

SEARCH AND RESCUE

Search and rescue is a technical activity rendered by a group of specially trained personnel, who rescue and attend to the casualties under adverse conditions, where life is at threat. Search and rescue is organized in close cooperation with the community and in a team approach. The search and rescue activities are undertaken in two ways;

1. **Community Local Rescuers:** With adequate safety measures, rescue immediately after any natural calamities such as cyclone , flood, earthquake and fire in a community.
2. **Outside Community Resources:** Circumstances where the situation is grave and the local rescuers do not have required efficiency and equipments, then specialist assistance from outside the community is required.

Rescuers to immediately take up; the rescue activities after a cyclone, flood, earthquake and fire where people might be trapped by fallen debris and in need to be rescued without delay. The community rescuers shall have to be in readiness to respond quickly, when a cyclone is likely to strike .The rescuers efficiency level to be maintained thorough practice and demonstrations / mock-drills during the non-disaster period. The rescue team should undergo standard training from time to time.

1.1 Objectives;

- To rescue the survivors trapped under the debris, from the damaged buildings or from a cyclonic storm surge, flood, earthquake and fire.
- To provide First Aid services to the trapped survivors and to dispatch them for medical care.
- To take immediate necessary actions, as necessary, for temporary support and protection to endangered collapsed buildings to structures.
- To hand-over, recover and dispose-off the bodies of the deceased.
- To train, demonstrate and raise awareness on how to use the local materials for self-rescue amongst the community people.

1.2 Team Composition.

Physically and Psychologically sound volunteers male and female, having demonstrated ability, capacity and willingness to work in an emergency, could constitute a rescue team.

Volunteers, of both the sex, above 18 years of age, with a minimum education level to read and write in local language.

Preference would be given to ex-military or army personnel and artisans from the village or from the locality.

It is essential that each safe shelter form a rescue group, comprising of 8 members, out of which a minimum of 2 members should be skilled persons. The members should be from the safe shelter, community and from the periphery villages.

Team leader:	1
Skilled persons:	2
Members:	5

The members should have interest to participate in the training courses on search and rescue organised by the Government, Civil Society Organisation or any other NGOs.

1.3 Duties of the Rescuer

ASSESSMENT:

Proper assessment saves time and improves better performance. Collect information on the extent of; the damage, approach to the damaged area, particulars of the damage, and if any further damage is likely to occur. The assessment can be done in two methods.

INFORMATION:

Information provided by the local leaders or the group leader or from the Disaster Preparedness Committee is important.

OBSERVATION:

Follow the 3 key principles during the survey or assessment

- I. **LOOK:** See physically the incidents and make a thorough visual inspection.
- II. **LISTEN:** Listen to all sources of information from the community, from the people, Government records etc. Assess the community data regarding people in danger.
- III. **FEEL:** Feel convinced regarding the facts, the gravity of the dangers and your own capacity to respond.

1.4 Plan

Rescue is a team effort that needs coordination and planning amongst the members for an optimum response operation. After the assessment, the Rescue team would be in a position to adequately plan the Rescue Operation based on the following details and specifications;

- I. Manpower
- II. Equipments
- III. Methods

1.5 Rescue Stages

Stage-1

Surface Causality (Emergency Rescue)

To locate the surface casualty the rescue is conducted from the outer-edges of the damaged area and rescued shall be provided First Aid services. In case the rescued is more severely injured, after providing the First Aid services, dispatch as quickly as possible to the nearest hospital for medical care.

Stage-II

Search in Slightly Damaged Buildings (Immediate Rescue)

The rescue team should move towards the slightly damaged buildings after responding to the surface casualty. It might happen that some persons trapped can be contacted but cannot be reached easily. In such events, before entering to the damaged building or house, a careful analysis of the methods best suited to safely rescue the trapped is to be made. The team leader has to take proper decisions without risking the lives of the rescuers or the injured. Safety at all points is to be ensured. The same procedures shall be followed in the case of the trapped people or cyclone/flood - marooned people.

Stage-III

Search of Possible Survival Points (Specialised Rescue)

Any chances of a person being trapped or injured are to be searched at all possible places and all options. The rescue team should try with all means to rescue with the appropriate method. Consider safety as top priority.

Stage-IV

Selected Debris Clearance (Specialised Rescue)

The rescue team should search until all the persons are accounted for and identities are ascertained.

Stage-IV

General Debris Clearance (Specialised Rescue)

Clear up the debris and reach to the trapped persons, when all possible ways of contacting the trapped persons has failed.

Specialised Rescue Teams should preferably carry out the last three stages.

EMERGENCY RESCUE

Sometimes rescue materials are not available to the rescue team at site in emergency situations. There are various other methods, which could be useful for rescue. Such methods are known as, “Emergency Methods of Rescue”. The adequate methods of rescue is to be determined depending upon the nature of the casualty, the nature of the injuries and the position in which the casualty is found.

2.1 Rescues with One Rescuer

2.1.1. Human Crutch.

The rescuer acts as crutch to the injured. This method is used when the casualty is in a position to help them. The rescuer stands and assists the injured to place their arm around the shoulder. The rescuer grasps it with the hand. At the same time, the rescued place the other hand around the injured person 's waist and assist the person to move. This is called “Human Crutch”.

2.1.2 Pick-a-back

This method is applicable only when the casualty is conscious, without any injury but not able to walk. The rescuer lifts the injured person onto his/her back. The victim holds on with his legs and arms around the waist and neck of the rescuer. The rescuer passes both hands behind and back or under the knees and supports the injured person. This is known as “Pick-a-Back” method.

2.1.3. Pick-a-Back (Reverse)

This method is required when the casualty is conscious with an injury such as a burn on the belly or chest, wound on the neck or face (upper part of the body). The rescuer supports the patient as leans backward against the rescuer. The rescuer passes both hands backwards and grips around the waist of the injured person. The rescuer leans forward and lifts the injured person off their feet and upon the rescuer's back. This method is known as the “Pick-a-Back (Reverse).

2.1.4. Fireman's Lift.

“Fireman's Lift” is a nine-step method to lift the casualty and carry, If the casualty is unconscious but without injury to the body. It is an easy method for a single rescuer to carry the casualty down from the higher elevated areas or bring the casualty up from the basement via upper stairs and ladders also.

- a. If the casualty is laying on his / her back, the rescuer kneels on one knee.
- b. The rescuer turns the casualty on his/ her back gently, supporting the face of the casualty with one hand and the forearm of the casualty with other.
- c. The rescuer then puts his/ her hands underneath the armpits of the casualty and lifts the chest of the injured, first onto the rescuer's knees.

- d. The rescuer then gradually lifts the casualty up to a kneeling position of the casualty.
- e. The hands of the rescuer are then passed the casualty is lifted on to their feet around the body of the casualty.
- f. The casualty is lifted on to their feet. The body of the casualty is to be supported against the body of the rescuer.
- g. The rescuer then faces the casualty sideways and holds any wrist of the casualty, passed over the shoulder of the rescuer, with the other hand.
- h. The rescuer then bends down and picks up the casualty on to the shoulder, one hand of the rescuer now passes in between the legs and the other hand holds the wrist of the casualty.
- i. The rescuer now lifts the casualty and transports.

2.1.5. Rescue Crawl

This method is applicable when the casualty is found unconscious, in a smoke filled room, or in a confined place limiting movement or the casualty is too heavy.

Steps:

1. Gently turn the casualty on their back and tie their wrist together using a triangular bandage or handkerchief, napkin etc.
2. The rescuer kneels astride the casualty facing their head, and place their head through the loop formed by their arms. In one palm hold and neck and head of the casualty to avoid sweating or further injury.
3. The rescuer crawls forwards on; their hands and knees and drags the casualty forwards along the ground.

2.1.6. Removal Downstairs:

This method is applicable when a casualty is found on the up-stair floors but not in position to be transferred via the staircase. The rescue of the casualty has to be done with specific procedures as detailed below;

To move a casualty downstairs, lay him/her on his/her back and tie his/her wrists together. With his /her head pointing downwards on the stairs, the rescuer will keep their arm under his /her armpits so; that his /her head rest on the rescuers arm, and ease him/ her downstairs.

2.1.7. Bowline Drag

This method of rescue is useful, when a casualty is found in a narrow space/ confined area. Turn the casualty onto his /herd back and tie his/her wrist together using a triangular bandage, handkerchief, napkin etc.

- I. Use a sash cord of 15 feet (4.5mtrs) length or 40 ft. (12mtrs) lashing line, tie a Bowline at each end to form the loops.
- II. Place one loop over the casualty's chest and under his /her armpits, with the knot resting under his/her head so that it will keep his /her head off the ground while he /she is being pulled.
- III. The rescuer will place the other loop over their shoulders and under the armpits, forming a harness with the knot in line with the center of the back or between the shoulders.

- IV. The rescuer drags the casualty out by crawling on their hands and knees.

2.1.8. Toe Drag

This method of rescue is required when a casualty is found in a narrow place where the Rescuer finds difficulty enters.

- I. The rescuer sits down at the casualty's head-side and places his/her feet under the casualty's armpits.
- II. With both hands free, the rescuer pulls himself/herself back and at the same time drags the casualty with his / her feet.

2.2 More than Two Rescuers

These methods are suitable when two or more rescuers are available for rescue.

2.2.1 Two-Handed Seat

Two rescuers face one another on either side of the casualty, bend down, and pass his/ her arm under the casualty's back, below the shoulders, and grip his/her clothing.

The casualty's back is raised and the rescuers slip their other arms under the middle of his/her thighs holding their hands with a handgrip. The casualty is lifted and the rescuers move with short pace.

2.2.2.Three-Handed Seat

This method is used for carrying a casualty who is conscious, heavier or might have bleeding or injured to one of the legs.

1. Two rescuers face each other and keep their hands to form a three-handed seat as shown in the picture.
2. One of the rescuers provides support and holds the injured person's limb in the free hand.
3. The rescuers support the casualty to sit on; the three-handed seat. The victim is carried and the rescuers supports his/ her injured limb.

2.2.3. Four-handed Seat

This method is useful when the victim is heavy but without any injury.

1. Two rescuers face each other and keep their hands as positioned in the picture to form a four handed seat.
2. The rescuers support the casualty to sit onto the so formed seat and the casualty puts one arm or both arms around the necks of the rescuers. The rescuers transfer the casualty with short paces.

2.2.4. Fore and Aft Method

In this method a casualty who has an injury in the abdomen and is unable to move can be rescued. The rescuers place the casualty onto his /her back. One rescuer raises and holds the casualty through the shoulders passing his/her hands under the arms from behind and clasping them in front of the chest as

shown in the picture. The other rescuer takes one leg under each arm and the casualty is transported.

2.2.5. Two-Person Human Crutch

This method can be used when the victim is injured conscious and can help, but is unable to walk.

- ❑ Rescuers take up their positions either side of the casualty.
- ❑ Place the victim's arms round the shoulders and grasp his/her wrists with the other hands.
- ❑ Pass the arms round the victim's waist, grasping the clothing at the hip and assisting him/her as crutches.

3.1. Clothes Lift

This method is applicable when the casualty is found in a condition that he /she cannot move himself /herself nor any equipment is available with the rescuers for transportation of the casualty.

Four rescuers are required for this lift. Two rescuers kneel on either side of the casualty, at the shoulders and hips, and turn him / herd onto his / her back.

The rescuers hold the casualty's clothing and the collar of person's shirt or dress behind the neck with one hand, and with the other hand holds the clothing at his her side.

The rescuers will hold clothing at the causality at the hips with one hand, and at the same time control the casualty's arms. With the other hand they hold the casualty's trousers, pant or dress, thus supporting his /her legs. Now the rescuers can move with short places.

3.2. Blanket Lift

This method is applicable when the rescuers do not have a stretcher to carry the casualty who is found in a grave condition and is to be shifted in a flat position.

- ❑ In line with the casualty, place the blanket lengthwise on; the ground and roll up half of its width. Carefully turn the victim onto their side.
- ❑ Place the rolled-up portion of the blanket close to the victim, and gently place onto their back upon the unrolled portion of the blanket.
- ❑ Unroll the rolled portion accordingly so that the victim lies in the center of the blanket.
- ❑ Roll up the two edges of the blanket against the casualty's body, hold by two rescuers on either side of the casualty and support the head shoulders, hips and legs.

RESCUE FROM DAMAGED BUILDING

Precautions Before Entering the Damaged Building;

- Observe the construction of the building and collapsed portions
- Check whether the walls need any supporting.
- Be careful for possible hazards, which may occur from the exposed household equipment.
- Precautions when Entering the Damaged building
- Use a helmet
- Work in pairs
- Listen for possible sounds
- Keep calling
- Do not touch or disturb any damaged walls or blocked doors which are broken and /or projecting.
- Treat all necked wires as live wire

Precautions Whilst Moving Inside the Damaged Building

- Do not ignite fire.
- Keep close to the walls
- Be careful in all of your movements.
- Do not pull anything projecting out from the collapsed portions.

SEARCH AND RESCUE

Search and rescue is a technical activity rendered by a group of specially trained personnel, who rescue and attend to the casualties under adverse conditions, where life is at threat. Search and rescue is organized in close cooperation with the community and in a team approach. The search and rescue activities are undertaken in two manners: -

Community Local Rescuers: With adequate safety measures, rescue immediately after a natural calamities such as cyclone, flood, fire and earthquake in a community.

Outside Community Resources: Circumstances where the situation is grave and the local rescuers do not have required efficiency and equipments, then specialist assistance from outside the community is required.

Rescuers to immediately take up, the rescue activities after a cyclone, flood, fire and earthquake where people might be trapped by fallen debris and in need to be rescued without delay. The community rescuers shall have to be in readiness to respond quickly, when a cyclone or flood is likely to strike .The rescue or wet ropes. Single sheet bend is formed by making a loop in the thicker one of the two ropes, hold the rope in one hand, enter the thinner rope upwards through the loop forming a half hitch around the two thickness or rope.

4.1. Double Sheet-Bend

This is required to join two ropes of different materials or when there is a great difference in the sizes of the ropes. It is formed some what like the Single Sheet-Bend, except that after having made the Half Hitch with the thinner rope, continue turning its short end to make another round turn around the two thickness of the thickness of the thicker drops and towards the bight.

4.1. Chair Knot

It is useful for rescue, and then recovers the rope very easily. The chair knot is used to rescue a sling in which a person may be lowered from heights. Grasping the rope near its center in the left hand palm downward, right hand palm upwards forms it. Turn the left palm upwards forming a loop (anti-clock wise) and turn; the right hand palm down forming a loop. Pass the standing part through the loops of the opposite hand pulling them through, thus forming two loops with a knot in the center adjust the loop, and make a half hitch on each loop. The Chair knot is prepared.

This is useful to recover the casualty from under the debris or from basement, where the rescuer has to crawl to the casualty and back again. Take the running end of the rope in one hand, pull it across the upturned palm of the left hand, through the fingers of the left hand, forming a loop to required size, pass the running end, which is; held in the right hand, up through the loop. Tighten the two ends. It can also be converted into a running Bow-line by simply passing the knot under the standing part. A running baseline can be put on a ring bold or object to drag an object floating debris, animals or human body standing from a remote place.

4.2. Lashings

Lashing means to “tie something firmly to something else”. Lashing is mainly used to secure two or more poles together. There are four common types of lashings.

4.2.1 Square Lashing

This is used for lashing together two poles that touch and cross at right angles. Put a clove hitch around the spar or leg and below the crosshead or ledger. Marry the running end to the standing parts tie up and around both the poles as shown in the figure. Repeat this circuit three to four times, drawing the rope as tightly as possible. Then take three to four flapping turns around the whole lashing between the poles. Tighten off with a clove hitch on the vertical pole above the horizontal.

4.2.2. Diagonal Lashing

This is used for lashing two poles where they cross at an angle and the poles are likely to spring apart when put under load or strain. Put a hitch around both the poles horizontally. Then take four vertical turns and draw them tight. Then take four horizontal runs and draw them tight. To finish put four turns over the lashing and between the poles. Draw them tight and end with a clove hitch.

4.2.3. Figure of Eight Lashings

This is used for lashing three poles together to form a tripod's before lashing, insert

spacers between the poles. Marry the ends and working upwards continue lashing in the figure of eight fashion with 6-8 turns. Add two to three turns between each pole and round the lashing. Finish with a clove hitch above and on the opposite to the starting pole.

4.2.4. Round lashing

This is used for lashing two poles together, when they are parallel to each other to form a sheer leg. This is also called sheer lashing. Before starting, insert spacers between the poles. Put a clove hitch around one pole and marry the ends and continue with 6-8 close turns around both; the poles, going upwards Add 2 or 3 turns around both the poles going upwards. Add 2 or 3 turns around the lashing and between the poles. End with a clove hitch above and on the opposite pole to the starting pole.

CHAPTER-IV

STRETCHER AND CASUALTY TRANSPORTATION

Wounded casualty is to be transported with utmost safety to avoid further risk. It may happen that the trained rescuers have to rescue the casualties from a collapsed structure, to from a confined place, or on the uneven ground with obstacles. Different techniques are required for different ground conditions. The knowledge of First Aid Services and adequate transportation of the casualty is important for the rescuers. In case of shock or serious injuries, the patient needs warmth, which could be provided by using blankets.

5.1. Standard Ambulance Stretcher

The standard stretchers used in the Ambulances are 230 cm pole length, 180 cms canvas 57 cms width, and 15cms height from the ground and weight about 14 kgs.

5.2. Improvised Stretcher Preparation

Very often the rescuers do not find a standard stretcher in rural areas or during a big emergency, in such situations stretchers could be improvised from the locally available materials.

Collect two or three shirts or thick materials. Inserted two equal sized bamboo poles in between the shirts. Keep both the poles separated by tying both sides with short pieces of bamboo. The stretcher is prepared.

Collect two paddy/sugar sacks, make small holes in both edges (vertical) of the sacks and insert two poles. The stretcher is prepared.

Wooden planks, doors covered with straw or clothes can be used as stretchers.

The charpai (rope bed) can be used as a stretcher.

5.3. Stretcher Carriage

Between two rod four bearers of equal height can carry a stretcher. The stretcher could be carried by hand or on the shoulders. Two bearers are sufficient on a level ground and without obstacles.

5.4. Four Stretcher Bearer Loading

Keep the stretcher at about 1mtr. Distance from the casualty. Three rescuers on one side and one on the other side will lift the patient onto the knees of the three rescuers side. The 4th rescuer will prepare the stretcher with the blanket, and place the stretcher under the patient. Then all four rescuers will lower the casualty onto the stretcher. The rescuers will all simultaneously lift the stretcher at one to avoid patient imbalance.

5.5. Two Stretcher Bearer Loading

Two bearers will prepare the stretcher and place it parallel to the casualty. Both the bearers stand at the hand and the foot of the casualty, together they left and place the patient.

5.6. Securing the Casualty to a Stretcher

A casualty has no danger of slipping upward to downward on a level ground when carried horizontally on a stretcher, however the casualty needs securing to the stretcher to prevent from slipping in more uneven terrains. It may happen that the casualty needs to be carried by a stretcher from the basement, lowered from an upper floor, or carried over rough ground. Where the bearers may stumble and the casualty may stumble and the casualty into the stretcher. Tie the right head side of the stretcher handle with clove hitch and pass the rope of about inches and take a round over the chest of the casualty and under the stretcher with Half-Hitch knot. The second and third round is made over the body. The third round should be placed below the knees. Secure the feet and the ankles with rope. Tie the end with the handle. The casualty is secured to the stretcher.

Precautions:

The lashing should not be secured so tightly around the casualty as to hurt the injured part or to interfere with their breathing.

The hitch around the feet and ankles must be sufficiently tight to hold the casualty firmly, when the stretcher is held up vertically.

WATER RESCUE

Flood and cyclone disasters take thousands of human lives every year; rescue from water related disasters is one of the important challenges for the rescuer. The rescuers must be equipped with swimming and floating aids and should have adequate swimming capacity for rescuing the drowning casualty. The rescuers must have knowledge and practice of swimming in order not to risk himself /herself whilst rescuing the victims.

6.1. Use of life Jackets

Life Jackets in rescue are important for water rescue. A life jacket is a standard life saving equipment, which gives confidence to the rescuee that he /she is safe. The life jacket is made out of waterproof canvas and is filled with fine cotton, weighing about 4 kgs equivalent 8.82 (pounds). Normally the life jacket is to be worn like a jacket, and has three tying ropes to secure the jacket.

Improvised Swimming and Floating Aids

Standard manufactured life jackets may not be available in rural areas or during an emergency, however swimming and floating aids could be improvised from the locally available materials.

6.2. Empty Tins and Jerricanes.

Steps for preparing floating equipment:

1. Collect 20 ltr. capacity empty tins.
2. Seal the openings of the empty tins.
3. Collect two equal size 4 feet (120 cm) bamboo pieces.
4. Place both the tins with a gap of 1.5 feet (45 cms) from each other or equal to the width of the chest of the rescuer.
5. Tie the empty tins with the bamboo poles at two places with coconut fiber ropes by square lashing, and tighten as far as possible to prepare the floating aid .
6. This can help to float a person in the water. The rescuer can use the device for water rescue also.

Empty and air tight 15 ltr. Capacity Jerricanes also could be used as floating aids

6.3. Empty glass bottles

1. Collect 8 empty bottles of 750 ml capacity.
2. Seal the openings of the bottles with polythene or waterproof materials to make them airtight
3. Tie each bottle at two places at the bottom edge and at the neck edge by using clove hitch and thumb knots in a series to prepare the floating aid as shown in the picture
This can help to float a person in the water.

6.2.1. Dry Coconuts

Collect dry coconuts. Continue adding the numbers of coconuts until, these can carry the weight of the rescuer. Tie the dried coconuts with coir fibers to prepare the swimming aid.

This can help to float a person in the water.

6.2.2. Bamboo Bundles

Collect bamboo pieces of 1.5 feet to 2 feet length (45 cms- 60 cms). Continue adding the numbers of the bamboo pieces until sufficient amount that can carry the weight of the rescuer. Tie the bamboo pieces with coir fibers to prepare the swimming aid. The swimming aid can help to float a person in the water.

6.2.3. Metal pitcher

Collect 2 metal pitchers. Cover the openings with polythene or any waterproofing materials

Place the two pitchers within a gap of 1.5 feet (0.5 mtr) or according to the width of the rescuer.

Tie the two pitchers with two bamboo pieces of 4 feet (120 cms) length with coconut fiber ropes and tighten as strong as possible.

The swimming aid is prepared. This can help to float a person in the water. The rescuer can use the device for water rescue also. This is also known as “ pot water wing”.

6.2.4. Motor Tubes

Collect good leak-proof motor tubes (Jeep, Truck, Car, Bus only). Fill up with air. The swimming aid is prepared. This can help to float a person in the water. This also can be used for water rescue.

6.2.5. Raft

During flood or cyclones availability of boats for rescue is likely to be difficult. Rafts could be improvised from locally available materials and used for rescue and relief activities

Collect 4 good quality empty barrels of 200 ltrs capacity (Kerosene barrels). Seal the empty barrels to make watertight. Tie the empty watertight barrels with a bamboo frame as shown in the figure. Ensure the Raft is fixed properly with ropes and becomes compact.

8-10 persons with safety can be transported on one Raft.

Breast- Line (Life-Lines)

Water rescuers and lifeguards practice “Breast-line-Throw” for life saving. Breast-line-Throw is life saving skill. This can help and save the life of an individual who is drowning in water. This method has the additional advantage that the person who is throwing the line will be standing either in a boat or on the ground, steadily able to rescue the individual who is drowning.

Rules of Breast-Line-Throwing:

Breast- Line should be a minimum of 40 to 60 feet long (16 mtrs to 20 mtrs), of 1.5 inch rope (3.5 cms) thickness. Breast- Line should be thrown in the same fashion as we do in case of a “ Discuss Through or Fishing Net”, the only difference being, that while doing a Breast-line throw we do not take a full circle but throw the rope by swinging the hands.

RESCUE EQUIPMENT

7.1. Personal Equipments for Rescuer

- Helmet
- Torch
- Life-line
- Gum-Boots
- Life-Jackets (Water Rescue)
- Whistle

7.2. Team Equipments for Rescuer

- Rope-3-inch (7 cms) diameter of 200 ft (61.5 mtrs)
- Lashing lines- 1.5 inches (3.8cms) circumference of 40 ft (12.32 mtrs) length
- 6 Sash-cord-inch (2.54cms)
- Pulley blocks with different sheaves
- Ladder (Wood/Bamboo)
- Small cutting tools
- First Aid Box
- Life Buoy
- Crow Bar
- Hammer
- Stretcher
- Blanket
