UNIT 8 DAMAGE ASSESSMENT*

Structure

8.0 OBJECTIVES

After reading this Unit, you should be able to understand:

- Major elements of Damage Assessment;
- Various Dimensions of Damage Assessment; and
- Framework and methods of Damage Assessment.

8.1 INTRODUCTION

Damage assessment is an important tool for retrospective and prospective analysis of disasters to assimilate the extent of impact of a disaster. This forms the basis for future disaster preparedness and preventive planning. It is essential in determining: What happened? What the effects were? Which areas were hardest hit? What situations must be given priority and what types of assistance are needed, for example, Local, State, or Union? Emergency response could be more effective; equipment and personnel could be better used; and help could be provided quicker, if a thorough damage assessment is performed beforehand. The basic objectives of damage assessment could be summarised as follows:

- To make a rapid assessment of areas affected to know the extent of impact for purpose of immediate rescue and relief operations;

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- To prepare estimates for the amount of relief to be provided and the mode of relief, be it food, clothing, medicines, shelter or other essential commodities;
- To make a detailed assessment regarding requirements for long-term relief and rehabilitation planning; and
- To identify focus areas for the purpose of 'retrofitting' actions in similar future situations.

Damage assessment is, therefore, a prerequisite for effective disaster response effort. For effective decisions, officials responsible for organising post-disaster relief operations should be properly informed of the damage/possible damage should the event repeat itself sometime in the future, so that they can know the needs, current, as well as prospective, in precise terms. They must have appropriate and timely information about: what happened, what needs to be done, and what resources are available? Their decisions can save lives; minimise injury, damage and loss; prevent any further escalation; prevent secondary hazards; and inform people who need to know. Well-organised response will also help in building confidence and enhancing the credibility of the administration. Relief operations are essentially about the management of information and resources, which is based on assessments and reports carried out from time to time. Information is needed at all levels of administration, but the nature of the information required varies from one level to another. In sum, disaster damage assessment is a vital tool to assimilate the extent of impact of a disaster, both short-term and long-term, and forms the basis for any disaster management and mitigation process and action plan. In the phase of recovery, the first step is damage assessment.

Damage assessment is to make an initial and preliminary onsite evaluation of damage or loss that has been caused by an accident or disaster. Through damage assessment exercise an attempt is made to put on record the amount and degree of damage and also to point out what can be replaced, restored or salvaged. Such an exercise brings to fore the likely required time for repair, replacement and recovery. Thus, damage assessment "is an integral part of facilitating effective and efficient response by government agencies and other organizations" (ODPM).

8.2 ELEMENTS OF DAMAGE ASSESSMENT

The following are the very important elements of damage assessment:

1) Identification of type of information needed and sources of data collection.
2) Data collection through primary and secondary sources.
3) Analysis of data.
4) Data interpretation.
5) Report writing
6) Drawing conclusion
7) Making Forecasts
8) Recommendation and measures suggested for decision makers, planners, implementers, community groups, NGOs, etc.

Definitely a detailed damage assessment needs to include much more, such as, verification of number of losses of human life and injured persons, losses of cattle lives, agricultural damage in hectares, building damage, losses of public works, business, utilities, total financial loss, etc.

Basic data generated from the flow is bottom up:

- Impact, which a hazard has had on the affected area;
- Needs and priorities for immediate emergency measures to save and sustain lives of survivors;
- Resources available for use;
- Possibilities for facilitating and expediting longer-term recovery and development;
- Directory information: Various line departments contact details;
- Habitation (Village/hamlet/ward) details;
- Village wise different types of disasters along with degree of risk (Vulnerability details);
- Historical records of past events with damage details and details of relief expenditure;
- Census data sets- Agriculture and population census, building and various structure details.

8.3 DIMENSIONS OF DAMAGE ASSESSMENT

Damage assessment is also a multi-disciplinary exercise involving officials from a cross section of experts and administrators from revenue, health, engineering, public works, social scientists, non-profit organisations, community, etc., to get a comprehensive account of losses for adequate future mitigation planning. Some of the data required are already available in the form of baseline data (maps, population statistics, etc.). However, it must be supplemented by real time information regarding the extent/nature of ongoing damage during a disaster event, from the damage site (through information report from various sources) as pre-disaster estimates, however accurate, may not provide sufficient information.

Information to be primarily compiled can be broadly segregated in the following categories:

1) Nature of the disaster, that is, the date, time, exact location;
2) Details of the occurrence of the disaster;
3) Regular reports regarding progress of damage assessment work;
4) Expected date and time of restoration or completion of a particular activity or mission.

Damage assessment is done through data collection and information assimilation and dissemination. It is useful to distinguish between the terms "data" and "information", as data are simply units of information including perceptions, numbers, observations, facts or figures. Data sometimes conflict with one another, for example, when two individuals report widely differing perceptions of the same event. Information, on the other hand, is "useful data". Data could become information when it can be translated into meaningful, relevant and understandable language, especially particular people at a particular time and place, for a particular purpose (IGNOU-NDMA, 2012).

Data collection, which is an on-going activity, depends on:

- Expertise and advice of survey specialists;
- Use of sample surveys;
- Cultural attitudes; and
- Personal preferences.

Concerned Department and Support Group

Administration and nodal department concerned are to collect all the available disaster related information and compile it at the earliest, through the concerned officials of the department. Support group coordination is a very important part of damage assessment. They provide a forum with which those affected can share their experiences. The group is both a source of information and a means of communication. Support groups can exploit the intense media interest in disaster by campaigning for public injuries by lobbying for better levels of compensation and safety change. The concerned Minister/Secretary, Department of Disaster Management and District Magistrate are only competent persons to interact with press and electronic media. These persons should ensure that only factually correct and confirmed information is shared with media. At the same time, no exaggerated version of any event or any criticism or one's personal opinion or views about the occurrence of disaster at any point of time should be made public.

Damage assessment is required at two basic levels of intervention. Firstly, it is required for emergency relief measures in which quick assessment of damage is the basis for the amount of relief material and food stocks that reach the disaster area. This type of an assessment is called Rapid Damage Assessment. The second level would be a detailed technical analysis of damage for long-term restoration and rehabilitation works. From a long-term perspective, damage assessment scrutinises the mechanisms of failure that took place during the disaster. It is called Detailed Damage Assessment. These studies are very useful for all prevention and mitigation efforts for disasters in the future.

Rapid Damage Assessment

The official agency for reporting estimates of damage is usually the Revenue and Relief Department of the State Government, as they are also the authority for distributing relief to affected persons. As usual, there is a hierarchy of officials who report from the lowest level of Villages/*Panchayats* through Blocks/Revenue Circles, *Tehsils/ Talukas*, and Sub-divisions and finally to the districts and then to the State headquarters. However, relief agencies including NGOs also have their own damage assessment systems and teams to carry out the assessments. The basic items covered in rapid assessment are:

- Name of the place
- The causative factors
- Date and time of disaster occurence
- Area affected
- Total number of villages or neighborhoods affected
- Total population

The estimate of a disaster's effects can be characterised as a scenario of possible losses and needs. Estimates can then be created that anticipate the resources that are required to respond to the loss. The estimates include commodities of food, medicines, manpower, and machinery and money requirements for getting relief to the potential victims.

Check Your Progress 1

Note: i) Use the space given below for your answers.

ii) Check your answers with those given at the end of the Unit.

1) What do you mean by damage assessment?

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2) Discuss elements of damage assessment?

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8.4 FRAMEWORK AND METHODS

The framework for damage assessment can be broadly divided in two parts:

1) Initial Situation overview

2) Needs Analysis

The first part is meant to bring to attention the amount of damage done by the disaster in the area concerned. Normally, it is a time bound activity and required to be put forth in the first 8 hours of the happening of the event. The major focus is on issues like casualties, displacement of the population and damage to lifelines and critical facilities. It is mostly through the observations of the key organisations and officials. "The ISO (Initial Situation Overview) often involves observation from an aircraft, sometime satellite photographs, and various other reports. The information from the ISO allows national/local officials to determine immediate action necessary to respond to the effects of the hazard" (ODPM).

The second part tries to articulate level and type of assistance required for the affected population. The damage assessment covers the nature and extent of a disaster, priority need of the affected community, particularly the vulnerable people. It must provide the extent and type of damage and identify secondary threats,

resource availability and the capacity of local response. Finally, the assessment process should make actions, interventions and resources needed to formulate long term rehabilitation or development strategies.

The post-disaster assessment completely highlights the damage and its impact on various aspects of life. Damage assessment plan for various critical sectors are as follows:

8.4.1 Assessing Loss and Damage to Human Life

The loss of human lives affects many other aspects for the lives of survivors which are critical for a dignified living. The first information regarding this loss is to determine the baseline data related to the number of families residing in the affected area where the damage assessment is being undertaken.

For such assessment, it is useful to have data regarding-deaths, permanent disabilities, major injuries, minor injuries and missing people. Data should be segregated on the bases of gender, age or occupations, to develop deeper understanding. Details of occupation also provide a hint of economic status of families and enable to determine number of earning members and dependents within the family.

It is important to pay attention to certain special groups of people who tend to get left out in the enumeration process. Migrant workers, tourists, and travelers or unregistered informal sectors workers may be difficult to be estimated because of the lack of such record. All this information helps in effective targeting of the humanitarian response.

It is essential to have an assessment methodology that uses the community information and is credible for the humanitarian response planners. Collecting information from secondary sources is also important. Loss of life is estimated by community institutions, media and the government and many a time they come up with different figures. It is important that the damage assessment report mentions all the figures published under different reports.

8.4.2 Assessing Damage to Housing

The catastrophic event can cause varying degrees of damage to houses depending on various factors. The quality of construction, materials used, construction technology, type of dwelling, location, etc., contribute to the vulnerability of built structures and affect the extent of damage.

The geographic location of the settlement is the first information needed, including information regarding proximity to natural features such as lakes, rivers or sea. The assessment should further elaborate, in terms of urban or rural, size, typology on the basis of design and structural system, types of ownership and functional usage, etc.

First thing that must be done in the affected area is a transect walk. Transect walk through the disaster struck village and its varied locations and habitations is very useful for the purpose of reconnaissance and gives an overview of the extent and type of damage. Following are parts of good assessment for housing damage:

i) Area transect;

ii) Habitat mapping (information such as house type, damage category, vulnerable category);

iii) Photographic documentation;

iv) Household level survey.

8.4.3 Assessing Damage to Community Infrastructure

Infrastructure damage includes not only damage to basic services (like drinking water, roads, electricity, etc.), but also to public buildings essential for providing education, health care or those serving other social functions. For the assessment of damage to infrastructure after a disaster, it is must for a good assessment to have following components:

i) Infrastructure mapping: It gives an overview of the services and infrastructure available in the area. These are shown on maps prepared by community members. This helps in determining the geographic extent of damage and the affected stakeholders;

ii) Area level survey: It is conducted for each public building, basic services and community owned infrastructure to understand the extent of damage. Steps needed for changes should also be included;

iii) Photographic documentation: The decision making regarding infrastructure may take a long time and may be done at a distant site: photographic documentation, therefore, helps in making the correct decision about repair or replacement.

8.4.4 Assessing Damage to Environment

It is essential to understand and assess the impact of natural disasters on environment as the state of environment has an important effect on the quality of life of the people living. The loss of many environmental resources like soil, trees, etc., can be assessed directly. However, some damages are indirect, particularly those to the environmental services such as reduction of pollution, carbon sequestration, provision of wild life habitat, etc.

In post-disaster situation, following changes need to be looked into as they may affect the goods (food, fodder, water, timber and other non-timber products) and services (oxygen emission, pollinators, etc.) provided by the ecosystem:

i) Unique/unusual land form changes;

ii) Changes in natural drainage;

iii) Soil degradation;

iv) Destruction of trees;

v) Water contamination;

vi) Loss of plants and animals or their natural habitat.

The methods used for environmental damage assessment are:

i) Resource mapping: It shows various elements of the ecosystem in which the settlement exists like types of plantation, forest, natural water resources etc.

ii) Area transect

8.4.5 Assessing Loss of Livelihood

Disasters have significant impact on the socio-economic well being of the community. Different occupations experience varying extents of vulnerability to different disasters.

For example, farmers may be more affected in droughts, fisher-folk in tsunamis, industrial workforce and artisans in earthquake, etc.

Loss of economic assets, employment; reduction in income, critical consumption of food and expenditure on education and health care need to be assessed to understand the impact of the disasters. The assessment of economic loss of disaster is important for future planning.

Economic losses can be divided into two categories:

i) Direct damages

ii) Indirect damages

Direct damage assessment includes losses in agriculture, fisheries, local trade and production of goods. Indirect damage assessment includes losses in terms of likely production, future employment, income etc due to direct damage caused by the disaster.

8.4.6 Assessing Impact on Health

The impact assessment on health may be required as part of the overall assessment to identify the possible fallouts of the disaster. Because of disaster's negative impacts on health, health risks, due to worsening living conditions, are aggravated after disaster. Therefore, it is necessary to observe the victims, particularly the families with infants, pregnant/lactating mothers, old aged, disabled, chronically ill, HIV positive members, etc. Health hazards may arise due to site conditions such as water stagnation, mosquito breeding, high population density, etc. The assessment on water, lack of safe sanitation, light and ventilation in shelters, nutrition and food is important. Another important aspect that needs assessment for humanitarian response planners is the extent of the healthcare services required.

Surveillance reveals the type, magnitude, pattern and trends of health problems through periodic and systematic collection of health related data. Mobility map for health services are of great importance because they indicate the distance, frequency of availability and the types of services available. This can also help in identifying vector breeding sites and developing control mechanisms.

8.4.7 Assessing the Psycho-social Impact of Disasters

Disaster affects not only physical and material life of the community, but also affects them psychologically. It is reflected in their emotional reactions and increase in incidents like, anger, irritability, panic attacks, sleeplessness, withdrawal from activities, increased anxiety, nightmares in children, etc. These are some of the universal responses amongst people who experience events beyond their coping capacities. The other important aspect relates to need for psycho-social care for all disaster affected people. For understanding the psycho-social trauma that one may be experiencing, observation and listening is the most essential methodology to understand the type of trauma and its extent. Psychologically it is only through informal community discussion, meeting and personal contact with the households that one can observe these symptoms. Severe traumatic conditions can be identified through the above processes and detailed case cards may have to be prepared. A case card is like a case history and it is important to record the symptoms, personal and family background associated with such reactions. This helps in engaging psycho-social experts.

8.4.8 Assessing the Impact of Disasters on Women

A clear gender framework helps in capturing the important aspects of vulnerabilities in the damage assessment. Therefore, assessment for women groups is of wider significance because gender analysis is useful to understand activities and extent of their role in decision making regarding various aspects that govern daily life and may have been affected in the disaster. Thus, these are all concepts of vulnerability reduction, social inclusion, community participation and gender perspective forming the very important process of damage assessment.

Check Your Progress 2

Note: i) Use the space given below for your answers.

ii) Check your answers with those given at the end of the Unit.

1) Explain the framework of damage assessment.

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2) Write a note on Environment Damage Assessment.

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3) List out the impact of damage assessment in the area of health and women.

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8.5 CONCLUSION

Damage assessment is an important aspect in the field of disaster management. In this Unit, we have covered various elements, assessments, frameworks and methods of damage assessment. Increasing the efficiency, effectiveness of post-disaster damage assessment will lead to effective rehabilitation, reconstruction and recovery and also bring backs the resilience of the society. Some of the major elements of damage assessment are identification of types of information needed and sources of data collection as level of primary and secondary sources, data analysis and interpretation then report writing and forecasting, recommendation and measures suggested for decision makers, planners and community group.

8.6 GLOSSARY

Rapid Damage Assessment (RDA) : Rapid Damage Assessment (RDA) emphasizes on a rapid appraisal of the situation and extent of damage to provide resources for effective relief and resource. RDA is to be conducted by the planning section of the Incident Response Team (IRT), responsible for response management. The planning section of the IRT may require support of the local community.

Detailed Damage Assessment (DDA) : Detailed Damage Assessment is supposed to be done at the district level during the recovery stage involving skilled personnel from various line departments. The aim of this assessment is to estimate the economical and financial aspects of damage, the detailed building damage, agricultural damage, and property damage. It also aims at retrofitting or strengthening of houses, roads, bridges, hospitals, school, warehouses, railway tracks and other infrastructure.

8.7 REFERENCES

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8.8 ANSWER TO CHECK YOUR PROGRESS EXERCISES

Check Your Progress 1

1) Your answer should include the following points:

- Damage assessment is an important process to assimilate the extent of impact of a disaster both short term and long term and forms the basis for any disaster management and mitigation process and action plan.
- Damage assessment is essential for effective rehabilitation and reconstruction.

2) Your answer should include the following points:

- Identification of type of information needed and sources of data collection; data collection through primary and secondary sources; analysis of data.; data interpretation; report writing; drawing conclusion; making Forecasts; recommendation and measures suggested for decision makers, planners, implementers, community groups, NGOs etc.

Check Your Progress 2

1) Your answer should include the following points:

- The framework can be divided into two types, that is, Initial situation overview and Needs analysis.
- Initial situation overview is carried out to obtain a broad picture of the extent of damage caused by disaster.
- Needs analysis is tries to articulate level and type of assistance required for the affected population.

2) Your answer should include the following points:

- Unique/unusual land form changes; changes in natural drainage; soil degradation; destruction of trees; water contamination and loss of plants and animals or their natural habitat.
- Resource mapping and Area transect are the methods of environment damage assessment.

3) Your answer should include the following points:

- It is very necessary to observe the situation during disaster particularly the families with infants, pregnant women, old aged, disabled, chronically ill, HIV positive members etc. Health hazards may arise due to site conditions such as water stagnation, mosquito breeding, high population density etc.
- The assessment of water, lack of safe sanitation, light and ventilation in shelters, nutrition and food is important. Other very important aspect that needs assessment for humanitarian response planners is the extent of the health care services required.
- Gender framework helps in capturing the important aspects of vulnerabilities in the damage assessment.