DISASTER PREPAREDNESS

A Handbook for Trainers

VOLUME - I

Council For Advancement Of
People's Action And Rural Technology

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CAPART - A Profile

The Council for Advancement of People's Action and Rural Technology (CAPART) is an autonomous body set up under the aegis of the Ministry of Agriculture and Rural Development and has been registered as a Society under the Societies Registration Act, 1848 . The objectives of the Council are :

- *to encourage, promote and assist voluntary action in the implementation of projects for the enhancement of rural prosperity;*
- *to strengthen and promote voluntary efforts in rural development with focus on injecting new technological inputs in this behalf;*
- *to act as the national nodal point for coordination of all efforts at generation and dissemination of technologies relevant to rural development in its wider sense;*
- *to act as a catalyst for development of technology appropriate for the rural areas, by identifying and funding research and development efforts and pilot projects by different agencies and institutions particularly voluntary organisations;*
- *to act as a conduit for transfer of appropriate technology to Government Departments, public sector undertakings, cooperative societies, voluntary agencies and members of public, to encourage adoption of modern techniques and appropriate technology in rural development ;*
- *to act as a clearing house of information and data bank;*
- *to disseminate knowledge on rural technology to manufacturers of machine tools, equipment and spare parts so that large scale production of technically improved machinery etc. is carried out in the private, cooperative and public sectors;*
- *to promote, aid, guide,organise, plan, undertake, develop, maintain and coordinate projects/schemes aimed to all-round development, creation of employment opportunities , promotion of self-reliance, generation of awareness, organisation and improvement in the quality of life of the people in rural areas in general and of the economically and socially handicapped sections in particular;*
- *to assist and promote programmes aimed at conservation of environment and natural resources;*

- *to strengthen existing institutions of research and develop or set up institutions, so that national level institutions on matters of purely or largely rural interest are built up;*

- *to collaborate with other institutions, associations and societies in India or abroad including concerned international agencies constitutions of the U N. system interested in similar objects;*

- *to conduct or sponsor training programmes, conferences, lectures and seminars on rural development activities of particular interest to women, with an accent on improved technologies appropriate to their role in rural development ;*

- *to conduct or sponsor training programmes for trainers, particularly in the voluntary sector , so that improved technology is disseminated to participants in development in rural areas;*

- *to conduct or sponsor training programmes , seminars, workshops and meetings to promote interaction between government agencies and voluntary agencies working in the field of rural development and technology,*

- *to carry out research studies , surveys, evaluation and the like on the use of appropriate technology and to offer fellowships, scholarships and prizes in furtherance of the projects of the Society;*

- *to prepare , print and publish papers, periodicals, monographs and books in furtherance of the objects of the Society.*

PREPARE - An Introduction....

PREPARE *is a non profit voluntary organisation involved in twenty programs in Tamilnadu, Andhra Pradesh and Orissa. Of these programs, the oldest and the core program is the Community Disaster Preparedness Program being implemented in Flood and Cyclone prone districts of Tamilnadu and Andhra Pradesh.*

PREPARE *and its Community Disaster Preparedness Program owe their origin to the 1977 Machilipatnam disaster when more than 10000 lives were lost on account of lack of preparedness. Some of the people who were involved in the post disaster relief at that time were frustrated at the irreplaceable loss of lives and destruction to properties and sought an effective alternative, pre disaster intervention. Their search led to the birth of* ***PREPARE*** *and a process of learning, teaching and doing.*

The learning phase included sponsoring staff to undergo trainings in Institutes, Academies, Colleges and Centres in India, Asia and Europe. ***PREPARE*** *now has a team of instructors who are alumni of CDI - Hyderabad, CDA - Bangalore, NCDC - Nagpur, ADPC - Bangkok, AUI - Paris and CRED - Brussels.*

The teaching phase included identification of volags working in coastal districts of Tamilnadu and Andhra Pradesh, collaborating with them to organise training programs to the community prone to floods and cyclones in these districts, training and organising village level volunteer forces from among the youth of these prone villages, training special groups of Government officials including Police, Homeguards, Fire service, Fisheries and Revenue officials. The staff of ***PREPARE*** *are now guest faculty in CDI and ASCI - Hyderabad.* ***PREPARE****'s efforts in that direction is recognised by UNDRO.*

The doing phase included participation in District level contingency committee consultations, organisation of seminars and workshops on disaster related aspects like relief camps, drought studies, pesticide studies, management of livestock during a disaster, early health measures in major disasters etc. activating trained volunteer forces during recent disasters and participation in relief and rehabilitation program during recent cyclones.

The impact of the pre-disaster training and during disaster action could be seen from the fact that while May'90 cyclone had more than 200% velocity of that of 1977, the casualty was less than 10%.

PREPARE *intends to bring out a series of publications in this International Decade For Natural Disaster Reduction. This manual is the first such publication and is supported by* CAPART. *It is being printed in Tamil and Telugu also. While continuing to play a trainer's role in Tamilnadu and Andhra Pradesh* ***PREPARE*** *hopes to build a large trainer force and spread the concept of community disaster preparedness to other parts of India through this manual This manual would provide supplemental reading to intending trainers. But practical training sessions with* ***PREPARE*** *is necessary to make the reader a complete trainer.*

Acknowledgements

This handbook, developed at PREPARE on behalf of CAPART is a guide for trainers. It is the result of a collaborative effort of the Community, the various Voluntary agencies and Institutions.

The entire project was funded by Council for Advancement of People's Action and Rural Technology (CAPART), New Delhi. I greatly appreciate the continued support and encouragement provided by CAPART since 1987.

Reputed Institutions in India also provided support. The ideas were also drawn from the material provided by the National Civil Defence College, Nagpur and the Civil Defence Academy, Bangalore. Acknowledgement is also due to the Civil Defence Institute., Hyderabad for reviewing a part of the manual and also for providing training to our field team.

Gracious thanks are also in order to the Directorate of NCC, Tamil Nadu, for their advice.

The Coast Guards, Naval Coast Battery, Tamil Nadu, provided the relevant practical training and Indian Meteorological Department, Madras,contributed to our understanding and implementation at the field. The help rendered by them is greatly appreciated.

Thanks are due to Mr.Patel, a friend, who was kind enough to share his Civil Defence experience with us.

A guide of this kind is obviously the outcome of a team work. I wish to thank the PREPARE staff for the effort they have put in towards the publication of this handbook.

I wish to acknowledge and thank the authors for their painstaking work in preparing the manuscript.

Credit goes to Dr.Daisy Dharmaraj, Director, PREPARE, for writing the section on Emergency Medical Care and the section on Purification of water and sanitation. She, along with Mrs. Sudha Murali, our Programme Co-ordinator, Hyderabad Office, also prepared the manual on Emergency Rescue and Evacuation.

Mrs. Sudha took great pains to prepare the sections dealing with Post-disaster Relief Camp Organisation and Safe handling of pesticides.

The Co-authors of the section explaining the Causes of Fire and Fire Fighting Methodology were Mrs.Sudha and Mr.Samuel Manuel, our Project Co-ordinator, Nagapattinam Office.

Mr.K.Elangovan, our Programme Administrator at Madras was responsible for preparing the section on Contingency Plan and Warning System.

The Project was field tested by Mr.Samuel Manuel at Nagapattinam and the feed back sent by him has been included in the following pages.

Special mention must be made to the line drawings of Mr.Sathyan and Mr.Chandoo. The manual would be incomplete but for these illustrations.

My appreciation to Dr.Indumathi Ravishankar, Associate Editor of PREPARE, who has looked after the compilation, editing and printing of the manual.

I express sincere gratitude to HIVOS who helped us in the formative years to initiate the concept of Disaster Preparedness.

I am greatly indebted to Christian Aid and OXFAM for their continued support since 1985. But for their encouragement, we would have found it difficult to sustain in this field.

Dr. JACOB D.RAJ
Executive Secretary,
PREPARE.

21-12-1990
MADRAS

PREFACE

Natural disaster is a recurring phenomenon from time immemorial. The trail of devastation it leaves behind plunges people into a state of confusion, helplessness and suffering. It disrupts the ordinary life of people, disorganizes public services and causes physical damage. And, we can do practically nothing to prevent the natural disaster from happening. What we can do is plan in advance and prepare the community in the region prone to calamity to face the situation without delay and panic. Timely action by the community can alleviate many of the grave consequences of disaster.

Disaster Preparedness - A handbook for trainers is intended to provide an overview of the measures undertaken at the time of emergency. Emphasis throughout is on community preparedness. The traditional practices and initiative of the community is of major importance in any emergency situation. Hence the use of indigenous resources are discussed in detail with pictorial representation using minimum script.

What the book depicts may be common knowledge but in emergency situation, even common sense knowledge fails. Moreover, to put into practical use what one vaguely knows may be dangerous. Herein the handbook comes handy. It can serve as the basic reference material for the training program imparted to the youth in the villages.

This manual is divided into seven sections, each covering a topic usually confronted in an emergency. The first section discusses the rescue measures taken to evacuate the stranded people. It explains methods of transferring people from disaster spot to a safe place. Temporary shelters should be erected and atleast two meals and clothing should be provided. The second section explains the camp organisation methods.

Once people are shifted, attention should be given to the injured. Emergency medical care is discussed in detail in the third section which includes the uses of bandages. Any pre-disaster

preparation involves a thorough planning. The next section on contingency planning gives guidelines to prepare the community wherein the elders are consulted and the youngsters are trained. This section also deals with warning systems since many natural disasters are related to meteorological conditions. Hence, an understanding of weather forecastings is necessary for the trainers so that the community involved is convinced of the impending danger.

This is followed by a detailed discussion on purification of water and sanitation methods. This helps to arrest many water borne diseases. Fire is another destructive agent which is man-made and sometimes accompanies natural disasters. The section on fire elaborates upon the causes of fire and the methods to fight it.

The last section deals with safe-handling of pesticides. Though not directly related to natural disaster, this section has been included in the manual since it is a 'slow disaster' which affects our environment and people. The knowledge of basic safety measures in purchase, storage and use of pesticide is essential. This section also discusses the alternative methods of pest control.

The objectives of this handbook are:

- *To enable people to have an overall idea of the skills and the trainings needed to combat disasters.*
- *To provide the task force a means of preparing themselves to deal with the abnormal conditions following a catastrophe.*
- *To put forth acceptable, made-to-easy standards that can be applied in disaster situations.*
- *To serve as the basic reference book for all trainers within the community or volags in disaster prone areas.*
- *To help trainers organise training program well before the disaster.*
- *To help organising pre-trained youth into a volunteer force during disaster.*
- *To enable replication of the* ***PREPARE*** *training module in other disaster prone areas of the country.*

This handbook will soon be followed by a second volume which will discuss the Housing in the disaster-prone areas and care of live stock.

Violent winds, heavy rains and floods often destroy the existing structures and installations. Buildings may have collapsed and roads washed away.Hence, the present structural system of housing in disaster prone areas needs an evaluation.There is a need to design low-cost, damage resistant housing in these areas.

The second volume will also elaborate upon the shifting and maintenance of live stock during disaster.

It is hoped that a cross referencing between the two volumes will assist the reader.

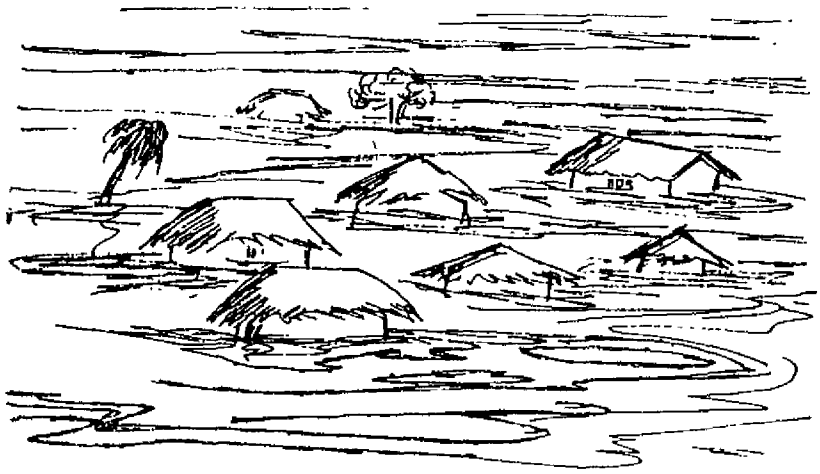
EMERGENCY RESCUE AND EVACUATION METHODS

Search, Rescue and Evacuation are the immediate task of the volunteer group within a community during or in the immediate aftermath of a cyclone, fire, building collapse, flood, etc. It is therefore necessary that a trained community know the best and available means to achieve this using locally available resources, financially within their reach.

In the manual, Emergency Rescue and Evacuation are outlined, simple yet effective ways to keep afloat during a flood or cyclone. This is a key factor for survival especially for non-swimmers, women, and children. Different types of floats individual or family units, methods of rescue in water, evacuation techniques in smoke filled rooms, use of ropes in lifeline throws are illustrated.

EVACUATION

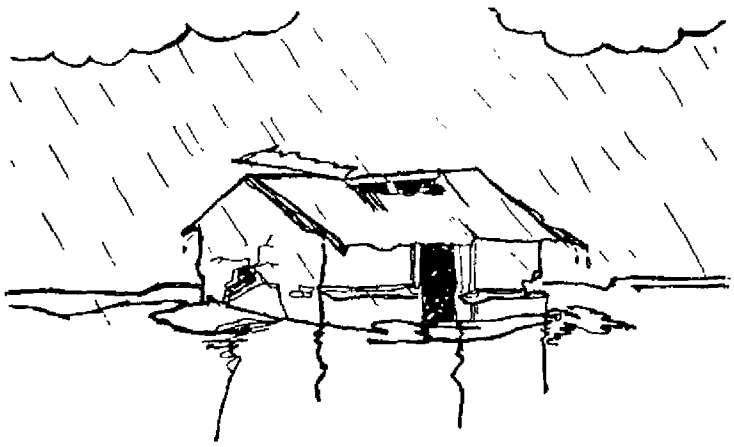
Shift At The Earliest



Water from the sea inundates villages directly and by flooding the rivers.

Villages in the lowlying areas are inundated easily.

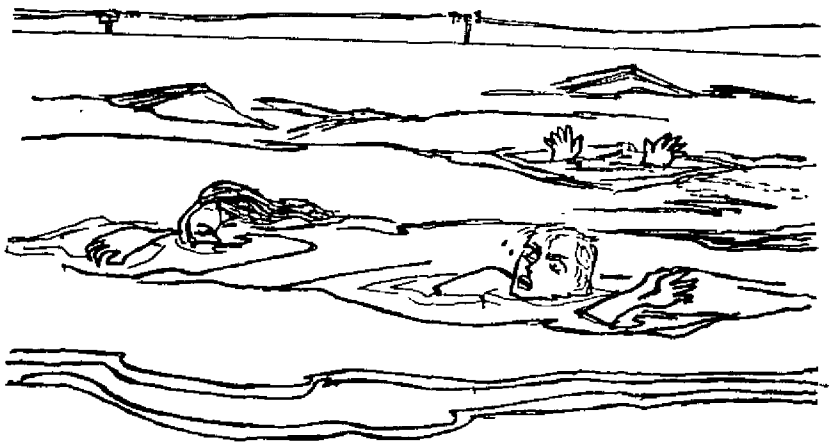
Floods destroy houses. The mud walls break down. The roof is damaged due to wind and rains. The foundations also are damaged due to water seepage.



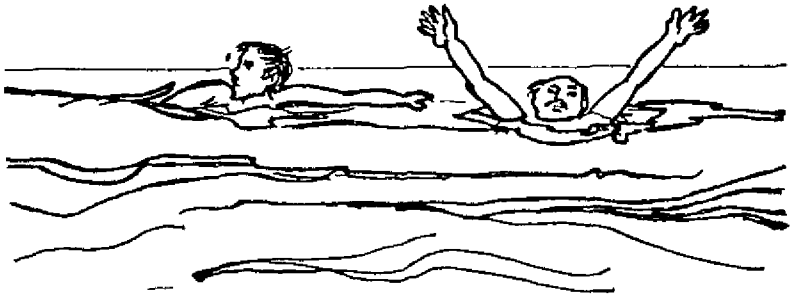
Even well rooted trees fall down ... let alone the vegetations and crops. Much damage is done due to falling of trees.

The elderly are vulnerable to floods and are the first to succumb.

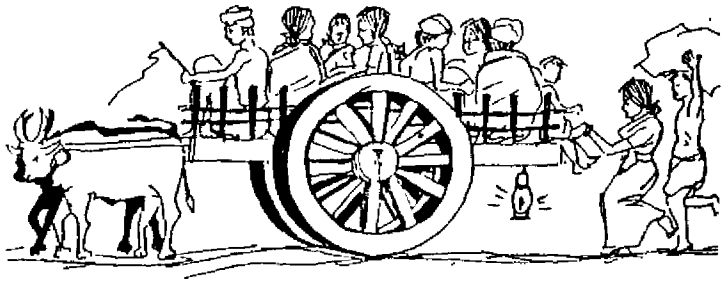
The women and children are equally vulnerable.



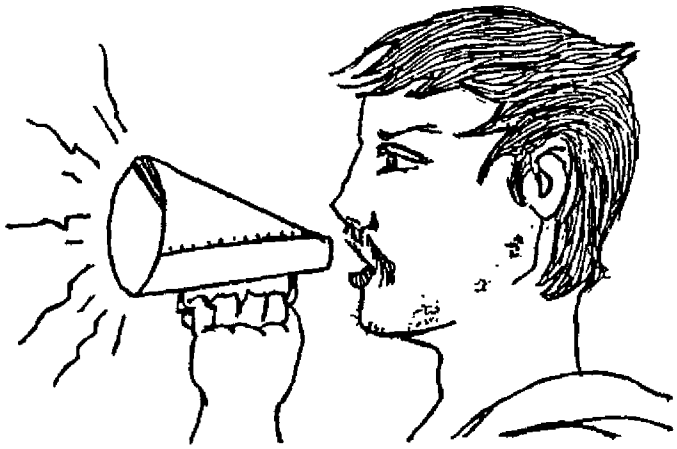
Trying to save another drowning person, without knowing the techniques is dangerous.



Pre-planned timely evacuation has to be coordinated by taskforces.

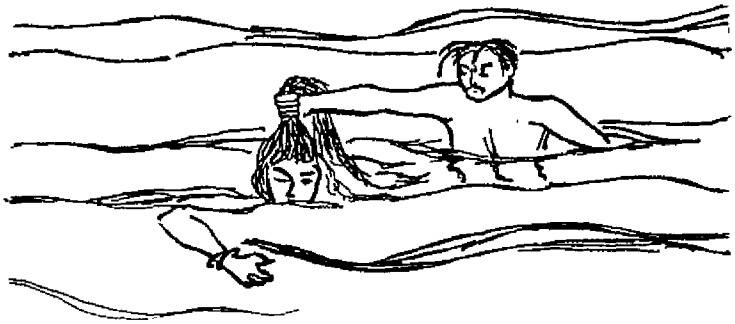


RESCUE

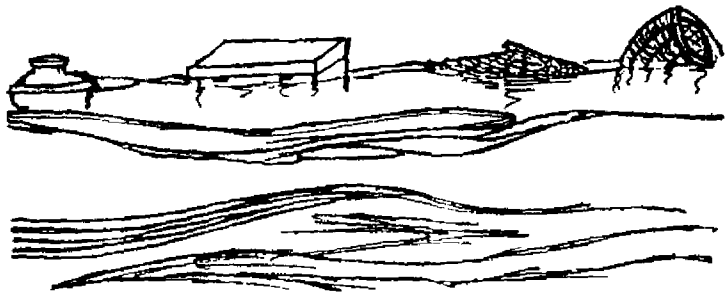


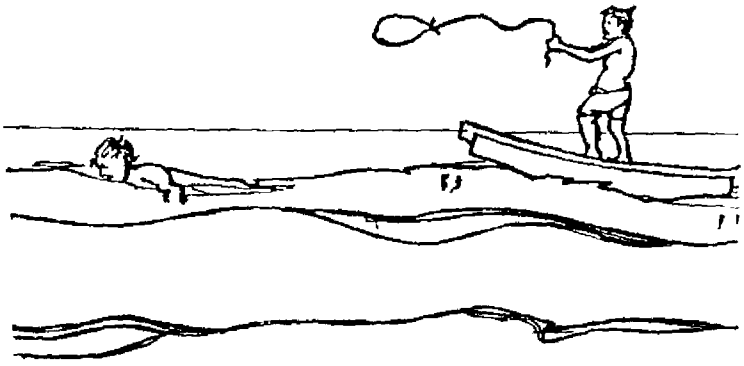
The task force is responsible to warn the villagers of the impending cyclone, and the damages expected. It should clearly instruct where, when and how the people should reach a safe shelter.

One who knows swimming can rescue another by holding on to the tuft of her hair and pulling her



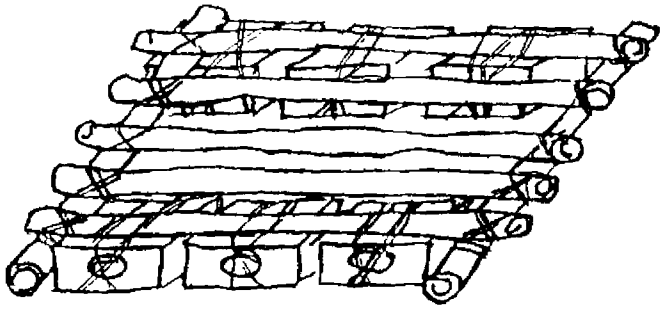
Any other floating equipment like empty tins, pots etc. could as well be used, if tested earlier.

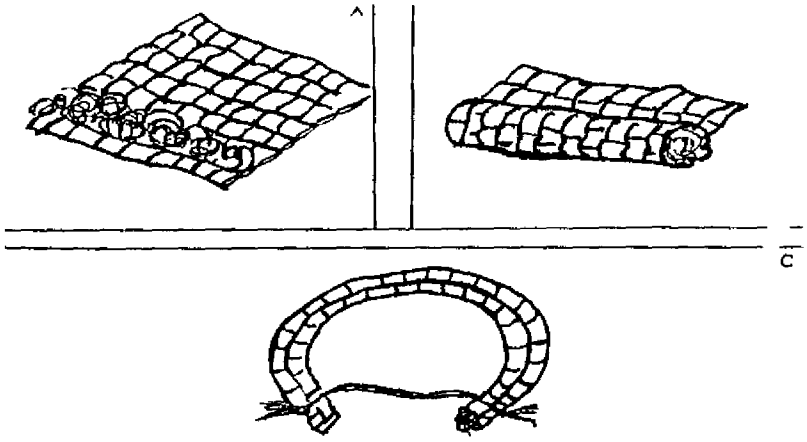




The bamboo float also helps to save others.

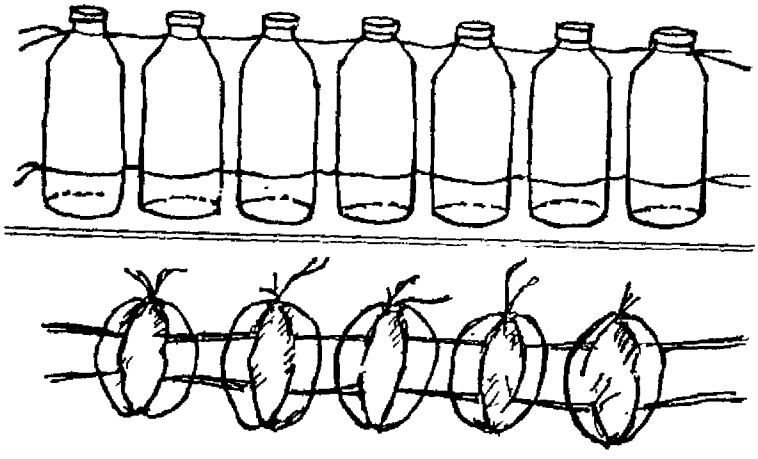
Bamboo sticks tied together with empty closed tins as shown could well serve as a float.



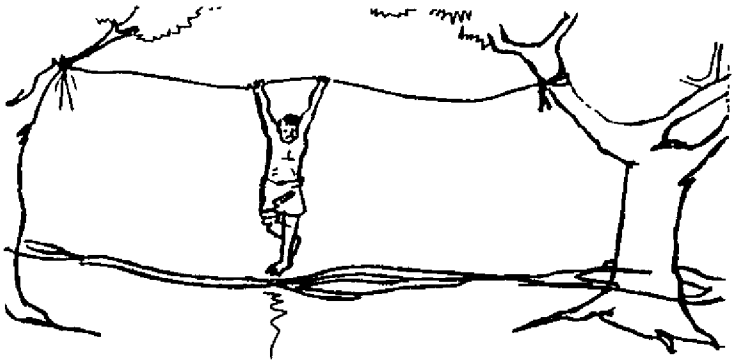


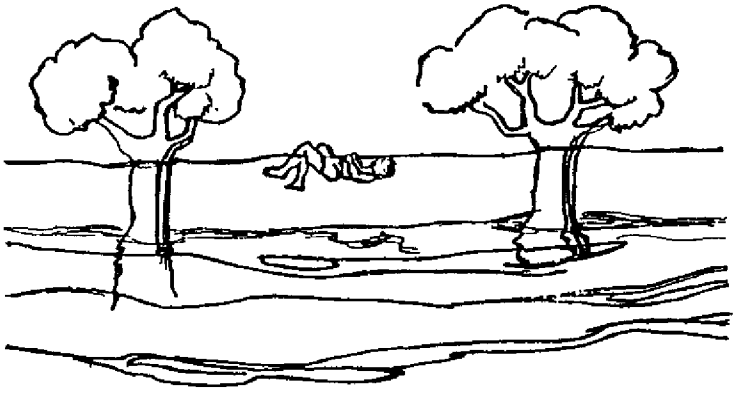
Yet another float could be made by wrapping hay around a mat. Tie both ends tightly and together, and float in the middle.

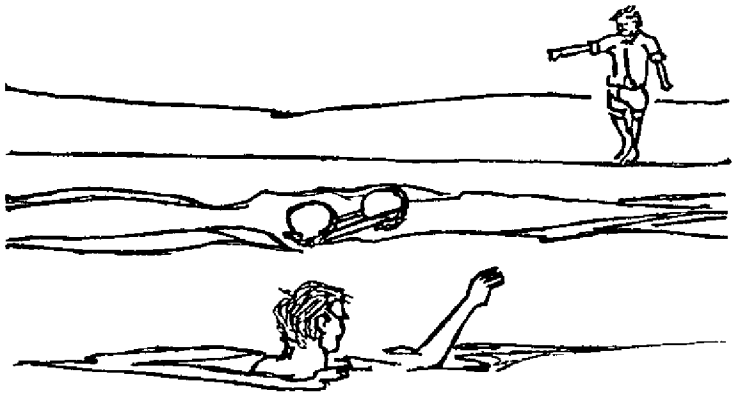
Empty bottles or dried coconuts tied to each other or together could carry a man's weight, and are useful as a float.



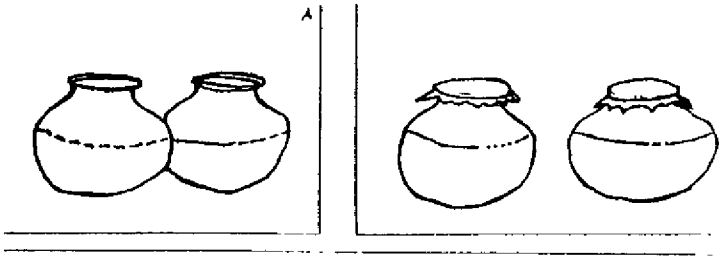
To cross a flooded area, secure a rope on trees on either side of the area to be crossed. Use clove hitch. Using this rope, one can cross over.



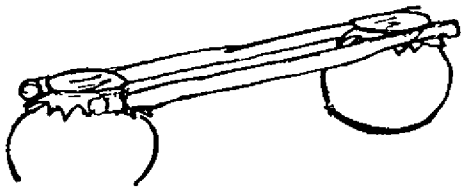




Pots for Rescue

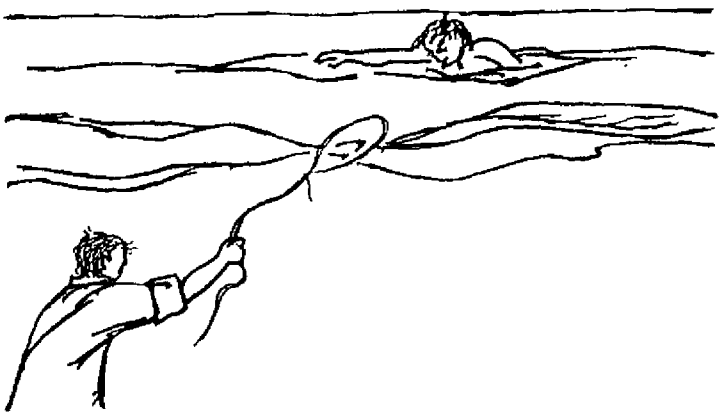


Cover tightly the mouths of two pots or tins with polythene paper. Tie the pots to two bamboo sticks as shown in the figure and float it upside down to the victim who could hold on to it and float.



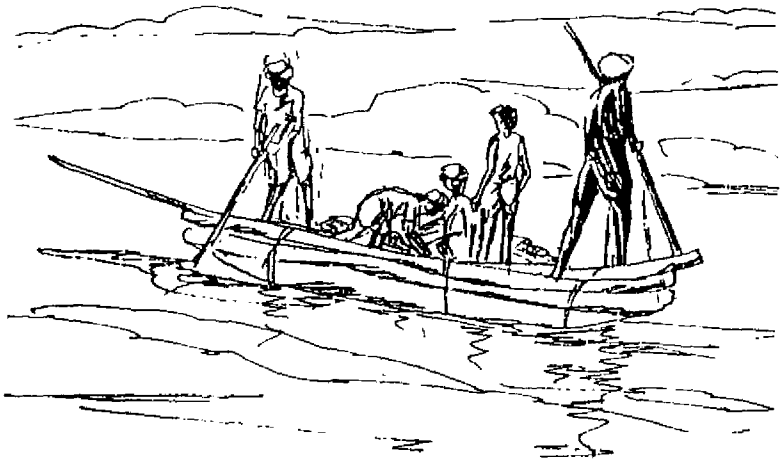
BREAST LINE THROW

A coil of rope is held in the left hand. At the free end a loop is made with a bowline knot and thrown to the victim who secures it around his waist or hand. Then he could be pulled out.

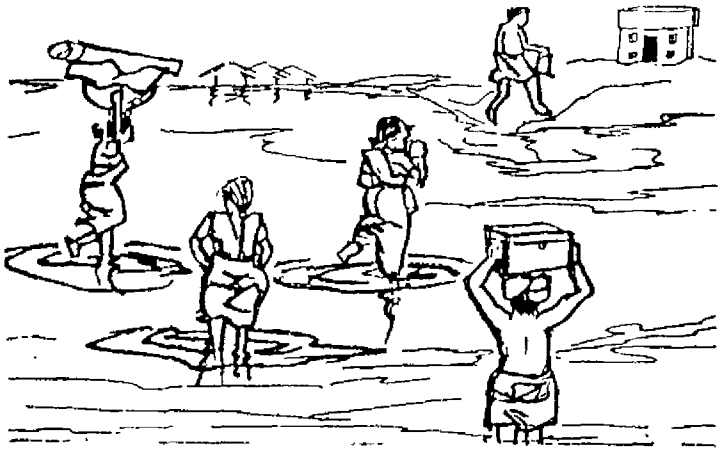


PRECAUTIONS TO BE TAKEN

Do not set out to sea if the sea is rough.



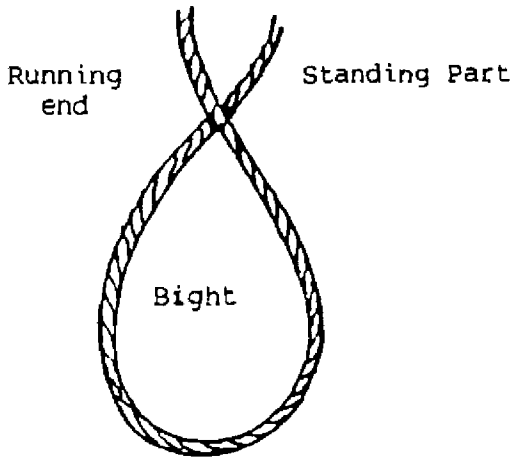
At the earliest, seek shelter in a well maintained cyclone shelter or any safe building. Only carry the most essential things.



USES OF ROPES

Rope is essential for rescue work. The rescuer must familiarise himself with the type of ropes and the knots made with these ropes. It is basic in camp making, water craft, rescue operation and evacuation of casualities in situations created by disasters.

PARTS OF A ROPE

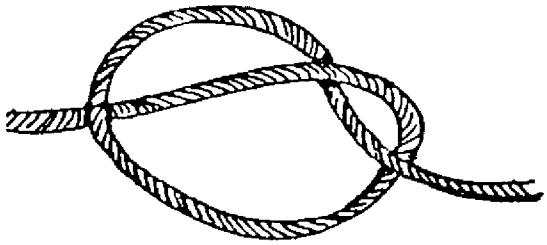


Running End: The free end of a rope with which the knot is made.

Standing Part: That part of the rope which is taking the load.

Bight : A bight is formed by turning the running end of the rope so that it remains parallel to the standing part.

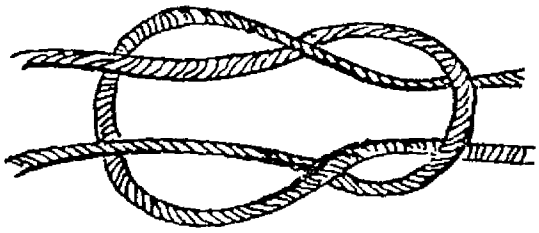
Overhead Knot :



This is an ordinary knot which we use in our day to day life otherwise known as thumb knot. Make a loop and again pass the running end through the loop, it is called overhead knot.

KNOTS FOR JOINING

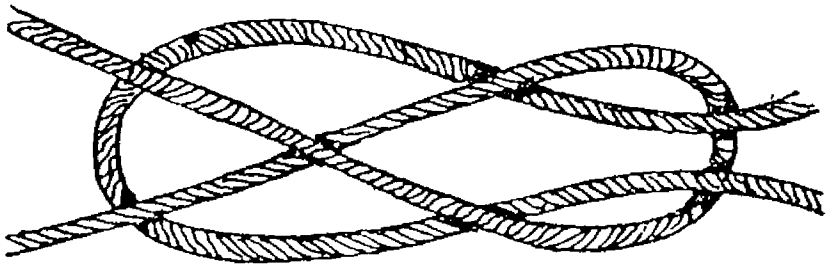
Reef Knot



This is essentially 2 thumb knots tied in reverse direction, left over right and then right over left.

Put the two rope ends together, left over right and twist the left hand end behind and around the right hand end. Bring the ends up and even with each other. Now place the right hand end over the other and twist it behind and down through the bight. Grasp both ends with fingers and thumbs and pull ends out to form the knot. This knot is used for joining two dry ropes of equal sizes.

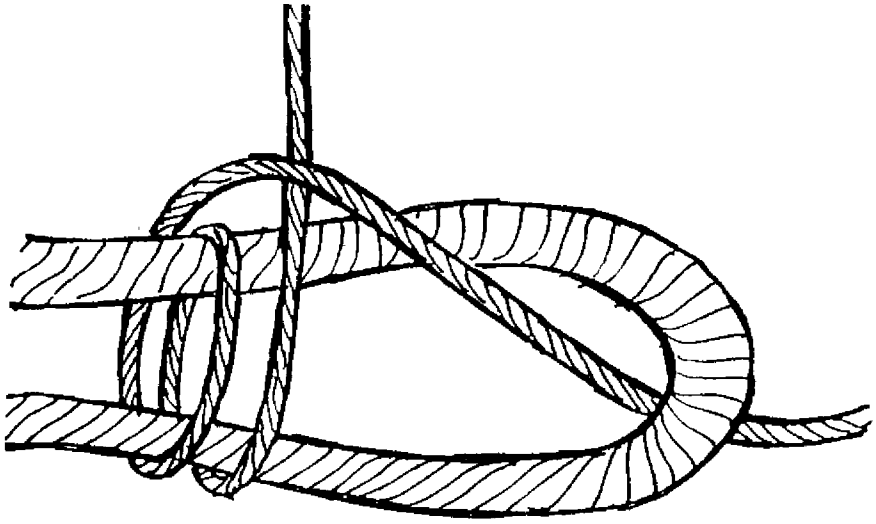
Sheet Bend



There are two types. Single sheet bend, double sheet bend. Both are useful for uniting two ropes of different thickness and they do not slip when the rope is wet

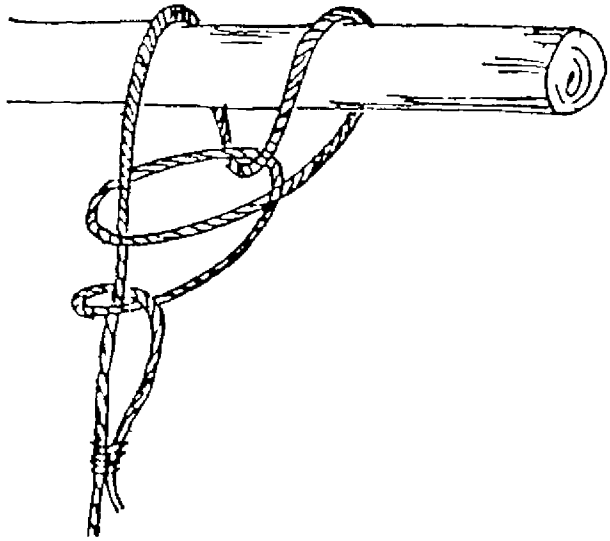
KNOTS FOR ATTACHING

Double Sheet Bend



This is little more secure than the single sheet bend. It is used when the difference between the ropes to be joined is great. It is formed somewhat like the single sheet bend upto forming the bight and passing the thinner rope under the bight and then making two turns over and around the bight before slipping it under its own standing part where this has entered the bight.

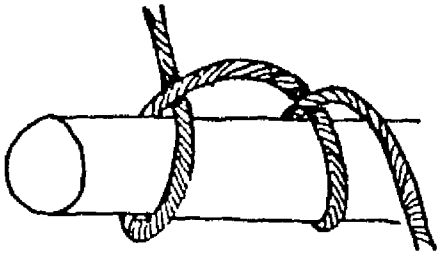
Fisherman's Knot



This is one of the best knots for tying fine ropes together. Tie an overhand knot in one of the ropes but do not pull it. Pass the other rope end through this overhand knot and along side the first ropes standing part. Then tie an overhand knot in the second rope around the standing part of the first rope. Pull each of the two overhand knots separately. Then pull the whole knot by pulling in the two standing parts, thereby interlocking the two overhand knots.

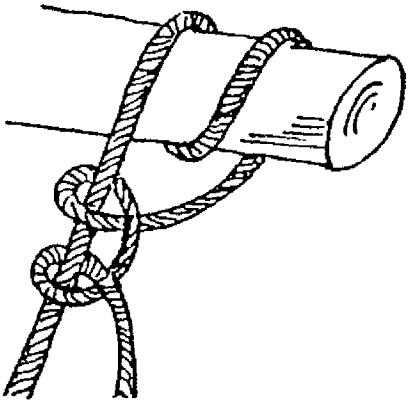
KNOTS FOR SECURING

Clove Hitch



Clove hitch is the most widely used knot for tying the rope around some object, pole or tree etc. and as the start/finish knot of most of the lashings. Pass the running end of the rope around the pole and bring the end forward over its own standing part. Pass the role end once more around the pole below first turn. Then bring the end in under the rope itself. Tighten the clove hitch by pulling hard on the running end and standing part. The second method of tying clove hitch on the mid-rope is by forming two loops in the centre of the rope, one in the left hand, the other in the right, one opposite to the other in direction. Then the right hand one is placed in front of the other loop. Both loops can be passed over the pole and drawn tight into a clove hitch.

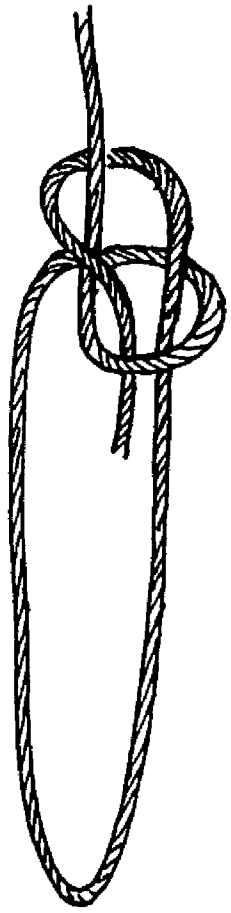
Two Half Hitches



Two half hitches are good for fastening a rope to a post For this knot, pass the running end of the rope around the pole then over and under its standing part through the loop formed. Make the second half hitch in front of the first by repeating the process of bringing the running end over, under and through the loop formed. Push the two half hitches close together and up against the pole Then by pulling, the standing part of the knot can be tightened.

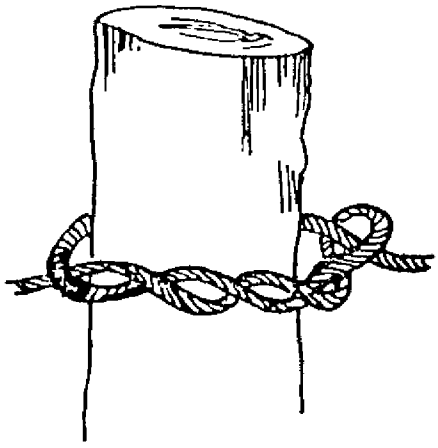
KNOTS FOR RESCUE

Bowline



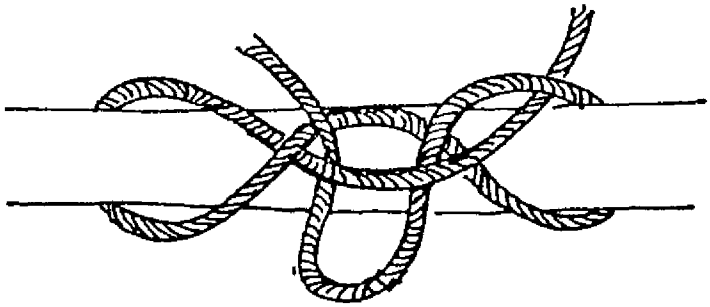
This is fundamentally a rescue knot which the rescuer ties around himself or throws to some one who needs a life line. Place the running end on the standing part of the rope. With a twist of the hand carry the end around, forming the loop in the standing part. Bring the running end around the standing part and down through the small loop just formed and along side of its own continuation. Tighten the bowline by holding on to the bight formed by the rope end and pulling in the standing part.

Timber Hitch



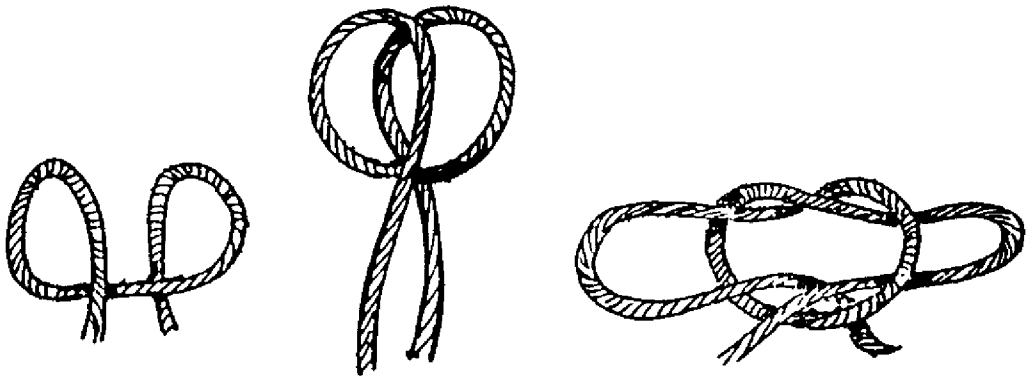
This knot is used for quick and temporarily securing a rope to a plank of a spar. This is also fine for raising logs, for dragging them over the ground or for pulling them through water. Pass the running end of the rope around the pole, then under and over its own standing part and through the loop thus formed, make a bend near the rope and twist the end a number of times around the loop till the running end is exhausted. Then pull the standing part and the hitch is formed.

Draw Hitch



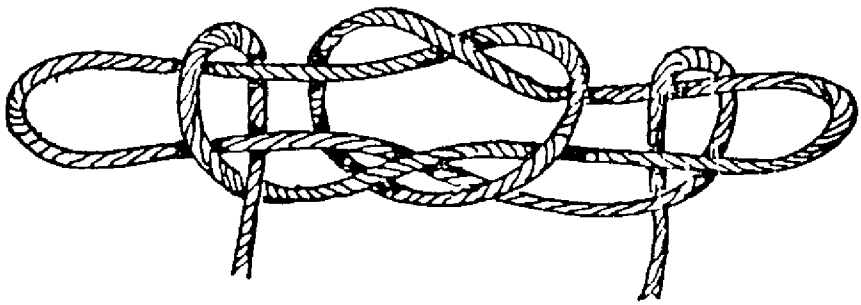
This knot is used for self rescue and then recover the rope very easily. This hitch will stand a considerable amount of strain on the standing part and it can be easily released by jerking the free end. This is otherwise popularly known as 'thief knot'. A bight is formed and passed around the spar and a second bight which is then formed on the standing part of the rope is passed through the first bight. A third bight is formed with the short end and passed through the first bight. One more bight is formed with the short end and passed through the second bight and the whole tightened up by pulling on the standing part.

Chair Knot

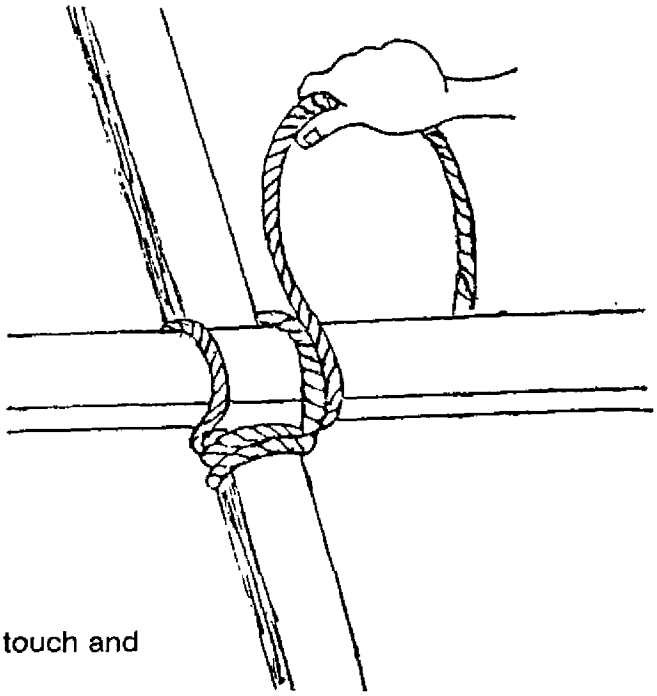


This knot is a good general purpose knot and one which is very important for emergency rescue work. Its purpose is to form an efficient and quickly made sling in which a person may readily be raised or lowered. The sling formed by this knot gives support to the chest and legs of the person being rescued.

The chair knot is formed by grasping the rope, near its centre, in the left hand, plam down. Approximately a yard from the left hand take the rope in the right hand, palm uppermost. Turn the left hand palm upwards forming a loop (anti-clockwise), turn tne right hand palm down forming a loop, bring the loops together, then pass the standing ropes through the loops of the opposite hand pulling them through thus forming two loops with a knot in the centre. These loops can be adjusted to the required size. A half-hitch is then made on each loop to keep them at their required size. One loop will be slightly larger than the other to keep the person being raised or lowered in a "chaired" position.



LASHINGS



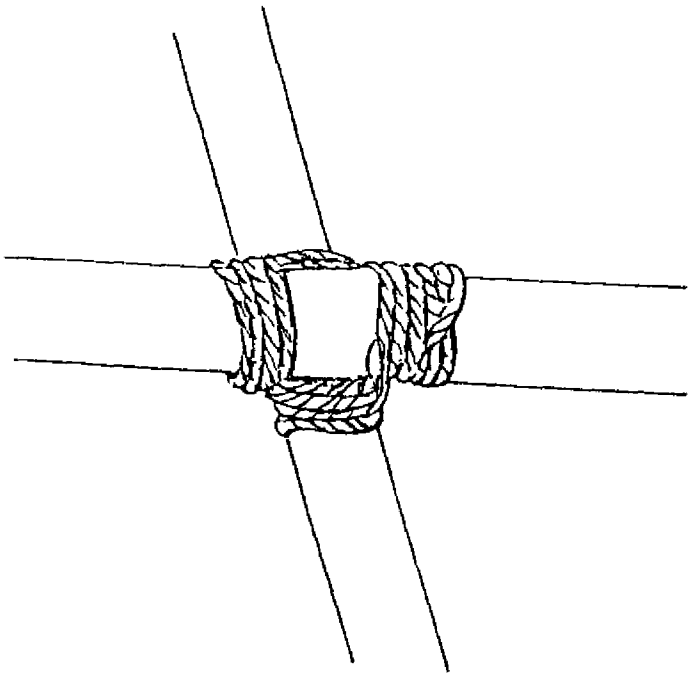
Square Lashing

This is used for lashing together two poles that touch and cross at right angles.

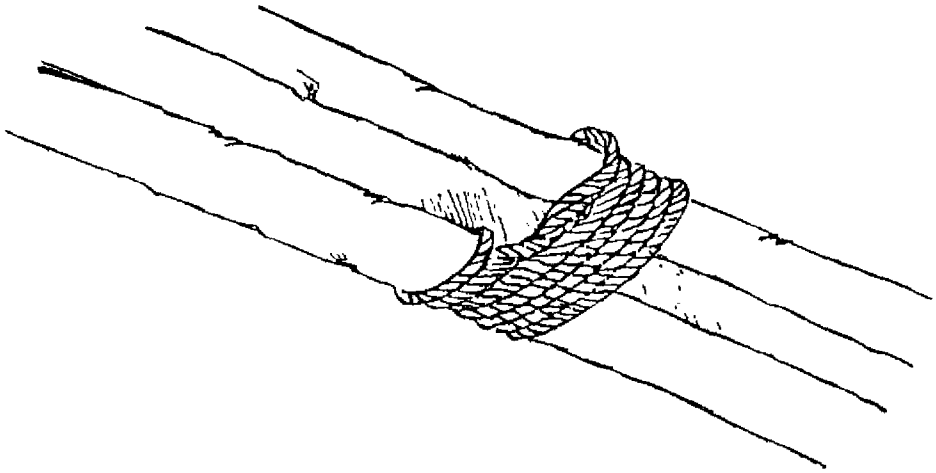
Put a clove hitch to start with around the spar or leg and below the cross head or leader. Carry the running end to standing parts, take up and around both the poles.

Repeat this circuit three to four times drawing the rope as taut as possible. Then take three to four frapping turns around the whole lashing but between the poles.

Draw vertical pole above the horizontal.

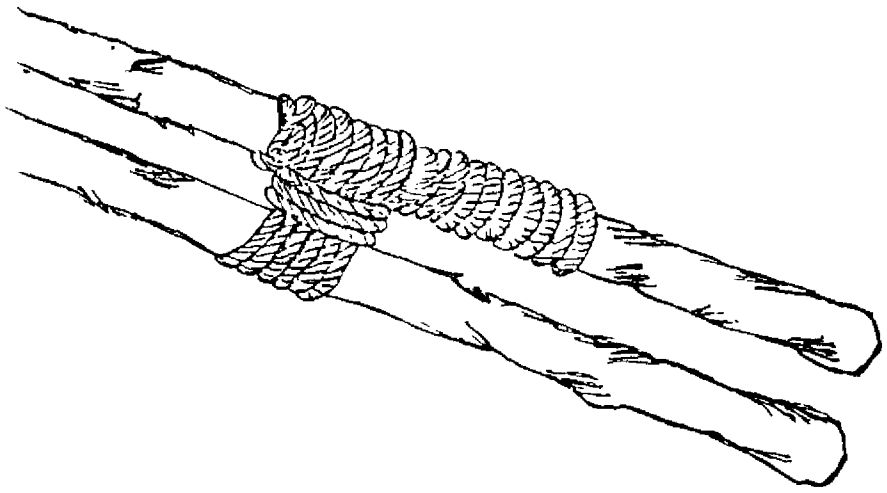


Round Lashing

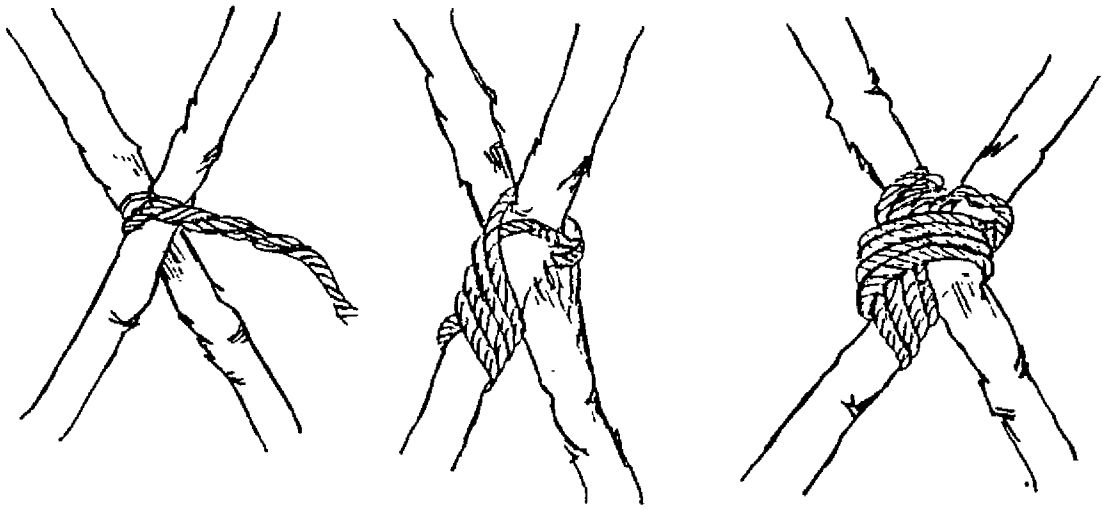


This is used for lashing two poles together, when they are kept parallel to each other e.g. sheer legs. This is also called sheer lashing.

Before starting insert spacers between the poles. The thickness of the spacers should be approximately half the diameter of the poles. Put a clove hitch around one pole, marry the ends and continue with 6-8 close turns round both the poles going upwards. Add two or three frapping turns round the lashing and between the poles End with a clove hitch above and on the opposite pole to the starting pole.



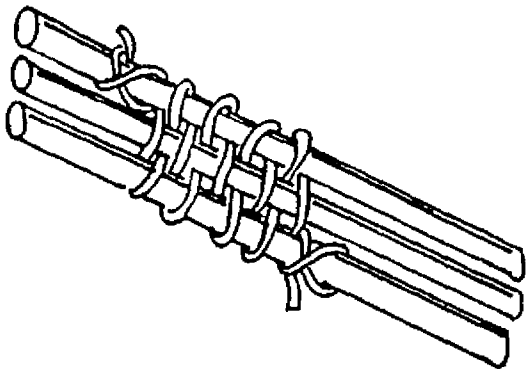
Diagonal Lashing



This is used to fix spars together at other angles, eg. when applying bracing spars to a frame.

Start by means of a timber hitch to hold the two spars together, four or five lashing turns are made around both spars in one direction followed by the same number at right angles to the first set, each turn being pulled tight as it is applied. Three or four frapping turns are then applied tightly by passing the rope between the spars and the lashing finished off with a clove hitch above the lashing.

Figure of Eight Lashing



This is used for lashing three poles together to form a tripod or gyn.

Before lashing, insert spacers between the pole. (Where you have marked the pole). The thickness of spacers should be half that of the poles, marry the ends and working upwards continue lashing in the figure of eight fashion with 6-8 turn. Add two to three frapping turns between each pole and round the lashing. Finish with a clove hitch above and on the opposite pole to the starting pole.

CARE OF ROPES

Since the ropes are the lifelines during Emergencies, proper care should be taken for its maintenance and durability.

- Fibre ropes should be kept as dry as possible.
- Hard and stiff rope gives trouble sometimes. Twists should be removed by stretching a rope throughout its length before use.
- Ropes should be hung on the poles or bamboos.
- Permanent knots in a rope should be avoided as it reduces the strength of the rope.
- Ropes should not be brought in contact with any chemicals or materials containing chemicals or strong alkali.
- Dragging the rope along the ground should be avoided.
- The rope end should always be properly whipped.
- Examine the rope for fraying, chafing and break each time before use