilitation.
- Equity and social impact, which can be in terms of the number of beneficiaries who are poor and destitute and who could not afford to rebuild on their own without outside support.
- Sustainability, which can be in terms of the reduction of risks and vulnerability of the people and other economic assets to future disasters.

Table 108 Impacts of identified post disaster projects

Name of proposed project	Expected Impacts and their levels of impact on recovery								
	Economic Impact			Equity and social impact			Sustainability		
	High	Medium	Low	High	Medium	Low	High	Medium	Low
	A	B	C	D	E	F	G	H	I

Based on the prioritized recovery and reconstruction needs, a summary should be created by the assessment team enumerating the post disaster projects for the recovery and reconstruction. The identified needs should have a rough schedule of implementation outlining at the very least the activities, timing and budget required for all the programs and projects. The following techniques can be considered:

- Identify the specific projects according to their relative urgency or priority in relation to recovery.
- Plot the timeline of activities of all the projects, with the urgent ones on top, in a Gantt chart, with the corresponding funding requirement on an annual basis. This will assist the national government in programming the necessary funds over a certain time period, like on a quarterly or annual basis.
- Identify and include in the list of projects that need further feasibility studies, which may be funded by foreign grants.
- To the extent possible, a logical framework (log-frame) should be created for each of the project proposed for inclusion in the recovery plan. Log-frames are normally required by foreign donors to consider project proposals.

Table 109 Summary of recovery and reconstruction projects in the transport sector

Name of Specific project	Annual Needed Amount of Assistance (Rs.)			Total Needs (Rs.)
	Disaster Year	Year 1	Year 2	
	A	B	C	D
Recovery Projects				
a.				
b.				
c.				
Total				
Reconstruction Projects				
a.				
b.				
c.				
Total				
Grand Total				

Notes of filling Table 109:

- Project titles can be inserted under the column on recovery and reconstruction needs.
- Columns can be added to accommodate any additional reconstruction needs beyond Year 2.

2.8.8 Step 8 – Sector Report

With all the information gathered using the previous steps, a report can be drafted by the assessment team, which will provide the inputs for a particular sector in the overall recovery and reconstruction plan. The following format may be considered:

- Brief description of the sector in the disaster-affected areas.
- Damages in the sector by areas and by types of assets affected.
- Losses in the sector emphasizing the losses in income, increase in expenditures, estimated period before normalcy will be attained, etc.
- Impact on the livelihood, individual households, vulnerable groups and the consequences to the greater community if no assistance for recovery will be provided.
- Proposed strategies for recovery and reconstruction of the sector.
- Needs of the sector, by priority, and the draft schedule of implementation with the estimated funds required for each project over time.

The draft sector report should be submitted to the Gujarat State Disaster Management Authority/ Secretary (R&R) for consolidation.

References

- National Institute of Disaster Management. (n.d.). Post Disaster Needs Assessment Manual Volume I. Retrieved from https://nidm.gov.in/PDF/pubs/pdna_manual_vol1.pdf
- National Institute of Disaster Management. (n.d.). Post Disaster Needs Assessment Manual Volume I. Retrieved from https://nidm.gov.in/PDF/pubs/pdna_manual_vol2.pdf
- National Database for Emergency Database, Gujarat Specific. Retrived from: https://ndem.nrsc.gov.in/login.php

Learning Unit 2.9
Communication Sector

Brief Description of the Learning Unit

The second learning unit is designed to guide learners through conducting Post Disaster Needs Assessments (PDNA) specifically for the communication sector in Gujarat. The session will provide a comprehensive guide detailing eight crucial steps that ensure the successful execution of PDNA. Throughout the training, participants will receive detailed instructions and best practices for each of the eight steps, ensuring they thoroughly understand the entire PDNA process. This focused approach will address the unique challenges and needs of assessing related impacts and recovery requirements. By the end of this session, participants will be equipped with the necessary knowledge and skills to effectively conduct PDNA for communication sector, ensuring comprehensive and reliable assessments that can inform recovery and reconstruction efforts in Gujarat.

Learning Objectives

- To introduce general step in conducting a PDNA.
- To understand required baseline information for each sector and its importance.
- To understand the requirements of field assessment.
- To understand assessment of disaster effects and impacts on each sector.
- To determine and prioritize the recovery needs.
- To understand the general guidelines to consider while compiling the sector report

Duration: 25 minutes

Methodology

- Lecture-based learning
- Case study-based learning
- Discussion
- Q&A session

Detailed Description

3.9.1 Step 1 - Recommended assessment team

The composition of the sector assessment team may vary by the type of disaster and the extent of the likely damage and production flow changes.

Table 110 Recommended assessment team for communication sector

Organization and Personnel	Role in the Sector Assessment
State Personnel from: • **Directorate of ICT & e-Governance** • **Gujarat State Wide Area Network** • **Gujarat Informatics Limited** • **Local departments and offices in the disaster-affected area:** • Civil Engineer (Communications Infrastructure) • Electronic Engineer • Electrical Engineer • Mechanical Engineer • Communications Infrastructure Economist • Goods/ Equipment Buyer	Lead and coordinate

Personnel from:
• **Ministry of Ministry of Communications and Information Technology**
  ○ Civil Engineer (Communications Infrastructure)
  ○ Electronic Engineer
  ○ Electrical Engineer
  ○ Mechanical Engineer
  ○ Communications Infrastructure Economist
  ○ Goods/ Equipment Buyer
	Provide baseline information and facilitate the field assessment of damages and losses

Development partners (if active in the sector)	Participate and provide technical advice

3.9.2 Step 2 - Baseline Information and Sources

Baseline information must be compiled before the field assessment or, if possible, prior to the occurrence of disaster. The baseline data should be validated before the field visit to serve as the basis for the estimation of damages and losses for the disaster-affected area/s. This data can be compiled at the State/Region office or at the District levels. The tables below can be used for the baseline information.

Table 111 Baseline information for communication companies

Name of District:						
Name of Company	**Ownership**		**Services Provided**			
	Public	**Private**	**Postal Services**	**Land Telecommunication**	**Wireless Telecommunication**	**Other Systems**
Company 1						
Company 2						
Company N						
Total						

Notes of filling Table 111:

- "Postal services" includes all types of postal services by land, water, and air.
- "Land telecommunication" refers to cabled services such as terrestrial TV, landline telephones, cable internet etc.
- "Wireless telecommunication" refers to wireless services such as mobile telephone, radio, satellite internet, satellite TV etc.
- "Other Systems" refers to specific satellite stations etc.
- The names of all the companies operating in the area should all be included.
- For "Services provided", this only requires a 'tick' in the box, not details of the service.
- If the companies cover more than one district or city, they should only be assessed as part of the district where their main offices are located to avoid double counting.
- If the is a joint venture between the government and a private corporation, it can be considered a public for the purpose of PDNA.

Table 112 Sources of information for collecting baseline data

1	Ministry of Statistics and Programme Implementation	http://www.mospi.gov.in
2	National Institution for Transforming India	http://niti.gov.in
3	The Registrar General & Census Commissioner, India	http://censusindia.gov.in
4	Department of Telecommunications	http://www.dot.gov.in
5	Telecom Regulatory Authority of India	http://www.trai.gov.in
6	Open Government Data (OGD) Platform India	http://dahd.nic.in
7	India Brand Equity Foundation	http://fsi.gov.in
8	Directorate of ICT & e-Governance Department of Science & Technology	https://directorit.gujarat.gov.in/
9	Gujarat State Wide Area Network (GSWAN)	https://gswan.gujarat.gov.in/
10	Gujarat Informatics Limited (GIL)	http://gil.gujarat.gov.in/

3.9.3 Step 3 - Estimation of Damages and Losses (Disaster Effects)

- With the baseline information, field assessment should be undertaken in the affected Districts after a disaster. The assessment team from the State must work with their local counterparts in the districts to ensure that the estimates for the damages and losses in the sector are accurate to the extent possible.
- Direct interviews with private contractors or government officials involved in the construction and repair of facilities can also be conducted during the field trip in order to validate unit costs of repair and reconstruction (which is already contained in the baseline data).
- It should be noted that since there is a possibility that only one company provides the service to a number of Districts and Talukas; caution should be exercised to avoid double counting.
- It is recommended that the assessment of damages and losses of the company should be accounted for in the district where the main office of the company is located. However, if the main office is located outside the disaster area, the assessment team must account for the damages and losses of the company with an indication as to where such damages and losses occurred.

- Repair and replacement costs should be estimated for the damages of the sector. The time needed to reconstruct the damages should also be estimated.
- During the field visits to the disaster sites, the assessment team should interview the officers of the company/ies to ascertain the extent and value of the damages and the estimated period before operations can be fully restored to the pre-disaster level.
- To assess the value of damages and losses the assessment team can arrange a meeting with the owners of trading and services companies and require them to fill out the questionnaire below; consult with representatives from chambers of commerce and other organizations of specific businesses; and consult with representatives of the informal sector in the trade and services sectors.

Table 113 Damages and Losses to communication sector

Name of District:						
Company Name:						
Services Provided: Postal services ( ) Land Telecommunication ( ) Wireless telecommunication ( ) Other systems ( ) Others (specify)_____						
Ownership: Public ( ) Private ( )						
Employees: Male – Female –						
Number of Clients:						
Assets	**Damage Information**					
	Event	**Building Collapse/ Building fire/ Cyclone/ flood**				
	Event Date					
	Totally Destroyed		**Partially Damaged**		**Total Value of Damages**	**Average Time to Replace or Repair (Days)**
	Number of Totally Destroyed	**Average Replacement Cost (Rs)**	**Number of Partially Damaged**	**Average Replacement Cost (Rs)**		
	A	**B**	**C**	**D**	**E**	**F**
Structures						
Towers						
Office buildings						
Others						
Equipment						
Antennae						
Computers						
Others						
Machinery						
Generators						
Others						
Vehicles						
Service vehicles						
Others						
Others assets						
others						
TOTAL						

Types of Losses	Loss Information			
	Disaster Year	Year 1	Year 2	Total Estimated Losses (Rs.)
Foregone Income				
Cleaning up of Debris				
Higher Operating Costs				
Other Unexpected Expenses				
TOTAL				

Notes of filling Table 113:

- 'Average Replacement Cost' will be the average pre-disaster value of the structures and assets that were totally destroyed while 'average repair cost' will be the estimated cost of repair of the partially damaged assets.
- In formula, the total damages of the companies surveyed will be
  (Column E) = (Column A) x (Column B) + (Column C) x (Column D)
- Years 1 to 2 are the years after the disaster.
- Losses in the sector will include the following:
  1. Foregone income after the structures, equipment and machineries of factories were damaged or destroyed by disasters.
  2. Additional expenses to clean and rehabilitate the factory site after destruction.
  3. Possible higher cost of operation that may arise after the disaster, such as payment of higher rates of electricity from alternative sources, or acquiring raw materials from alternative sources, or renting temporary premises while repairing or rebuilding the original premises
  4. Additional expenses to clean up the debris.
- In this sector losses occur until full capacity and supply have been re-established in all system components and user demand (in all sectors) has been restored to pre-disaster levels. Losses are expressed in monetary value at current values. It should be noted that it is possible for this sector to experience losses even if they have only minimal damages. This can occur if power supply is affected which can cause the stoppage of telecommunications operations.

3.9.4 Step – 4 Summarizing of Damages and Losses in the State

Table 114 Summarizing of Damages and Losses in communication sector

Name of State:									
Totao number of clients affected:									
Total number of employees affected in the communication sector: Male- Female-									
Assets	Estimated Reduction in the Value of Production								Total Estimated Losses (Rs.)
	Within the Disaster Year				Losses beyond Disaster Year				
	Damages		Losses		Year 1		Year 2		
	Public	Private	Public	Private	Public	Private	Public	Private	
District 1:									
Company 1									
Company 2									
Company N									
Total									
District 2:									
Company 1									
Company 2									
Company N									
Total									
Grand Total									

3.9.5 Step 5 - Estimation of Disaster Impacts

The assessment team should analyse all potential impacts of the damages and losses of the communication sector and must answer the following questions:

- Will there be employment losses for the telecommunications companies?
- What are the potential adverse impacts to the production and employment of other industries if telecommunication services are not restored?
- What are the possible impacts to government services?
- A re there local traditional modes of communications that were adversely affected? How will they affect the local communities?

Table 115 Social Impacts of the Damages and Losses to the communication sector

Areas of Impacts	Expected Impacts						Brief description of Impacts
	General Population			Women and Children			
	Severe	Moderate	Low	Severe	Moderate	Low	
	A	B	C	D	E	F	G
Employment							
Environment							
Foreign currency earnings							
Vulnerabilities							
Others (Specify)							

Notes of filling Table 115:

- Severe impacts are very distinct and extensive change in the situation for more than 50% of the people in the sector, which will require outside assistance for more than 6 months to enable them to cope and recover.
- Moderate impacts are distinct changes in the situation affecting 20% to 50% of the people in the sector, which may require 3 to 6 months outside assistance to enable the people to cope and recover.
- Low impacts are distinct changes but less than 20% of the people are affected and may not be widespread or only in limited areas which may require less than 3 months of outside assistance before the people recover.
- The impacts can be briefly described under the column "Brief Description of Impacts". For example, a brief description of a severe "environment" can happen if toxic chemicals and materials used in mining are spilled due to the disaster; the "vulnerabilities" can be described as the natural hazards that may be caused by the damages to tunnels or open pit mines; while "employment" will refer to those who might lose employment in the sector.
- The impacts on women and children may be different from the general population. The assessment team must be able to observe any special issues or concerns that may affect women.

3.9.6 Step 6 - Estimation of Recovery and Reconstruction Needs

2.9.6.1 Estimation of Recovery Needs

Recovery needs are intended to bring back normalcy in the sector as quickly as possible. Recovery activities should include those that will enable companies to resume their normal operations. Some of the possible recovery-related activities in the sector can include:

- Repairs of the damages to structures, which are normally affected by strong winds and floods.
- Emergency procurement of vital equipment necessary to normalize operations.
- Clearing of debris that may have affected the sector.
- Emergency credit for re-capitalization.

2.9.6.2 Estimation of Reconstruction Needs

Reconstruction needs are generally long-term in nature (3 years and more) and are intended to 'build back better' from the ruins of a disaster. It is to be noted that reconstruction activities should include both public as well as private facilities and may require different types of financing strategies. It is to be noted that since the companies in this sector are revenue-generating enterprises, financing their needs can come through soft-term credit schemes for the reconstruction and repair of their damaged assets. Such schemes can be accompanied by technical assistance for improved disaster resilient standards of construction. Some possible reconstruction related activities in the sector could include the following:

- Soft-term credit for the replacement or reconstruction of affected structures under a building back better strategy to ensure future disaster resilience through the adoption and enforcement of improved construction standards
- Procurement of equipment and machinery;
- Structural retro-fitting of undamaged or partially damaged structures so that they are not affected by disaster event in the future
- Relocation of facilities to safer areas
- Other mitigation measures such as construction of support infrastructure to prevent serious landslides and floods to energy facilities.

3.9.7 Step 7 – Prioritization of Needs

Among the projects identified, relative priorities can be set in order to determine which among them are the more important. Based on the broad strategies for recovery, the assessment team should select the priority projects/activities among the identified needs.
The prioritization can be made by using a set of impact indicators and the level by which the projects can achieve said impacts. Examples of the criteria that can be used are the following, among others:

- Economic impact, which can be evaluated in terms of the relative cost to the government of not undertaking reconstruction or rehabilitation.
- Equity and social impact, which can be in terms of the number of beneficiaries who are poor and destitute and who could not afford to rebuild on their own without outside support.
- Sustainability, which can be in terms of the reduction of risks and vulnerability of the people and other economic assets to future disasters.

Table 116 Impacts of identified post disaster projects

Name of proposed project	Expected Impacts and their levels of impact on recovery								
	Economic Impact			Equity and social impact			Sustainability		
	High	Medium	Low	High	Medium	Low	High	Medium	Low
	A	B	C	D	E	F	G	H	I

Based on the prioritized recovery and reconstruction needs, a summary should be created by the assessment team enumerating the post disaster projects for the recovery and reconstruction. The identified needs should have a rough schedule of implementation outlining at the very least the activities, timing and budget required for all the programs and projects. The following techniques can be considered:

- Identify the specific projects according to their relative urgency or priority in relation to recovery.
- Plot the timeline of activities of all the projects, with the urgent ones on top, in a Gantt chart, with the corresponding funding requirement on an annual basis. This will assist the national government in programming the necessary funds over a certain time period, like on a quarterly or annual basis.
- Identify and include in the list of projects that need further feasibility studies, which may be funded by foreign grants.
- To the extent possible, a logical framework (log-frame) should be created for each of the project proposed for inclusion in the recovery plan. Log-frames are normally required by foreign donors to consider project proposals.

Table 117 Summary of recovery and reconstruction projects in the communication sector

Name of Specific project	Annual Needed Amount of Assistance (Rs.)						Total Needs (Rs.)
	Disaster Year	Year 1	Year 2	Year 3	Year 4	Year 5	
	A	B	C	D	E	F	G
Recovery Projects							
1.							
2.							
Total							
Reconstruction Projects							
1.							
2.							
3.							
Total							
Grand Total							

Notes of filling Table 117:
- Project titles can be inserted under the column on recovery and reconstruction needs.

3.9.8 Step 8 – Sector Report

With all the information gathered using the previous steps, a report can be drafted by the assessment team, which will provide the inputs for a particular sector in the overall recovery and reconstruction plan. The following format may be considered:

- Brief description of the sector in the disaster-affected areas.
- Damages in the sector by areas and by types of assets affected.
- Losses in the sector emphasizing the losses in income, increase in expenditures, estimated period before normalcy will be attained, etc.

- Impact on the livelihood, individual households, vulnerable groups and the consequences to the greater community if no assistance for recovery will be provided.
- Proposed strategies for recovery and reconstruction of the sector.
- Needs of the sector, by priority, and the draft schedule of implementation with the estimated funds required for each project over time.

The draft sector report should be submitted to the Gujarat State Disaster Management Authority/ Secretary (R&R) for consolidation.

References

- National Institute of Disaster Management. (n.d.). Post Disaster Needs Assessment Manual Volume I. Retrieved from https://nidm.gov.in/PDF/pubs/pdna_manual_vol1.pdf
- National Institute of Disaster Management. (n.d.). Post Disaster Needs Assessment Manual Volume I. Retrieved from https://nidm.gov.in/PDF/pubs/pdna_manual_vol2.pdf
- National Database for Emergency Database, Gujarat Specific. Retrived from: https://ndem.nrsc.gov.in/login.php

Technical Session 2c
Sector-wise Standard Procedures for Undertaking PDNA (Part 3 Social Sectors)

Introduction, Overview & Perspectives

This technical session is designed to guide learners through the process of conducting Post Disaster Needs Assessments (PDNA) for social sectors in the state of Gujarat. The session will provide a comprehensive guide, detailing eight crucial steps that ensure the successful execution of PDNA. These steps encompass the entire process, starting from the formation of the recommended assessment team responsible for conducting the PDNA, to the final stage of compiling the sector report. Throughout the training, participants will receive detailed instructions and best practices for each of the eight steps, ensuring they have a thorough understanding of the entire PDNA process.

The primary objectives of this technical session

- To introduce general step in conducting a PDNA.
- To understand required baseline information for each sector and its importance.
- To understand the requirements of field assessment.
- To understand assessment of disaster effects and impacts on each sector.
- To determine and prioritize the recovery needs.
- To understand the general guidelines to consider while compiling the sector report.

Duration: 125 minutes

Methodology

- Lecture-based learning
- Case study-based learning
- Discussion
- Q&A session

Trainer's Note

The entire technical session is aimed to help trainees to apply the concepts learned in the previous session. There are total of five social sectors including environment, and each sector has different guidelines to consider. Trainees should seek understanding through learners' active participation in discussions and question & answer sessions.

The learning units of this technical session

Learning Unit 2.10: Housing Sector
- 2.10.1: Step 1 -Recommended assessment team and sub-sectors
- 2.10.2: Step 2 - Baseline information and sources
- 2.10.3: Step 3 - Estimation of damages and losses (disaster effects)
- 2.10.4: Step 4 - Summarization of damages and losses in the state
- 2.10.5: Step 5 - Estimation of disaster impacts
- 2.10.6: Step 6 - Estimation of recovery and reconstruction needs
- 2.10.7: Step 7 - Prioritization of Needs
- 2.10.8: Step 8 - Sector Report

Learning Unit 2.11: Education Sector
- 2.11.1: Step 1 -Recommended assessment team and sub-sectors
- 2.11.2: Step 2 - Baseline information and sources
- 2.11.3: Step 3 - Estimation of damages and losses (disaster effects)
- 2.11.4: Step 4 - Summarization of damages and losses in the state
- 2.11.5: Step 5 - Estimation of disaster impacts
- 2.11.6: Step 6 - Estimation of recovery and reconstruction needs
- 2.11.7: Step 7 - Prioritization of Needs
- 2.11.8: Step 8 - Sector Report

Learning Unit 2.12: Health Sector
- 2.12.1: Step 1 -Recommended assessment team and sub-sectors
- 2.12.2: Step 2 - Baseline information and sources
- 2.12.3: Step 3 - Estimation of damages and losses (disaster effects)
- 2.12.4: Step 4 - Summarization of damages and losses in the state
- 2.12.5: Step 5 - Estimation of disaster impacts
- 2.12.6: Step 6 - Estimation of recovery and reconstruction needs
- 2.12.7: Step 7 - Prioritization of Needs
- 2.12.8: Step 8 - Sector Report

Learning Unit 2.13: Culture and Heritage Sector
- 2.13.1: Step 1 -Recommended assessment team and sub-sectors
- 2.13.2: Step 2 - Baseline information and sources
- 2.13.3: Step 3 - Estimation of damages and losses (disaster effects)
- 2.13.4: Step 4 - Summarization of damages and losses in the state
- 2.13.5: Step 5 - Estimation of disaster impacts
- 2.13.6: Step 6 - Estimation of recovery and reconstruction needs
- 2.13.7: Step 7 - Prioritization of Needs
- 2.13.8: Step 8 - Sector Report

Learning Unit 2.14: Environment Sector
- 2.14.1: Step 1 -Recommended assessment team and sub-sectors
- 2.14.2: Step 2 - Baseline information and sources
- 2.14.3: Step 3 - Estimation of damages and losses (disaster effects)
- 2.14.4: Step 4 - Summarization of damages and losses in the state
- 2.14.5: Step 5 - Estimation of disaster impacts
- 2.14.6: Step 6 - Estimation of recovery and reconstruction needs
- 2.14.7: Step 7 - Prioritization of Needs
- 2.14.8: Step 8 - Sector Report

Session

Content	Trainer's Note	Time
Housing Sector	Focus in explaining the eight steps and elaborate the methodology and calculation at each step. Explain guidelines to prepare the sector report.	25 min
Education Sector		25 min
Health Sector		25 min
Culture and Heritage Sector		25 min
Environment Sector		25 min

Learning Unit 2.10
Housing Sector

Brief Description of the Learning Unit

The second learning unit is designed to guide learners through conducting Post Disaster Needs Assessments (PDNA) specifically for the housing sector in Gujarat. The session will provide a comprehensive guide detailing eight crucial steps that ensure the successful execution of PDNA. Throughout the training, participants will receive detailed instructions and best practices for each of the eight steps, ensuring they thoroughly understand the entire PDNA process. This focused approach will address the unique challenges and needs of assessing related impacts and recovery requirements. By the end of this session, participants will be equipped with the necessary knowledge and skills to effectively conduct PDNA for housing sector, ensuring comprehensive and reliable assessments that can inform recovery and reconstruction efforts in Gujarat.

Learning Objectives

- To introduce general step in conducting a PDNA.
- To understand required baseline information for each sector and its importance.
- To understand the requirements of field assessment.
- To understand assessment of disaster effects and impacts on each sector.
- To determine and prioritize the recovery needs.
- To understand the general guidelines to consider while compiling the sector report

Duration: 25 minutes

Methodology

- Lecture-based learning
- Case study-based learning
- Discussion
- Q&A session

Detailed Description

2.10.1 Step 1 - Recommended assessment team

The composition of the sector assessment team may vary by the type of disaster and the extent of the likely damage and production flow changes.

Table 118 Recommended assessment team for housing sector

Organization and Personnel	Role in the Sector Assessment

State Personnel from:
• **Town Planning & Valuation Department**
• **Municipal Corporations (8)**
• **Commissioner of Municipalities Administration**
• **Urban Development Authorities (15)**
• **Area Development Authorities (10)**
• **Rural Development Department**
• **Gujarat Housing Board**
• **Local departments and offices in the disaster-affected area:**
  ○ Civil Engineer (Housing)
  ○ Housing Construction Specialist
  ○ Land Administration Specialist
  ○ Quantity Surveyor
  ○ Goods/ Equipment Buyer
	Lead and coordinate

Personnel from:
• **Ministry of Housing and Urban Poverty Alleviation**
• **Building Materials and Technology Promotion Council (BMTPC)**
• **National Building Organization (NBO)**
• **Indian Tourism Development Specialist**
  ○ Civil Engineer (Housing)
  ○ Housing Construction Specialist
  ○ Land Administration Specialist
  ○ Quantity Surveyor
  ○ Goods/ Equipment Buyer
	Provide baseline information and facilitate the field assessment of damages and losses

Development partners (if active in the sector)	Participate and provide technical advice

2.10.2 Step 2 - Baseline Information and Sources

Baseline information must be compiled before the field assessment or, if possible, prior to the occurrence of disaster. The baseline data should be validated before the field visit to serve as the basis for the estimation of damages and losses for the disaster-affected area/s. This data can be compiled at the State/Region office or at the District levels. The tables below can be used for the baseline information.

Table 119 Baseline information of housing types in district

Name of District:							
Housing Typology		**Number of Houses**	**Number of Houses for Rent**	**Household Head/ Ownership (%)**		**Average number of Occupants**	
Types	**Description**			**Female**	**Male**	**Female**	**Male**
Type 1	**Grass/Thatch/Bamboo etc.**						
Type 2	**Plastic/Polythene**						
Type 3	**Mud/Unburnt Brick**						
Type 4	**Wood**						
Type 5	**Stone not Packed with Mortar**						
Type 6	**Stone Packed with Mortar**						
Type 7	**G.I./Metal/Asbestos Sheets**						
Type 8	**Burnt Brick**						
Type 9	**Concrete**						
Type 10	**Others**						
Total							

Notes of filling Table 119:

- Housing types will vary from state to state. Each concerned state should indicate the common types of dwellings or houses existing in the districts. These types should include the lowest types of dwellings up to the high-end types like condominiums.
- The 'Houses for rent' refers to the number of houses (as part of the total number) that are rented out.
- The 'Average number of occupants' refers to the number of people who live in each type of housing unit by sex.
- Others will refer to any type of housing unit in a district which is not included in the list.

Notes of filling Table 120:

- The 'average repair cost' refers the value (in Rs) normally spent to repair the various parts of the housing units. 'Others' may include the average repair cost of latrines (if separate from the house), electrical and plumbing, etc. which should can based on previous costs.

Table 120 Baseline information of related costs for various housing types in district

Name of District:										
Particulars	**Value (in Rs) of Various Types of Housing**									
	Type 1	**Type 2**	**Type 3**	**Type 4**	**Type 5**	**Type 6**	**Type 7**	**Type 8**	**Type 9**	**Type 10**
Average Replacement Cost of:										
Structure										
Roofing per Square Meter										
Wall per Square Meter										
Flooring per Square Meter										
Electrical Installation										
Plumbing										
Average Repair Cost of:										
Structure										
Roofing per Square Meter										
Wall per Square Meter										
Flooring per Square Meter										
Electrical Installation										
Plumbing										
Average Contents / Rent										
Average Value of Contents										
Average Rent Per Month										
Construction / Repair Time (in days):										
Average Construction Period										
Average Repair Period										

Table 121 Sources of information for collecting baseline data

1	Ministry of Statistics and Programme Implementation	http://www.mospi.gov.in
2	National Institution for Transforming India	http://niti.gov.in
3	The Registrar General & Census Commissioner, India	http://censusindia.gov.in
4	Ministry of Housing and Urban Poverty Alleviation	http://www.mhupa.gov.in
5	Make in India Initiatives	http://www.makeinindia.com
6	Open Government Data (OGD) Platform India	http://dahd.nic.in
7	Housing Info India	http://www.housingindia.info
8	Municipal Corporations (Eight)	https://communi.gujarat.gov.in/en/list-municipalities
9	Town Planning & Valuation Department	https://udd.gujarat.gov.in/ctp.php
10	Commissioner of Municipalities Administration	https://udd.gujarat.gov.in/dom.php
11	Urban Development Authorities	https://udd.gujarat.gov.in/UrbanDevelopment.php
12	Area Development Authorities	https://udd.gujarat.gov.in/AreaDevelopment.php
13	Municipal Corporations	https://udd.gujarat.gov.in/corporations.php
14	Gujarat Housing Board	https://udd.gujarat.gov.in/ghb.php

2.10.3 Step 3 - Estimation of Damages and Losses (Disaster Effects)

- With the baseline information, field assessment should be undertaken in the affected Districts after a disaster. The assessment team from the State must work with their local counterparts in the districts to ensure that the estimates for the damages and losses in the sector are accurate to the extent possible.
- Direct interviews with private contractors or government officials involved in the construction and repair of facilities can also be conducted during the field trip in order to validate unit costs of repair and reconstruction (which is already contained in the baseline data).
- The post disaster assessment of housing units should be done on a per District basis, which can later be totalled to create a State assessment. This can be done by undertaking the following:
    - Counting broadly the number of houses damages according to type;
    - General assessment of the parts of the houses which were damaged like the roof, walls, fences, electrical installations, plumbing, etc.

Table 122 Damages and Losses to housing sector

Name of District:									
Assets	**Damage Information**								
	Event	**Building Collapse/ Building fire/ Cyclone/ flood**							
	Event Date								
	Totally Destroyed				**Partially Damaged**				**Grand total**
	Quantity	**Average value of house replacement (Rs.)**	**Average value of house contents destroyed (Rs)**	**Total**	**Quantity**	**Average value of house replacement (Rs.)**	**Average value of house contents destroyed (Rs)**	**Total**	
	A	**B**	**C**	**D**	**E**	**F**	**G**	**H**	**I**
Private Housing									
Type 1									
Type 2									
Type 3									
Type 4									
Type 5									
Type 6									
Type 7									
Type 8									
Type 9									
Type 10									
TOTAL									
Government Housing									
Type 1									
Type 2									
Type 3									

Type 4									
Type 5									
Type 6									
Type 7									
Type 8									
Type 9									
Type 10									
TOTAL									

Loss Information	
Types of Losses	**Total Estimated Losses (Rs.)**
Private Housing	
Foregone Income	
Cleaning up of Debris	
Higher Operating Costs	
Other Unexpected Expenses	
TOTAL	
Private Housing	
Foregone Income	
Cleaning up of Debris	
Higher Operating Costs	
Other Unexpected Expenses	
TOTAL	

Notes of filling Table 122:

- 'Average The values in the baseline information should be used in estimating damages. For example, if 20 square meters of the roof are damaged, the repair cost will be the cost of roofing per square meter multiplied by 20 square meters. On the other hand, if the whole structure is totally destroyed, the value of damage will be its replacement cost at post disaster prices.
- The total value of damages from totally destroyed (or partially destroyed) houses will be the quantity of totally destroyed (or partially destroyed) houses multiplied by the average replacement cost (or average repair cost) plus the value of the destroyed (or damaged) house contents. The values for the average replacement and repair costs are in the baseline information.
- The total damages **(Column I) = Column D + Column H**, where:
  Column D = (Column A x Column B) + (Column A x Column C)
  Column H = (Column E x Column F) + (Column E x Column G)
- For the losses, foregone income will be losses from the non-payment of rent for the houses that were destroyed. These can be derived by estimating the average rent of houses multiplied by the number of houses for rent that were damaged or unusable after the disaster multiplied by the number of months before they can be used and rented out again.
- The cleaning up of debris is usually done by household owners, especially after flooding. The cost of government clearing operations outside the houses should not be included here.

2.10.4Step – 4 Summarizing of Damages and Losses in the State

Table 123 Summarizing of Damages and Losses in housing sector

Name of State:							
Total number of employees affected in the housing sector: Male- Female-							
Assets	Types of Damages to Houses				Total Damages (Rs.)		Total Losses (Rs.)
	Totally Destroyed		Partially Destroyed				
	Quantity	Total Value (Rs.)	Quantity	Total Value (Rs.)			
District 1:							
Private Housing							
Public (Government Housing)							
Total							
District N:							
Private Housing							
Public (Government Housing)							
Total							
Grand Total							

2.10.5 Step 5 - Estimation of Disaster Impacts

The assessment team should analyze all potential impacts of the damages and losses of the housing sector and must answer the following questions:

- What are the possible impacts on the safety of the population who lost their houses especially the vulnerable groups like women in general, special groups like pregnant women, lactating mothers, children, the elderly, indigenous people, etc.
- What are the potential vulnerabilities of the people who lost their houses?
- Are there additional costs to families if they have to stay in temporary shelters or rent temporary houses?
- What will be the impact on employment? Are people able to go to work if their houses are damaged or destroyed?

Table 124 Social Impacts of the Damages and Losses to the housing Sector

Areas of Impacts	Expected Impacts						Brief description of Impacts
	General Population			Women and Children			
	Severe	Moderate	Low	Severe	Moderate	Low	
	A	B	C	D	E	F	G
Employment							
Livelihoods							
Foreign currency earnings							
Culture							
Others (Specify)							

Notes of filling Table 124:

- Severe impacts are very distinct and extensive change in the situation for more than 50% of the people in the sector, which will require outside assistance for more than 6 months to enable them to cope and recover.
- Moderate impacts are distinct changes in the situation affecting 20% to 50% of the people in the sector, which may require 3 to 6 months outside assistance to enable the people to cope and recover.
- Low impacts are distinct changes but less than 20% of the people are affected and may not be widespread or only in limited areas which may require less than 3 months of outside assistance before the people recover.
- The impacts can be briefly described under the column "Brief Description of Impacts". For example, a brief description of a severe "environment" can happen if toxic chemicals and materials used in mining are spilled due to the disaster; the "vulnerabilities" can be described as the natural hazards that may be caused by the damages to tunnels or open pit mines; while "employment" will refer to those who might lose employment in the sector.
- The impacts on women and children may be different from the general population. The assessment team must be able to observe any special issues or concerns that may affect women.

2.10.6 Step 6 - Estimation of Recovery and Reconstruction Needs

2.10.6.1 Estimation of Recovery Needs

Recovery needs are intended to bring back normalcy in the sector as quickly as possible. Recovery activities should include those that will enable companies to resume their normal operations. Some of the possible recovery-related activities in the sector can include:

- Food-for-work or a combination of cash-for-work to rehabilitate/reconstruct damaged houses.
- Direct subsidy on housing materials especially to those who are the poorest.
- Setting up of temporary housing in either alternative suitable building facilities or in tents, until the destroyed houses are rebuilt.
- Additional operation budget over and above the regular government appropriations for the sector required to finance additional personnel or to pay overtime to existing personnel.
- Provision of basic household utensils that may have been destroyed during the disaster.
- Additional budget to preventing and control the possible occurrence of violence in evacuation centres.
- Credit programs for housing repairs

2.10.6.2 Estimation of Reconstruction Needs

Reconstruction needs are generally long-term in nature (3 years and more) and are intended to 'build back better' from the ruins of a disaster. It is to be noted that reconstruction activities should include both public as well as private facilities and may require different types of financing strategies. It is to be noted that since the companies in this sector are revenue-generating enterprises, financing their needs can come through soft-term credit schemes for the reconstruction and repair of their damaged assets. Such schemes can be accompanied by

technical assistance for improved disaster resilient standards of construction. Some possible reconstruction related activities in the sector could include the following:

- Relocation of housing areas to safe areas, as necessary. In this case, the additional costs land acquisition, and basic services provision (water, sanitation, electricity, etc.) should be included.
- Assistance in the reconstruction and repair of housing structures under a building-back-better strategy to ensure future disaster resilience through the adoption and enforcement of improved construction standards.
- Structural retro-fitting of undamaged or partially damaged structures so that they are not affected by disaster event in the future.
- Soft-term credit for reconstruction and repair of housing units. Such schemes can be accompanied by technical assistance for improved disaster resilient standards of construction.
- Other mitigation measures such as construction of support infrastructure to prevent serious landslides and floods to housing units.

2.10.7 Step 7 – Prioritization of Needs

Among the projects identified, relative priorities can be set in order to determine which among them are the more important. Based on the broad strategies for recovery, the assessment team should select the priority projects/activities among the identified needs.

The prioritization can be made by using a set of impact indicators and the level by which the projects can achieve said impacts. Examples of the criteria that can be used are the following, among others:

- Economic impact, which can be evaluated in terms of the relative cost to the government of not undertaking reconstruction or rehabilitation.
- Equity and social impact, which can be in terms of the number of beneficiaries who are poor and destitute and who could not afford to rebuild on their own without outside support.
- Sustainability, which can be in terms of the reduction of risks and vulnerability of the people and other economic assets to future disasters.

Table 125 Impacts of identified post disaster projects

Name of proposed project	Expected Impacts and their levels of impact on recovery								
	Economic Impact			Equity and social impact			Sustainability		
	High	Medium	Low	High	Medium	Low	High	Medium	Low
	A	B	C	D	E	F	G	H	I

Based on the prioritized recovery and reconstruction needs, a summary should be created by the assessment team enumerating the post disaster projects for the recovery and reconstruction. The identified needs should have a rough schedule of implementation outlining at the very least the activities, timing and budget required for all the programs and projects. The following techniques can be considered:

- Identify the specific projects according to their relative urgency or priority in relation to recovery.
- Plot the timeline of activities of all the projects, with the urgent ones on top, in a Gantt chart, with the corresponding funding requirement on an annual basis. This will assist the national government in programming the necessary funds over a certain time period, like on a quarterly or annual basis.
- Identify and include in the list of projects that need further feasibility studies, which may be funded by foreign grants.
- To the extent possible, a logical framework (log-frame) should be created for each of the project proposed for inclusion in the recovery plan. Log-frames are normally required by foreign donors to consider project proposals.

Table 126 Summary of recovery and reconstruction projects in the housing sector

Name of Specific project	Annual Needed Amount of Assistance (Rs.)						Total Needs (Rs.)
	Disaster Year	Year 1	Year 2	Year 3	Year 4	Year 5	
	A	B	C	D	E	F	G
Recovery Projects							
a.							
b.							
c.							
Total							
Reconstruction Projects							
a.							
b.							
c.							
Total							
Grand Total							

Notes of filling Table 126:

- Project titles can be inserted under the column on recovery and reconstruction needs.
- Columns can be added to accommodate any additional reconstruction needs beyond Year 5.

2.10.8 Step 8 – Sector Report

With all the information gathered using the previous steps, a report can be drafted by the assessment team, which will provide the inputs for a particular sector in the overall recovery and reconstruction plan. The following format may be considered:

- Brief description of the sector in the disaster-affected areas.
- Damages in the sector by areas and by types of assets affected.

- Losses in the sector emphasizing the losses in income, increase in expenditures, estimated period before normalcy will be attained, etc.
- Impact on the livelihood, individual households, vulnerable groups and the consequences to the greater community if no assistance for recovery will be provided.
- Proposed strategies for recovery and reconstruction of the sector.
- Needs of the sector, by priority, and the draft schedule of implementation with the estimated funds required for each project over time.

The draft sector report should be submitted to the Gujarat State Disaster Management Authority/ Secretary (R&R) for consolidation.

References

- National Institute of Disaster Management. (n.d.). Post Disaster Needs Assessment Manual Volume I. Retrieved from https://nidm.gov.in/PDF/pubs/pdna_manual_vol1.pdf
- National Institute of Disaster Management. (n.d.). Post Disaster Needs Assessment Manual Volume I. Retrieved from https://nidm.gov.in/PDF/pubs/pdna_manual_vol2.pdf
- National Database for Emergency Database, Gujarat Specific. Retrived from: https://ndem.nrsc.gov.in/login.php

Learning Unit 2.11
Education Sector

Brief Description of the Learning Unit

The second learning unit is designed to guide learners through conducting Post Disaster Needs Assessments (PDNA) specifically for the education sector in Gujarat. The session will provide a comprehensive guide detailing eight crucial steps that ensure the successful execution of PDNA. Throughout the training, participants will receive detailed instructions and best practices for each of the eight steps, ensuring they thoroughly understand the entire PDNA process. This focused approach will address the unique challenges and needs of assessing related impacts and recovery requirements. By the end of this session, participants will be equipped with the necessary knowledge and skills to effectively conduct PDNA for education sector, ensuring comprehensive and reliable assessments that can inform recovery and reconstruction efforts in Gujarat.

Learning Objectives

- To introduce general step in conducting a PDNA.
- To understand required baseline information for each sector and its importance.
- To understand the requirements of field assessment.
- To understand assessment of disaster effects and impacts on each sector.
- To determine and prioritize the recovery needs.
- To understand the general guidelines to consider while compiling the sector report

Duration: 25 minutes

Methodology

- Lecture-based learning
- Case study-based learning
- Discussion
- Q&A session

Detailed Description

2.11.1 Step 1 - Recommended assessment team

The composition of the sector assessment team may vary by the type of disaster and the extent of the likely damage and production flow changes.

Table 127 Recommended assessment team for education sector

Organization and Personnel	Role in the Sector Assessment

State Personnel from:
• **Directorate of Primary Education**
• **Samagra Shiksha**
• **Commissionerate of Schools**
• **Commissionerate of Higher Education**
• **Commissionerate of Technical Education**
• **Directorate of NCC**
• **Director of Literacy & Continuing Education**
• **Pradhan Mantri Poshan Shakti Nirma (PM-POSHAN)**
• **Local departments and offices in the disaster-affected area:**
  ○ Civil Engineer (Education)
  ○ Architect (Education Facilities)
  ○ Education Administrator
  ○ Child Psychologist
  ○ Education Economist
  ○ Social Scientist
  ○ Goods/ Equipment Buyer
	Lead and coordinate

Personnel from:
• **Ministry of Education**
  ○ Civil Engineer (Education)
  ○ Architect (Education Facilities)
  ○ Education Administrator
  ○ Child Psychologist
  ○ Education Economist
  ○ Social Scientist
  ○ Goods/ Equipment Buyer
	Provide baseline information and facilitate the field assessment of damages and losses

Development partners (if active in the sector)	Participate and provide technical advice

2.11.2 Step 2 - Baseline Information and Sources

Baseline information must be compiled before the field assessment or, if possible, prior to the occurrence of disaster. The baseline data should be validated before the field visit to serve as the basis for the estimation of damages and losses for the disaster-affected area/s. This data can be compiled at the State/Region office or at the district levels. The tables below can be used for the baseline information.

Table 128 Baseline information of education facilities in district

Name of District:										
Total number of enrolled students: Male- Female-										
Type of facilities	Number			Total	Household Head/ Ownership (%)				Average number of Teachers	
Education facilities	Number				Public		Private		Public	Private
	Public	Private	Religious		Female	Male	Female	Male		
Pre-Primary School										
Pre-Primary School										
Secondary School										
University										
Training Institutes										
Vocational/ Training School										
Others										
Total										

Table 129 Baseline information of unit cost education facilities in district

Name of District:							
Particulars	Value (in Rs)						
	Pre-Primary School	Pre-Primary School	Secondary School	University	Training Institutes	Vocational/ Training School	Others
Average Replacement Cost							
Structure							
Roofing per Square Meter							
Wall per Square Meter							
Flooring per Square Meter							
Desks							
Computers							
Books							
Chalk Boards							
Other Educational Materials, Equipment and Furnishings							
Average Repair Cost							
Structure							
Roofing per Square Meter							
Wall per Square Meter							
Flooring per Square Meter							
Desks							
Computers							
Books							

Chalk Boards							
Other Educational Materials, Equipment and Furnishings							
Average Fees/ revenue							
Average Revenue per month							
Construction/ Repair Period							
Average Construction Period							
Average Repair Period							

Notes of filling Tables 128 - 129:

- Other types of educational facilities like public libraries should be included.
- The replacement and repair costs of structure/s, values of books, equipment and furnishing/s should be per unit or per type in each educational facility.
- Replacement costs can be estimated by the considering the acquisition or construction costs less the depreciation of the asset/s.
- The average construction period refers to the number of days for a new building to be erected.
- The average repair period refers to the number of days required for the repair of the structures/ buildings. This can be based on past experiences

Table 130 Sources of information for collecting baseline data

1	Ministry of Statistics and Programme Implementation	http://www.mospi.gov.in
2	National Institution for Transforming India	http://niti.gov.in
3	The Registrar General & Census Commissioner, India	http://censusindia.gov.in
4	Department of Higher Education Department of School Education & Literacy	http://mhrd.gov.in
5	National Council of Educational Research and Training	http://www.ncert.nic.in
6	Open Government Data (OGD) Platform India	http://dahd.nic.in
7	National Institute of Education	http://www.ncert.nic.in/departments/nie. html
8	Ministry of Human Resource Development	http://mhrd.gov.in/statist
9	Directorate of Primary Education	https://newschool.orpgujarat.com/home
10	Samagra Shiksha	https://samagrashiksha.ssagujarat.org/en/home
11	Commissionerate of Schools	https://cos.gujarat.gov.in/Index
12	Commissionerate of Higher Education	https://www.rascheguj.in/
13	Commissionerate of Technical Education	https://dte.gujarat.gov.in/
14	Director of NCC	https://nccauto.gov.in/microsite/gujdddnh
15	Director of Literacy & Continuing Education	https://gujarat-education.gov.in/litracy/Default.aspx?id=51&lg=en
16	Pradhan Mantri Poshan Shakti Nirman (PM-POSHAN)	https://mdm.gujarat.gov.in/

2.11.3 Step 3 - Estimation of Damages and Losses (Disaster Effects)

- With the baseline information, field assessment should be undertaken in the affected Districts after a disaster. The assessment team from the State must work with their local counterparts in the Districts to ensure that the estimates for the damages and losses in the sector are accurate to the extent possible.
- Direct interviews with private contractors or government officials involved in the construction and repair of facilities can also be conducted during the field trip in order to validate unit costs of repair and reconstruction (which is already contained in the baseline data).
- The post disaster assessment of housing units should be done on a per District basis, which can later be totaled to create a State assessment. This can be done by undertaking the following:
    - Counting broadly the number of houses damages according to type;
    - General assessment of the parts of the houses which were damaged like the roof, walls, fences, electrical installations, plumbing, etc.

Table 131 Damages and Losses to education sector

Name of District:						
Type of Educational Facility: Pre-Primary School ( ) Primary School ( ) Secondary School ( ) University ( ) Training Institute ( ) Voc./ Training School ( ) Others (specify): _____						
Category: Government ( ) Private ( )						
Number of Affected Students: Male- Female-						
Assets	**Damage Information**					
	Event	**Building Collapse/ Building fire/ Cyclone/ flood**				
	Event Date					
	Totally Destroyed		**Partially Damaged**		**Grand total**	**Average time to repair (days)**
	Quantity	**Total (Rs.)**	**Quantity**	**Total (Rs.)**		
	A	**B**	**C**	**D**	**E**	**F**
A. Government						
Structures						
Buildings/ Structures						
Equipment						
Desks						
Computers						
Books						
Chalk Boards						
Furniture						
Appliances						
Other Assets						
TOTAL						

Loss Information				
Types of Losses	**Disaster Year**	**Year 1**	**Year 2**	**Total Estimated Losses (Rs.)**
Foregone Income				
Cleaning up of Debris				
Higher Operating Costs				
Other Unexpected Expenses				
TOTAL				

Notes of filling Table 131:

- 'Average The values in the baseline information should be used in estimating damages. For example, if 20 square meters of the roof are damaged, the repair cost will be the cost of roofing per square meter multiplied by 20 square meters. On the other hand, if the whole structure is totally destroyed, the value of damage will be its replacement cost at post disaster prices.
- The total for the totally destroyed (or partially damaged) assets will be the total number multiplied by the replacement cost (or average repair cost). The average replacement and repair costs are in the baseline information.
- **Column B = (Column A) x replacement cost**
- **Column D = (Column C) x repair cost**
- In formula, 'Total damages' **Column E = (Column B) + (Column D)**
- The average time to repair refers to the time to restore the affected structures to their pre-disaster levels. This will give an indication on the number of days before normal services will be restored.
- **Cost of temporary school buildings:** The cost of temporary school buildings is a loss that must be estimated. When temporary schools are built, it will be necessary to estimate the cost of construction and related services, such as the provision of water, latrines and electric power and the duration for which these temporary schools would function. When using rented buildings as temporary schools, the total value of rent will be part of the loss.
- **Cost of urgent repairs of schools to be used as emergency shelter**: Some schools may need urgent repair, water installations, latrines, etc. if they were used as temporary shelters. This should be included in the loss since this will require unexpected expenses on the part of the government.
- **Higher costs of education**: Government facilities may incur additional expenses (over and above the regular budget of the sector) to assist the population for any of the following reasons:
  - Extension of classes over a period of time to compensate for the delays due to the disaster which will require additional expenses like cost of training if new teachers will be hired, overtime payment, etc.
  - Supplemental feeding and subsidy on transportation costs of students and teachers, if applicable.
  - Higher electricity costs from the use of generator sets; higher cost of water supply; etc.
- **Losses due to lower revenues**: Revenue losses may arise from interruption of classes while school buildings are being repaired or reconstructed. The values of losses in revenues will be the pre-disaster revenues minus the estimated post disaster revenues.
- **Other losses such as demolition and cleanup costs**: Aside from repair or reconstruction, a school building may require partial or total demolition and the resulting debris removed.

2.11.4 Step – 4 Summarizing of Damages and Losses in the State

Table 132 Summarizing of Damages and Losses in education sector

Name of State:							
Total number of students affected: Male- Female-							
Assets	Types of Damages to Houses						Total Damages (Rs.)
	Totally Destroyed			Partially Destroyed			
	Quantity		Total Value (Rs.)	Quantity		Total Value (Rs.)	
	Public	Private		Public	Private		
	A	B	C	D	E	F	G
District 1:							
Pre-Primary School							
Pre-Primary School							
Secondary School							
University							
Training Institutes							
Vocational/ Training School							
Others							
Total							
District N:							
Pre-Primary School							
Pre-Primary School							
Secondary School							
University							
Training Institutes							
Vocational/ Training School							
Others							
Total							
Grand Total							
Loss Information							
Types of Losses	Disaster Year		Year 1		Year 2		Total Estimated Losses (Rs.)
	Public	Private	Public	Private	Public	Private	
Foregone Income							
Cleaning up of Debris							
Higher Operating Costs							
Other Unexpected Expenses							
TOTAL							

2.11.5 Step 5 - Estimation of Disaster Impacts

The assessment team should analyse all potential impacts of the damages and losses of the education sector and must answer the following questions:

- What are the possible impacts on the future education of the youth especially the girls if the damaged facilities are not rehabilitated?
- What are the potential vulnerabilities of the students if the facilities are not repaired? (For example, increase in school drop-out rates, child labour or girls may end up uneducated and/or be forced to seek lower levels of employment outside their own villages, etc.)
- What are the added costs or consequences to families if the facilities are not repaired immediately? (For example, students may be forced to enroll in schools outside the community or there may be additional costs to families if classes will be extended beyond the normal school year).
- Are there potential losses of teaching jobs (in the private sector) if school buildings are totally destroyed?

Table 133 Social Impacts of the Damages and Losses to the education Sector

Areas of Impacts	Expected Impacts						Brief description of Impacts
	General Population			Women and Children			
	Severe	Moderate	Low	Severe	Moderate	Low	
	A	B	C	D	E	F	G
Employment							
Livelihoods							
Foreign currency earnings							
Culture							

Notes of filling Table 133:

- The impacts can be briefly described under the column "Brief Description of Impacts". For example, a brief description of a severe "vulnerability of students" can be due to the dangers of conducting classes in rooms that are weakened by the floods or open alternative classrooms and the "added cost to households" can be described as the higher cost of transportation if alternative schools are far away.

2.11.6 Step 6 - Estimation of Recovery and Reconstruction Needs

2.11.6.1 Estimation of Recovery Needs

Recovery needs are intended to bring back normalcy in the sector as quickly as possible. In the education sector, quick recovery efforts must be undertaken to prevent the delay of classes of the affected students. The government must ensure that its education services will be normalized as soon as possible. Some of the possible recovery related activities are:

- Reactivation of education activities under special conditions such as:
  - More intensive utilization of undamaged education facilities by establishing several daily "shifts" instead of normal ones;
  - Rental of alternative premises which can be used as school buildings;
  - Setting up temporary classrooms, by using tents, containers or other similar facilities.
- Repair of schools used as temporary shelter which may have sustained damage due to overuse.
- Replacement of education materials and minimum vital equipment which cannot wait until reconstruction begins.
- Accelerated training of teachers if a large number of teachers died in the disaster. Food-for-work or a combination of cash-for-work to rehabilitate/reconstruct damaged houses.

2.11.6.2 Estimation of Reconstruction Needs

Reconstruction needs are generally long-term in nature (3 years and more) and are intended to 'build back better' from the ruins of a disaster. Some possible reconstruction related activities in the sector could include the following:

- Reconstruction of public schools under a building-back-better strategy to ensure future disaster resilience through the adoption and enforcement of improved construction standards;
- Relocation of schools to safe areas, as necessary. In this case, the additional costs land acquisition, and basic services provision (water, sanitation, electricity, etc.) should be included.
- Soft-term credit for reconstruction of private schools. Such schemes can be accompanied by technical assistance for improved disaster resilient standards of construction;
- Cost of replacing furniture and equipment that were destroyed may be included within the needs for reconstruction, unless they have been covered under the recovery needs to provide temporary education services for the affected area;
- Structural retro-fitting of undamaged or partially damaged schools so that they are not affected by disaster event in the future;
- Other mitigation measures such as construction of support infrastructure to prevent serious landslides and floods to education facilities.

2.11.7 Step 7 – Prioritization of Needs

Among the projects identified, relative priorities can be set in order to determine which among them are the more important. Based on the broad strategies for recovery, the assessment team should select the priority projects/activities among the identified needs.

The prioritization can be made by using a set of impact indicators and the level by which the projects can achieve said impacts. Examples of the criteria that can be used are the following, among others:

- Economic impact, which can be evaluated in terms of the relative cost to the government of not undertaking reconstruction or rehabilitation.

- Equity and social impact, which can be in terms of the number of beneficiaries who are poor and destitute and who could not afford to rebuild on their own without outside support.
- Sustainability, which can be in terms of the reduction of risks and vulnerability of the people and other economic assets to future disasters.

Table 134 Impacts of identified post disaster projects

Name of proposed project	Expected Impacts and their levels of impact on recovery								
	Economic Impact			Equity and social impact			Sustainability		
	High	Medium	Low	High	Medium	Low	High	Medium	Low
	A	B	C	D	E	F	G	H	I

Based on the prioritized recovery and reconstruction needs, a summary should be created by the assessment team enumerating the post disaster projects for the recovery and reconstruction. The identified needs should have a rough schedule of implementation outlining at the very least the activities, timing and budget required for all the programs and projects. The following techniques can be considered:

- Identify the specific projects according to their relative urgency or priority in relation to recovery.
- Plot the timeline of activities of all the projects, with the urgent ones on top, in a Gantt chart, with the corresponding funding requirement on an annual basis. This will assist the national government in programming the necessary funds over a certain time period, like on a quarterly or annual basis.
- Identify and include in the list of projects that need further feasibility studies, which may be funded by foreign grants.
- To the extent possible, a logical framework (log-frame) should be created for each of the project proposed for inclusion in the recovery plan. Log-frames are normally required by foreign donors to consider project proposals.

Table 135 Summary of recovery and reconstruction projects in the education sector

Name of Specific project	Annual Needed Amount of Assistance (Rs.)						Total Needs (Rs.)
	Disaster Year	Year 1	Year 2	Year 3	Year 4	Year 5	
	A	B	C	D	E	F	G
Recovery Projects							
a.							
b.							
c.							
Total							

Reconstruction Projects							
a.							
b.							
c.							
Total							
Grand Total							

Notes of filling Table 135:

- Project titles can be inserted under the column on recovery and reconstruction needs.
- Columns can be added to accommodate any additional reconstruction needs beyond Year 5.

2.11.8 Step 8 – Sector Report

With all the information gathered using the previous steps, a report can be drafted by the assessment team, which will provide the inputs for a particular sector in the overall recovery and reconstruction plan. The following format may be considered:

- Brief description of the sector in the disaster-affected areas.
- Damages in the sector by areas and by types of assets affected.
- Losses in the sector emphasizing the losses in income, increase in expenditures, estimated period before normalcy will be attained, etc.
- Impact on the livelihood, individual households, vulnerable groups and the consequences to the greater community if no assistance for recovery will be provided.
- Proposed strategies for recovery and reconstruction of the sector.
- Needs of the sector, by priority, and the draft schedule of implementation with the estimated funds required for each project over time.

The draft sector report should be submitted to the Gujarat State Disaster Management Authority/ Secretary (R&R) for consolidation.

References

- National Institute of Disaster Management. (n.d.). Post Disaster Needs Assessment Manual Volume I. Retrieved from https://nidm.gov.in/PDF/pubs/pdna_manual_vol1.pdf
- National Institute of Disaster Management. (n.d.). Post Disaster Needs Assessment Manual Volume I. Retrieved from https://nidm.gov.in/PDF/pubs/pdna_manual_vol2.pdf
- National Database for Emergency Database, Gujarat Specific. Retrived from: https://ndem.nrsc.gov.in/login.php

Learning Unit 2.12
Health Sector

Brief Description of the Learning Unit

The second learning unit is designed to guide learners through conducting Post Disaster Needs Assessments (PDNA) specifically for the health sector in Gujarat. The session will provide a comprehensive guide detailing eight crucial steps that ensure the successful execution of PDNA. Throughout the training, participants will receive detailed instructions and best practices for each of the eight steps, ensuring they thoroughly understand the entire PDNA process. This focused approach will address the unique challenges and needs of assessing related impacts and recovery requirements. By the end of this session, participants will be equipped with the necessary knowledge and skills to effectively conduct PDNA for health sector, ensuring comprehensive and reliable assessments that can inform recovery and reconstruction efforts in Gujarat.

Learning Objectives

- To introduce general step in conducting a PDNA.
- To understand required baseline information for each sector and its importance.
- To understand the requirements of field assessment.
- To understand assessment of disaster effects and impacts on each sector.
- To determine and prioritize the recovery needs.
- To understand the general guidelines to consider while compiling the sector report

Duration: 25 minutes

Methodology

- Lecture-based learning
- Case study-based learning
- Discussion
- Q&A session

Detailed Description

2.12.1 Step 1 - Recommended assessment team

The composition of the sector assessment team may vary by the type of disaster and the extent of the likely damage and production flow changes.

Table 136 Recommended assessment team for health sector

Organization and Personnel	Role in the Sector Assessment

State Personnel from:
• **Commissionerate of Health**
• **National Health Mission**
• **Office of Director, Ayush (Ayurveda, Yoga, and Naturopathy, Unani, Siddha and Homoeopathy)**
• **Gujarat Medical Services Corporation Limited (GMSCL)**
• **Local departments and offices in the disaster-affected area:**
  ○ PIU Health Engineer (Health Facilities)
  ○ Architect (Health Facilities)
  ○ Medical Doctor
  ○ Epidemiologist
  ○ Health Economist
  ○ Goods/ Equipment Buyer
	Lead and coordinate

Personnel from:
• **Ministry of Health and Family Welfare**
  ○ PIU Health Engineer (Health Facilities)
  ○ Architect (Health Facilities)
  ○ Medical Doctor
  ○ Epidemiologist
  ○ Health Economist
  ○ Goods/ Equipment Buyer
	Provide baseline information and facilitate the field assessment of damages and losses

Development partners (if active in the sector)	Participate and provide technical advice

2.12.2 Step 2 - Baseline Information and Sources

Baseline information must be compiled before the field assessment or, if possible, prior to the occurrence of disaster. The baseline data should be validated before the field visit to serve as the basis for the estimation of damages and losses for the disaster-affected area/s. This data can be compiled at the State/Region office or at the District levels. The tables below can be used for the baseline information.

Table 137 Baseline information of medical facilities in district

Type of medical facilities	Number		Total	Average number of clients per day				Average number of medical staff	
				Public		Private			
	Public	Private		Female	Male	Female	Male	Public	Private
Health Centre									
Primary health centre									
Community health centre									
Others									
Hospital									
District/ General/ Taluk hospital									
Ayurvedic Hospital									
Others									
Other facilities									
Anganwadi centres									
Medical laboratories									
Others									
Total									

Table 138 Baseline information of unit cost medical facilities in district

Name of District:						
Particulars	Value (in Rs)					
	Health centres		Hospitals		Other facilities	
	Single floor	Multi- floor	Single floor	Multi-floor	Single floor	Multi-floor
Average Replacement Cost						
Structure						
Roofing per Square Meter						
Wall per Square Meter						
Flooring per Square Meter						
Electrical Installation						
Plumbing						
Average Repair Cost						
Structure						
Roofing per Square Meter						
Wall per Square Meter						
Flooring per Square Meter						
Electrical Installation						
Plumbing						
Average fees/ revenue						
Average see/s per client per visit						

Average revenue per day or month						
Construction/ repair period (in days)						
Average construction period						
Average repair period						

Table 139 Baseline information of unit cost medical equipment in district

Name of District:			
Medical equipment and supplies	**Unit Costs (Rs.)**		
	Average Acquisition Value Per Unit	**Average Replacement Cost Per Unit**	**Average Repair Cost Per Unit**
Equipment			
CT Scanner			
X-ray Machine			
MRI Machine			
Other Equipment (Specify)			
Supplies			
Medicines			
Other Medical Supplies			
Other Assets			
Furniture			
Ambulance			
Other Vehicles			
Others (Specify)			

Notes of filling Tables 137 - 139:

- Other types of medical facilities like mobile clinics should be included.
- Other types of medical facilities like mobile clinics should be included.
- The construction cost of structure/s, values of equipment, supplies and furnishing/s should be per unit or per type in each facility.
- The average construction period refers to the number of days for a new building to be erected.
- The average repair period refers to the number of days required for the repair of the structures/ buildings. This can be based on past experiences.
- Types of equipment and supplies, especially those are important and expensive, should be enumerated.

Table 140 Sources of information for collecting baseline data

1	Ministry of Statistics and Programme Implementation	http://www.mospi.gov.in
2	National Institution for Transforming India	http://niti.gov.in
3	The Registrar General & Census Commissioner, India	http://censusindia.gov.in
4	Ministry of Health & Family Welfare	http://www.mohfw.nic.in
5	Department of Health Research | MoHFW | Government of India	http://www.dhr.gov.in
6	Open Government Data (OGD) Platform India	https://data.gov.in
7	Central Bureau of Health Intelligence	http://www.cbhidghs.nic.in

8	NHM Health Statistics Information Portal	https://nrhm-mis.nic.in
9	Commissionerate of Health	https://nhm.gujarat.gov.in/state-officers.htm
10	National Health Mission	https://nhm.gujarat.gov.in/state-officers.htm
11	Office of Director, Ayush (Ayurveda, Yoga, and Naturopathy, Unani, Siddha and Homoeopathy)	https://ayush.gujarat.gov.in/contactus.htm
12	Gujarat Medical Services Corporation Limited	http://gmscl.gujarat.gov.in

2.12.3 Step 3 - Estimation of Damages and Losses (Disaster Effects)

- With the baseline information, field assessment should be undertaken in the affected Districts after a disaster. The assessment team from the State must work with their local counterparts in the Districts to ensure that the estimates for the damages and losses in the sector are accurate to the extent possible.
- Direct interviews with private contractors or government officials involved in the construction and repair of facilities can also be conducted during the field trip in order to validate unit costs of repair and reconstruction (which is already contained in the baseline data).
- The post disaster assessments of government-owned health facilities are the primary concerns of the Ministry of Health and Family Welfare. Assessment should be done on a per District basis, which can be totalled to create a State assessment. The following table can be used in assessing the damages and losses

Table 141 Damages and Losses to health sector

Name of District:						
Name of health facility:						
Type of Health Facility: **Primary health centre ( ) Community health centre ( ) Ayurvedic hospital ( ) District/ general/ taluk hospital ( ) Anganwadi centres ( ) Medical laboratories ( ) Other facility (specify): _____**						
Category: Government ( ) Private ( )						
Number of Affected Students: **Male-** **Female-**						
Assets	**Damage Information**					
	Event	**Building Collapse/ Building fire/ Cyclone/ flood**				
	Event Date					
	Totally Destroyed		**Partially Damaged**		**Grand total**	**Average time to repair (days)**
	Quantity	**Total (Rs.)**	**Quantity**	**Total (Rs.)**		
	A	**B**	**C**	**D**	**E**	**F**
Structures						
Buildings/ Structures						
Equipment						
CT Scanner						
X-ray Machine						
MRI Machine						
Other Equipment (Specify)						
Supplies						
Medicines						

Other Medical Supplies						
Other Assets						
Furniture						
Ambulance						
Other Vehicles						
Others (Specify)						
TOTAL						

Loss Information				
Types of Losses	**Disaster Year**	**Year 1**	**Year 2**	**Total Estimated Losses (Rs.)**
Foregone Income				
Cleaning up of Debris				
Higher Operating Costs				
Other Unexpected Expenses				
TOTAL				

Notes of filling Table 141:

- There is a possibility that totally destroyed and partially damaged structures may occur for a certain health facility. For instance, one hospital building may be totally destroyed while some of its building are only partially damaged.
- The values in the baseline information should be used in estimating damages. For example, if 20 square meters of the roof are damaged, the repair cost will be the cost of roofing per square meter multiplied by 20 square meters. On the other hand, if the whole structure is totally destroyed, the value of damage will be its replacement cost at post disaster prices.
- The total for the totally destroyed (or partially damaged) assets will be the total number multiplied by the replacement cost (or average repair cost). The average replacement and repair costs are in the baseline information.
- **Column B = (Column A) x replacement cost**
- **Column D = (Column C) x repair cost**
- In formula, 'Total damages' **Column E = (Column B) + (Column D)**
- **Other losses such as demolition and cleanup costs**: Aside from repair or reconstruction, a school building may require partial or total demolition and the resulting debris removed.

A note on estimated losses:

Losses in the health sector will include the following:

- *Higher costs of health care. Government health facilities may incur additional expenses to assist the disaster-affected population (over and above the regular budget of the sector). This higher cost can be for any of the following reasons:*
- *Treatment of physically and psychologically injured persons over a period of time which will require additional expenses for medicine and supplies*
- *Transportation costs of injured persons to alternative, unaffected health facilities*
- *Additional home visits to women and children needing more attention since they are more vulnerable and at risk*

- *Rent of additional equipment, transportation to make more out of facility service provision*
- *Overtime payment of health sector personnel, or cost of employing temporary additional staff if needed. Losses due to lower revenues. Closure of private and public health care facilities due to physical damages would result in the loss of revenues. On the other hand, even if the facilities are not affected, there may be a reduction in demand/patients if the facility has become inaccessible or if the people lost their source of income to pay for health services. Revenue losses will be: Pre-disaster revenues minus the estimated post disaster revenues.*
- *Other unexpected expenditures like:*
  - *Direct costs of monitoring and control of outbreak of diseases. After a disaster, there is a possibility of breakout of epidemics which may require direct interventions like health surveillance and other disease control like fumigation, control of water-borne diseases, vaccination, public information and education, etc.*
  - *Demolition and clean-up costs. The costs of demolition, removal of debris in the affected health facilities, disposal of bio-hazardous materials, among others are considered losses in health sector. Demolition costs vary widely in relation to the type of building materials involved. The health sector specialist should consult with an engineer or architect at this point. Typically, the cost of removal of debris up to the roadside is incurred by the health facilities while the disposal of debris from the road to the disposal site may be incurred by other mandated agencies.*
- *Losses can extend beyond the year that the disaster occurred and these should be reflected in the loss assessment for the coming year/s. The duration will also include the time required for controlling and monitoring the possible outbreak of disease that may change the morbidity levels arising from the disaster. Losses are expressed in monetary value at current prices.*

2.12.4 Step – 4 Summarizing of Damages and Losses in the State

Table 142 Summarizing of Damages and Losses in health sector

Name of State:							
Total number of patients affected: **Male-** **Female-**							
Assets	**Types of Damages to Houses**						**Total Damages (Rs.)**
	Totally Destroyed			**Partially Destroyed**			
	Quantity		**Total Value (Rs.)**	**Quantity**		**Total Value (Rs.)**	
	Public	**Private**		**Public**	**Private**		
	A	**B**	**C**	**D**	**E**	**F**	**G**
District 1:							
Primary health centre							
Community health centre							
Others							
District/ General/ Taluk hospital							

Ayurvedic Hospital							
Others							
Anganwadi centres							
Medical laboratories							
Others							
Total							
District N:							
Primary health centre							
Community health centre							
Others							
District/ General/ Taluk hospital							
Ayurvedic Hospital							
Others							
Anganwadi centres							
Medical laboratories							
Others							
Total							
Grand Total							

Loss Information							
Types of Losses	**Disaster Year**		**Year 1**		**Year 2**		**Total Estimated Losses (Rs.)**
	Public	**Private**	**Public**	**Private**	**Public**	**Private**	
Foregone Income							
Cleaning up of Debris							
Higher Operating Costs							
Other Unexpected Expenses							
TOTAL							

2.12.5 Step 5 - Estimation of Disaster Impacts

The assessment team should analyse all potential impacts of the damages and losses of the health sector and must answer the following questions:

- What are the possible impacts on the future health conditions of the population, especially the vulnerable groups like pregnant women, lactating mothers, children, the elderly etc., if the damaged health facilities are not rehabilitated?
- What are the added health-related vulnerabilities of the people if the health facilities are not repaired? (For example, break out of epidemics; cancellation of vaccination and regular check up of pregnant women and infants; spread of diseases, etc.)
- What are the added costs or consequences to families if the health facilities are not repaired immediately?
- Are there possible losses of jobs and/or productivity if the medical infrastructure is immediately repaired? Losses in productivity may occur if injured workers are not medically treated immediately.
- Are there significant number of people that have been affected with post-traumatic stress disorder (PTSD), 'disaster syndrome' and other psycho-social illnesses which may need long-term medical rehabilitation and assistance?
- Are there possible illnesses that may be detectable only after a longer period of time such as those caused by toxic wastes from industries, mines, fuel containers, etc. that were leaked into the natural environment?

Table 143 Social Impacts of the Damages and Losses to the education Sector

Areas of Impacts	Expected Impacts						Brief description of Impacts
	General Population			Women and Children			
	Severe	Moderate	Low	Severe	Moderate	Low	
	A	B	C	D	E	F	G
Maternal Mortality							
Infant Mortality							
Increase of Disabilities							
Added Cost to Households							
Employment							
Economic Productivity							
Others (Specify)							

2.12.6 Step 6 - Estimation of Recovery and Reconstruction Needs

2.12.6.1 Estimation of Recovery Needs

Recovery needs are intended to bring back normalcy in the sector as quickly as possible. In the health sector, quick recovery efforts must be undertaken to prevent the delay of classes of the affected students. The government must ensure that its education services will be normalized as soon as possible. Some of the possible recovery related activities are:

- Setting up of temporary hospitals in either alternative suitable building facilities or in tents, until the destroyed facilities are rebuilt.
- Additional budget over and above the regular government appropriations to finance additional personnel or to pay the overtime work of existing personnel.
- Replenishment of medical supplies and medicines that may have been destroyed during the disaster.
- Preventing and controlling the possible occurrence of disease outbreaks or epidemics. Under this heading, the cost of public information campaigns, vaccinations, vector control schemes and monitoring of morbidity levels are to be included.
- Psycho-social interventions can be provided especially to those who were traumatized and experienced longer term depression.
- If food insecurity is imminent due to the disaster, a temporary nutrition scheme for mothers and children may be designed and implemented.

2.12.6.2 Estimation of Reconstruction Needs

Reconstruction needs are generally long-term in nature (3 years and more) and are intended to 'build back better' from the ruins of a disaster. Some possible reconstruction related activities in the sector could include the following:

- Relocation of health areas to safe areas, as necessary. In this case, the additional costs land acquisition, and basic services provision (water, sanitation, electricity, etc.) should be included.
- Assistance in the reconstruction and repair of health structures under a building-back-better strategy to ensure future disaster resilience through the adoption and enforcement of improved construction standards.
- Structural retro-fitting of undamaged or partially damaged structures so that they are not affected by disaster event in the future.
- Soft-term credit for reconstruction and repair of private health facilities. Such schemes can be accompanied by technical assistance for improved disaster resilient standards of construction.
- Medium- to long-term medical treatment to injured persons as well as psychological attention to the affected population
- Other mitigation measures such as construction of support infrastructure to prevent serious landslides and floods to health facilities.

2.12.7 Step 7 – Prioritization of Needs

Among the projects identified, relative priorities can be set in order to determine which among them are the more important. Based on the broad strategies for recovery, the assessment team should select the priority projects/activities among the identified needs.
The prioritization can be made by using a set of impact indicators and the level by which the projects can achieve said impacts. Examples of the criteria that can be used are the following, among others:

- Economic impact, which can be evaluated in terms of the relative cost to the government of not undertaking reconstruction or rehabilitation.
- Equity and social impact, which can be in terms of the number of beneficiaries who are poor and destitute and who could not afford to rebuild on their own without outside support.
- Sustainability, which can be in terms of the reduction of risks and vulnerability of the people and other economic assets to future disasters.

Table 144 Impacts of identified post disaster projects

Name of proposed project	Expected Impacts and their levels of impact on recovery								
	Economic Impact			Equity and social impact			Sustainability		
	High	Medium	Low	High	Medium	Low	High	Medium	Low
	A	B	C	D	E	F	G	H	I

Based on the prioritized recovery and reconstruction needs, a summary should be created by the assessment team enumerating the post disaster projects for the recovery and reconstruction. The identified needs should have a rough schedule of implementation outlining at the very least the activities, timing and budget required for all the programs and projects. The following techniques can be considered:

- Identify the specific projects according to their relative urgency or priority in relation to recovery.
- Plot the timeline of activities of all the projects, with the urgent ones on top, in a Gantt chart, with the corresponding funding requirement on an annual basis. This will assist the national government in programming the necessary funds over a certain time period, like on a quarterly or annual basis.
- Identify and include in the list of projects that need further feasibility studies, which may be funded by foreign grants.
- To the maximum extent possible, a logical framework (log-frame) should be created for each of the project proposed for inclusion in the recovery plan. Log-frames are normally required by foreign donors to consider project proposals.

Table 145 Summary of recovery and reconstruction projects in the health sector

Name of Specific project	Annual Needed Amount of Assistance (Rs.)						Total Needs (Rs.)
	Disaster Year	Year 1	Year 2	Year 3	Year 4	Year 5	
	A	B	C	D	E	F	G
Recovery Projects							
a.							
b.							
c.							
Total							
Reconstruction Projects							
a.							
b.							
c.							
Total							
Grand Total							

Notes of filling Table 145:

- Project titles can be inserted under the column on recovery and reconstruction needs.
- Columns can be added to accommodate any additional reconstruction needs beyond Year 5.

2.12.7 Step 8 – Sector Report

With all the information gathered using the previous steps, a report can be drafted by the assessment team, which will provide the inputs for a particular sector in the overall recovery and reconstruction plan. The following format may be considered:

- Brief description of the sector in the disaster-affected areas.
- Damages in the sector by areas and by types of assets affected.
- Losses in the sector emphasizing the losses in income, increase in expenditures, estimated period before normalcy will be attained, etc.
- Impact on the livelihood, individual households, vulnerable groups and the consequences to the greater community if no assistance for recovery will be provided.
- Proposed strategies for recovery and reconstruction of the sector.
- Needs of the sector, by priority, and the draft schedule of implementation with the estimated funds required for each project over time.

The draft sector report should be submitted to the Gujarat State Disaster Management Authority/ Secretary (R&R) for consolidation.

References

- National Institute of Disaster Management. (n.d.). Post Disaster Needs Assessment Manual Volume I. Retrieved from https://nidm.gov.in/PDF/pubs/pdna_manual_vol1.pdf
- National Institute of Disaster Management. (n.d.). Post Disaster Needs Assessment Manual Volume I. Retrieved from https://nidm.gov.in/PDF/pubs/pdna_manual_vol2.pdf
- National Database for Emergency Database, Gujarat Specific. Retrived from: https://ndem.nrsc.gov.in/login.php

Learning Unit 2.13
Culture and Heritage Sector

Brief Description of the Learning Unit

The second learning unit is designed to guide learners through conducting Post Disaster Needs Assessments (PDNA) specifically for the culture and heritage sectors in Gujarat. The session will provide a comprehensive guide detailing eight crucial steps that ensure the successful execution of PDNA. Throughout the training, participants will receive detailed instructions and best practices for each of the eight steps, ensuring they thoroughly understand the entire PDNA process. This focused approach will address the unique challenges and needs of assessing related impacts and recovery requirements. By the end of this session, participants will be equipped with the necessary knowledge and skills to effectively conduct PDNA for culture and heritage sectors, ensuring comprehensive and reliable assessments that can inform recovery and reconstruction efforts in Gujarat.

Learning Objectives

- To introduce general step in conducting a PDNA.
- To understand required baseline information for each sector and its importance.
- To understand the requirements of field assessment.
- To understand assessment of disaster effects and impacts on each sector.
- To determine and prioritize the recovery needs.
- To understand the general guidelines to consider while compiling the sector report

Duration: 25 minutes

Methodology

- Lecture-based learning
- Case study-based learning
- Discussion
- Q&A session

Detailed Description

2.13.1 Step 1 - Recommended assessment team

The composition of the sector assessment team may vary by the type of disaster and the extent of the likely damage and production flow changes.

Table 146 Recommended assessment team for culture and heritage sector

Organization and Personnel	Role in the Sector Assessment

State Personnel from:
• **Commissioner Youth Services & Cultural Activities**
• **Director of Archaeology & Museums**
• **Director of Abhilekhagar**
• **Director of Libraries**
• **Director of Language**
• **Local departments and offices in the disaster-affected area:**
  ○ Architect/ Conservator
  ○ Structural Engineer
  ○ Archaeologist
  ○ Collection/ Libraries/ Archives Expert
  ○ Cultural Anthropologist
  ○ Economist
	Lead and coordinate

Personnel from:
• **Ministry of Culture**
  ○ Architect/ Conservator
  ○ Structural Engineer
  ○ Archaeologist
  ○ Collection/ Libraries/ Archives Expert
  ○ Cultural Anthropologist
  ○ Economist
	Provide baseline information and facilitate the field assessment of damages and losses

Development partners (if active in the sector)	Participate and provide technical advice

2.13.2 Step 2 - Baseline Information and Sources

Baseline information must be compiled before the field assessment or, if possible, prior to the occurrence of disaster. The baseline data should be validated before the field visit to serve as the basis for the estimation of damages and losses for the disaster-affected area/s. This data can be compiled at the State/Region office or at the District levels. The tables below can be used for the baseline information.

Table 147 Baseline information of cultural assets in district

Name of District:					
Type of cultural assets	**Ownership**		**Description**	**Average visitors per month**	**Average fee per visitor (Rs.)**
	Public	**Private**			
Museums					
1.					
2.					

Name of District:					
Type of cultural assets	**Ownership**		**Description**	**Average visitors per month**	**Average fee per visitor (Rs.)**
	Public	**Private**			
Religious Sites					
1.					
2.					
Historical Sites					
1.					
2.					
Other Cultural Sites					
1.					
2.					
Total					

Notes of filling Table 147:

- The above table will provide the assessment team with an overall picture of the cultural sector in the area – the types of cultural and heritage sites, their location where visitors go, the visitor attractions, etc. - which they can use in post disaster damage and loss assessment.
- Cultural and heritage sites can be either man-made, natural formations or assets.
- If a certain site is both religious and historical, they should only be counted as one.

Table 148 Sources of information for collecting baseline data

1	Ministry of Statistics and Programme Implementation	http://www.mospi.gov.in
2	National Institution for Transforming India	http://niti.gov.in
3	The Registrar General & Census Commissioner, India	http://censusindia.gov.in
4	Ministry of Culture	http://www.indiaculture.nic.in
5	Make in India Initiatives	http://www.makeinindia.com
6	Open Government Data (OGD) Platform India	https://data.gov.in
7	Museums of India	http://museumsofindia.gov.in
8	National Culture Fund	http://ncf.nic.in
9	Commissioner Youth Services & Cultural Activities	http://commi-synca.gujarat.gov.in/
10	Director of Archaeology & Museums	http://archeologymuseum.gujarat.gov.in/
11	Director of Abhilekhagar	http://abhilekhagar.gujarat.gov.in/
12	Director of Libraries	http://dolib.gujarat.gov.in/
13	Director of Language	http://dol.gujarat.gov.in/

2.13.3 Step 3 - Estimation of Damages and Losses (Disaster Effects)

- With the baseline information, field assessment should be undertaken in the affected Districts after a disaster. The assessment team from the State must work with their local counterparts in the Districts to ensure that the estimates for the damages and losses in the sector are accurate to the extent possible.

- Direct interviews with private contractors or government officials involved in the construction and repair of facilities can also be conducted during the field trip in order to validate unit costs of repair and reconstruction (which is already contained in the baseline data).
- The post disaster assessments of government-owned health facilities are the primary concerns of the Ministry of Health and Family Welfare. Assessment should be done on a per District basis, which can be totalled to create a State assessment. The following table can be used in assessing the damages and losses

Table 149 Damages and Losses to culture and heritage site

Name of District:						
Name of site:						
Category: Museum ( ) Religious site ( ) Historical site ( ) Other cultural site ( )						
Ownership: Government ( ) Private ( )						
Number of Affected Students: Male- Female-						
Assets	**Damage Information**					
	Event	**Building Collapse/ Building fire/ Cyclone/ flood**				
	Event Date					
	Totally Destroyed		**Partially Damaged**		**Grand total**	**Average time to repair (days)**
	Number of totally destroyed	**Average replacement cost (Rs.)**	**Number of partially damaged**	**Average repair cost (Rs.)**		
	A	**B**	**C**	**D**	**E**	**F**
Structures						
Buildings/ Structures						
Inventories						
Artifacts						
Manuscripts						
Others						
Equipment						
Other Equipment						
Others (Specify)						
TOTAL						

Loss Information				
Types of Losses	**Disaster Year**	**Year 1**	**Year 2**	**Total Losses (Rs.)**
Foregone Income				
Cleaning up of Debris				
Higher Operating Costs				
Other Unexpected Expenses				
TOTAL				

Notes of filling Table 149:

- There are various types of structures in heritage sites, which may need special expensive restoration after a disaster. The actual estimated cost of restoration should be used.
- Inventories or stocks in various types of cultural and historical sites will vary. If, for example, a museum lost an artifact, which has no market value and cannot be replaced, the actual cost of damage can be expressed qualitatively in the impact assessment part.
- 'Average Replacement Cost' will be the average pre-disaster value of the structures and assets that were totally destroyed while 'average repair cost' will be the estimated cost of repair of the partially damaged assets.
- In formula, the total damages of the companies surveyed will be (Column E) = (Column A) x (Column B) + (Column C) x (Column D).
- Years 1 to 2 are the years after the disaster. Other losses such as demolition and cleanup costs: Aside from repair or reconstruction, a school building may require partial or total demolition and the resulting debris removed.
- Losses in the culture sector will include the following:
  - Foregone income from visitors and other related sources of income, which will last until the facilities are repaired.
  - Possible higher cost of operation that may arise after the disaster, such as payment of higher rates of electricity from alternative sources, or acquiring raw materials from alternative sources or renting temporary premises while repairing or rebuilding the original premises.
  - Costs involved for the demolition or removal of debris, etc.
  - Additional cost of visitor promotion after the disaster.
- Losses can continue during the entire period of recovery and reconstruction. It is expressed in monetary values at current prices

2.13.4 Step – 4 Summarizing of Damages and Losses in the State

Table 150 Summarizing of Damages and Losses in culture and heritage sector

Name of State:								
Total number of patients affected: **Male-** **Female-**								
Types of Cultural or Heritage Sites	**Within the Disaster Year**				**Losses Beyond the Disaster Year**			
	Damages		**Losses**		**Year 1**		**Year 2**	
	Public	**Private**	**Public**	**Private**	**Public**	**Private**	**Public**	**Private**
Museums								
Religious Sites								
Historical Sites								
Other Cultural Sites								
TOTAL								

2.13.5 Step 5 - Estimation of Disaster Impacts

The assessment team should analyse all potential impacts of the damages and losses of the culture and heritage sector and must answer the following questions:

- Were workers laid off, leading to massive unemployment?
- Were livelihoods lost, especially those who depend on the arrival of tourists like tourist guides and micro-entrepreneurs engaged in handicrafts for souvenirs?
- What are the spiritual and cultural impacts of the loss of heritage, religious and historical sites?

Table 151 Social Impacts of the Damages and Losses to the culture and heritage Sector

Areas of Impacts	Expected Impacts						Brief description of Impacts
	General Population			Women and Children			
	Severe	Moderate	Low	Severe	Moderate	Low	
	A	B	C	D	E	F	G
Employment							
Livelihoods							
Culture							
Others (Specify)							

2.13.6 Step 6 - Estimation of Recovery and Reconstruction Needs

2.13.6.1 Estimation of Recovery Needs

Recovery needs are intended to bring back normalcy in the sector as quickly as possible. In the culture & heritage sector, quick recovery efforts must be undertaken to prevent the delay of classes of the affected students. The government must ensure that its education services will be normalized as soon as possible. Some of the possible recovery related activities are:

- Repairs of the damages to structures, which are normally affected by strong winds and floods and provide access to tourists.
- Emergency procurement of vital equipment necessary to normalize operations.
- Clearing of debris that may have affected the sector.

2.13.6.2 Estimation of Reconstruction Needs

Reconstruction needs are generally long-term in nature (3 years and more) and are intended to 'build back better' from the ruins of a disaster. Some possible reconstruction related activities in the sector could include the following:

- Soft-term credit for the replacement or reconstruction of affected structures under a building-back better strategy to ensure future disaster resilience through the adoption and enforcement of improved construction standards;
- Procurement of equipment and machinery;
- Structural retro-fitting of undamaged or partially damaged structures so that they are not affected by disaster event in the future; • Relocation of facilities to safer areas; and
- Other mitigation measures such as construction of support infrastructure to prevent serious landslides and floods.

2.13.7 Step 7 – Prioritization of Needs

Among the projects identified, relative priorities can be set in order to determine which among them are the more important. Based on the broad strategies for recovery, the assessment team should select the priority projects/activities among the identified needs.

The prioritization can be made by using a set of impact indicators and the level by which the projects can achieve said impacts. Examples of the criteria that can be used are the following, among others:

- Economic impact, which can be evaluated in terms of the relative cost to the government of not undertaking reconstruction or rehabilitation.
- Equity and social impact, which can be in terms of the number of beneficiaries who are poor and destitute and who could not afford to rebuild on their own without outside support.
- Sustainability, which can be in terms of the reduction of risks and vulnerability of the people and other economic assets to future disasters.

Table 152 Impacts of identified post disaster projects

Name of proposed project	Expected Impacts and their levels of impact on recovery								
	Economic Impact			Equity and social impact			Sustainability		
	High	Medium	Low	High	Medium	Low	High	Medium	Low
	A	B	C	D	E	F	G	H	I

Based on the prioritized recovery and reconstruction needs, a summary should be created by the assessment team enumerating the post disaster projects for the recovery and reconstruction. The identified needs should have a rough schedule of implementation outlining at the very least the activities, timing and budget required for all the programs and projects. The following techniques can be considered:

- Identify the specific projects according to their relative urgency or priority in relation to recovery.
- Plot the timeline of activities of all the projects, with the urgent ones on top, in a Gantt chart, with the corresponding funding requirement on an annual basis. This will assist the national government in programming the necessary funds over a certain time period, like on a quarterly or annual basis.
- Identify and include in the list of projects that need further feasibility studies, which may be funded by foreign grants.
- To the maximum extent possible, a logical framework (log-frame) should be created for each of the project proposed for inclusion in the recovery plan. Log-frames are normally required by foreign donors to consider project proposals.

Table 153 Summary of recovery and reconstruction projects in the culture and heritage sector

Name of Specific project	Annual Needed Amount of Assistance (Rs.)						Total Needs (Rs.)
	Disaster Year	Year 1	Year 2	Year 3	Year 4	Year 5	
	A	B	C	D	E	F	G
Recovery Projects							
d.							
e.							
f.							
Total							
Reconstruction Projects							
d.							
e.							
f.							
Total							
Grand Total							

Notes of filling Table 153:

- Project titles can be inserted under the column on recovery and reconstruction needs.
- Columns can be added to accommodate any additional reconstruction needs beyond Year 5.

2.13.8 Step 8 – Sector Report

With all the information gathered using the previous steps, a report can be drafted by the assessment team, which will provide the inputs for a particular sector in the overall recovery and reconstruction plan. The following format may be considered:

- Brief description of the sector in the disaster-affected areas.
- Damages in the sector by areas and by types of assets affected.
- Losses in the sector emphasizing the losses in income, increase in expenditures, estimated period before normalcy will be attained, etc.
- Impact on the livelihood, individual households, vulnerable groups and the consequences to the greater community if no assistance for recovery will be provided.
- Proposed strategies for recovery and reconstruction of the sector.
- Needs of the sector, by priority, and the draft schedule of implementation with the estimated funds required for each project over time.

The draft sector report should be submitted to the Gujarat State Disaster Management Authority/ Secretary (R&R) for consolidation.

References

- National Institute of Disaster Management. (n.d.). Post Disaster Needs Assessment Manual Volume I. Retrieved from https://nidm.gov.in/PDF/pubs/pdna_manual_vol1.pdf
- National Institute of Disaster Management. (n.d.). Post Disaster Needs Assessment Manual Volume I. Retrieved from https://nidm.gov.in/PDF/pubs/pdna_manual_vol2.pdf
- National Database for Emergency Database, Gujarat Specific. Retrived from: https://ndem.nrsc.gov.in/login.php

Learning Unit 2.14
Environment Sector

Brief Description of the Learning Unit

The second learning unit is designed to guide learners through conducting Post Disaster Needs Assessments (PDNA) specifically for the environment sector in Gujarat. The session will provide a comprehensive guide detailing eight crucial steps that ensure the successful execution of PDNA. Throughout the training, participants will receive detailed instructions and best practices for each of the eight steps, ensuring they thoroughly understand the entire PDNA process. This focused approach will address the unique challenges and needs of assessing related impacts and recovery requirements. By the end of this session, participants will be equipped with the necessary knowledge and skills to effectively conduct PDNA for mining and quarrying sectors, ensuring comprehensive and reliable assessments that can inform recovery and reconstruction efforts in Gujarat.

Learning Objectives

- To introduce general step in conducting a PDNA.
- To understand required baseline information for each sector and its importance.
- To understand the requirements of field assessment.
- To understand assessment of disaster effects and impacts on each sector.
- To determine and prioritize the recovery needs.
- To understand the general guidelines to consider while compiling the sector report

Duration: 25 minutes

Methodology

- Lecture-based learning
- Case study-based learning
- Discussion
- Q&A session

Detailed Description

2.14.1 Step 1 - Recommended assessment team

The composition of the sector assessment team may vary by the type of disaster and the extent of the likely damage and production flow changes.

Table 154 Recommended assessment team for environment sector

Organization and Personnel	Role in the Sector Assessment

State Personnel from:
• Principal Chief Conservator of Forest & Head of the Forest Force
• Gujarat Pollution Control Board (GPCB)
• Gujarat Ecology Commission
• GEER Ecological Education and Research Foundation
• **Local departments and offices in the disaster-affected area:**
  ○ Environmental Specialist (Biodiversity/ Ecology/ Pollution/ Soil Degradation/ Salinization/ Climate Change)
  ○ Environmental Economist
  ○ Environmental Impact Assessor
  ○ Communication Specialist
	Lead and coordinate

Personnel from:
• **Ministry of of Environment, Forest and Climate Change**
  ○ Environmental Specialist (Biodiversity/ Ecology/ Pollution/ Soil Degradation/ Salinization/ Climate Change)
  ○ Environmental Economist
  ○ Environmental Impact Assessor
  ○ Communication Specialist
	Provide baseline information and facilitate the field assessment of damages and losses

Development partners (if active in the sector)	Participate and provide technical advice

2.14.2 Step 2 - Baseline Information and Sources

Baseline information must be compiled before the field assessment or, if possible, prior to the occurrence of disaster. The baseline data should be validated before the field visit to serve as the basis for the estimation of damages and losses for the disaster-affected area/s. This data can be compiled at the State/Region office or at the district levels. The tables below can be used for the baseline information.

Table 155 Baseline information of environmental assets in district

Name of District:				
Name of Environmental Assets	**Number of Environmental Assets by Ownership**		**Area (Hectare)**	**Pre-Disaster Description and Characteristics**
	Public	**Private**		
Forests (Primary, Secondary, Mixed, Mangrove, Others)				

Protected Areas (Wildlife Sanctuaries, National Parks, Wetlands, Coral Reefs, others)				
Other Environmental assets (Areas of importance, High Biodiversity, Breeding Grounds, Endangered Species, Landscape/ Recreation)				
Total				

Notes of filling Table 155:

- The above table will provide the assessment team with an overall picture of the environmental assets in the area, which will help prioritize the areas for post disaster assessment and as a reference for the same.
- Note that the environmental assets are often closely linked to other sectors. For example, "natural formations" (e.g. underwater caves, rivers in caves, mountains etc. are estimated in the Culture Sector Assessment. The results of the sector assessments will be important for the Environment Assessment; special care should be taken to avoid double counting in the environmental assessment.
- "Ownership" refers broadly to management of the environmental asset (not specifically to ownership through legal land rights).

Table 156 Baseline information of environmental service flows in district

Name of District:			
Environmental Services	**Estimated Value of Services (Rs./Hectare/Yr)**		
	Forests	**Protected Areas**	**Other Environmental Assets**
Carbon Sequestration			
Water Cycle Protection			
Bio-Diversity Protection			
Ecosystem Protection			
Recreation			
Others (Specify)			

Table 157 Baseline information of assets of company or agency operating physical infrastructure at an environmental site

Name of District:		
Name of Agency or Company:		
Category: Forest ( ) Protected Areas ( ) Other Environmental Assets ( )		
Ownership: Public ( ) Private ( )		
Number of Employees: Male- Female -		
Assets	**Estimated Replacement Cost**	**Estimated Repair Cost**
Roads and Bridges		
Internal Roads (km)		
Bridges (m)		
Structures		
Living Quarters		
Research facilities		
Observation Towers		
Other Buildings (Specify)		
Equipment		
Vehicles		
Machinery		
Others (Specify)		
Stocks/ Inventories		
Materials/ Stocks		
Others (Specify)		

Note: If roads and bridges are estimated in the transportation sector, they should not be included in the environment sector

Table 158 Sources of information for collecting baseline data

1	Ministry of Statistics and Programme Implementation	http://www.mospi.gov.in
2	National Institution for Transforming India	http://niti.gov.in
3	The Registrar General & Census Commissioner, India	http://censusindia.gov.in
4	Ministry of Environment and Forests	http://www.moef.nic.in
5	Ministry of Environment, Forest and Climate Change	http://envfor.nic.in
6	National Green Tribunal	http://www.greentribunal.in
7	Central Pollution Control Board	http://cpcb.nic.in
8	India Environment Portal	http://www.indiaenvironmentportal.org.in
9	Indian State-Level Basic Environmental Information Database (ISBEID)	http://isbeid.gov.in/home.aspx
10	Principal Chief Conservator of Forest & Head of the Forest Force	https://fed.gujarat.gov.in/index.htm
12	Gujarat Pollution Control Board	http://gpcb.gov.in
13	Gujarat Ecology Commission	http://www.gec.gujarat.gov.in
14	GEER Ecological Education and Research Foundation	http://www.geerfoundation.gujarat.gov.in/

2.14.3 Step 3 - Estimation of Damages and Losses (Disaster Effects)

- With the baseline information, field assessment should be undertaken in the affected Districts after a disaster. The assessment team from the State must work with their local counterparts in the districts to ensure that the estimates for the damages and losses in the sector are accurate to the extent possible.
- Direct interviews with private contractors or government officials involved in the construction and repair of facilities can also be conducted during the field trip in order to validate unit costs of repair and reconstruction (which is already contained in the baseline data).
- Data gathering can be carried out at the actual affected areas through direct observations and consultations with the affected people. For areas that are inaccessible, data gathering can be done at local offices of agencies concerned with the environment combined with interviews of key government and nongovernmental actors. Stakeholder consultations with representatives of the affected community that are inaccessible, including women, should be carried out if possible.
- Due to the difficulties and uncertainties associated with quantitative valuation of environmental assets, the main assessment of post disaster effects can be qualitative. The following matrix and table present a suggested format to aid the qualitative assessment; the environmental assessment team can revise the format if more detailed assessment is feasible.

Table 159 Qualitative criteria of environmental impact

Impact Leve	Damage	Damage Description
A	**Total Destruction**	Total destruction of environmental assets. This may occur when it is deemed impossible for the affected ecosystem to recover over, say, a period of 25 years or more, and the likelihood that the affected areas may be put to future use is nil.
B	**Very Severe Destruction**	Very severe destruction of environmental assets refers to those that are serious and destructive with very extensive range or coverage, which will require high cost of rehabilitation.
C	**Severe Destruction**	Severe destruction of environmental assets refers to extensive ones but with a possibility to partially recover over the medium to the long term at a very high cost.
D	**Moderate Destruction**	Moderate destruction will refer to the destruction of environmental areas that is feasible to recover in the short to medium term through introduction of costly to moderately costly remediation measures.
E	**Minimal or Slight Destruction**	Minimal or Slight destruction of assets are those that will require natural regeneration or low-cost assisted remedial measures that ensure short-term recovery.
F	**Zero destruction**	Zero destruction refers to destruction that is very negligible requiring natural generation in a short period of time.

Table 160 Qualitative post disaster assessment of environmental assets

Name of District:				
Name of Area	**Special features of asset and services provided**	**Area affected (Hectare)**	**Impact level (A-F)**	**Immediate Physical Effects**
Area 1				
Area 2				
Area N				
TOTAL				

Notes of filling Table 160:

- The areas can be the name of forests, protected areas, wetlands and other environmentally sensitive areas, which the assessment team must identify.

Table 161 Initial estimate of losses in environmental services

Name of District:							
Environmental Services	**Loss Information**						
	Extent of damage (%)	**Recovery Time (yrs)**	**Disaster year**	**Year 1**	**Year 2**	**Year 3 -10**	**Total (Rs.)**
Carbon Sequestration							
Water Cycle Protection							
Bio-Diversity Protection							
Ecosystem Protection							
Recreation							
Others (Specify)							

Notes of filling Table 161:

- If credible estimates for the value of environmental service flows already exist, it may be possible to estimate the losses associated with Forests, Protected Areas, and Other Environmental Assets. The baseline information on environmental service flows and estimated recovery time of the asset can be used to calculate associated losses. Otherwise, the effects and impacts due to the losses in environmental services should only be done qualitatively.

Table 162 Damages and Losses of company operating physical infrastructure at an environmental site

Name of District:						
Name of Company:						
Category: Forest ( ) Protected Ares ( ) Other environmental assets ( )						
Ownership: Public ( ) Private ( )						
Number of Affected Students: Male- Female-						
Assets	**Damage Information**					
	Event	**Building Collapse/ Building fire/ Cyclone/ flood**				
	Event Date					
	Totally Destroyed		**Partially Damaged**		**Grand total**	**Average time to repair (days)**
	Number of totally destroyed	**Average replacement cost (Rs.)**	**Number of partially damaged**	**Average repair cost (Rs.)**		
	A	**B**	**C**	**D**	**E**	**F**
Internal Roads (km)						
(surface type)						
Internal Bridges (m)						
(main material)						
Structures						
Living Quarters						
Research Facilities						
Observation towers						
Other building (specify)						
Equipment						
Vehicles						
Others (Specify)						
Stock/ inventories						
Stock / Materials						
Others (Specify)						
TOTAL						

Loss Information				
Types of Losses	**Disaster Year**	**Year 1**	**Year 2**	**Total Losses (Rs.)**
Foregone Income				
Cleaning up of Debris				
Higher Operating Costs				
Other Unexpected Expenses				
TOTAL				

Notes of filling Table 162:

- 'Average Replacement Cost' will be the average pre-disaster value of the structures and assets that were totally destroyed while 'average repair cost' will be the estimated cost of repair of the partially damaged assets.
- In formula, the total damages of the companies surveyed will be **(Column E) = (Column A) x (Column B) + (Column C) x (Column D)**
- Years 1 to 2 are the years after the disaster.
- In case that the company is also assessed by the Tourism or Culture Assessment teams, the results must be validated to avoid double counting

2.14.4 Step – 4 Summarizing of Damages and Losses in the State

Table 163 Summarizing of Damages and Losses in environment sector

Name of State:							
Total number of patients affected: Male- Female-							
A. Qualitative Assessment of Environment Assets							
Environmental Assets Type	**Special features of asset and services provided**	**Area affected (Hectares)**	**Impact Level (A-F)**	**Immediate Physical Effects**			
Forests							
Protected areas							
Other Environmental assets							
B. Effects on Physical Infrastructure at Environmental Sites							
Estimated Damages							
Types of Assets	**Totally Destroyed**			**Partially Damaged**			**Total Damages (Rs.)**
	Public	**Private**	**Total (Rs.)**	**Public**	**Private**	**Total (Rs.)**	
District 1:							
Company 1							
Company 2							
Company N							
Total							
District 1:							
Company 1							
Company 2							
Company N							
Total							
Grand Total							

Types of Losses	**Within the Disaster Year**				**Losses Beyond the Disaster Year**			
	Damages		**Losses**		**Year 1**		**Year 2**	
	Public	**Private**	**Public**	**Private**	**Public**	**Private**	**Public**	**Private**
Foregone Income								
Cleaning up of Debris								
Higher Operating Costs								
Other Unexpected Expenses								
TOTAL								

2.14.5 Step 5 - Estimation of Disaster Impacts

Environmental impacts can affect the population directly and indirectly whether in the short or long run. Direct short-term effects are visible and can be easily identified. In contrast, many indirect and usually long term environmental effects of disasters can involve changes in community structures and ecological processes that may not be well understood or visible.

The EA team should identify at least the qualitative impacts on the following:

1. Carbon sequestration
2. Water cycle protection
3. Bio-diversity protection
4. Ecosystem protection
5. Recreation
6. Strategic wildlife areas and highly diverse ecological and biological areas
7. Areas important for the maintenance of species useful to agriculture, fish-farming, animal raising, etc.
8. Biological corridors and areas of seasonal importance to the feeding or reproduction of one or more species.
9. Woodlands, wetlands, etc. and the environmental services provided by these areas.
10. Impacts on the population such as potential reduction of air and water quality, increase or over population of one species that will be detrimental to the people (like mosquitoes, pests, etc.)
11. Potential or added risk of businesses and the people from future disasters, etc.

2.14.6 Step 6 - Estimation of Recovery and Reconstruction Needs

The identified needs should have a rough schedule of implementation outlining at the very least the activities, timing and budget required for all the programs and projects. The following techniques can be considered:

- Identify the specific projects according to their relative urgency or priority in relation to recovery.
- Plot the timeline of activities of all the projects, with the urgent ones on top, in a Gantt chart with the corresponding funding requirement on an annual basis. This will assist the national government in programming the necessary funds over a certain time period, like on a quarterly or annual basis.
- Identify and include in the list of projects that need further feasibility studies, which may be funded by foreign grants.
- To the maximum extent possible, a logical framework (log-frame) should be created for each of the project proposed for inclusion in the recovery plan. Log-frames are normally required by foreign donors to consider project proposals.
- Reconstruction needs mostly require long-term implementation periods. They normally require three or more years to complete. The recovery and reconstruction needs of the sector can be summarized in the table below showing the financing requirements over the years.

2.14.7 Step 7 – Prioritization of Needs.

Table 164 Summary of recovery and reconstruction projects in the environment sector

Name of Specific project	Annual Needed Amount of Assistance (Rs.)						Total Needs (Rs.)
	Disaster Year	Year 1	Year 2	Year 3	Year 4	Year 5	
	A	B	C	D	E	F	G
Recovery Projects							
Total							
Reconstruction Projects							
Total							
Grand Total							

Notes of filling Table 153:

- Project titles can be inserted under the column on recovery and reconstruction needs.
- Columns can be added to accommodate any additional reconstruction needs beyond Year 5.
- It should be noted that some environmental areas assessed cuts across the borders of districts or even states. In such a case, the area should only be assessed as a single entity. Moreover, caution must be exercised that the identified needs of this sector are not included in the other sectors.

2.14.8 Step 8 – Sector Report

With all the information gathered using the previous steps, a report can be drafted by the assessment team, which will provide the inputs for a particular sector in the overall recovery and reconstruction plan. The following format may be considered:

- Brief description of the sector in the disaster-affected areas.
- Damages in the sector by areas and by types of assets affected.
- Losses in the sector emphasizing the losses in income, increase in expenditures, estimated period before normalcy will be attained, etc.
- Impact on the livelihood, individual households, vulnerable groups and the consequences to the greater community if no assistance for recovery will be provided.
- Proposed strategies for recovery and reconstruction of the sector.
- Needs of the sector, by priority, and the draft schedule of implementation with the estimated funds required for each project over time.

The draft sector report should be submitted to the Gujarat State Disaster Management Authorities/ Secretary (R&R) for consolidation.

References

- National Institute of Disaster Management. (n.d.). Post Disaster Needs Assessment Manual Volume I. Retrieved from https://nidm.gov.in/PDF/pubs/pdna_manual_vol1.pdf
- National Institute of Disaster Management. (n.d.). Post Disaster Needs Assessment Manual Volume I. Retrieved from https://nidm.gov.in/PDF/pubs/pdna_manual_vol2.pdf
- National Database for Emergency Database, Gujarat Specific. Retrived from: https://ndem.nrsc.gov.in/login.php

Technical Session 3

Development of Recovery Framework

Introduction, Overview & Perspectives

This technical session deals with the critical process of linking Post-Disaster Needs Assessments (PDNA) to Disaster Recovery Frameworks (DRF), essential for creating effective recovery plans. Learners will explore how to develop a DRF based on PDNA findings, translating detailed damage, loss, and needs analyses into a comprehensive recovery strategy. The session will cover the key elements of a DRF and the timing of initiating the DRF, highlighting the balance between urgency and thorough planning. Additionally, the key steps for developing a DRF will be outlined, such as conducting a PDNA, engaging stakeholders, setting recovery priorities, identifying financing options, and establishing a coordination mechanism. By the end of this session, participants will be equipped with the knowledge and tools to seamlessly link PDNA to DRF, ensuring a strategic and well-coordinated disaster recovery process.

The primary objectives of this technical session

- To formulate a Sector Recovery Strategy.
- Illustrate how the needs identified in the PDNA lead to the formulation of a Post Disaster Recovery Strategy.
- Identify and describe the links between the PDNA and the Disaster Recovery Framework.

Duration: 50 minutes

Methodology

- Lecture-based learning
- Case study-based learning
- Discussion
- Q&A session

The learning units of this technical session

Learning Unit 3.1: Development of Disaster Recovery Strategy

- 3.1.1: Disaster Recovery Strategy
- 3.1.2: Consolidation and analysis of data
- 3.1.3: Objectives of Disaster Recovery Strategy
- 3.1.4: Guidelines for forming policies and strategies
- 3.1.5: Formulating Disaster Recovery Strategy

Learning Unit 3.2: Transitioning from PDNA to DRF (Disaster Recovery Framework)

3.2.1: Linking PDNA to DRF
3.2.2: Development of DRF based on PDNA
3.2.3: Key elements of DRF
3.2.4: Optimum time to initiate DRF
3.2.5: Key steps for developing DRF

Session

Content	Trainer's Note	Time
Development of Disaster Recovery Strategy	Focus in explaining the objectives of disaster recovery strategy and its related guidelines and policies. Explain guidelines to formulate the disaster recovery strategy	25 min
Transitioning from PDNA to DRF	In this section focus on disaster recovery framework and its linkages to PDNA process. Explain the timeline, key elements and steps for developing disaster recovery framework.	25 min

Learning Unit 3.1
Disaster Recovery Strategy

Brief Description of the Learning Unit

This learning unit is meticulously designed to guide learners through the comprehensive process of analysing sector reports and developing an effective disaster recovery strategy. The initial focus will be on understanding and evaluating the detailed sector reports, which provide critical insights into the impacts of disasters across various sectors Following this, the unit will delve into the development of a disaster recovery strategy. Key elements such as setting objectives, formulating policies, and prioritizing recovery activities will be covered. Moreover, the unit will provide detailed explanations of the major guidelines that must be followed throughout this process. These guidelines will include best practices for data consolidation, stakeholder engagement, and cross-sector coordination. By the end of this unit, learners will be equipped with the knowledge and skills to develop a robust disaster recovery strategy that can effectively guide recovery efforts and contribute to sustainable development in the aftermath of disasters.

Learning Objectives

- To formulate a Sector Recovery Strategy.
- Illustrate how the needs identified in the PDNA lead to the formulation of a Post Disaster Recovery Strategy.

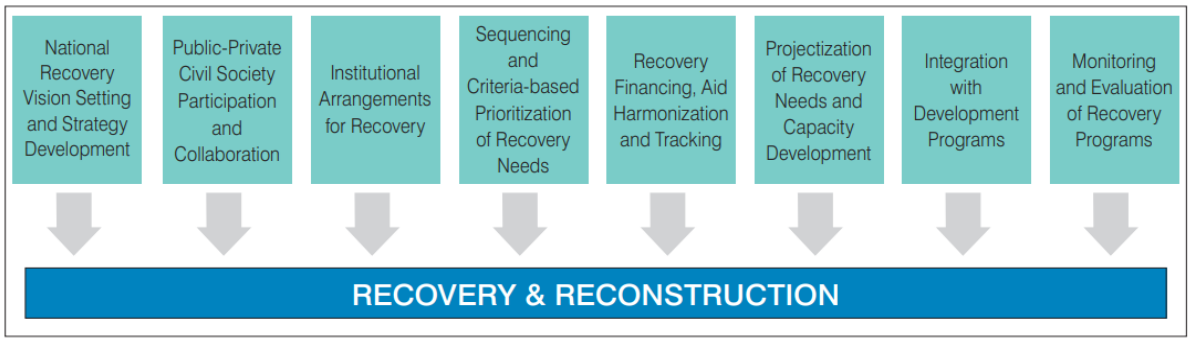
Duration: 25 minutes

Methodology

- Lecture-based learning
- Case study-based learning
- Discussion
- Q&A session

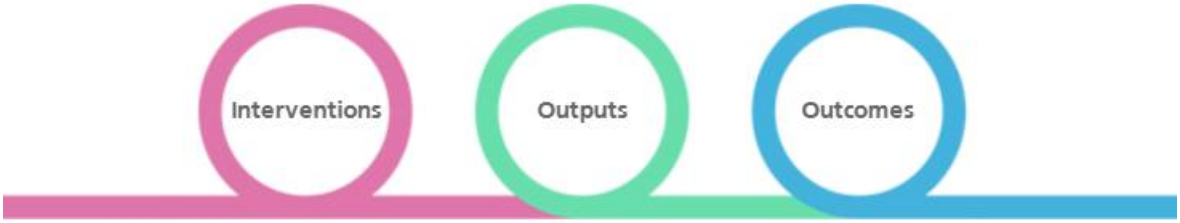
Detailed Description

3.1.1 Disaster Recovery Strategy



Source: The World Bank and et al, 2014

- Should provide the guiding principles to be followed during the recovery phase and must be contained explicitly in the recovery plan.
- Includes frameworks and strategies. The strategies can be through policy (like exempting the private sector from certain fees as incentive for them to start reconstruction) or through regulation (like establishing a 'no-build zone' or adoption of new disaster-resilient construction methods).
- The framework and strategies can also include prospective measures like proposed legislation that will enhance the overall disaster risk management of the country or areas affected. It is always advisable to consult the affected people in developing the framework and strategies.



Interventions

- Interventions refer to the inputs and activities (programmes, projects or policies) needed to address the priority recovery needs identified and transform them to outputs.
- Recovery interventions are developed for all sectors and are included in the Recovery Strategy along with their timeframe for implementation, the responsible government agency and implementations partners. The interventions are designed for:
  1. Short-term (disaster event to 6 months)
  2. Medium-term (6-18 months)
  3. Long-term (18 months to 5 years) recovery timeframes.
- In selecting interventions, it is important to assess the impacts they are likely to have on the affected population and their feasibility in terms of implementations, that is, government and donor support as well as political implications, among others.

Outputs
The expected outputs are the specific products and services that emerge from processing inputs through recovery activities. Outputs, therefor, relate to the completion (rather than the conduct) of activities and constitute the type of result over which managers have a high degree of influence.

Outcomes
The intended outcomes are actual or intended changes in disaster conditions that the recovery interventions seek to support.

3.1.2 Consolidation and Analysis of Data

The PDNA produces an integrated sector-by-sector report of the damages, losses, needs and sector recovery strategy that is then summarized into a preliminary and broad Disaster Recovery Strategy. The primary objective of recovery is to enable all people to improve their overall well-being. This is done by restoring their physical assets, livelihoods, and socio-cultural and economic status in a resilient, risk reducing context implied in the concept of Building Back Better.

3.1.3 Objectives of Disaster Recovery Strategy

The primary objective is to enable people to improve their overall well-being by restoring their physical assets, livelihoods, socio0cultural and economic status.

3.1.4 Guidelines for forming Policies and Strategies

After the consolidation of the field assessment, the assessment team must identify or recommend the policies and strategies to be followed for recovery and reconstruction of the sector. The following are some of the general policies and strategies that could be considered.

A. Policy Measures

There are certain policies that can be adopted over a limited period, which can provide incentives to the private sector to reconstruct damaged assets with higher standards of resilience. Among them are:

- Income tax breaks for private companies such as:
  a. Temporary reduction or freeze or deferment in the collection of tax;
  b. Temporary freeze on basic service charges in the utilization of certain services over the time of the recovery phase;
  c. Non-collection of property taxes for the duration of the recovery period;
  d. Exemption from registration fees for replacement of the destroyed equipment and machinery over a certain period of time.
- Subsidizing construction materials and equipment to be imported by private companies during the recovery and reconstruction phase through an exemption from paying customs duties and other levies.

- Extending bank guarantees on loans by the government to enable the private sector to rebuild immediately.

B. Strategies

The following strategies can be adopted for the post-disaster recovery and reconstruction activities:

- Building Back Better (BBB). Recovery activities based on BBB principles will promote longer-term disaster risk reduction and management. BBB principle should look at the how to make infrastructure and facilities safer from future disasters like stronger engineering design, the advantages of resettlement of facilities in disaster-safe areas instead of rebuilding in the same disaster-prone areas, etc.
- Focus on the most vulnerable and socially disadvantaged groups such as children, women, and the disabled. Recovery programming needs to give priority to the most vulnerable groups, including female-headed households, children and orphans, and the poor, and take into account those with special needs.
- Community Participation and Use of Local Knowledge and Skills. The participation of the community in all process (identification, planning, design and implementation) of recovery activities will help ensure the acceptability of projects and optimize the use of local initiatives, resources and capacities.
- Secure development gains. Recovery strategies, although may be a separate set of activities, must be supportive of existing development plans and must attempt to re-establish and secure previous development gains.
- Coordinated and coherent approaches to recovery. Projects for disaster recovery must have the full and effective coordination among all involved agencies based on comprehensive information exchange, flexibility in administrative procedures, and uniformity of policies. In some instances, a special new agency may be needed to oversee, coordinate and monitor complex disaster recovery programs. Under this strategy, capacity building activities for the local public administration may be part of the recovery activities including a well-defined monitoring and evaluation system for the overall implementation of the recovery plan.
- Efficient use of financial resources. The overall strategy should also include the identification of funding sources that are suited for the recovery activities. It should be clear how assistance to the recovery of the private sector would be delivered. Also, some cheaper source of funds from international donor partners should be initially identified for longer-term expensive projects.
- Transparency and accountability. The overall plan and implementation of projects for recovery must be transparent, especially to those affected, through open and wide dissemination of information on all aspects of the recovery process. An effective monitoring system must be established.

3.1.5 Formulating Disaster Strategy

The Disaster Recovery Strategy defines the vision and principles for recovery and includes a description of the implementation arrangements, particularly in terms of the following key elements:

1. Partnerships, coordination, and management,
2. Cross-cutting themes,
3. Links to development,
4. Resource mobilization,
5. Key assumptions and constraints

Partnerships, coordination and management

This section of the Recovery Strategy describes:

- Key partnerships in the recovery process
- Intra-sectoral and inter-sectoral coordination arrangements among all key actors and including the Government, civil society, and the private sector.
- Management arrangements for the recovery process, including arrangements for:
  a. How the Government would organize the recovery process, within each sector and overall?
  b. Which government agencies would be responsible for managing recovery?
  c. What changes or additional support may be needed for a successful recovery?
- Inter-agency management arrangements among them the Coordination Unit or a similar arrangement proposed with the establishment of corresponding support service (for example, offices and Human Resources).

Cross-cutting themes

These affect all or a substantial number of sectors and have important implications for post-disaster recovery.

Cross-cutting sectors in PDNA	Cross-cutting issues in PDNA
Employment and Livelihoods	Gender
Disaster Risk Reduction (DRR)	HIV/ AIDS
Governance	Age
Environment	

- Where applicable, sector teams should incorporate these cross-cutting issues in their assessment process. The recommended interventions should be included in the Recovery Strategy. In any PDNA, additional context-specific cross-cutting issues may also arise and require treatment by the sector.
- Implementation arrangement: In addition to these cross-cutting issues, there are linkages among various sectors, which require inter-sector cooperation. For example, the housing sector may require repair or rebuilding, which may link to the livelihoods sector when the rebuilding process is able to provide paid employment. Or, the damages suffered by the water and sanitation infrastructure may require additional preventive health measures and

quality control of water supply. Hence it is important for each sector to share its findings with others and jointly determine cross-cutting linkages. This requires working collaboratively with other sector teams to develop cohesive recovery interventions. This process would be aided by the Coordination Team, which has access to the assessment reports of all sectors and can identify areas for collaboration.

Links to development

The disaster recovery strategy would be useful for outlining the ways in which the recovery process could link up with and support the country's development goals and priorities. Wherever possible, it would permit the alignment of the recovery process to the broader strategic development objectives of national governments.

The recovery strategy is also a building element for establishing and potential modification of:

- The National Recovery Framework aligned with the pre-disaster national development plans and the country's development budget.
- The alignment with local development plans, and the cooperation plans, interventions and commitment of development partners.

The Recovery Strategy guides the interventions of the National, State and Local Governments, the NGOs. Development Partners, the Donor Community, and promotes the involvement of the private sector and civil society – including women's organizations – in the recovery process. When conditions allow or it appears to be necessary, the recovery strategy could lead to adjustments to the above documents.

Resource Mobilization

The disaster recovery strategy forms the basis for mobilizing the majority of resources that support a country's recovery. A resource mobilization effort under this strategy would be able to secure funds for the recovery program. When internal mobilization or nationality available resources are insufficient for identified needs, organizing a donor round table or conference could constitute a key element of the strategy. Such an event could be organized following the completion of the PDNA and the Recovery Strategy.

The objectives and targets of the donor and potential pledging conference, and of the strategy for resource mobilization, should be discussed and decided by the government with the support of the PDNA Team members. The donor conference could be convened under the leadership of the Government and the High-Level Management Team.

The resource mobilization strategy should consider advocacy and communications to raise awareness among:

- Policy makers
- Potential donors
- Media
- Key population groups
- Other stakeholders considered important audiences.

Key assumptions and constraints

PDNA identifies the key assumptions made to successfully complete the recovery process, and the major constraints likely to be encountered during the recovery process indicating how they might be overcome.

Examples of the key assumptions would include the following:

- Key stakeholders would be part of an open and participatory recovery process.
- There would be no new disaster affecting the country.
- The country's institutions and administrative capacities would be able to incorporate the recovery with their functional and technical capacities.
- As part of the support provided for the recovery, resources would be earmarked to enhance the functional and technical capacities of local and national institutions to undertake the recovery process.

The constraints would include:

- Limited financial and material resources
- Insufficient human resources and technical expertise to support timely recovery.

The constraints could be overcome by soliciting financial and technical support from international donors and partners, and organizing trainings for government, community staff and volunteers.

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- Suwal, R. K. A Study of Post Disaster Reconstruction Recovery Framework (PDRF) From the Perspective of Theory of Change Thinking.

Learning Unit 3.2
Transitioning from PDNA to DRF (Disaster Recovery Framework)

Brief Description of the Learning Unit

This learning unit deals with the critical process of linking Post-Disaster Needs Assessments (PDNA) to Disaster Recovery Frameworks (DRF), an essential step in creating effective and sustainable recovery plans. Learners will understand how to translate the detailed assessments from PDNA, which encompass damage, loss, and needs analyses across various sectors, into a comprehensive recovery framework. This will involve synthesizing data to prioritize recovery needs and align them with available resources and strategic goals. Then will discuss the optimum time to initiate the DRF and outline the key steps for developing a DRF. By the end of this session, participants will be equipped with the knowledge and tools to link PDNA to DRF seamlessly, ensuring a strategic and well-coordinated disaster recovery process.

Learning Objectives

- Identify and describe the links between the PDNA and the Disaster Recovery Framework.

Duration: 25 minutes

Methodology

- Lecture-based learning
- Case study-based learning
- Discussion
- Q&A session

Detailed Description

3.2.1 Linking PDNA to DRF

The data and findings produced by conducting the post-disaster needs assessment (PDNA) or another comprehensive damage and needs assessment processes are the most critical inputs for preparing a Disaster Recovery Framework, DRF. These data will be augmented and refined as the DRF process proceeds. The most established methodology, PDNA, provides an assessment of the effects, impacts, prioritized recovery needs and a preliminary Disaster Recovery Strategy that must be further developed into a detailed recovery framework. The DRF expands on these elements and transforms them into concrete programmes for detailed sequencing, prioritization, financing and implementation of the recovery

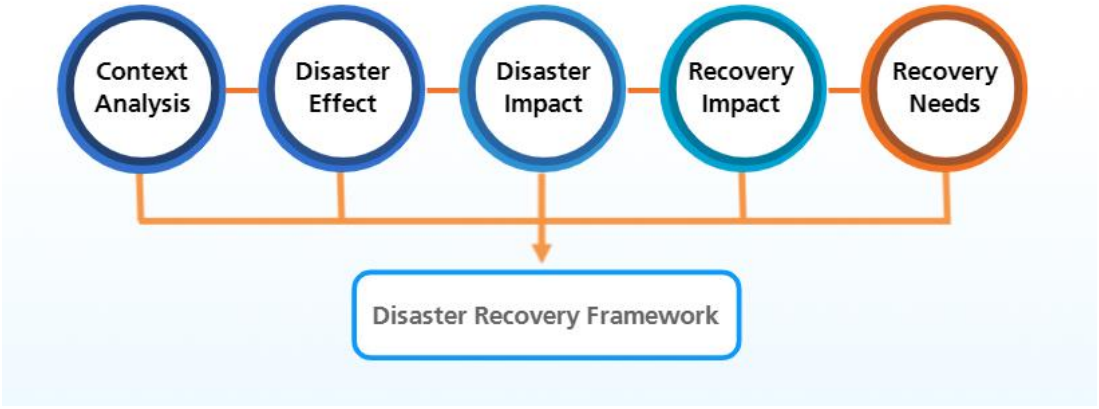

Figure 13 Components of DRF

3.2.2 Development of DRF based on PDNA

How does the DRF build on PDNA?	
PDNA	DRF
A government-led and complete assessment.	A government-led action plan that can be updated periodically.
Estimate damages and losses, and identifies recovery needs.	Details the timeframe, priorities, financial and implementation arrangements recovery.
Priorities needs within sectors and provides generic cost estimates.	Priorities and sequences recovery needs within and across sectors based on budget allocation and external financing estimates.
Provides an initial assessment of institutional issues and capacity constraints.	Carries out extensive assessment of recovery capacities and skills and institutional options for recovery. Identifies corresponding capacity building needs for efficient and effective recovery.
Recommendations to incorporate recovery into longer term national development plan.	Ensures that recovery is an integral part of national development policy and plans.
Recommendations to integrate recovery into longer-term risk reduction and resilience building efforts.	Ensures that recovery is integral part of ongoing climate and disaster risk reduction and resilience building efforts.

3.2.3 Key elements of DRF

The key elements of a DRF include:

1. Recovery Vision and Strategic Objectives (updated/fine-tuned from the PDNA Disaster Recovery Strategy);
2. Reference to Policy Framework;
3. Institutional Framework;
4. Detailed Sector Recovery Plans;
5. Financing Mechanisms;
6. Implementation Arrangements.

3.2.4 Optimum time to initiate DRF

There is not a specific timeframe that would be considered optimal to develop a DRF as it depends on a number of different considerations. In some instances, combining the PDNA and DRF processes could optimize the use of human and financial resources, and build on the momentum and interest on post-disaster interventions. Others argue that countries should start thinking of the DRF well before the disaster strikes, as part of its preparedness for recovery programs. This would certainly help countries to accelerate recovery interventions when more needed

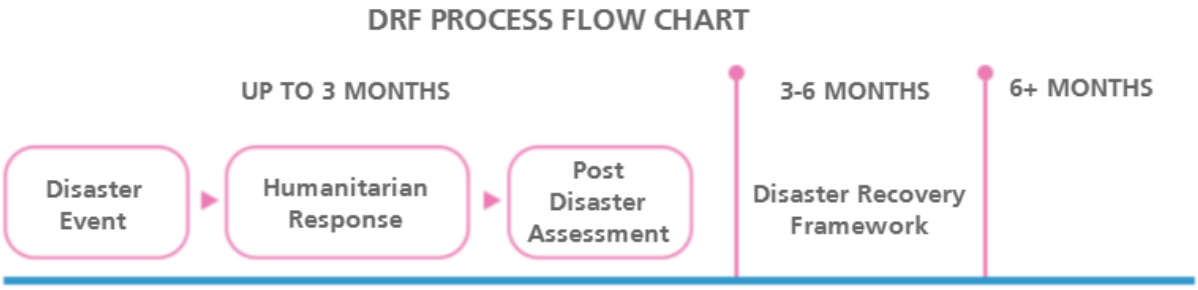

Figure 14 Timeline to develop the DRF

3.2.5 Key steps for developing DRF

1. Government's decision to develop a DRF;
2. Identification of lead agency(ies) and partners;
3. Development of Terms of Reference (ToR) to define scope and schedule;
4. Orientation for sectors teams;
5. Preparation to draft the DRF including sector plans;
6. Consultation within sectors and validation;
7. Cross-sector prioritizations;
8. Final review and submission of the DRF to the government for validation.

References

- National Institute of Disaster Management. (n.d.). Post Disaster Needs Assessment Manual Volume I. Retrieved from https://nidm.gov.in/PDF/pubs/pdna_manual_vol1.pdf
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