A GUIDE TO SUCCESSFUL ASSESSMENT FOR EMERGENCY RESPONDERS

Prepared under the United Nations Development Programme (UNDP) and the European Commission Humanitarian Office (ECHO) through the Disaster Preparedness Programme (DIPECHO)

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Introductory Remarks and Acknowledgments

A Guide to Successful Assessment

This first responder manual is part of the risk reduction and emergency practices comprised of manuals and guidelines named Waters, Winds and Fires, funded by the European Commission Humanitarian Office (ECHO) through the Disaster Preparedness Programme (DIPECHO) in cooperation with UNDP Mozambique. A field communication (Guide to Radio Communications Standards for Emergency Responders in Southeast Africa and Southwest Indian Ocean) guideline is the accompanying document that will assist the practitioner and district and communities authorities to better transmit damage and losses, after a disaster strikes in their areas.

The United Nations Development Programme (UNDP) and DIPECHO has prepared this document based on desk reviews, available international validated assessment, and consultations with experts as necessary. This document also benefited from combined efforts and valuable contribution of Dr Jane S. P. Mocellin, a.i DIPECHO Regional Coordinator on behalf of UNDP. A consultant , B. Donaldson, have greatly contributed to the process of preparation of this document and gave useful advice and suggestions and finalizing it.

Overview

The frequency and intensity of accelerated disaster risks in the region directly increases consequences to human life, social impacts and economic losses that exaggerates already fragile and challenging conditions experienced by people in rural areas. It becomes evident that global warming and the current high frequency of man-made and natural disasters, are drives for impoverishment and are related to unemployment in the rural areas. The importance of a common approach with agreed methodologies is a key lesson. So, is the commitment by all agencies, and partners that are all interlinked with assessment of vulnerability and risks, from various natural disasters such as floods, cyclones and droughts.

Assessments

The integrated focus of the rapid humanitarian assessment sets a baseline, an early and longer-term recovery. At the core of the rapid assessment is the attention to human beings and the levels of suffering caused by a disaster. From this perspective, suffering means a populations' lack of capacity to satisfy its basic needs in health, water, food, shelter, livelihood and protection. And where rehabilitation and reconstruction should promote development that reduces risk of disasters to communities and empowers local communities, including gender, so that development opportunities are not missed or compromised because of short-term focus on relief.

The assessors must differentiate between what is normal for the location and what is occurring because of the disaster, so that emergency food aid, health care and other assistance can be provided at the appropriate level. Thus, baseline information, i.e., what the situation was prior to the disaster, is essential to be able to compare vulnerability, before and after the disaster, identify the impact the disaster had, and differentiate between chronic and emergency needs.

Helping people to help themselves is an important part of their rehabilitation

The initial assessment should concentrate on the effect of the disaster and not attempt to rectify chronic needs. The recovery phase highlights the need for emphasis on the development framework and the disaster recovery envisages that there is a great need to develop strategic recovery programs, which fit together with national and state level development goals, as disasters can be a vehicle for major development programs. Disasters can highlight particular areas of vulnerability and underdevelopment. The rapid assessment consists of assessing the situation and the needs in the critical stage immediately after a disaster, through the use of a clear and concise standard, which measures damages, losses and injuries, for the effective planning and implementation of relief.

Principles for Relief

The primary responsibility for disaster relief lies with the affected government, as intra-country response capacity has to be preferred over outside assistance, in order not to destroy self-help capacities. The same principle applies to the local situation: community response capacities have to be preferred over government assistance. Disaster relief is to be based solely on humanitarian needs, but planned in the context of long-term development, as this gives an opportunity to reduce vulnerability to future disasters.

Principles for Assessments

- Identify the level of response by the affected country and its

internal capacity to cope with the situation – nature and extent of a disaster;
- Identify the level of response from the international community – damage and secondary threats;
- Identify the most urgent relief needs for the population affected, and potential methods of providing aid mostly effectively – needs of the population;
- Make recommendations which define and set priorities on the actions and resources needed for immediate response – resource availability and local response capacity; and
- Highlight special concerns regarding the development of the situation such as the options for relief assistance, longer-term recovery and development.

Assessment Goals

- To provide timely and comprehensive information on the scope and impacts of a disaster;
- To support effective emergency decision-making at local, state and federal levels;
- To keep the public accurately informed; and
- To develop and support requests for disaster resources and recovery assistance.

Immediate and Continuous Assessment

Activate assessment staff immediately as the response unfolds, or even when a threat is imminent. Early information is crucial and the reporting process is continuous. Capturing an early overview and quickly targeting life/safety issues is vital. It's important to resist to the urge to hold and wait for better, or more complete information. Parts of a report at intervals are often more helpful than waiting for a complete report.

- Data collection is an ongoing process, which ensures that up-to-date information is always available; and
- Information requirements and the level of detail of information vary at different times, therefore, different types of assessments are conducted, such as initial and detailed assessments.

Types of Assessments

Initial Damage Assessment (IDA)

An IDA is to be conducted at the local level usually by a trained Village Disaster Committee (VDC) volunteers and will be comprised of representatives from the medical officer, engineers, and other locally trained volunteers. The IDA team will report to the District Commissioner and identifies:

- The magnitude of a disaster (without necessarily delivering exact figures) and its impact on society;
- People's capacity to cope with a disaster;
- The most urgent relief needs and potential methods for delivery;
- Priorities for action;
- The utilization of resources for immediate response;
- The need for detailed assessment of specific geographical areas or substantive sectors and the level of continuing or emerging threats; and
- The need for international assistance.

Detailed Damage Assessment (DDA)

Detailed Damage Assessment. It is done at the district level during the recovery stage, involving skilled personnel. The aim of this assessment is to estimate economical and financial aspects of damage, the detailed building damage, agricultural damage, and property damage and propose retrofitting or strengthening. The DDA team should ideally be comprised of the same people involved in the IDA and expanded to add specialists according to the findings of the IDA.

- Aims at determining the longer-term recovery and development requirements;
- Is conducted two to four weeks after a disaster, depending on the accessibility of the affected area;
- Covers critical sectors in terms of the country's future economic and social development strategy;

- Is carried out by specialists in the sectors concerned; and
- Identifies:
  - Recovery program options;
  - Estimates on financial and material recovery requirements;
  - Estimates on value loss through damage, and on damage to the social structure;
  - Links between relief and development and continuing need for relief assistance; and
  - The need for international assistance.

Situation and Needs Assessment

A situation assessment depicts a picture of the situation by describing the magnitude of the disaster and the impact on population and infrastructure (what has happened).

A needs assessment defines the level and type assistance required for the affected population (what needs to be done).

For both, initial and detail assessments:

- Information has to be accurate – the best sources to obtain information need to be accessed and biased information avoided;
- Information has to be timely – assessments should be carried out as soon as possible after the disaster;
- Information has to be continuously updated, in order to re-evaluate the needs and the appropriateness of response and recovery actions;
- Emergency and chronic needs have to be distinguished, in order to know what is normal for the location and what is the result of the disaster;
- Survey methods, terminologies, ratings and classifications have to be used in a standard manner;
- Surveyors have to be sensitive towards the local situation to prevent unrealistic expectations on the part of the affected population;
- Information has to be presented in a manner that suits the needs of the respective target groups;

- Assessment results have to be presented in a way that makes implications for prioritization and action very clear;
- Assessments hardly reflect the full picture of the situation and surveyors have to be aware, that intangible things can be equally important; and
- Resources to carry out assessments (i.e. teams, transportation, logistical support) have to be immediately available.

Elements of the Assessment Process

Assessments needs to be formulated in content and logistics thorough planning, design and preparation, well in advance of a disaster. Most information needs can be identified well in advance. The means for collecting data and the formats in which it is to be presented should be established well in advance during the pre-disaster planning period. It is important to seek advice widely from survey specialists, statisticians, epidemiologists and people with local knowledge.

By preparing people to undertake assessments well in advance of a disaster, both the data required, and the process most appropriate for its accurate and speedy collection, can be identified and refined prior to the disaster impact. Proper design of sampling and survey methods can increase substantially the accuracy and usefulness of assessment data. Standard survey techniques, questionnaires, checklists and procedures should be prepared to ensure that all areas are examined and that the information is reported using standard terminology and classifications.

Collect and maintain baseline and background data (for details see Annex 1), prepare survey forms for data collection, and formats for presentation of results and prepare standard survey techniques and procedures, are some of the tasks to be addressed. Furthermore:

- Pre-identify survey teams;
- Know available personnel, resources and stocks;
- Pre-identify likely problem areas and indicators;
- Develop standards for minimal performance requirements on living conditions, human services, life-sustaining elements, safety

(based on baseline data); and

- Establish standing agreements for emergency coordination among agencies concerning staff, communication, transport etc. and clarifying roles and responsibilities during the assessment phase.

Survey and Data Collection

The collection of data about the extent of damage caused by a disaster is the basis upon which decisions on relief and recovery are taken. Information gathering must proceed rapidly and thoroughly. Surveyors should look for patterns and indicators of potential problems. Using procedures developed earlier, key problems should be checked more thoroughly.

Sources of information should be identified (e.g. whether the information was observed by the surveyor himself, reported by an informant, collected through a randomly sampled population, or heard by rumor). The information will be more meaningful to those who interpret it if the source is indicated, especially when there are conflicting reports.

Interpretation and Forecasting

Incoming assessment data has to be thoroughly analyzed and interpreted in order to become meaningful and useful information for decision-makers. Those performing the analysis must be trained to detect and recognize trends and indicators of problems, to interpret the information and to link it to action programs. Estimates must be constructed of how the situation might develop so that contingency plans can be drawn up. Forecasting requires inputs from many specialists. People with previous disaster experience are likely to be especially helpful. Please refer to the checklist below:

- Cross check and compare reports, check against baseline for validity;
- Differentiate chronic and disaster-related needs;
- Consider information sources and survey methods;

- Avoid generalization;
- Detect and recognize trends and indicators of problems;
- Link information to action programs; and
- Estimate how the situation might develop in the future. This requires input of specialists who have had extensive experience in previous emergencies.

Reporting

Information and results of the analysis process need to be disseminated in a format that enables disaster managers and decision-makers to formulate action program.

Assessment Teams

Initial assessments should be carried out by multidisciplinary assessment teams comprising of four to five members. The characteristics of a team are:

- Common interest;
- Clear allocation of responsibilities among team members and complementarity of tasks;
- Shared commitment; and
- Inputs of all members are important to fulfill the task.

The skills and competence assessment teams should have, are in the fields of:

- Team leader;
- Agriculture;
- Public works and logistics;
- Health (environmental health specialist, epidemiologist, nutritionist) and education;
- Regional development or other local expertise;
- Gender; and
- Communication.

Assessment teams should be pre-identified and their contact details held at the District Office or Division and be regularly updated. Assessment staff

can be drawn from:

- National ministries and government departments at all levels;
- National military and navy units;
- Local and international NGOs; and
- International organizations.

Team members should be adequately trained and familiar with:

- Damage and needs assessments;
- Completion of assessment survey forms;
- Reporting channels procedures;
- Roles and responsibilities; and
- Safety and security instructions.

Prior to the field mission, team members should be briefed on:

- The current situation (whatever is known about the disaster situation);
- The mission objectives (time frame, sectors to focus on, geographical area to be covered);
- Local particularities;
- Their roles, specific tasks and responsibilities;
- Available resources (equipment, transport, communication); and
- To whom to report to and how to transmit reports.

Team members should be equipped with:

- Pen or pencils;
- Official report forms;
- A board or a file to write on;
- Protection of papers from water and dirt;
- Blank paper;
- Maps of the area;
- Food and water for the team;
- Fuel supplies; and
- Spare clothes and first aid supplies for longer missions.

Sources of Information

- District or regional government officials;

- Sectoral specialists;
- Chiefs and other community leaders;
- Crews of ships and aircrafts;
- Police and other officials in the affected areas;
- Individuals living in, coming out or going to the affected area;
- Satellite imagery; and
- Aerial photographs.

Standards for Initial Assessment

This list should not be considered a substitute for community training, but it should act as memory aid that helps to ensure that all of the indicators have been covered with available information.

Sector	Indicator	Standard
General Situation of the Population		
Objective: Determine the number of people affected (approximate number of families), their relation with the population, and available indicators prior to the disaster (total country population, proportion of men and women, number of handicapped or disabled people) that have been acutely affected by the event.	**Determine:** Total population affected (include host population as well as displaced), including age (under 5 years), male and female ratio, average family size, number of arrivals in displaced populations (internally or refugees). Identify vulnerable populations (numbers of female or child-headed households, unaccompanied children, disabled, elderly, single women, pregnant and lactating women, etc.).	**General situation of the population** Include data from prior to the event (statistics) and the situation after the event to be able to carry out the corresponding comparison. The population and its distribution are fundamental elements in determining the magnitudes of the event and the amount of humanitarian assistance required. As such, its characteristics offer indicators to focus on the strategies and priority actions.
Geographic Situation		
Objective: Establish the affected zones, the surfaces, and general characteristics	**Accessibility:** Determine the operability of the roads (in hours of travel and specifying the stretches),	**Geographic situation of the disaster zone:** Geographic information

Geographic Situation		
	airports and ports of entry to the head of the municipality and the most appropriate routes to the affected zones(s). • Roads (starting from; and arriving at); • Land; • Air; • Fluvial (maritime/rivers); • Availability of services of electric energy, communication and fuel; and special conditions.	offers information on the characteristics of the humanitarian response strategy. It provides data on the topographic and climactic characteristics of the affected zone, accessibility, and security conditions. This information is also important for the logistics of humanitarian operations. **Special care should be taken in validating sources of information, in order to avoid contradictions with the government which could damage the coordination processes and the credibility of the information*.*
Health Situation		
Objective: Determine the situation with regards to the placement of health personnel, determine the effect on the population and the increase in the demand for and causes for attention, availability of medicines and supplies, and the situation of the health establishments. **Health facilities:** • Extent of damage & losses; • Early identification of threats to public health; • Problems with the disposal of corpses;	**Health of the people:** Causes for attention per type of illness, Availability of medicines, medical supplies and others. **Health personnel:** • Number of doctors; • Nurses; • Technicians. Health facilities: • Name and category of health centre; • Laboratories and blood banks; • Number of available beds;	**<5 mortality rate:** Rate in many developing countries 1/10,000/day Emergency phase under control < 2/10,000/day Serious situation > 2/10,000/day Emergency: out of control > 4/10,000/day. **Crude mortality rate:** Typical rate in many developed 0.3/10,000/day countries Typical rate in many developing countries 0.5/10,000/day Relief program under control < 1/10,000/day

Health Situation		
• Vector control.	• State of operation: a. >60% fully damaged; b. 30-60 % partially damaged; and c. functional <30%.	Serious situation > 1/10,000/day Emergency: out of control > 2/10,000/day Famine: major catastrophe > 5/10,000/day.
Food and Nutrition		
Objectives: Determine the loss of crops, animals, productive goods, affectation of sources of income and food, the effect on the consumption of food, existing facilities for the preparation of food, food reserves in the affected population and the existence of possible food aid in the zone.	**Food Assistance:** • Means to prepare food; and • Coping strategies and food reserve.	(For only food aid dependency) -2,100 Kcols per day -10-12% of total emergency provided by protein -17% of total emergeny provided by fat -adequate micronutrient intake trough fresh or fortified foods (Apply Sphere Minimum Standards (Sphere Handbook, 2004. The Sphere Project, Switzerland).
Water		
Objective: Availability of water available for the affected and displaced population and identify the sources of provision of water and its level of operation.	**State of water sources in the zone.** • Reticulated (central): a. fully damaged; b. partially damaged; c. functional. • Decentralized (wells, borehole): a. fully damaged; b. partially damaged; c. functional. • Level of contamination	**Water** **Individuals:** 20 litres/ person/day; **Absolute minimum for survival:** 3 to 5 litres/person/day; **Tap stands:** 1 per 200 persons, sited not further than 100 mts from user accommodation; **Health centres:** 40 to 60 litres/person/day; **Feeding centres:** 20 to 30 litres/beneficiary/day;

Water		
	• Alternative sources of water supply.	**Sanitation facilities:** 2 to 5 litres/person/day for many systems; **Livestock:** 30 litres/day/ head of cattle, 5 litres/day/head of small animals.
Basic and Environmental Sanitation		
	Sanitation: • Central: a. fully damaged b. partially damaged c. functional; • Latrine – household: a. fully damaged; b. partially damaged; and c. functional. • Risks of diseases from vectors; and • Rubbish disposal.	**Latrines:** 1 seat per 20 people (ideally 1/family) sited not further than 50 m from user accommodation, and not closer than 6 m distance between latrines and water sources – minimum of 100 m; **Solid waste disposal:** 1 disposal site per 500 persons (measuring 2 m x 5 m x 2 m; 2.2 yd x 5.5 yd x 2.2 yd); **Soap:** 250 g (8.8 oz) per person per month; **Communal refuse pits:** 1 pit (2m x 5m x 2m) per 500 people; **Wheelbarrows:** 1 per 500 people; **Tip trucks:** 1 truck (1 to 2 ton capacity) per 5,000 people; **Graveyards:** > 30 m from water sources and > 2 m above the water table.

Shelters		
Objective: Determine types and characteristics of shelters, sheltered population and main conditions, and need for shelters.	**Number and types of shelters needed:** a. Family – 4-8 people; b. Single – 1-2 person(s). • Temporality conditions; a. Cooking sets; and b. Stoves and fuel.	**Total land:** 30 m2 per person. Minimum 45 m2 per person, including for gardens; **Sheltered space:** 3.5 m2 per person (shelter only) in warm (in buildings or tents) climates where cooking is outside – to 5.5 m2 per person, in cold climates or urban areas (including for cooking, etc.); **Fire break space:** 50 m wide clear area, every 300 m. Minimum 1 to 1.5 m between guy lines/ropes of tents on all sides; **Roads and walkways:** 20% to 25% of the entire site; **Open space and public facilities:** 15% to 20% of the entire site; **Household cooking fuel:** Fuelwood (typical) 15 kg/household/day. Fuelwood (with 1 fuel-efficient stove per household) 5 kg/household/day.
Livelihood (recovery)		
Objective: Report of situation of livelihood.	Crops – estimated ha; Livestock – estimated dead; Fishing boats and equipment.	

Protection		
Objective: Report of mistreatment, rape and sexual abuse. Situation of children orphaned or separated from their family.	Situation of orphans or children separated from their families; Reports of mistreatment, rape, and sexual abuse; Elderly care centres.	
Education		
Objective: Determine the damages in infrastructure, furniture and didactic material.	Number of schools; Number of students; and Proportion of loss of furnishings and didactic material.	
Organization and Coordination		
Objective: Organization and mechanisms for coordination and information management.	Organization or person responsible for sector coordination; and Contributions in emergency supplies, money, and personnel. **Flow of information** Recommendations and comments; Outline immediate actions required (be sure to identify the action items, referenced by paragraph number, in the first paragraph of the table). If commodities are requested, specify the item, quantity needed, and other specifications as appropriate; when the commodities are needed;	Responsible at national level; Responsible at departmental level; Responsible at municipal level; and Other actors.

Organization and Coordination		
	and how they will be received, transported, stored, and distributed; If by air, information should be provided about runway capability (dirt/paved, damaged/ intact, length), air traffic control services, and possible security problems as appropriate. If additional expertise is needed, specify what type and when. Note any issues such as customs clearances, storage, special handling, and any holidays that may interrupt delivery; Recommendations can also include making additional funds available for project proposals, additional assessments.	

Annexes

1. Disaster Management Baseline Data

Baseline and background data that is relevant for disaster management purposes is listed below:
(NOTE: To be administered prior to disaster impact in at -risk areas)

Baseline Data	
Population	
Village/settlement details	
Health sector details	
Agricultural sector details	
Educational facility details Transportation network details	• Air • Sea • Roads/bridges
Plant and equipment	
Commercial sector	Location of central economic sectors or high risk sectors
Food supply	
Critical government stockpiles	• Food • Fuel • Energy • Building material • Relief materials • Pharmaceuticals
Social system	
Lifelines	• Water • Power • Sewage • Waste
Communication	• Broadcasting • Radio
Critical facilities	• Government buildings
Manpower	• Critical persons in emergency phase
Shelter and evacuation facilities	• Location • Capacity

Damage Assessment and Baseline Data Forms

Baseline Data			
Time	Form	By	Contents
Before a disaster strikes; updates on a yearly basis prior to the cyclone season	Baseline data form – Rural village / Settlement		Sectoral baseline and background data about the conditions in the rural areas: • Resources • General • Problems and needs
	Baseline data form – Rural health facility		Sectoral baseline and background data: • Resources • General • Problems and needs
	Baseline Data Form- Educational Institution		Sectoral baseline and background data: • Resources • General; • Problems and needs
	Baseline Data Forms - Agriculture: • crop and fruit trees • livestock		Sectoral baseline and background data: • Resources • General • Problems and needs
	Baseline Data Forms - Agriculture: • crop and fruit trees • livestock		Sectoral baseline and background data: • Resources; • General; • Problems and needs

2. Initial Needs and Damage Assessment

(NOTE: To be administered in the first 12 hours after the disaster impact)

Initial Needs and Damage Assessment			
Time	Form	By	Contents
As soon as possible after the disaster	Initial Damage Report • Rural Village/ Settlement		Initial picture of: • Immediate needs of community, esp. life support and safety – rationing, evacuation etc • Extent of damage and losses
	Initial Damage Report • Rural Health Facility		• Early identification of threats to public health • Epidemiological Surveillance; • Immediate needs of village health facilities
	Initial Damage Report • Educational Institution		Initial picture of: • Immediate needs • Damage and losses • Suitability for shelter

Reference Values

(For further details see the sphere standards at (http://www.sphereproject.org)

Shelter

- Total land: 30 m^2 per person minimum;
- 45 m^2 per person including for gardens;
- Sheltered space: 3.5 m^2 per person (shelter only) in warm (in buildings or tents) climates where cooking is outside – to 5.5 m^2 per person in cold climates or urban areas (including for cooking, etc.);
- Fire break space: 50 m wide clear area, every 300 m;
- Minimum 1 to 1.5 m between guy lines/ropes of tents on all sides;
- Roads and walkways: 20% to 25% of the entire site; and
- Open space and public facilities 15% to 20% of the entire site.

Water

- For individuals: 20 litres/person/day;
- Absolute minimum for survival: 3 to 5 litres/person/day;
- For health centers: 40 to 60 litres/person/day;
- Feeding centers: 20 to 30 litres/beneficiary/day;
- Sanitation facilities: 2 to 5 litres/person/day for many systems;
- Livestock: 30 litres/day/head of cattle, 5 litres/day/head of small animals; and
- Tap stands: 1 per 200 persons, sited not further than 100 m from user accommodation.

Sanitation

- Latrines: 1 seat per 20 people (ideally 1/family) sited not further than 50 m from user accommodation, and not closer than 6 m distance between latrines and water sources – minimum of 100 meters;
- Solid waste disposal: 1 disposal site per 500 persons (measuring

2 m x 5 m x 2 m; 2.2 yd x 5.5 yd x 2.2 yd);
- Soap: 250 g (8.8 oz) per person per month;
- Communal refuse pits: 1 pit (2m x 5m x 2m) per 500 people;
- Wheelbarrows: 1 per 500 people;
- Tip trucks: 1 truck (1 to 2 ton capacity) per 5,000 people; and
- Graveyards: > 30 m from water sources and > 2 m above the water table.

Household Cooking Fuel

- Fuelwood: (typical) 15 kg/household/day; and
- Fuelwood: (with 1 fuel-efficient stove per household) 5 kg/household/day.

Nutrition

- Energy: 2100 kilocalories per person per day;
- Kilocalorie/100 g (3.5 oz): monthly ration per person;
- Cereals: 350/100 g (3.5 oz) 13.5 kg (7.7 lb);
- Beans: 335/100 g (3.5 oz) 1.5 kg (3.3 lb);
- Oil (vegetable): 885/100 g (3.5 oz) 0.8 kg (1.8 lb);
- Sugar: 400/100 g (3.5 oz) 0.6 kg (1.3 lb);
- Protein: 10%Ð12% total energy (52Ð63 g) but < 15%;
- Fats: 17% of total energy (40 g);
- Vitamin A: 1666 IU (or 0.5 mg retinol equivalents);
- Thiamine (B1): 0.9mg (or 0.4 mg per 1000 kcal ingested);
- Niacin (B3): 12.0 mg (or 6.6 mg per 1000 kcal ingested);
- Vitamin C: 28.0 mg;
- Vitamin D: 3.2Ð3.8 µg calciferol;
- Iron: 22 mg (low bio-availability, i.e., 5%Ð9%); and
- Iodine: 150 mg.

Crude Mortality Rate

- Typical rate in many developed countries: 0.3/10,000/day;
- Typical rate in many developing countries: 0.5/10,000/day;
- Relief program under control: < 1/10,000/day;

- Serious situation: > 1/10,000/day;
- Emergency: out of control: > 2/10,000/day; and
- Famine: major catastrophe: > 5/10,000/day.

<5 Mortality Rate

- Rate in many developing countries: 1/10,000/day;
- Emergency phase under control: < 2/10,000/day;
- Serious situation: > 2/10,000/day; and
- Emergency (out of control): > 4/10,000/day.

Miscellaneous Conversion Information

Temperature
Celsius to Fahrenheit (Celsius x 1.8) + 32 = Fahrenheit
Fahrenheit to Celsius (Fahrenheit – 32) / 1.8 = Celsius

Weight and Volume
Weight of water by volume (at 16.7° C or 62° F)

Litre	=	1 kilogram
U.K. gallon	=	10 pounds
U.K. gallon	=	1.2 U.S. gallons
U.K. gallon	=	4.54 litres
U.S. gallon	=	0.833 U.K. gallons
U.S. gallon	=	8.33 pounds
U.S. gallon	=	3.79 litres
Litre	=	0.26 gallons
Cubic foot of water	=	62.3 pounds (7.48 gallons)

Distance
1 nautical mile = 1.152 statute miles = 1.852 kilometers

Area and Volume
Volume area = width x length area of a circle = Đr2
Where Đ = 3.14 r = 1/2 the diameter of a circle
Volume = width x length x height volume of a cylinder = Đr2H or Đr2L
where: H = height of cylinder, L = length of cylinder

Metric to English Conversion Factors

To convert	into	multiply by
Lengths		
millimeters	inches	0.0394
centimeters	inches	0.3937
meters	inches	39.37
meters	feet	3.2808
meters	yards	1.0936
kilometers	yards	1093.6133
kilometers	miles	0.6214
Surfaces		
square centimeters	square inches	0.1 550
square meters	square feet	10.7639
square meters	square yards	1.196
square kilometers	square miles	0.3861
hectares	acres	2.471
Volumes		
cubic centimeters	cubic inches	0.061 02
cubic centimeters	liquid ounces	0.03381
cubic meters	cubic feet	35.31 467
cubic meters	cubic yards	1.30795
cubic meters	gallons (U.S.)	264.17205
liters	cubic inches	61.02374
liters	cubic feet	0.03531
liters	gallons (U.S.)	0.26417
milliliters	teaspoon	0.20289
milliliters	tablespoon	0.06763
milliliters	fluid ounces	0.03381
liters	cups	4.22675
liters	pints	2.11338
liters	quarts	1.05669
Weights		
grams	grains	15.4324
grams	ounces	0.0353
kilograms	ounces	35.274
kilograms	pounds	2.2046
kilograms	tons (U.S.)	0.001102
kilograms	tons (long)	0.000984
Tons (metric)	pounds	2204.6226
Tons (metric)	tons (U.S.)	1.1023
Tons (metric)	tons (long)	0.9842

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