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FIRST DRAFT:

PROJECT MANUAL FOR AN EMERGENCY SHELTER-TO-HOUSING PROGRAM

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I. INTRODUCTION

This manual describes the procedures for conducting an emergency shelter-to-housing program in the aftermath of cyclones and floods. The manual sets out procedures for establishing the program and for conducting the various activities and projects needed to successfully complete the program.

CONCEPT

An emergency shelter-to-housing program is a series of post-disaster housing projects that respond to a variety of needs in a stricken community, with the objective of stimulating recovery not only in the housing sector, but in related sectors. They are planned and carried out in such a way that each is complementary to and builds upon the other activities.

In a shelter-to-housing program, a variety of post-disaster shelter and housing services are offered to low-income disaster victims. The program is designed so that every input in the emergency phase contributes to and speeds the long-term recovery phase. During the emergency, building materials are supplied to the victims to be used in erecting an emergency shelter or repairing a damaged structure to make it more livable. At the same time, a program of construction education teaches safer construction methods to local builders. Building designs that use these features and that can be built with the materials supplied are introduced. These structures can serve as the "cores" of disaster resistant permanent houses, with the methods for upgrading the buildings in a safe manner included in housing education classes for homeowners and local builders.

There are several fundamental features of a shelter-to-housing program. The first is multiple objective planning: the use of resources, projects and especially money in such a way that more than one objective is accomplished each time an effort or expenditure is made. For example, in this program, building materials are sold at a subsidized price. By selling the materials, program administrators are able to:

1. provide low-cost materials to the disaster victims that can be used first to erect an emergency shelter, then recycled into a more permanent house;
2. provide the materials in such a way that normal commercial markets are not disrupted and market price stabilization is encouraged;
3. purchase more materials with the proceeds of the sales, thereby increasing the amount of materials available to the disaster victims and/or the number of people that can be assisted by the program;

4. provide funds which can be used to pay for labor-intensive projects designed to give disaster victims an opportunity to earn the money needed to purchase building materials for housing reconstruction.

The second basic principle is mitigation through reconstruction, to reduce future loss of life and property. A primary objective of the program is to teach people how to rebuild their homes in such a way that the magnitude of damage will not be repeated in the future. The program focuses on creating public awareness of why the houses are vulnerable and stresses the actions that people can take to make their houses safer.

The third principle is community participation. The program emphasizes giving people choices and options in the repair and reconstruction of their housing. The program provides information on a variety of housing types, helps them decide what is the most appropriate type of house to rebuild, and helps them choose the level of protection that they want or can afford.

The fourth principle is cooperative participation. The families participating in the program are encouraged to help each other repair and rebuild, in order to help reduce the cost and time needed for reconstruction and to foster the concept that working together can help accomplish many activities in their communities.

OBJECTIVES OF THE PROGRAM

The objectives of the program are:

1. to help the disaster victims repair or rebuild safe houses at a cost they can afford;
2. to improve the building skills of local carpenters, masons and other building tradesmen so that they can continue to build safe houses;
3. to lower the overall vulnerability of the housing in the community to future disasters;
4. to stimulate economic recovery as well as physical reconstruction;
5. to stimulate the development of micro-enterprises in the housing sector in order to help reduce building costs and provide a basis for improving the standard of housing throughout the project area;
6. to establish a basis for vulnerability reduction areas outside the disaster-affected zone.

COMPONENTS OF THE PROGRAM

A shelter-to-housing program is an integrated reconstruction program consisting of several activities and projects. These are:

1. disaster assessment;
2. design and planning of the program;
3. materials distribution;
4. construction education;
5. small-scale labor-intensive projects using the proceeds from the sale of materials in the materials distribution program;
6. development of micro-enterprises to produce low-cost building materials.

Each of these components is supported by extensive public awareness campaigns and community organizational efforts.

PROGRAM SYSTEMS AND SEQUENCE

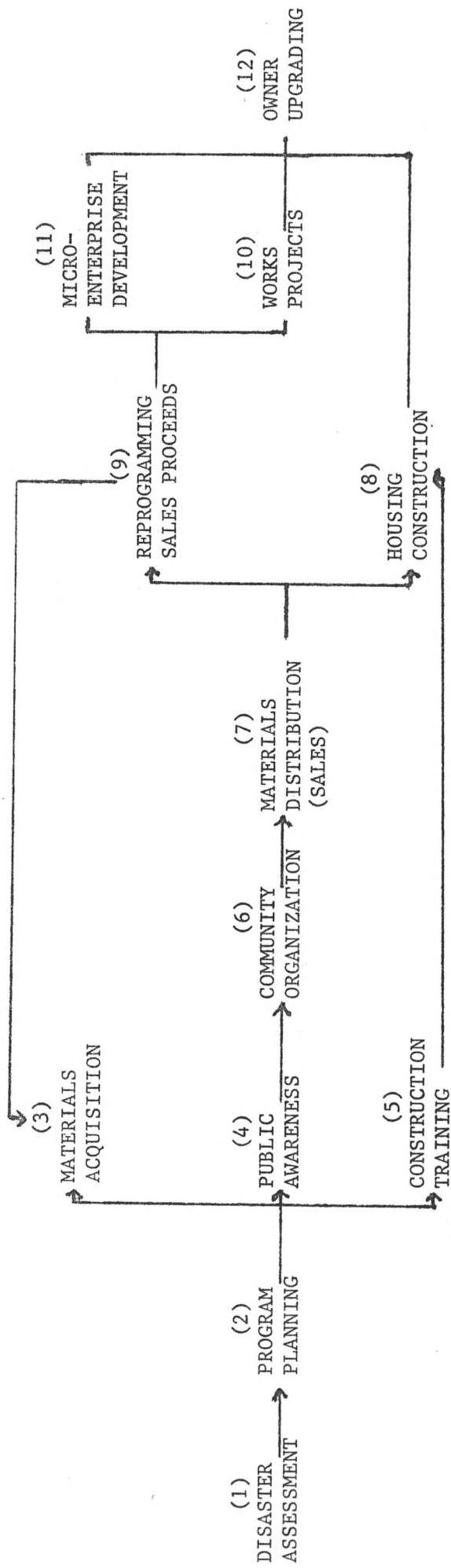
The chart on the following page (Figure 1) shows the series of activities and the sequence in which they are carried out.

From the chart it can be seen that the principal activities are:

1. Disaster Assessment: The assessment determines the needs in the project area and the resources available in the area.
2. Program Planning: The program planning process sets out a framework that will guide the project during the initial stages of implementation. As the project proceeds, plans may be revised or changed.
3. Materials Acquisition: The materials that are necessary to help people rebuild or repair houses are identified and acquired during this phase.
4. Public Awareness: As the program commences, an extensive program is carried out to inform the public about how they can participate in the program.
5. Construction Training: The principal element of the program is education in methods of improved, disaster resistant construction. The training program consists of training a team of instructors and construction supervisors to teach people how to build safely, and preparing training aids to help people understand more clearly the construction methodologies being taught.

FIGURE 1

PROGRAM SEQUENCE



6. Community Organization: Extensive efforts are carried out by the program staff to help communities organize to more effectively participate in the program. Special attention is given to the organization of groups of families to help each other build as a means of reducing costs and speeding construction.
7. Materials Distribution: Building materials are offered to qualified program participants to enable them to rebuild. Some materials are offered at subsidized prices (depending on the family's ability to pay) and a small amount are provided to qualified recipients at no charge.
8. Housing and Shelter Construction.
9. Reprogramming the Proceeds from Sales of Materials: The proceeds from the sale of the building materials can be used in two ways:
 - a. To purchase more materials so that more people in the project area can obtain them;
 - b. To fund small-scale, labor-intensive projects in the affected communities that will offer an opportunity to earn the needed money to persons who cannot initially afford to purchase building materials
10. Micro-enterprise Development: Small-scale enterprises are established to produce low-cost building materials to help reduce construction costs. Funding support for micro-enterprise development can be obtained from the proceeds of the materials sales.
11. Housing Upgrading.

II. DISASTER ASSESSMENT

INTRODUCTION

This section describes the procedures needed to conduct an assessment of a disaster-affected area and to acquire information necessary to conduct an emergency shelter-to-housing program.

Objectives

The overall objective of the assessment is to determine the feasibility for conducting an emergency shelter-to-housing program. Specific objectives include:

1. identification of the extent of damage;
2. identification of the types of assistance needed;
3. identification of the types of structures that must be repaired or rebuilt;
4. determination of the amount of materials needed, the material resources available in the area, and the amount of materials required from outside the affected area;
5. identification of local institutions that could carry out the program and their capabilities;
6. identification of the level of skills in the construction sectors in the affected community;
7. determination of the patterns of damage and the technical assistance requirements in order to build or repair the houses safely;
8. determination of the receptivity of local institutions and the public to an integrated reconstruction program.

Issues

The most important aspect of feasibility is the receptivity of the local people and institutions to the various activities and projects of the overall program.

The disaster assessment should attempt to develop rough quantifications of damages and needs. It is important, however, that the assessment team not devote too much time to an exact count of buildings damaged or destroyed. This information is difficult to obtain. Rough estimates gathered by surveying sample neighborhoods can provide enough information to commence program planning.

ASSESSMENT PROCEDURE

The following procedure should be used to conduct the assessment.

1. Check in with the appropriate authorities and/or counterparts. During the check-in, identify organizations and personnel active in the disaster and working in the housing sector. Be sure to contact both governmental and non-governmental organizations.
2. Identify priority zones. Priority areas can be determined through:
 - (a) reports;
 - (b) other disaster assessments; and
 - (c) interviewing persons who have been working in the affected areas.
3. Determine the areas to be assessed and notify the appropriate authorities of your intentions.
4. Conduct the assessment. The disaster assessment should consist of several activities including:
 - a. An overflight of the project area: A flight over the disaster-affected area can provide a good picture of the extent of damage and can help identify areas of priority concern. During the flight the observer should note concentrations of activity, concentrations of damage, the general topography, problems relating to transportation, logistics, and secondary threats (such as flooding, potential landslides, etc.). The observer should try to take low-level, oblique photographs of the priority areas and, if possible, high altitude, vertical or near-vertical photographs of the same zones. The photos may be either in black-and-white or color.
 - b. Ground Surveys: The assessment team should then visit the priority areas and collect data regarding the extent, types and patterns of damage. It is important that the ground survey verify the priority of areas of concern.
 - c. Interviews: The assessment team should conduct a series of interviews in the affected area. Persons to be interviewed include the disaster victims, local public officials, personnel working in the relief operation, persons from housing institutions, persons from lending institutions and persons in the building trade.

- d. Summary: Before leaving the project area, the assessment team should review the data collected and identify any gaps in the information so that an attempt can be made to collect any missing information. All information that may be subjective should be verified so that inaccuracies can be reduced.
5. Conduct post-assessment interviews. After leaving the affected area, the assessment team should interview persons outside the area who are knowledgeable about conditions and housing in the affected communities. The team should relate their findings and ask those being interviewed if any major discrepancies or gaps appear in the assessment. During these interviews, it is important that the general concepts of the Shelter-to-Housing Program be explained so that the persons being interviewed can understand the reasons for the inquiry and can help identify additional sources of information useful in the assessment.
6. Prepare a final report. Once the assessment is complete, it is important that the findings be written to enable program planners to have a ready source of information for the purpose of designing the project. As additional information is developed during the project or obtained from other assessments, it should be reviewed in together with the initial assessment to make sure that underlying assumptions are still valid.

Disaster Assessment Data Needs

The following data should be collected during the disaster assessment:

1. Damage Assessment Data: Damage assessment is an analysis of the failure of the buildings and a determination of whether or not they can be safely repaired or rebuilt. Damage assessment should be carried out by a qualified engineer, architect or housing specialist.

Damage assessment includes:

- a. Identification of the common types of buildings, building trends, and housing preferences.
- b. Determination of the patterns of failure of each building type. For example, it is important to determine if the building failed because of its design, because of a failure of the materials due to inherent weaknesses or the type or size of material used, or because of the quality or technique of construction.

- c. Identification of siting problems: For example, the failure of some buildings is due to a poor choice of site such as low-lying coastal areas, landslide zones, flood-prone areas, construction on landfills or areas subject to subsidence, etc.
- d. Identification of urban design problems: Certain urban designs create special problems in disasters. For example, in high wind areas, grid layouts can increase the speed of winds running between blocks of houses.
- e. Determination of material needs: A decision should be made whether additional types of materials or alternative building materials could substantially improve the performance of each type of structure. For example, increasing the gauge or thickness of roofing sheets can improve stiffness and resistance to high winds. In other cases, hurricane straps or fasteners improve the overall resistance of houses in high wind areas.

During the damage assessment, it is important that adequate photographs be taken of both damaged and non-damaged structures. The photographs will aid in designing measures to strengthen the buildings.

Pictures of buildings should be taken from two points: the front and side corner and the opposite rear and side corner as shown.

It is also important to take photographs of the details of each type of building construction, pictures that show the quality of workmanship, and photos that show ways that people in the project area normally build houses. It is especially important to photograph buildings under construction to determine whether people are making any adaptations to improve the performance of buildings on their own.

2. Quantifications: It is important to quantify some of the data collected in the assessment. This includes:

- a. Rough estimates of the number of buildings damaged and destroyed. These estimates can be revised later when more information is available and the program gets underway. Two techniques can be used: aerial photographs and sample surveys. Sample surveys usually take longer, but are far more accurate than analysis from aerial photographs. If possible, it is helpful to categorize the information according to housing type.
- b. Estimates of material needs: Rough estimates should be developed as to the quantity of materials that will be required for reconstruction and repair. Include the types of materials, the quantity, sizes and other specifications. Of special concern are roofing materials, wood for roofs and building frames, and cement.
- c. Estimates of the stocks of building materials on hand in the project area. The amount on hand can be subtracted from project needs to determine the amount of materials that must be brought in from outside the affected area.
- d. Estimates of the local ability to replace stocks from: (a) commercial stocks in-country; (b) increased production in-country; and (c) commercial stocks in nearby countries.
- e. Estimates of the materials that will be supplied by other donors. This should be expressed both in total numbers and in an approximate percentage of need being met by other donors for each material.
- f. Estimates of what percentage of the houses in the affected area are covered by insurance. Insurance proceeds can reduce the demand for building materials from the program and can affect prices. Insurance reimbursement for losses can also stimulate private suppliers to acquire more materials to help meet the overall need.
- g. Good estimates of the cost of materials, both the normal price as well as the post-disaster price of all major building materials. Also determine, if possible, the difference in post-disaster legal "black market" prices.
- h. Amount of production capacity of local material producers. Especially important are lime and cement production, cement block-making, brick kilns, sawmills and rolling mills producing corrugated roofing sheets.

- i. Storage and handling capacity of ports, airports, and warehouses in the project area.
 - j. Transport capacity of local trucking firms.
 - k. Estimates of the cost reductions possible through local production of building materials.
3. Institutional Capabilities: Successful implementation of the program requires the participation of many different agencies and institutions. During the assessment, it is important to determine the capabilities, efficiency, honesty, credibility and commitment of each agency that might be involved. Each of the major functions of the program could be handled by a different agency (see Figure 2 below for examples.) The assessment team should identify the most appropriate institution to implement each particular component of the program.

FIGURE 2

<u>Service Agency</u>	<u>Possible Implementer</u>
Materials Handling	Government, VOLAGS, Cooperatives, Others
Housing Education Agency	Government, VOLAGS, Others
Local Credit Agencies	Banks, Savings & Loans, Credit Unions, Others
Transport	Government, Private Firms
Printing and Reproduction	Government, Private Firms

4. Miscellaneous Data Needs: The following data should be collected during the assessment:
 - a. data on the organization of the national and local governments in the affected area;
 - b. lists of key people in each institution that would be involved in the housing program;
 - c. maps;
 - d. demographic trends;
 - e. development plans (including plans made prior to the disaster and after);
 - f. other disaster assessment reports and/or data;
 - g. photos from other sources; and
 - h. land tenure information.

III. PROGRAM PLANNING

If the assessment indicates that a Shelter-to-Housing Program is feasible and would be welcomed by both the local government and the residents of the affected area, the program planning process begins.

Preconditions

The following preconditions must be met in order to successfully implement a shelter-to-housing program.

1. Government acceptance of the proposed program and of each of its components. In some countries, formal permits may be required in order to operate.
2. Government commitment to support the program. This commitment may include facilitating customs clearance of imported materials; providing technical support to the project; making available maps, charts, plans and other information that can facilitate program planning and execution; and making available government resources to help implement different project activities. The extent of the commitment should be determined in advance and, if goods or services are to be provided, a written agreement should be developed.
3. Local organizational support for the program. It is important that staff of local organizations support the program and agree to participate.
4. Public acceptance in the affected community and in surrounding areas. In the initial stages, people will probably not know enough about the program to make an informed choice as to whether or to what extent they wish to participate. However, they will definitely know enough from hearing an initial description of the program to determine that they might not want such a program in their area. If this is the case, no implementation activities should start.
5. Uniform policy on the distribution of materials. The government must agree to set a uniform materials distribution policy. This policy should encourage subsidized sales of building materials and discourage free gifts of materials to the general public. If a uniform distribution policy is not in effect and other agencies decide to give away materials, this can undercut the subsidized sales program and reduce the proceeds to such an extent that it is difficult to carry out labor intensive work projects and/or stimulate local production of building materials.

6. Uniform price structure for building materials. The government should establish fair prices for all building materials sold in the project area, applicable both to materials sold commercially and those sold by the various reconstruction projects. As a general rule, the government should permit a 10-15% increase on the cost of commercial materials and should permit relief agencies to sell building materials at a price of one-half to three-quarters off the normal market price.
7. Access to local media. Public awareness activities are a key part of the reconstruction program. The program staff must be able to access print and electronic media so that public announcements and information can be provided to persons in the project area. Without the cooperation of the media, successful implementation of the program will be difficult.

The Planning Process

There are seven steps involved in setting up the reconstruction program:

1. defining the project area and scope of the project;
2. establishing policies for the program;
3. establishing objectives;
4. quantifying the objectives;
5. determining strategies and approaches for implementation;
6. establishing a program budget;
7. setting up an organizational and administrative structure for the program.

Step 1: Determining the Project Area and the Scope of Service

The disaster assessment provides the basic data for determining the priority areas for assistance. The planning staff reviews the assessment and selects those areas where the program can be most successful. The choice of project areas often depends on priority of need, whether another agency is providing services in the area, and the amount of coverage that the agency can provide, given the resources that are expected to be available.

The scope of the project is determined on the basis of estimated resources available to the agency. These are calculated in terms of both the direct resources (i.e., cash or

materials that can be provided) and the estimated proceeds or reflow of money from sale of the subsidized materials.

Both the scope of the project and the selection of a project area can be influenced by the participation of other agencies. For example, if another donor provides a portion of the building materials, the overall scope of the project can be increased. If, on the other hand, another agency is adequately providing service, another project area may be selected.

As a general rule, planners should try to extend the scope and impact of a project by cooperating with other agencies and concentrating resources on a particular area.

Step 2: Setting Policies

Policies are used to guide the program staff and provide a framework for making decisions. Examples of program policies might be:

- to support and expand local activities or groups.
- to conduct all activities in such a way that they promote long-term community development.
- to give priority to people who are not eligible for other forms of assistance.
- to emphasize appropriate or intermediate technology.
- to spend the majority of project funds in the project areas and to support local merchants to the greatest extent possible.
- to give priority to a particular area or sector.

Policies should be flexible, comprehensive and clear.

Step 3: Setting Objectives

The overall objectives of the program are stated in the introduction to this manual. The program staff should review the overall scope of the project and determine whether other objectives can be set. During the discussion of objectives the staff should also discuss the priority of each objective and the assignment of the appropriate person or service agency to carry out each one.

It is also important to determine how each objective can be measured. Objectives should be measured not only in terms of the numbers of persons receiving assistance, but also in terms of the quality of the assistance and the benefit provided.

Step 4: Quantification of Objectives

The purpose of quantifying objectives is to determine how much assistance is to be provided and how many beneficiaries will participate in the program. Goals must be realistic and must recognize practical limits; i.e., often not everyone in the affected area can be served.

Sample goals are:

1. To assist ___% of the low-income persons in the project area.
2. To provide subsidized building materials to _____ persons in _____ (project area).
3. To provide ___ grants-in-aid (building materials) to special groups (such as widows with dependent children, elderly and handicapped persons unable to purchase building materials or participate in the work programs).
4. To improve the margin of safety in ___ houses in the project area.

Step 5: Determining Strategies and Approaches

The strategies and approaches used in an integrated reconstruction program include subsidized sales of building materials; construction education; small-scale, labor-intensive projects to provide jobs and income-generating opportunities for the disaster victims; and small-scale production of building materials as a means of lowering building costs. Examples of other strategies that can be considered are:

1. Providing financial assistance to the local housing industry to stimulate building materials production.
2. Providing credit to families to enable them to purchase the required building materials.
3. Providing funding for teams of carpenters and/or masons to build peoples' houses.

Step 6: Budgeting and Resource Allocation

In the allocation of resources and development of a budget, it is important to balance the program and design an appropriate mix of activities. It is especially important to try to extend the financial resources of the organization. This can be done by:

1. Cooperating with other programs. Methods include cost sharing, pooling resources, or contributing matching funds.
2. Maximizing buying power. It may be possible to selectively spend money so that the benefits are extended. For example, if people need loans for building materials, project funds might be used to guarantee loans from financial institutions rather than to used to make the loans directly. In this manner an amount of \$100,000 could be used to guarantee \$350,000 to \$1,000,000 worth of loans, increasing the "buying power" of the money.

The agency should try to ensure that every time money is expended, a portion of the funds are returned to the program. Examples are revolving loans, sales and subsidized sales schemes. Recoverable funding increases the number of people who can be served and extends the "service" of the cash originally allocated to the program.

3. Multiple objective planning. Expenditures should be targeted so that more than one objective is reached with each disbursement.

Budgeting is the final step in resource allocation. Two budgets are used in this program -- a Preliminary Budget and an Operating Budget.

The Preliminary Budget is developed for the first three months of the operating period. It is based on the financial and material commitments that can be identified during the planning process. At the end of three months, the Preliminary Budget is reviewed and serves as the basis for estimating the Operating Budget.

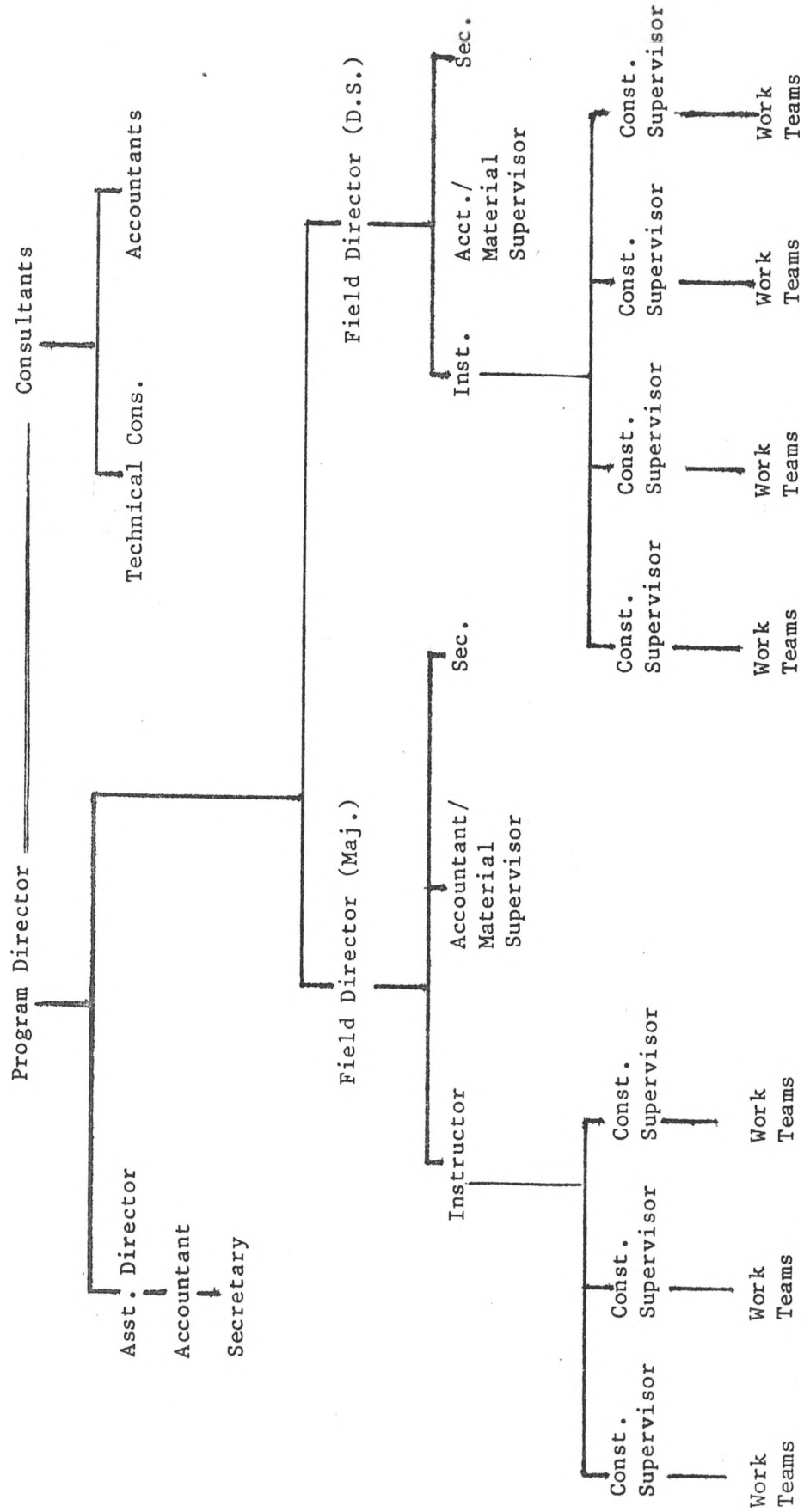
An alternate budgeting method for longer-term projects is a "moving budget". This means that an initial budget is prepared for the term of the project with periodic updating occurring at three-month intervals.

The Operating Budget is based on trends that have been identified during the first three months of program operation. It takes into account the use of the proceeds or reflow funds from the subsidized sale of materials, as well as new resources that may have been committed during the initial period. Because the program has been in operation for three months, planners have a better idea of the total needs in the project area and more precise estimates can be defined.

Step 7: Structuring the Program

The table of organization shown in Figure 3 can be adapted to the specific program scope and used as a basis for organizing the program staff. When drawing up an organization chart, program planners should be sure that clear lines of authority are established and each person is responsible to only one superior.

Figure 3
STAFFING TABLE



IV. MATERIALS DISTRIBUTION

The purposes of the materials distribution project are:

1. to provide good quality building materials to the disaster victims;
2. to provide those components that are required to make houses safer;
3. to provide the materials at a low cost as an incentive to encourage people to participate in the construction training offered by the program.

Most of the materials are to be sold at subsidized prices. Subsidized sales make the materials affordable to low-income families and serve as a means of controlling prices in the local markets. Proceeds from the sales of these materials can be used for purchasing more materials, thereby increasing the total amount of materials offered. As the program continues, proceeds from subsequent sales can be used to finance works projects and other activities that will benefit the disaster victims.

The materials distribution project has five components: material acquisition; logistics; materials distribution; credit; and reprogramming the proceeds.

MATERIAL ACQUISITION

Materials can be acquired for the program in several ways:

Purchase of materials from commercial suppliers. Purchases may be from suppliers in the disaster-affected area; from suppliers in surrounding areas; from suppliers in other parts of the country; and/or from suppliers in other countries.

The advantages of local purchase are:

- it stimulates local markets;
- it helps local economic recovery;
- it is usually cheaper overall since the supplies are already on hand;

Furthermore, since the supplies are already there, the program does not have to arrange storage; the materials can be held by the suppliers until they are distributed.

The disadvantages of local purchase are:

- It may cost more if demand is high. Inflation almost always occurs in the aftermath of a disaster; prices of materials in demand will increase, sometimes dramatically, unless a good price control system is in effect. (Even with price controls, local purchase is generally still cheaper than purchasing outside and trying to set up a transport system to bring the materials in.)
- The materials may have been damaged by the disaster (e.g., they may have been exposed to the elements, damaged by water, or damaged in the collapse of a storage facility.)
- Purchasing local supplies can further inflate the cost of the materials in local markets.

Outside purchases. The primary advantage to purchasing outside the area is that the prices are usually lower. Outside purchases also have less of an inflationary effect inside the disaster area (although they may create an inflationary situation or shortages in other parts of the country.)

Disadvantages of outside purchases are:

- The program must often arrange for transport and storage facilities, thereby increasing costs.
- The program must provide security in the storage area to reduce pilferage.
- Outside purchases require more time and delays may slow other program activities.
- If purchases are made outside the country, additional delays may occur in customs, or special clearances may be needed to import the materials.

On-site production of building materials. In many cases building materials can be produced on-site; for example, brick-making, block-making, and timber milling can all be carried out by small-scale enterprises. The purchasing manager should work with program planners to determine whether any of the materials and components required for reconstruction or repair can be produced locally. If it is possible and the basic materials are available, a brief feasibility study should be carried out to determine the costs of locally-produced materials in relation to purchase from normal commercial suppliers. If the costs are lower, the program may decide to commit money from the proceeds of the sale of other materials or to use capital funds from the initial program grant to finance part of the costs for local material production. Start-up costs can be financed either by loans, grants, or in kind contributions of materials or equipment.

Two other strategies are:

- Placing advance orders for the materials. This could enable the producer to borrow the money from normal credit institutions to set up production facilities.
- Advancing part of the money for the order so that the producer can purchase the necessary equipment or supplies to produce the order.

Salvage. In the aftermath of a cyclonic storm or flood, there are normally large amounts of building materials that can be salvaged. Low-income families usually salvage materials on their own, and informal markets can develop that allow people to sell or exchange salvaged materials.

Materials that are damaged or odd-sized may have only limited use. On the other hand, they may be of use for small components that would be normally purchased and distributed in the materials distribution project. For example, corrugated iron roofing sheets that have been damaged in a cyclone may not be suitable for reuse as roofing material; they may have lost a portion of their strength or lamination protection. However, they can be cut into small strips to be used as hurricane straps and fasteners. The purchasing manager should determine whether salvaged materials can be purchased locally, recycled and re-distributed through the materials distribution project.

Purchase of salvaged materials also provides people with needed cash at a time when reconstruction activities are just beginning.

Purchase of salvaged materials can be made with funds from the proceeds of the initial sales of subsidized materials or with funds from the initial program grant.

Purchasing Problems and Strategies for Overcoming Them

Problem 1: Suppliers may raise prices when it is known that large purchases are being made. The strategy for dealing with this problem is to make discreet inquiries about prices rather than to engage in open bidding.

Problem 2: If the program purchases substantial amounts of materials from one supplier, all of those supplies in the area may be depleted, causing prices to increase for those residents not participating in the program. One option is to purchase from a variety of suppliers (if they are available) and to balance supplies purchased in the area with supplies purchased outside the area.

Problem 3: In anticipation of large purchases, all suppliers in an area may conspire to raise their prices (a suppliers' cartel). One strategy for dealing with this situation is to order supplies from outside the area and then attempt to get one or more of the local suppliers to match the price.

Purchasing Requirements

There are three basic purchasing requirements in a housing reconstruction program. They are:

- Purchase all materials at a fair market price.
- Ensure timely and steady deliveries.
- Ensure that all materials purchased are of the best quality and are structurally sound.

To determine a fair market price, it is important that inquiries be made to suppliers and to persons who have recently purchased the materials in both large and small quantities. Contrary to popular belief, competitive open bidding does not always lower prices; often it raises them, because the number of primary sources of supplies (i.e., the wholesalers, or materials producers) is fairly limited in a developing country. Thus, they can control the price and set it artificially high. Furthermore, cartels of suppliers develop quickly in emergency situations. Nonetheless, most governments and many agencies still require open bidding. When it is required, the purchasing agent should be as discreet as possible within the guidelines supplied by the agency under whose auspices the purchasing is being carried out.

LOGISTICS

[to be added]

DISTRIBUTION

Materials are distributed in three ways: (a) sales; (b) grants-in-aid; and (c) materials for work.

The sale of materials is the primary means of distribution in an integrated shelter-to-housing program. Some materials may be sold at cost, but the vast majority are sold at a subsidized price. Prices are established by the program staff in conjunction with the local government. As a general rule, major materials are usually sold at a 50% subsidy, and minor materials at a subsidy of 25-35% of the normal price.

Most sales are on a fixed basis, although in some cases sale prices may vary according to the economic status of the purchaser. For example, a middle-income family might purchase materials at a 25% discount while persons from low-income families may purchase at a 50% discount.

Items that are normally sold include: corrugated iron roofing sheets, cement, wood, construction wire, iron rebar, roofing nails, steel framing nails, lime, wood preservative, and cyclone straps and fasteners.

Grants-in-aid are gifts of materials to persons who cannot afford to purchase materials and cannot participate in a work project to earn the money to purchase the materials. Grants-in-aid are normally given to elderly families, widows with dependent children, handicapped persons and/or organizations that are providing housing for destitutes, refugees and other groups who cannot participate in the project activities.

Grants-in-aid may also be given to community groups who agree to build model houses demonstrating the construction techniques advocated in the construction education program.

Materials-for-work projects are another means of providing building materials to people in the program area. The labor intensive works projects described later in this manual often pay people with building materials in lieu of cash. The decision to use materials rather than cash payments is generally made by the program manager in consultation with the host government. As a general rule, however, **cash is the preferable payment for work** as it leaves the choice of how to spend it with the person who earns it.

Per Capita Distribution Limits

The project staff must set limits on the amount of each material that may be obtained from the program by a family. These limits are set according to estimates of how much material is required for the reconstruction of a simple, one-story house in the project area. Planners must take into consideration whether people are able to obtain other materials of the same type and quality from other sources or whether the program is the only supplier.

If material deliveries are slow and many people must be supplied, the program staff may decide to limit initial purchases so that the maximum number of people in the project area can purchase a small basic amount of material at first; second and even third or fourth purchases can then be made as more materials become available.

Program staff should recognize that purchases by disaster victims are limited by the amount of cash they have on hand. Initial purchases in the immediate aftermath of the disaster may not be as large as forecasted. Scheduling of second or third disbursements may be required as families acquire the needed cash for more materials. This should be taken into account in initial program planning.

Some sample limits on initial sales of specific materials are shown in Figure 4. These are averages that should be used only for comparative purposes.

Service Agencies

Since the distribution of materials usually occurs over a wide area, it is often impractical for the program staff to set up and operate the distribution system themselves. Therefore, the program normally contracts with a local group, called a service agency, to handle the distribution of materials for a specified area. In large programs, more than one service agency may be used.

Service agencies may be:

- the local government;
- local service groups;
- cooperatives, credit unions, trade unions;
- churches.

Service Agreement

When a service agency is selected, the agency and the program enter into a formal agreement setting out the obligations of both parties and establishing the required controls over the distribution.

Service agencies may receive a fee, often approximately 2% of the total value of the materials sold by the program.

Audits and Control

Systems of audit and control are required to monitor the fiscal accountability of the service agencies. Normally a bank, saving-and-loan association or credit union will be hired to monitor the service agencies' handling of cash and materials. A fee, negotiated between the auditing agency and the program, is usually paid.

FIGURE 4

Average Limits On Initial Sales Of Building Materials

Roof Sheets	20 (or enough to cover a small building)
Cement	10 bags
Roofing Nails	Weight equivalent of 600 nails
Wood (corner posts)	10 posts each
Wood (framing)	40 studs
Wood (roof frame)	15 truss components
Wire	4 rolls
Steel Rebar	Weight equivalent of 160 linear meters
Cyclone Fasteners	Unlimited
Wood Preservative	Unlimited

Sometimes government auditors will oversee the service agencies. In this case, a fee is not paid.

Distribution Controls

It is important to establish some means of controlling the amount of materials that each family receives under the program to make sure that no family receives more than is permitted. Some methods commonly used are:

1. Identity Cards: In many countries, each person or head of family is required to have an identity card which usually specifies the name and address of the person. The identity card can be used independently or in conjunction with census information to serve as a means of identifying the head of household for the distribution program.
2. Map and Address Systems: In urban areas, it is often possible to obtain maps that show each individual house site and address. As each family obtains their materials, the address is noted and a mark is made on the map denoting that that particular site has received its allotment of materials.
3. On-site Delivery: In areas where addresses are not fully established, on-site delivery and sales of material may be required. In this approach, packets of materials are placed on trucks and driven to the site, and the sale is made directly to the family. On-site delivery has the advantage of ensuring that the materials are delivered directly to the site, reducing the resident's transport burden. However, on-site delivery is the most expensive method for the program, unless the cost of transportation can be factored into the sales price.
4. Group Sales: Group sales are often used as a means of reducing the logistics problems. In this method, a representative of a group of families or a small geographic area determines the material needs, collects the money from the families, then brings the list of required materials and the payment to the program and purchases in bulk for their group.

For group distribution to work, the person making the purchase for each group must be known and some system of identification must be feasible. That way, if any discrepancies occur, the person who made the purchase can be traced and a degree of accountability can be retained. In practice, group purchases have proven to be a fairly effective means of distributing materials in rural areas.

CREDIT

In some cases it may be necessary to provide loans to families to enable them to purchase building materials. **As a general rule, credit programs should be avoided by the program staff** for two reasons. First, in the aftermath of a disaster, victims often are unable to forecast accurately their cash requirements for the recovery period or to determine their income during that period. Therefore, they may tend to over-borrow and have difficulty repaying the loans.

Second, low-income families often do not have prior experience with lending programs. Credit is a valuable asset for low-income families and is something that should be approached very carefully. In the post-disaster period, when prices are inflated, incomes are uncertain and record-keeping may be marginal, credit programs can have experience difficulty in operating. People who have never been exposed to a credit program need extensive education about their responsibilities, which is difficult to provide in a post-disaster environment. By allowing these people to assume unrealistic debts, additional hardships are created.

Credit programs for housing reconstruction appear to operate better in urban than in rural areas.

Credit Service Agencies

If credit is to be provided, a credit agency must be designated. Because the term of a loan is normally several years or more, the program itself cannot usually provide the loans. Therefore, a lending institution already operating in the area should be approached to provide the loans. Banks, credit unions, savings-and-loan associations and cooperatives with loan programs are all ideal vehicles for a loan program.

Credit Mechanisms for the Reconstruction Program

There are several ways that the program can help people obtain loans. They are:

Providing the cash for the loans. It is possible for the program to give cash to a lending institution to make the loans. The institution is permitted to charge a small amount of interest (normally 3-5%) for servicing the loans (a higher interest is not permitted because the agency does not have to borrow the money to loan). Interest rates are simple, rather than compound. To keep the program simple, the money might only be loaned in certain fixed amounts; the program and lending institution may agree to set an upper limit on the total amount that any one family can borrow.

Loan Guarantees. In a loan guarantee, the program places a certain amount of money on deposit with a lending institution to guarantee loans to low-income families. The program and the lending institution jointly set an upward limit on the maximum

amount any one family can borrow and a limit on the number of families that may borrow against the guaranteed amount. The program may agree to forego interest on the amount of money deposited if the lending institution will lower the interest on the loans being guaranteed.

REPROGRAMMING PROCEEDS FROM MATERIALS SALES

An interest-bearing savings account should be set up in each project area. Each day when the sales transactions are completed, all funds are deposited in the savings account.

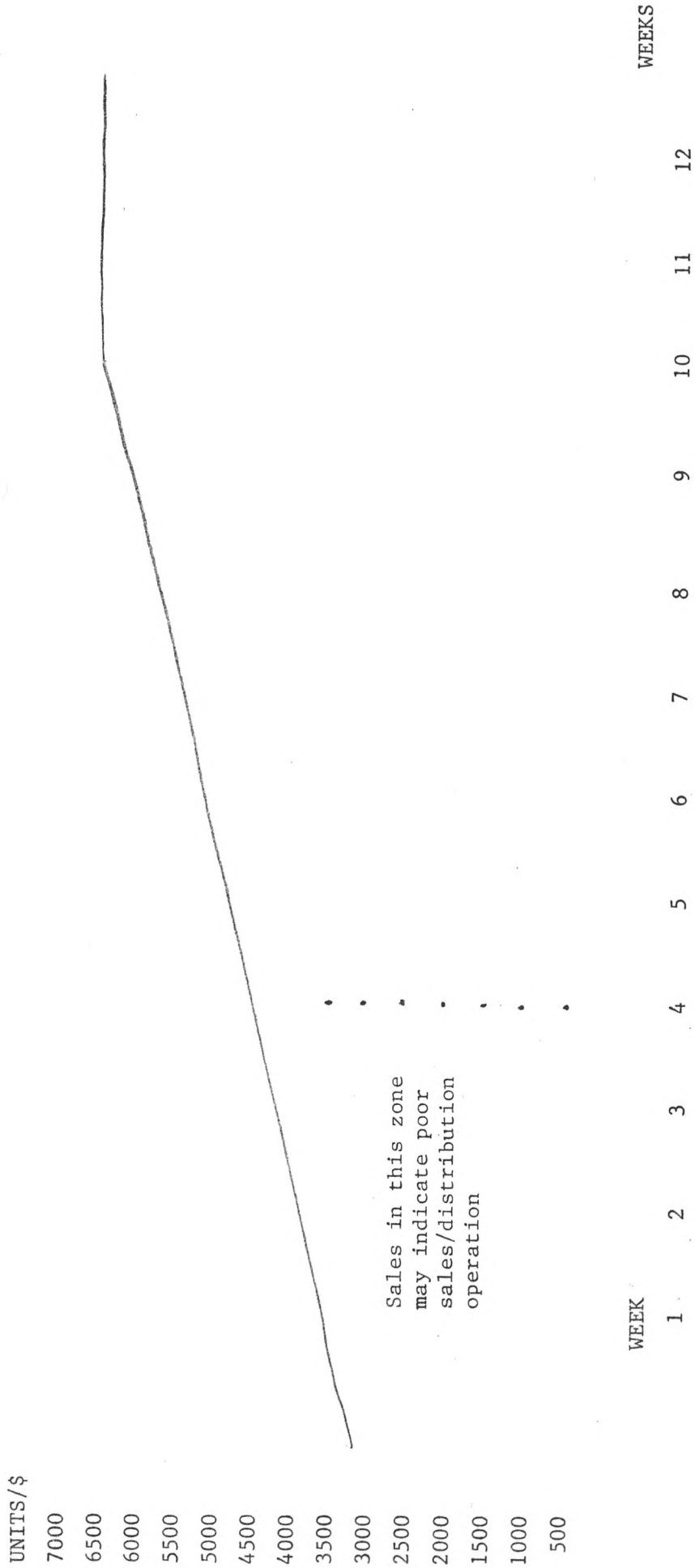
The materials supervisor should determine quantities of sales that were made in each area and plot them on a datametric graph (see example, Figure 5). At the end of every two-week period, the materials supervisor determines whether the sales trend is above or below the datum line shown on the graph. If the sales are above the line, the proceeds should be used to reorder more materials. If the sales are below the line, the proceeds should be held in an escrow account for use in works projects or micro-enterprise development.

FIGURE 5

SALES MONITORING GRAPH (ROOF SHEETS)

(PER 5,000 VICTIMS/BENEFICIARIES

CACULATED AT AVERAGE DISTRIBUTION OF 15 SHEETS PER FAMILY)



V. PUBLIC AWARENESS

The public awareness component emphasizes the systematic distribution of information about the reconstruction program. Its purpose is to inform people about project activities and how qualified families can participate. The information provided should include general advice about housing repair and reconstruction, details about the materials distribution program, and where to go to obtain further information or to register for the program.

Timing

Public awareness activities should commence prior to the distribution of building materials.

Audience

Low-income families residing in the project area and builders, carpenters, masons and other construction tradesmen, are the primary audience.

Media

Different media should be used in a complementary fashion to stimulate public awareness. Radio, films and newspapers are very good at conveying general information about the program and about reconstruction/repair policies. Posters and leaflets are used to reinforce this information and to focus on specific details about the location of project activities, how and where local residents can participate, etc.

Public Awareness Activities

Figure 6 shows some suggested public awareness activities that can be carried out by the program staff. Examples of posters and leaflets are attached as Appendices.

FIGURE 6

Suggested Public Awareness Activities

Newspapers

- Place series of news stories in newspaper
- Print drawings of repair or reconstruction techniques in newspapers
- Encourage locally-important persons to visit area and be photographed and interviewed

Radio

- Place a series of public service announcements on radio

Posters

- Distribute color posters throughout project area

Booklets

- Distribute booklets
- Convert booklets to school books/coloring books for use in schools, adult education classes

Cinema

- Make announcements prior to feature film

Other

- Incorporate the message in something printed that will be used daily (such as a calendar)
- Encourage extensionists from other on-going programs to include the topic/information in their work
- Develop other innovative methods/opportunities with local staff. Objective: put the information out where people will be reminded of it daily.

VI. COMMUNITY ORGANIZATION

The purposes of community organization are (1) to encourage participation in the project and (2) to bring together small groups of families to help each other rebuild or repair as a means of speeding reconstruction and lowering costs.

Models for Community Organization

Two models for organizing family groups are described below as examples. Community organization can be accomplished in many ways depending upon local social customs. Where a cooperative tradition exists, the program can be organized around customary times and ways of working together. Where cooperation is not customary or is very limited, program staff must work within the usual social groupings to promote the concept.

Organizational Model 1

Step 1: The program staff divides the project area into sectors.

Step 2: The community organizers hold a public meeting in each sector.

Step 3: Families are asked to band together in groups of five to seven families (community organizers should suggest that their houses be in close proximity to each other).

Step 4: One construction supervisor is assigned to each group of families to advise on reconstruction and repair of the houses.

Step 5: The supervisor meets with the families, helps determine their needs for building materials, and helps them draw up a procurement list.

Step 6: A representative of the group then takes the materials list to the materials distribution point and procures the material.

Step 7: The construction supervisor helps the families rebuild or repair their houses in sequence.

In this model the salary of the construction supervisor is either paid by the families (each pay one-fifth to one-seventh of the price) or may be paid by the program from the initial program grant or the proceeds from materials sales.

The quality of reconstruction or repair should be checked by one of the program instructors at periodic intervals during the rebuilding process.

Organizational Model 2

Step 1: The program staff divides the area into **sectors** of 25-35 houses. Each sector is then subdivided into blocks of 5-7 houses.

Step 2: One supervisor is assigned to each sector.

Step 3: The community organizers hold a public meeting in each sector. At the public meeting, people are shown their a map of their blocks and are given a schedule for reconstruction in the sector. Each block is asked to send one person to the supervisor for training in repair and/or reconstruction.

Step 4: The block representatives are trained by the supervisor through the construction or repair of a model house located somewhere in the sector.

Step 5: The block representatives return to their blocks and help the families determine their material needs.

Step 6: The block representatives collect the money and purchase the materials for their blocks.

Step 7: The block representatives supervise repair and reconstruction in their blocks. The construction supervisor works with the block representatives and helps them advise people on the construction techniques.

In this model the construction supervisor is paid by the program. The block representatives receive a stipend paid by the program while they are building a model house, then receive a small fee while they are supervising reconstruction/repair activities in their blocks. The second fee may be paid either by the program or by persons participating in the reconstruction program.

VII. HOUSING EDUCATION

TRAINING INSTRUCTOR/INSPECTORS

The key persons in the construction education program are the instructor/inspectors -- master tradesmen who train building supervisors and help ensure that all construction activities are being carried out properly and swiftly.

The role of the instructor/inspector is:

- to train construction supervisors who in turn will work with local people to rebuild and repair.
- to supervise the construction supervisors;
- to maintain quality control by conducting spot inspections to ensure that all building techniques are being carried out properly.

The instructor/inspectors work very closely with community organizers to help promote and explain the program.

The qualifications for instructor/inspectors are:

1. they must be thoroughly experienced in all forms of building construction.
2. they must be thoroughly familiar with the local non-engineered forms of construction.
3. they must be thoroughly familiar with different types of building materials and methods for improving them.
4. they must be good leaders and feel comfortable in large groups.
5. they must be good teachers and/or willing to learn teaching techniques and methods.

A suggested curriculum for training instructor/inspectors is shown in Appendix 6-A.

TRAINING CONSTRUCTION SUPERVISORS

Construction supervisors are local building tradesmen such as carpenters, masons, contractors, etc., who undergo training in disaster resistant construction methods and are then certified to work with families in the project area to help them safely repair and reconstruct their houses.

The role of a construction supervisor is:

1. to help organize family work groups;
2. to advise families on the design of their replacement structures;
3. to help families determine their material requirements;
4. to supervise the groups of families as they rebuild their houses to ensure that the houses are reconstructed as safely as possible;
5. to advise families about other aspects of the program so that they can participate in such activities as the works projects.

Qualifications

The qualifications for construction supervisor are:

1. they must be experienced builders (although they need not be master builders).
2. they must be good leaders.
3. they must be willing to learn and to participate in all training activities.

Training Curriculum

A suggested curriculum for training construction supervisors is shown in Appendix 6-B.

Certification

All construction supervisors should be certified upon satisfactory completion of training. Certification is conditional upon maintaining good standards of construction, and it can be revoked anytime a construction supervisor does not meet the standards of construction set out by the program. Lists of certified construction supervisors are maintained by the program staff and periodically published in local newspapers. Certified construction supervisors should receive priority for all construction jobs in the project area.

Quality control of the construction supervisors is maintained by the instructor/inspector of the program. Instructors periodically visit the construction sites of each construction supervisor and check to see that the maximum feasible disaster resistant construction techniques are being employed correctly in the houses being built or repaired under the direction of the construction supervisor. If deficiencies are noted, the instructor may:

1. show the supervisor the proper construction method on-site;
2. suggest further training;
3. reassign the supervisor to work on types of buildings where he has demonstrated proficiency.

If the deficiencies are not corrected in subsequent work, the supervisor's certification may be revoked.

MODEL REPAIR AND RECONSTRUCTION PROJECTS

In order to train both instructors and construction supervisors, a series of model reconstruction and repair projects is required. The homes constructed as models should employ all of the safe housing recommendations that are promoted by the program. In a sense, the model houses are life-size visual aids. Construction and repair demonstrations serve:

1. to demonstrate to both building craftsmen and the public the proper techniques for safely repairing or rebuilding houses with different types of building materials;
2. to give less-experienced tradesmen who are training to become supervisors the proper "hands on" experience needed in order to begin construction in their assigned areas;
3. to provide housing on a selective basis to persons unable to rebuild or repair their houses using their own resources.
4. to help promote the education program by focusing community attention on simple ways to strengthen their homes, and by creating a demand for the services that the education program plans to provide.

Siting

Whenever possible, it is desirable to locate a model dwelling in each neighborhood or village where the education program will operate. This may not always be practical because of time constraints or other factors, but the program should attempt to accomplish this goal to the greatest extent possible.

The site should be chosen to demonstrate improved construction and repair techniques to the greatest possible number of families. The following sites should be considered:

1. heavily travelled urban streets, especially those leading to local markets;
2. major arteries that connect rural towns with more populated areas; and
3. intersections where several walking paths come together.

What to Build

From experience in a variety of situations, it appears that the model houses should be houses rather than other structures, as people do not "trust" the techniques if they are not used in a building with which they can identify. The learning objectives of the model will be achieved in most cases, no matter what type of house is built, and the public awareness objectives will be accomplished as people see the house go up and see the details as it is erected. Furthermore, other types of structures may lack some details of a house (for example, small rooms, kitchens, etc.). The students building a model house need to have some exposure to working out these problems.

There is often a debate over who should have title to a model house. Some agencies argue that houses should be used for families (especially the needy, elderly, and handicapped). Others suggest they should be for communities, providing offices for local elected officials, residences for teachers in locations adjacent to schools (in many countries, teachers play a major role in organizing the villagers for community betterment projects), or village meeting halls, centers for health, nutrition, agriculture, etc; or any combination of the above which suits the community's needs.

Written Agreements

A written agreement should be drawn up between the homeowner(s) and the program specifying the terms under which the house will be built and financed. Agreements are required for families or communities.

Family Agreements. The agreement should specify the owner's financial obligations well as the program's. Before the agreement is signed, the construction manager should ensure that the homeowner has tenure to the land. In most cases, the family provides the materials and the program pays the labor costs, but this may be negotiable.

Community Agreements. The town or village should provide the land and all materials to be used in the construction which are locally available. The educational program should provide only those materials which must be bought outside of the area and paid for in cash.

When an agreement is reached with a community that a model house will be built, a written agreement should be drawn up between the education program and representatives of the community who have some legal basis for their position. The agreement should spell out the agreed-upon conditions: what the community will provide (including the land, with future land rights guaranteed), what the program will provide (roofing sheets, cement, roofing nails, etc.), and the purpose for which the building will be used including any restrictions (for example, religious or political considerations).

Designation

All model houses should be clearly designated with a sign that indicates that they are model disaster-resistant constructions. If the educational program has a logo, that should be included on the sign as well. The sign attracts attention to the model building, and it tells interested individuals where more information can be obtained about the techniques utilized in its construction or repair.

DESIGN AND PRODUCTION OF TRAINING AIDS

In the construction education program, a variety of training aids are required in order to help convey information and to make certain construction details and processes clearer to the students.

The purposes of the training aids are:

1. to convey technical information in an understandable way;
2. to show the proper procedure for erecting or repairing a structure to improve its disaster resistance;
3. to illustrate correct method for constructing certain details of the buildings;
4. to give the students a reference or a reminder of the proper construction methods to use after they have completed the formal training.

Types of Training Aids

There are two categories of training aids. They are:

1. training aids for instructors and construction supervisors; and
2. training aids for self-help builders and the public in general.

Training aids for instructors and construction supervisors must convey information about the various types of buildings that could be built in the project area, the proper sequence for construction, and specific construction techniques. They should provide sufficient information to enable the instructors and the construction supervisors to answer questions from homebuilders. The information is usually presented in the form of simple manuals that use both illustrations and text to convey the information.

Training aids for self-help builders and the general public convey all the information primarily through pictures rather than through text. The most popular and effective aids are illustrated booklets that present the information in story form. Comic books and pamphlets are the two most common formats. Film strips that tell a story can also be used as classroom aids with a moderate degree of success.

Determining Reader Comprehension

In many areas, the average self-help builder participating in the reconstruction program will be functionally illiterate or lacking in formal education experience. It should be assumed that the majority of users of the training aids will not be able to interpret highly sophisticated drawings. Obviously, in different societies and in different settings, a range of comprehension levels and abilities can be found. However, in preparing the training aids, the lowest common denominator should be used.

It is important to determine the level of comprehension and the degree of simplicity or sophistication that will be required in the illustrations. To do this, a sample comprehension test is conducted on a random sample basis throughout the project area. (A sample comprehension test booklet is attached as Appendix 7.)

Experience indicates several methods for improving reader comprehension of training aids:

1. Use a story as a means of conveying sequential information such as the steps for building a house.
2. Use a horizontal, rather than vertical, format and present the information in a steady sequence on one line. The sequence of illustrations should move from one side to the other according to the reading direction of the language

being used. For example, materials being prepared in French or Spanish are placed on the page so that they are read from left to right; materials being presented in Arabic are presented to read from right to left.

3. Show all action in the drawings moving in the same direction as the sequence of the drawings. For example, to illustrate hurricane winds on a left-to-right format, depictions of wind should be seen as blowing from the left to the right.
4. Drawings in sequence should start with a "key" drawing. The key drawing presents some information that is obvious and easy to understand and provides a key or introduction to the rest of the sequence. For example, illustration of the proper means of installing a wooden brace should begin with a key drawing showing someone cutting the wood.
5. Training aids that tell a story should use two characters to convey the message. The first is the expert who does all the teaching and demonstrates the proper techniques. The second is the student or helper who is depicted learning the proper techniques. If possible, the expert in the drawings should have some identifying characteristic or manner of dress that is similar to the characteristics of the construction supervisors in the project. For example, all construction supervisors could be issued a standard hard-hat in a particular color. The drawings would then depict the expert as a person wearing a hard-hat of that color.
6. Illustrators must take care to ensure that the persons depicted in the drawings have similar characteristics and features to people in the project area. Care should also be taken to ensure that no unintended cultural slurs are conveyed in the illustrations.
7. Drawings should not be larger than approximately 3 x 5 inches. Drawings larger than this are hard to read and do not focus the reader's attention on the crucial details.
8. Drawings should be simple line drawings using two dimensions as much as possible.

Reproduction of Training Aids

Design of training aids for self-help builders and the public must take into consideration the need for quick mass reproduction at a cost affordable to the program. The materials must also be durable, printed on stock that will not deteriorate or fade in field conditions.

All booklets should be issued with a protective cover. The cover may be produced on colored cover stock, or plastic covers may be used.

Sample Training Aid List

A sample list of the types of training aids that can be used in a construction education project for cyclones/hurricanes is attached as Appendix 6-C.

Additional Information

Further information on development of public awareness materials is attached as Appendix 6-D.

VIII. WORKS PROJECTS

A portion of the proceeds from the sales of subsidized building materials can be used to initiate labor intensive works projects in the areas served by the program. The objectives of the work projects are:

1. to put the money taken out of the community by the sales program back into the community;
2. to stimulate the local economy;
3. to give low-income people a chance to earn the money to purchase building materials and/or earn additional income to help meet their post-disaster needs;
4. to help repair and/or upgrade facilities that can benefit the entire community.

Criteria For Projects

Works projects funded by the reconstruction program must:

1. be labor-intensive;
2. be in the affected community;
3. be feasible with unskilled labor;
4. benefit the entire community or neighborhood where they are conducted.

Priority should be given to projects that repair facilities damaged in the disaster or provide services or installations that will help improve the health or living environment of persons in the project area.

Permissible Projects

Any labor-intensive project may be considered providing that it meets a labor-material ratio of 70% labor to 30% materials.

Suggested projects include:

1. road repair/upgrading;
2. water and sewer installations;
3. construction of drainage improvements;
4. construction of flood control measures;
5. construction/repair of community buildings.

Service Agency

Works projects are normally carried out by a service agency rather than by program staff. Possible service agencies include:

1. the municipal or provincial government;
2. cooperatives;
3. service organizations in the affected area.

Permissible Costs

If the service agency is a government agency, no cost for services may be paid. If the service agency is a non-government organization, a salary for the project supervisor may be paid as well as the cost of plans, drawings or training aids for the project workers.

Service Agreement

A formal service agreement should be drawn up between the program and the service agency describing the project, its parameters, timing, etc.

IX. DEVELOPMENT OF SMALL-SCALE MATERIALS PRODUCTION ENTERPRISES

A portion of the proceeds from the sale of subsidized building materials may be used to fund the development of small-scale building materials production. The purposes of this activity are:

1. to help produce materials needed in the reconstruction project;
2. to help introduce alternative materials that can make housing safer;
3. to help reduce the costs of building materials to the disaster victims.

Types of Projects

The projects that are eligible for funding are small-scale activities that can produce a high volume of building materials. As a general rule, the projects should have a low capital investment and high utility of labor.

Examples of projects that might be considered are:

1. sawmills;
2. wood-treating facilities;
3. block production;
4. brick production;
5. lime production;
6. stabilized adobe production;
7. production of hurricane fasteners and straps.

Eligibility Criteria

To be eligible for funding, a project must meet the following criteria:

1. it must serve the project area as its first priority;
2. the majority of jobs must be for disaster victims and persons in the project area;
3. the enterprise must be self-sustaining after the project terminates (with the possible exception of the production of hurricane straps and fasteners);

4. the enterprise must produce materials at or below the normal cost of building materials in the area.

Financing Methods

The following methods may be used to financially support development of materials production capabilities:

1. Cash Grants: The grants are limited to \$10,000 each and may only be used for the purchase of equipment and/or tools.
2. Loans: Loans are limited to \$20,000 (with the exception of sawmills). Loans made under the program should bear simple interest. Loans may be made for equipment, tools, or raw materials.
3. Loan Guarantees: The program may guarantee loans made by lending institutions to enterprises meeting the eligibility criteria established above. Loan guarantees may be made for equipment, tools, facilities, raw materials purchase, and initial start-up costs.
4. Advance Purchase: At the discretion of the materials manager, an advance purchase in cash or credit may be given to a potential supplier to enable them to start-up the enterprise. No more than 10% of the total projected purchase from that supplier or a maximum of \$5,000, whichever is higher, should be paid in cash.
5. Advance Orders: At the discretion of the materials manager, an advance order for building materials from a supplier may be made guaranteeing payment on delivery of materials that meet specifications. This advance order may be given in writing to enable the supplier to obtain loans for setting up the production facilities and acquiring the raw materials necessary. There are no limits to advance orders, but project managers should use discretion and ensure that the supplier will be able to meet the materials needs on a timely and cost-effective basis.

Whenever possible, program staff should attempt to encourage other agencies to provide matching funds to help establish local materials production enterprises.

At the discretion of the program staff, any combination of the above financing methods may be used in conjunction with other agencies to increase the total financial assistance available to the potential material supplier.

Project Development Process

The following steps should be followed when setting up a materials production enterprise:

- Step 1: Identify material needs.
- Step 2: Identify materials that could be produced locally.
- Step 3: Identify potential operators of a materials production enterprise.
- Step 4: Conduct a feasibility study. The feasibility study should determine: (a) start-up costs; (b) operating costs; (c) price of materials when produced; (d) quantity of production possible; (e) number of people required to operate; (f) training/technical assistance required; etc.
- Step 5: Determine if the project meets eligibility criteria.
- Step 6: Determine the method for financing the enterprise.
- Step 7: Organize and legally establish the enterprise.
- Step 8: Draw up an agreement between the program and the enterprise (or between the program and the lending institution, in the case of loan guarantees).
- Step 9: Fund the project.

SAMPLE IDENTIFICATION CARD

FICHE D'IDENTITÉ N° 000100

NOM : _____

Prénoms : _____

Carte d'identité N° _____ délivrée à _____ le _____

Adresse _____ Fokontany de _____

Firaisampokontany de _____ Fivondronana de _____

Faritany de _____

Autorisation _____

Date _____

SAMPLE DISTRIBUTION RECORD
(In Triplicate)**BON DE COMMANDE****N° 000051**

NOM _____

PRENOMS _____

CARTE D'IDENTITÉ _____

AUTORISATION _____

DATE _____

	DIMENSIONS	QUANTITÉ	PRIX	MONTANT	LIVRE LE
TOLES					
POINTES					
BOIS					
CIMENT					
FERS PLATS					

TOTAL _____

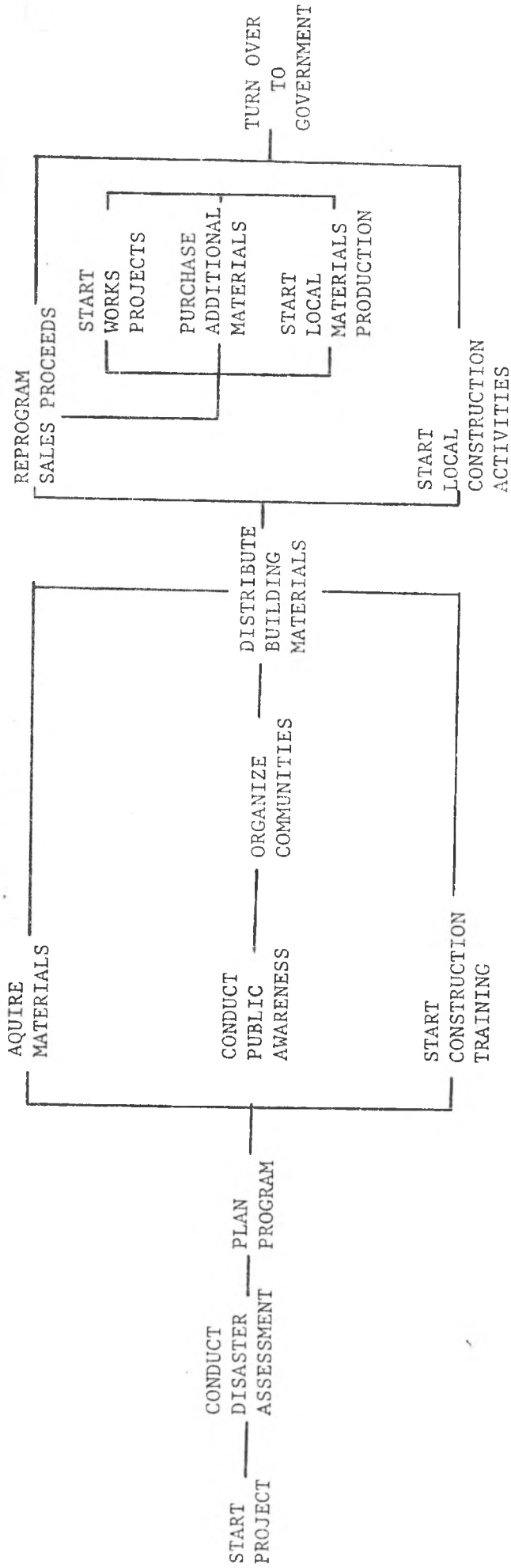
Livré par _____

APPENDIX
SAMPLE LIST OF CONSTRUCTION COURSES

<u>COURSE</u>	<u>TRAINING AID</u>
1. What is a cyclone	What is a cyclone
2. How cyclones affect houses	Guide for agencies
3. Principals of safe house construction	Guide for agencies
4. How to build a safe tin house	Pamphlet
5. How to convert a wood frame structure to slip-form concrete	Pamphlet
6. How to convert a wood frame structure to brick or rubble nog	Pamphlet
7. How to build a safe concrete block house	Pamphlet
8. How to build a safe wattle-and-daub house	Pamphlet
9. How to inspect a damaged building	Pamphlet
10. How to repair a damaged building	Pamphlet
11. The housing education process	--
12. Teaching techniques and training aids	Outlines
13. Community organization	--
14. Public awareness	Posters

APPENDIX 5

PROJECT SEQUENCE



APPENDIX 6-A

Sample Curriculum for Instructor/Inspectors

In order to orient and provide basic training to instructors, the following curriculum is recommended. This is followed by actual construction of model buildings for the practical portion of the training.

1. Orientation:

The orientation program begins with a discussion of the overall goals and objectives of the integrated shelter-to-housing program, the components of the housing vulnerability reduction project, the roles played by participating financial institutions, and the role of the instructor/inspector. The recommended training aid for this segment is the "Program Description".

Following the introduction, a film or slide series on safe construction techniques is shown, followed by a general discussion of housing improvement methods and means of economically introducing change in the normal housing process.

2. Introduction to Safe Construction:

A classroom discussion on how to build a safe house is conducted next. Detailed explanations of building techniques are given. Recommended training aids are the instructor's version of "How to Build a Safe House" and other booklets on safe housing construction for specific building types.

3. Introduction to Vernacular Buildings:

Classes are presented on different types of construction and how to build safely and/or retrofit each type of housing. Recommended training aids are the instructor's versions of the pamphlets on safe housing construction of particular building types and on the upgrading of existing buildings.

Field trips are conducted with walk-around discussions of specific types of buildings. It is recommended that each group be limited to 5-7 students per instructor. During the walk-around inspection, each student is asked to critique a house for safety.

4. The same class as above is repeated for a second type of house.

5. The same class is repeated for a third type of house, if required.

6. Introduction to Training Techniques:

This classroom instruction includes: introduction to the curriculum; techniques of instruction; information about which techniques to stress in the classroom and construction activities; introduction to the training aids and how to use them properly; introduction to preparation of classes and course outlines for topics not covered; and the techniques of monitoring the progress of students. The recommended training aid is the Instructor's Manual.

7. Review:

The final class reviews the training procedures with the students. Following this, students practice their presentation techniques and are critiqued by the program staff.

APPENDIX 6 - B

Proposed Curriculum For
Construction Supervisors And Self-Help Builders

The following curriculum is recommended for the training of construction supervisors and self-help builders. The course includes theoretical training and demonstrations followed by the actual construction, repair or upgrading of a demonstration house under the supervision of an instructor.

Part I: Theory and Demonstration

1. Orientation

The orientation begins with the showing of a film or slides on safe construction, followed by a discussion of safe building techniques and opportunities. The recommended training aids are the film/slides and posters.

At the end of the class, the booklet about how to build a safe house is distributed for review prior to the next class.

2. Introduction to Safe Construction

The booklets about how to build a safe house are reviewed with the students and followed by general discussion and a question-and-answer period. The course follows a specified curriculum to ensure that the basic principles are introduced and stressed. Recommended training aids are the flipcharts, an instructor's version of "How to Build a Safe House", and model houses.

3. Field Trip (Part I)

A field trip to examine local buildings and construction techniques is arranged as the third class. Students are shown specific problems in the local housing and asked to critique the houses themselves.

4. Field Trip (Part II)

The field trip then visits a model house demonstrating the proper construction techniques. On site, the instructor points out specific improvements and the correct placement and construction of each.

5. Detailing (Part I)

In this class, the proper methods of building specific structural components are demonstrated, including:

- a. Better wood joints;
- b. Use and placement of braces;
- c. Use and placement of fasteners.

Recommended training aids are the model houses, model braces and wood joints, and an adequate supply of fasteners, tools and supplies for students to build practice models of the components.

6. Detailing (Part II)

In this class, the proper techniques for preparing and using concrete are presented. Where cement block construction will be used, proper masonry techniques are demonstrated. Where wooden houses will be built, proper techniques for building concrete footings are demonstrated.

Recommended training aids are the booklets on safe construction and the pamphlet, "Techniques of Concrete Construction".

7. Detailing (Part III)

Classes about specific building details and techniques are held. Subjects include the use of plumbs and guidestrings for alignment of houses, wood preservation, carpentry techniques, etc.

PART II: ACTUAL CONSTRUCTION PRACTICE

Students must participate in the actual construction or modification of a house using the new building methods.

APPENDIX 6 - C

Recommended Training Aids and Promotional Materials: Cyclones

MATERIALS REQUIRED FOR TRAINING INSTRUCTORS/INSPECTOR

Program Description: A brief pamphlet outlining the goals and objectives of the program, and describing the role of the agency and the Inspector/Instructors in accomplishing these tasks.

Instructor's Manual: A manual including sections on construction techniques, building details, instructional techniques and guidelines for training including how to prepare a class, how to effectively demonstrate building details, and how to prepare course outlines for topics not discussed. Suggested course outlines and checklists for each class in a training program should be included.

Instructor's versions of all student training aids.

MATERIALS FOR PUBLIC AWARENESS AND PROMOTIONAL ACTIVITIES

Film or Slides on Disaster Resistant Construction: A 20-minute film or slide presentation explaining how the forces of cyclones or earthquakes damage houses. This presentation can be used for both public information activities and portions of the instructional program. The presentation should explain how buildings collapse and illustrate how different building features and designs affect performance.

Audio-cassettes for Radio Programs: A series of audio-cassettes for distribution to radio stations, describing methods for improving buildings, providing information about the pilot program, and announcing specific activities that are about to commence.

Posters: A variety of posters used to announce program activities and to stimulate interest in the program. Posters should describe where interested parties can obtain more information.

MATERIALS FOR TRAINING INSTRUCTORS AND CONSTRUCTION SUPERVISORS

What is a Cyclone? INTERTECT publication explaining the mechanics of cyclones, how they are formed, and how they damage houses.

How to Build a Safe House: Simple illustrated booklet using drawings with minimal text to convey the information about safe housing construction for each type of house in the project area.

Techniques of Concrete Construction: Pamphlet to demonstrate correct techniques for preparing and using cement and concrete (can be prepared from existing materials available from VITA and the Peace Corps).

Flipcharts: Training aids to amplify points made in the various booklets, for use by instructors in the classes. These charts should be prepared on cloth or plastic to make them more durable.

Models of Each Housing Type: Scale models that depict the correct construction for each type of house. These would show the proper placement of braces and fasteners, and would demonstrate correct techniques for joining and splicing wood and other materials.

APPENDIX 6-D

DEVELOPING PUBLIC AWARENESS MATERIALS

Effective communication of building modification techniques to village craftsmen and homebuilders is essential to reduce housing vulnerability. Although the technology may well be known by those involved in housing development, it has been found that little or no literature exists which simply communicates with the ultimate audience -- the villager with little or no formal education.

Preparation of Training Booklets:

The following section suggests ways of communication with villagers through training booklets and other types of programs. In developing training booklets, the following techniques should be considered so as to make the materials more understandable to the villagers and village carpenters. It cannot be assumed that what an educated person sees in an illustration is also understood by someone who lacks formal education. For example, a house shown in perspective may be interpreted as a building with walls that become smaller near the corners. Or, a detail out of context may be seen as a totally unrelated object. Abstract symbols, such as arrows or directional lines might be viewed as objects of religious significance or telephone wires. The artistic rendering of detail can also be misinterpreted. What is illustrated as a thatched roof may be seen as wood or C.I. sheeting. Hence, it is essential that any pictures used in charts, booklets or films be developed in accordance with the following guidelines:

1. Size of Drawing: If too large, the drawing cannot be seen as a whole. If too small, it cannot be interpreted at all. Illustrations should be scaled to a comfortable reading size, keeping in mind the distance from which the pictures will be viewed.
2. Perspective: Two-dimensional drawings are often more easily understood than 3-dimensional. Drawings should show perspective according to what a person normally sees. For example, the drawing of a village as seen from a nearby hill may be correctly interpreted, whereas an aerial perspective of structures might be misleading and should be used only when necessary.
3. Shading and Coloring: Certain colors have traditional significance that will distract from the message of the visual. Colors should be selected within the appropriate cultural context, or better yet, extension agents/instructors from the local population might be encouraged to "color" teaching aids themselves. Whenever used, color should not distract from the main message of the drawing.

Shading can help identify an object or person as a solid form, thus clarifying lines that might otherwise be confusing. Skin tone is important in helping local viewers identify persons depicted in drawings as belonging to their own racial/ethnic group. Care must be taken that shaded or colored areas are not interpreted as whole objects, rather than merely the enhancement of an object.

4. Symbols: Arrows, dotted lines, wind lines, X's, check marks, directional indicators and other symbols are often misunderstood or are interpreted as religious symbols, telephone poles, appendages of the illustration in point, or as other unrelated objects. These are best avoided unless dealing with a more educated community.
5. Details: Details out of context are often totally misinterpreted. For example, a drawing depicting the enlargement of a foundation footing may be seen as a multi-story building, a train, or not comprehended at all. If possible, details should be shown within the context of the larger picture, or as whole objects. For example, a person with part of the head cropped off will be distracting to a villager; a disembodied hand may be difficult to identify.
6. Background: Background should be eliminated or simplified as much as possible. Drawings and photos should include only such background details which would encourage recognition of subjects depicted, or would place subjects in the appropriate cultural context.
7. Sequencing of Images: People unaccustomed to reading often have difficulties making the mental connection from one image to another. For example, if attempting to show what happens to a house during an earthquake or hurricane, it is best to show the destruction of the house in stages. A picture of the house immediately followed by a picture of the collapsed structure may be interpreted as two totally unrelated structures and the message is lost.
8. Style: Clarity of drawing style is important. Too many details tend to confuse, while too few details create ambiguities. It has been found that simple line drawings that carry only the essential information are most effective. For example, if showing the plastering of a wall, emphasis should be placed on the activity of plastering and on the plaster, rather than on the wall details or other components.
9. Story Line: Creation of a story line is extremely effective, especially when developing training booklets. A simple chronology of events can show the steps to be

followed for modifying a house or for constructing a totally new house. People respond very well to information conveyed through stories and generally retain the information longer when presented in this format. This implies the use of a character or characters throughout the booklet who, through their actions, show how to modify or build a house.

10. Text: If desired, a simple text in the local dialect can be added to enhance the story for those who do read, yet all necessary information should be conveyed by the drawings alone. The text should focus on essentials only. It should reinforce the key message conveyed in drawings or photos. Bold, upper-case lettering is more easily comprehended than small typed texts.
11. Cultural Conformity: Drawings are generally viewed fairly literally. Hence, if a housing style or detail does not conform to conventions of a particular region, villagers may respond with "we don't have that kind of house here", or "we don't do that here", and the message will be lost. Training aids should always be prepared with attention to regional building practices and cultural differences.

Understandably, in countries where language and literacy levels vary from region to region, the most effective means of communication is through on-site demonstrations, dialogue and visual aids. Radio, television and film can augment a program if the means and economics exist. It is imperative that these be prepared with sensitivity to local customs, level of skill, and language.

Teachers' Instructional Booklet:

This should be created as a supplement to the cartoon booklet providing technical background for teachers or extension workers. A more cost-effective means would be to print explanation or technical information for teachers at the bottom of the drawings or on the facing pages.

Films:

Films are an extremely popular form of entertainment. It is recommended that a film or videotape be prepared which describes a hurricane or flood and its impact on housing. Through animation or dramatization, a short 10-15 minute film can serve as a popular means of introduction to a village. The film would be used for both public information activities and in instructional programs for extension workers. The film showing should be scheduled at a time when daily chores are completed and just before or during the building season. Discussions should be encouraged afterwards with special attention paid to reactions and attitudes concerning the film's message. An

inexpensive flyer illustrating, for example, what a hurricane is and how it can damage a house should be distributed to those watching the film. This will reinforce the film's message by helping to maintain a level of awareness. If a demonstration project is scheduled, the time and place might also be noted on this sheet as a reminder.

Demonstration Projects:

Demonstrations of ways to retrofit or build a house for vulnerability reduction should be planned for as many villages as possible. A demonstration on a house undergoing construction would provide the builders and villagers an opportunity to actively participate. Evening classes might be scheduled after the day's work to make as many villagers as possible aware of the modifications. By stimulating awareness, villagers would then be more demanding of tradesmen to include modifications when given the opportunity to build for themselves.

During this class, active audience participation should be encouraged. Training booklets could be distributed and explained to those involved in housing construction and/or to heads of households. Various incentives might be created within the village to encourage building practices outlined in the booklet.

Audio Cassettes for Radio Programs:

Radio can be used very effectively to educate the public of potential disaster events. Initially, short messages or dramatizations (about 1 minute in length) could be created to emphasize (a) the risk -- potential for damage to lives and property; and (b) the need to take action with information given on who to talk to for help or guidance if building a new house.

These short messages can be interjected between radio programs, music, etc., several times during the day. Repetition of the message is important, as is timing. Radio messages should be aired according to the listening habits of the target audience.

These short announcements could be augmented through longer, more in-depth programs that would reinforce the shorter messages and introduce new information.

Audio cassettes for distribution to radio stations could describe disaster risk and outline methods for improving buildings. A discussion with the village leader or extension worker could be aired afterwards in which information about pilot programs, demonstrations and specific activities could be announced.

Posters:

Posters or flyers displayed in public places in the village can stimulate interest in a program. A popular film actor or cartoon hero could be created to describe housing modifications. These should be prepared using guidelines suggested in the section on the development of teaching booklets. Posters should also indicate where interested parties can obtain more information.

Mobile Teaching Units:

These could be used to bring the film and other information to villagers. Based on the "village theater" form of entertainment, the mobile unit could serve as an entertaining and effective means of creating awareness and distributing materials in rural areas.

Exhibitions and Trade Fairs:

These are also very popular with villagers and present an opportunity to reach a wide audience, as these events are well attended. Films can be shown, booklets or flyers distributed and information on vulnerability reduction provided. Charts and diagrams showing how a disaster affects housing, and information on various modifications, should be prepared using the same guidelines explained in the section on training booklets.

When preparing an exhibition, it is important to remember that the majority of viewers may not be able to read and the effectiveness of the display will be to the degree in which it communicates through pictures, or better yet, realistic models.

Community Participation:

As much emphasis as possible should be placed on community involvement in the implementation program. This can be encouraged by involving villagers in the extension of the program. For example, youth leaders or carpenters selected by the villagers could be assigned the role of encouraging building modifications, or of inspecting houses where modifications have been completed. Involvement of women and children in the program should not be overlooked, as they often assist in the construction and maintenance of houses and can be very influential. Materials such as booklets, posters, etc., should be readily available to villagers. Copies can be given to village leaders, teachers, carpenters and masons, and should be available in schools, churches and libraries.

Throughout the training and implementation process, materials and programs should be evaluated for their effectiveness. Villagers should be questioned for responses to films, radio announcements and posters, and levels of acceptance should be considered. However, if these recommendations are followed, public awareness of disaster risks should be heightened, and hopefully, the necessary steps for

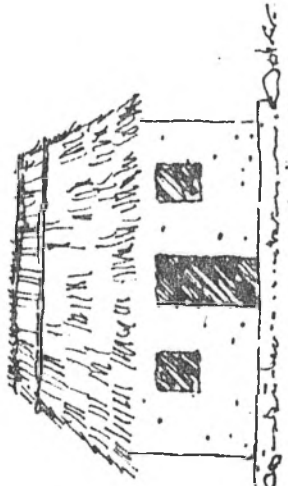
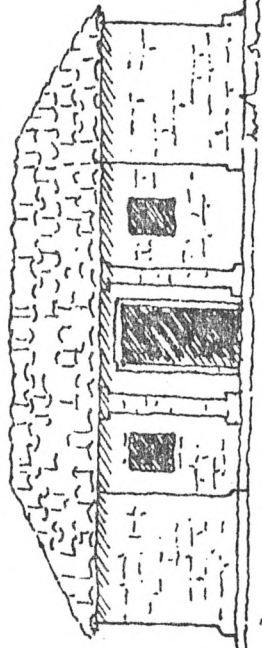
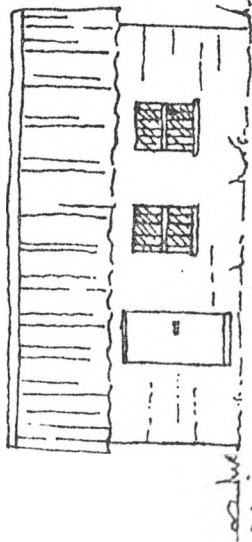
reducing the risk will result. Co-operation between technical and research organizations, state governments, voluntary agencies and local leaders will have a major impact on the program's effectiveness. Through concerted efforts, new or modified building techniques to strengthen local housing can gradually become part of the building tradition.

Comprehension Test Booklet

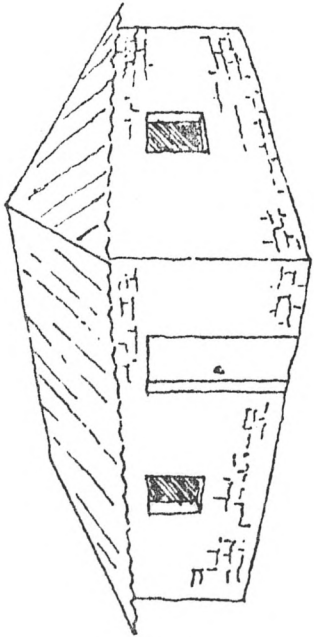
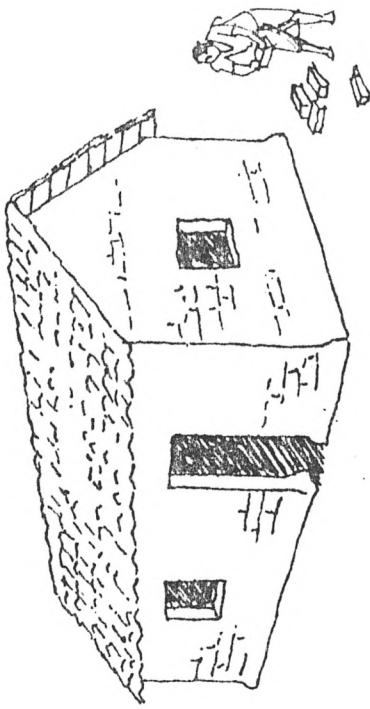
COMPREHENSION TEST BOOKLET

Note: The questions suggested on each page are to aid the instructor in determining what a villager sees in the drawings. These will simply begin a dialogue which the instructor should further encourage through questions of his own.

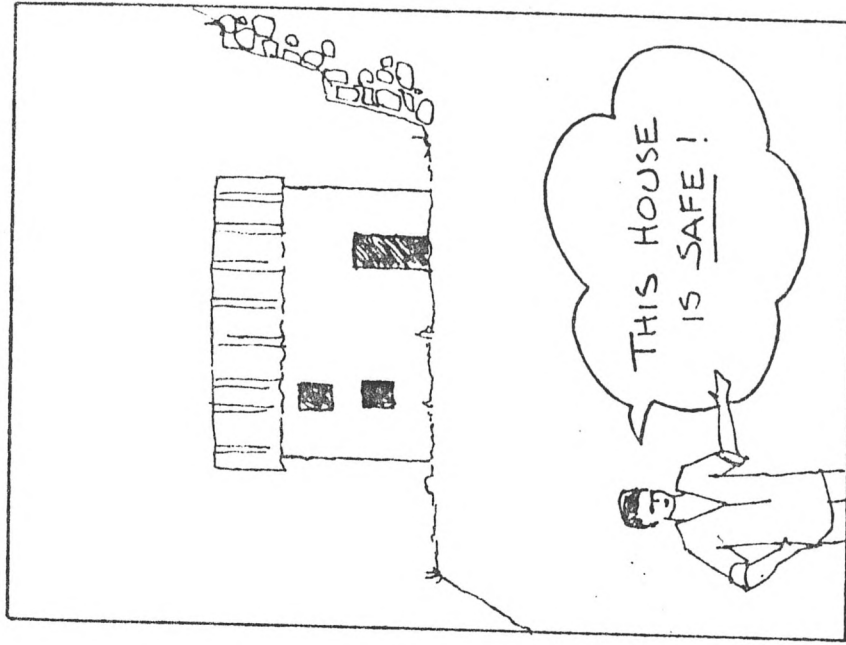
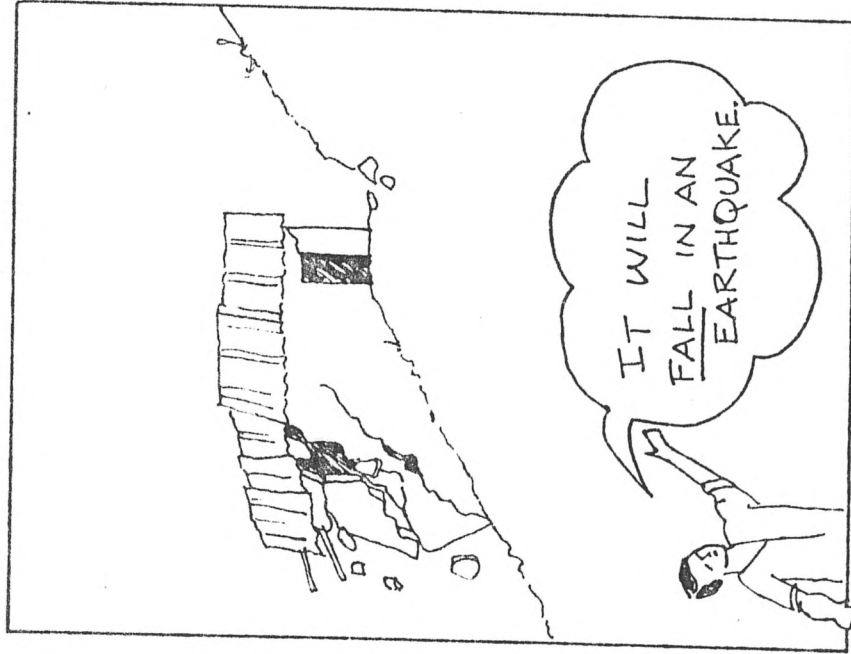
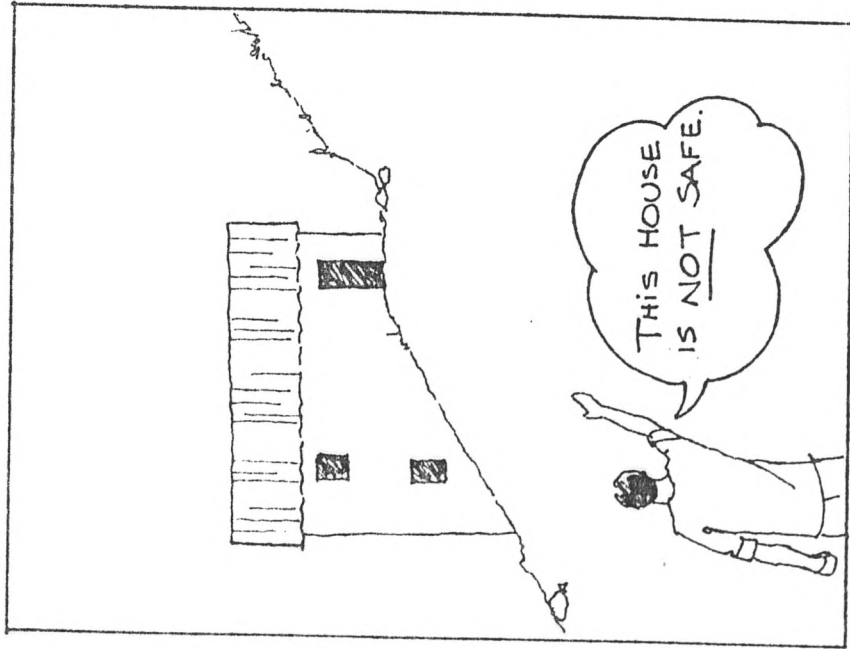
Manual prepared by Juliana Marek, INTERTECT, under contract to the University of New Mexico, with funding provided by the Office of U.S. Foreign Disaster Assistance, Agency for International Development



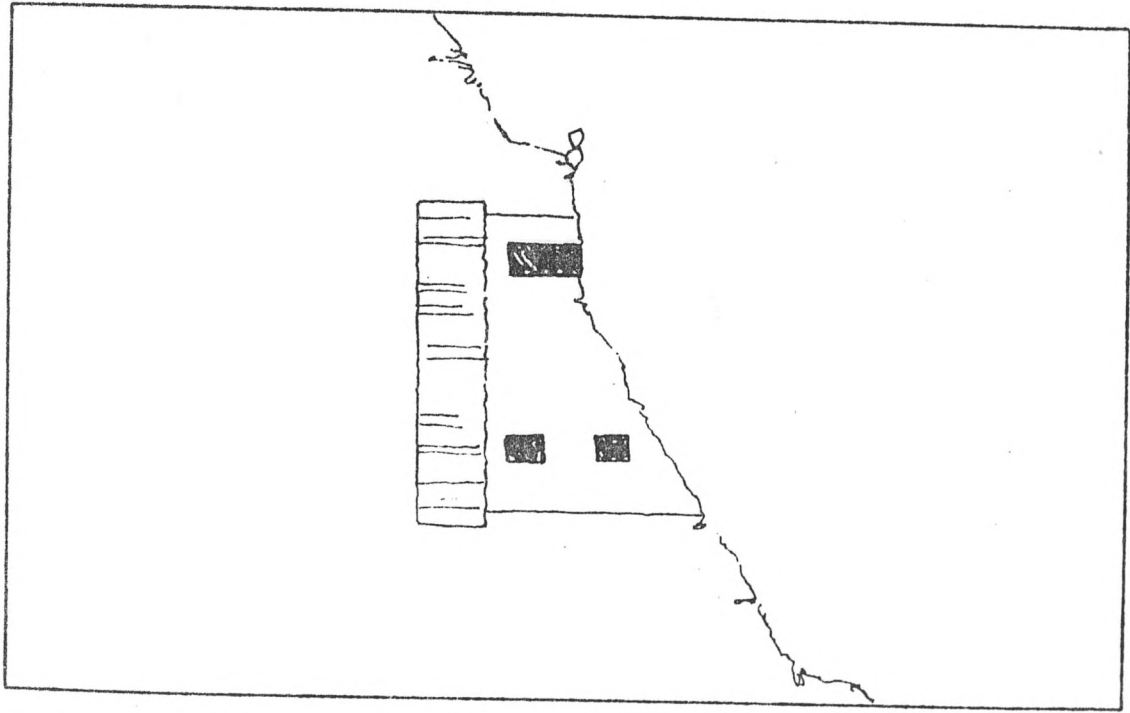
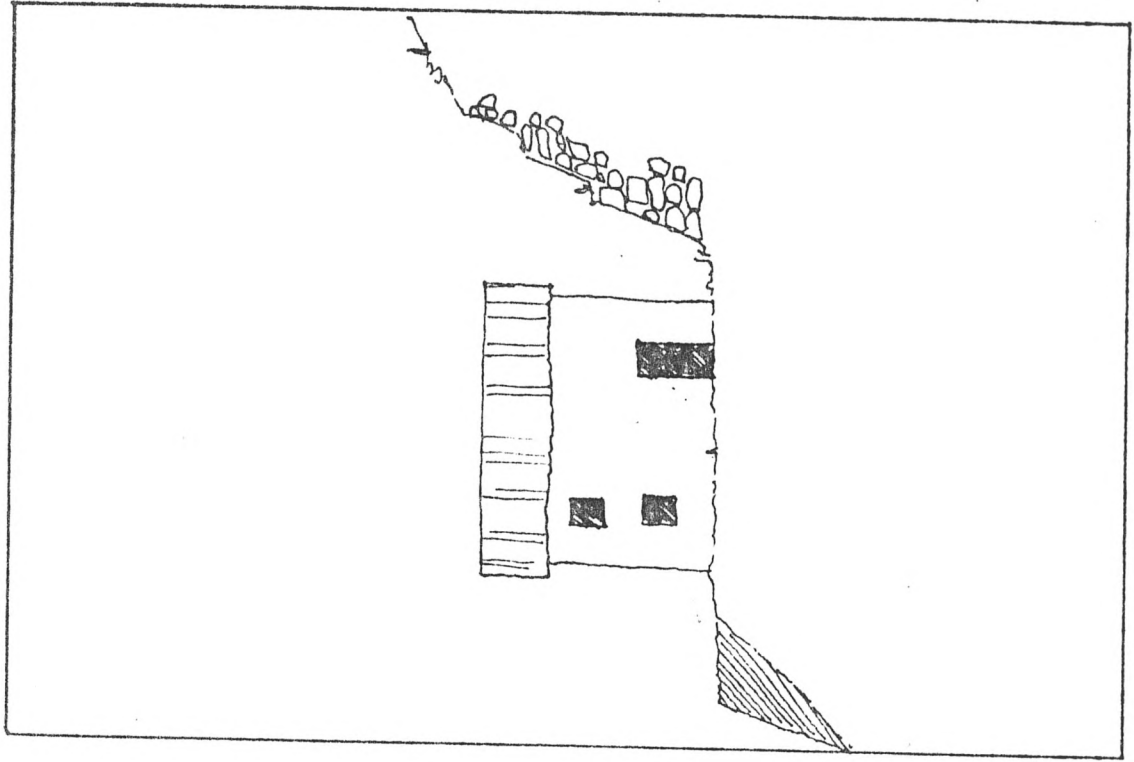
Ask villagers what they see on this page. Have them describe materials used on each roof.



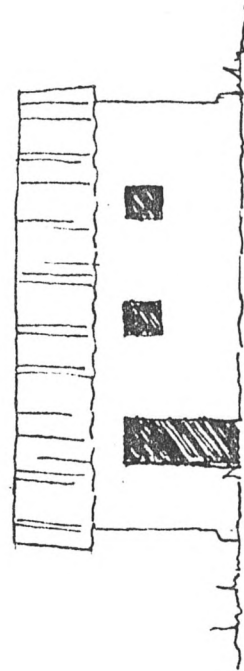
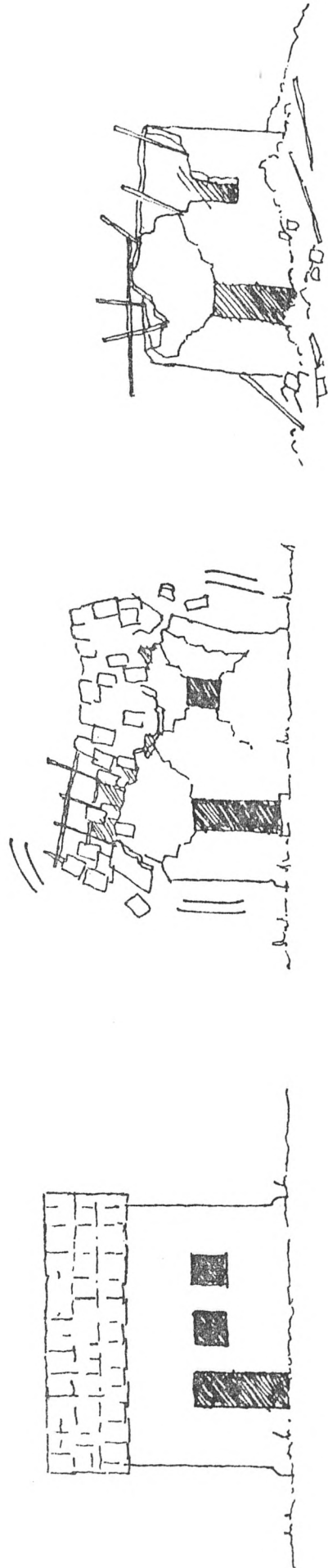
Ask how many walls can be seen on each house.



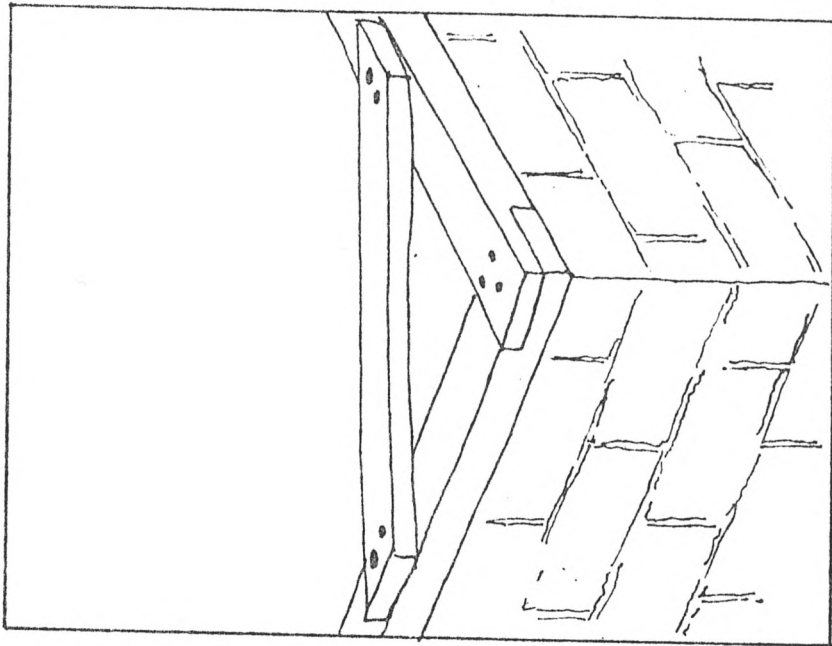
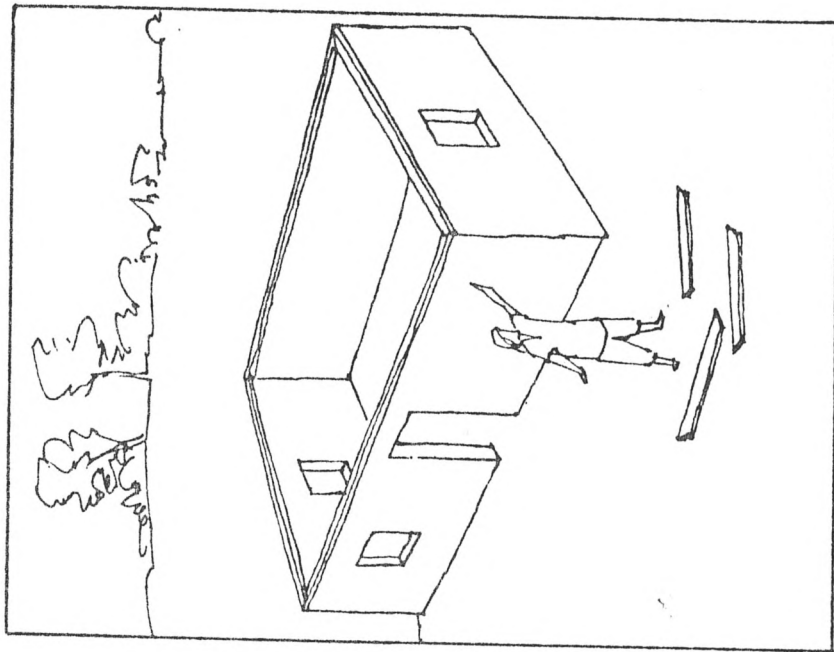
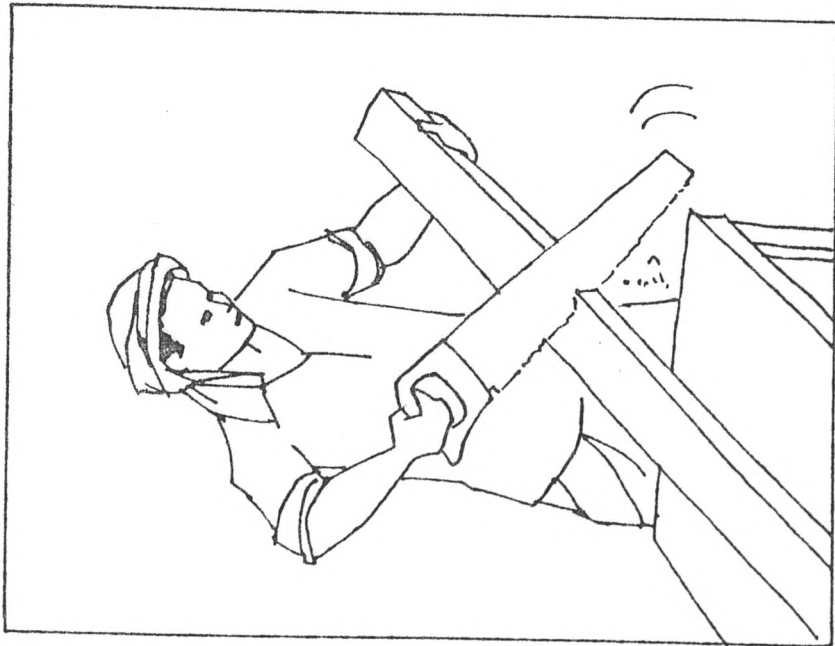
Read captions. Ask someone to tell why the house in the last box is safer. Ask which house is the safest in an earthquake.



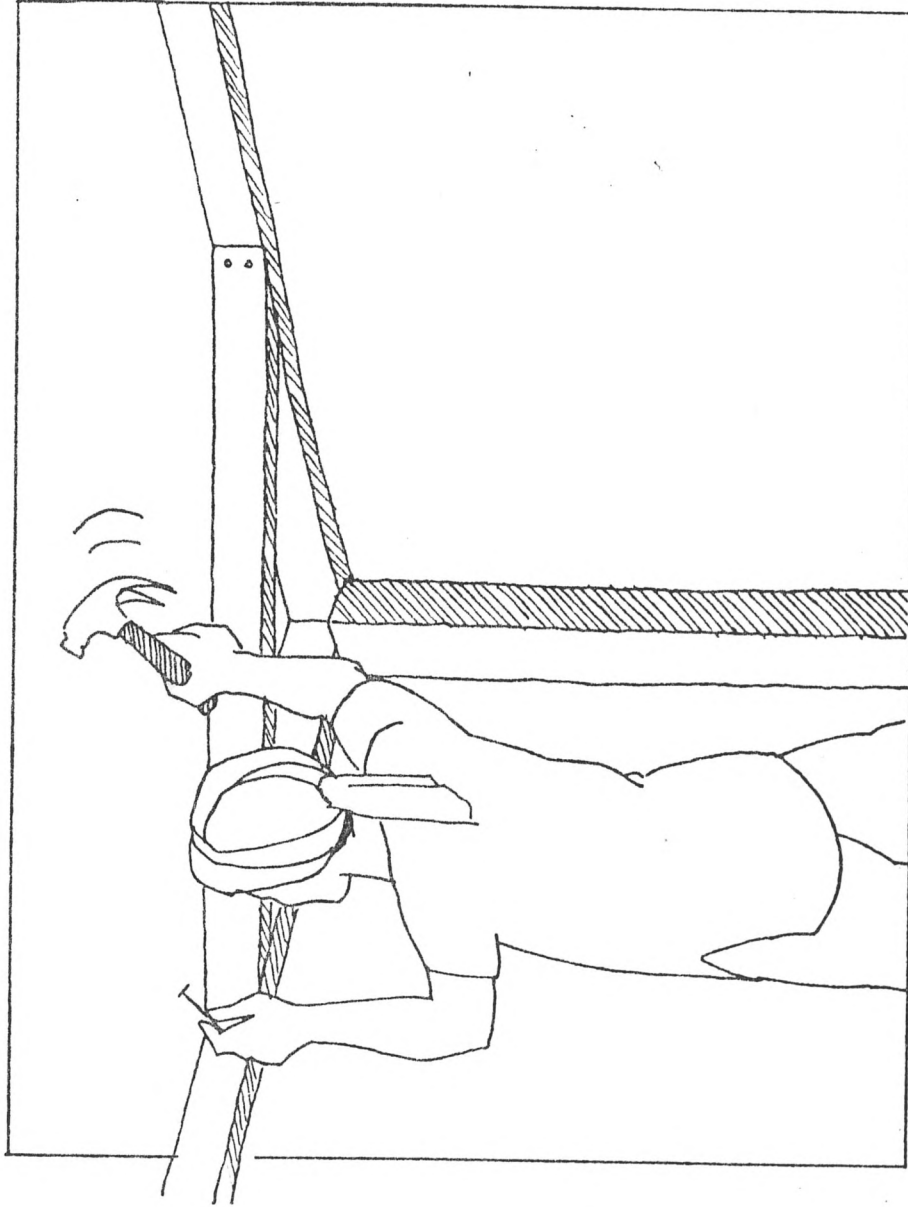
If the previous drawings were understood, villagers should see that the second house is safest and will explain why.



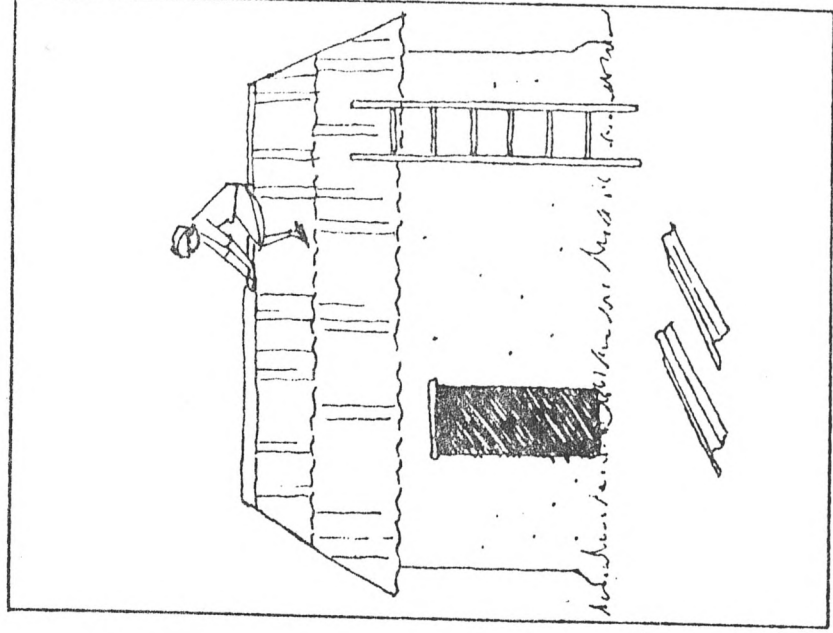
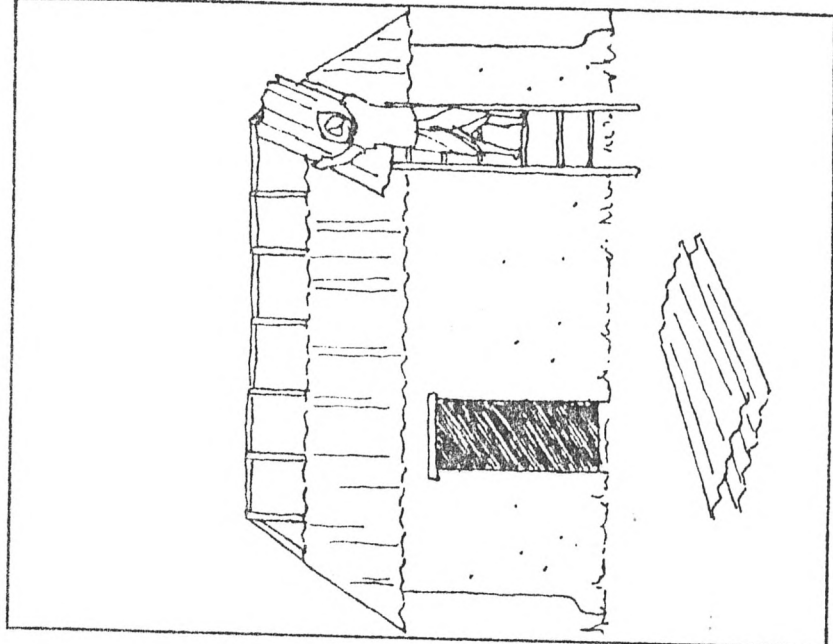
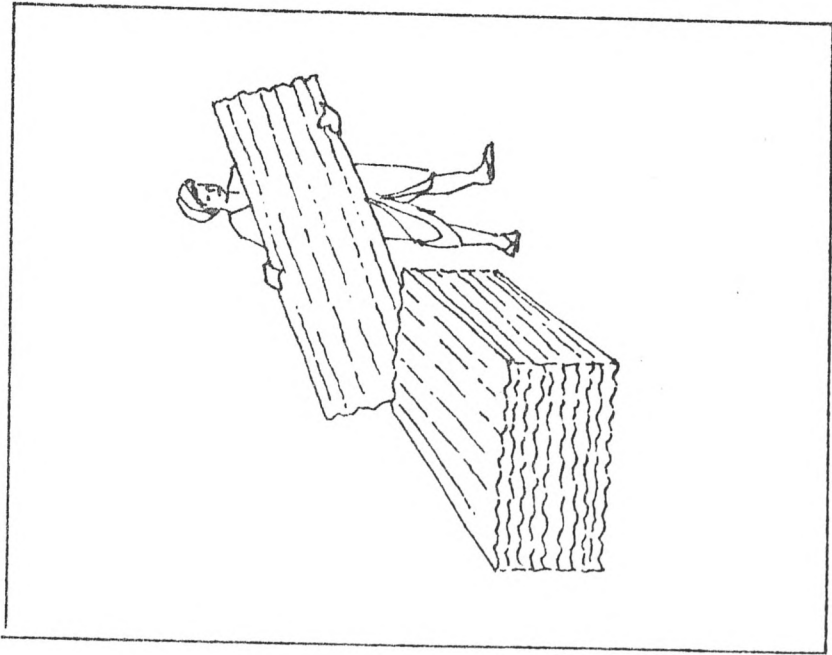
Ask someone to describe what is happening to the house on top.
Explain that the bottom house is safer during an earthquake. See if
villager can see the difference between lower house and upper house.



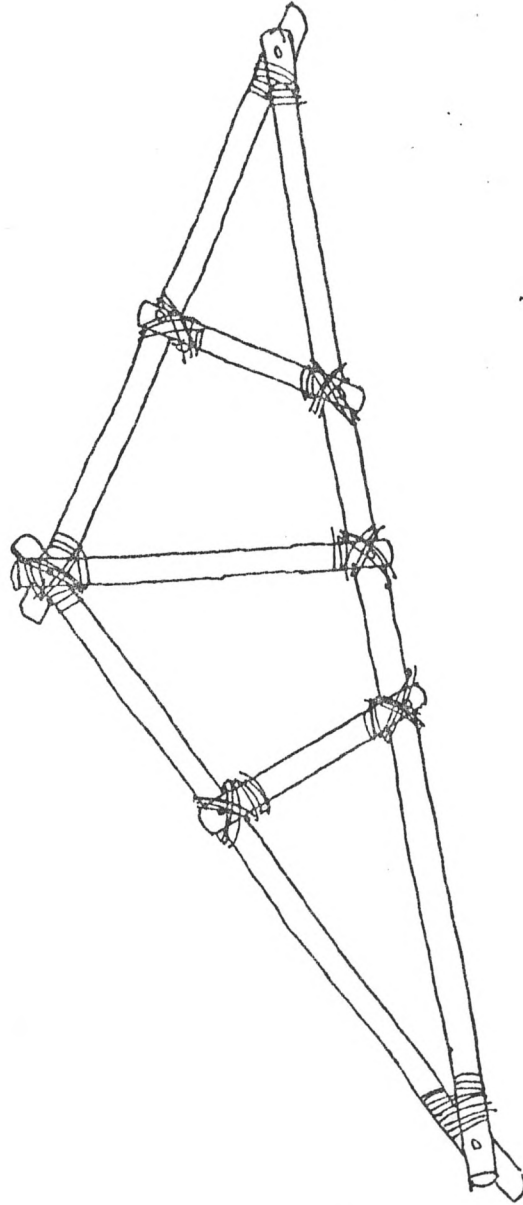
Ask someone to describe what is happening in this sequence. Ask what part of the house is being braced and what material is being used.



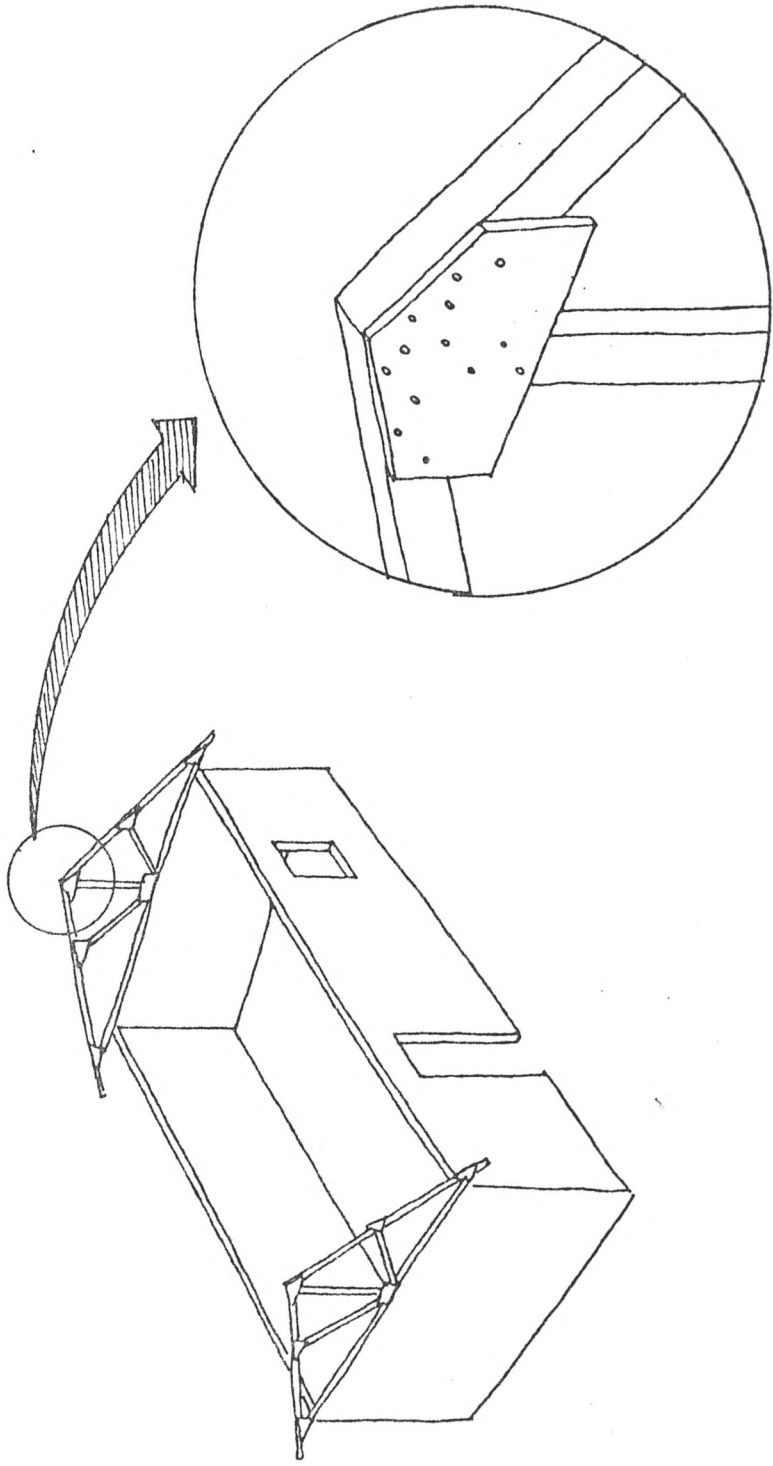
Ask villager to describe what the man is doing. Ask which part of the house is shown e.g. corner, center post, etc.



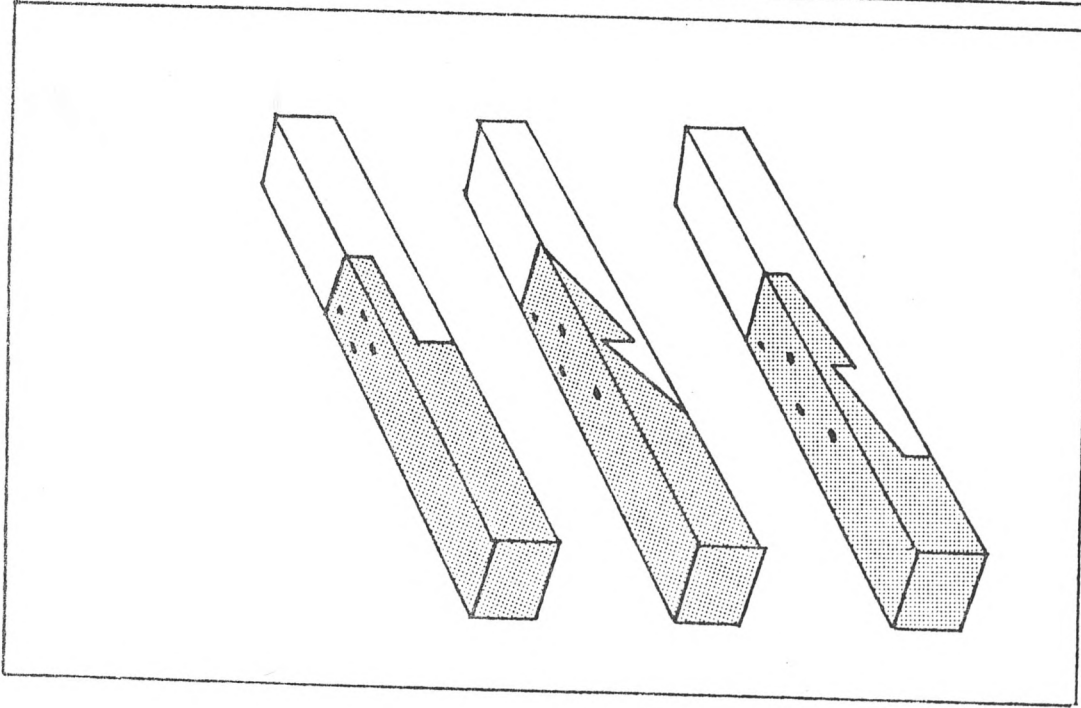
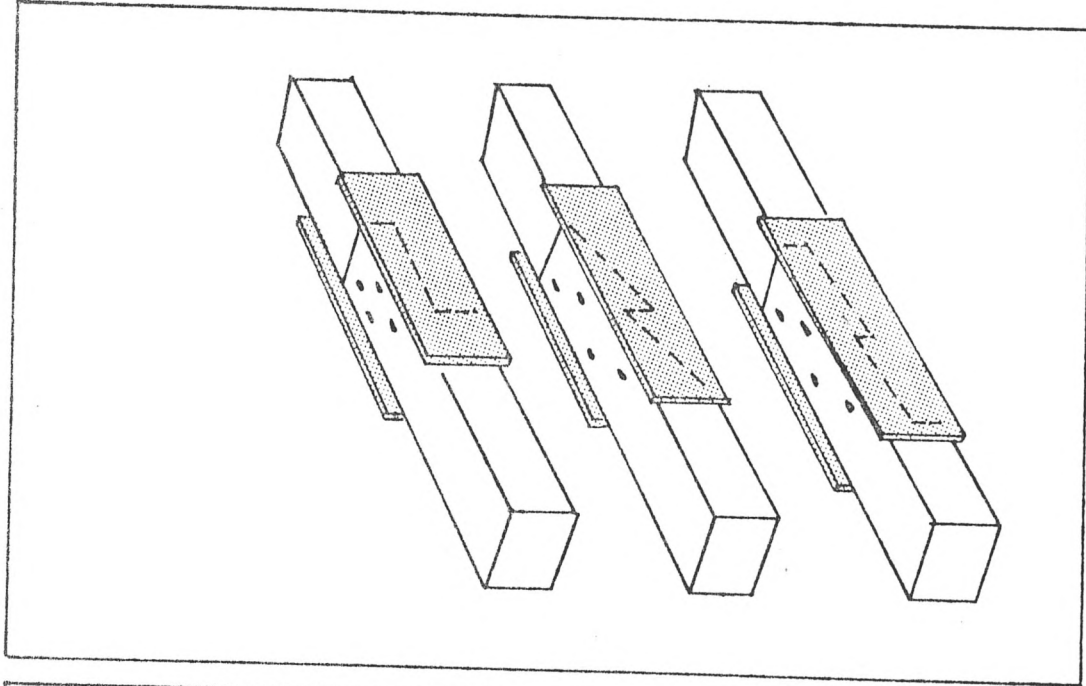
Ask someone to describe what is happening in the sequence. Ask what material is being used on the roof.



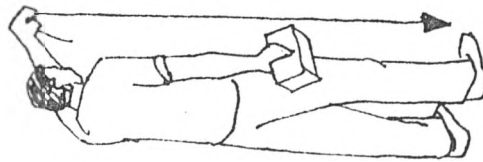
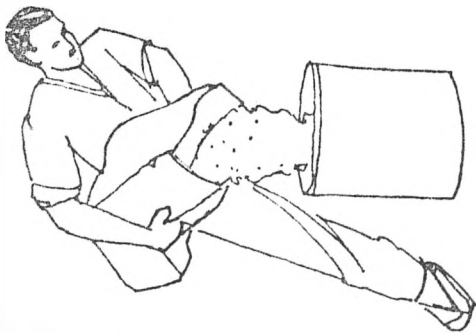
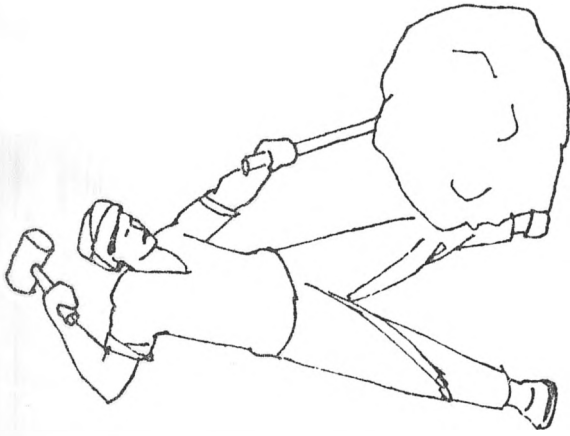
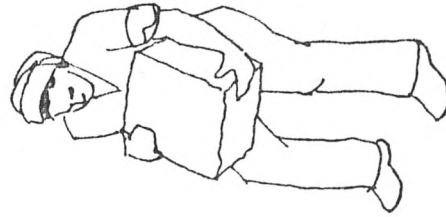
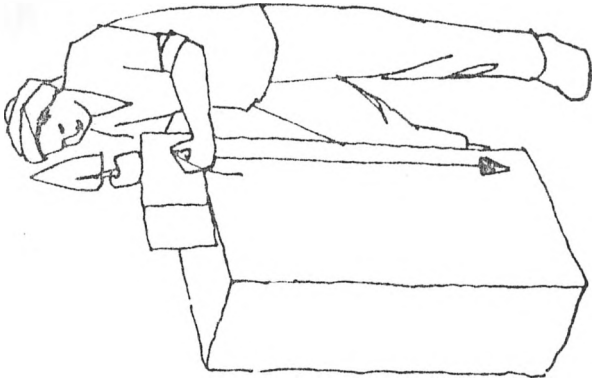
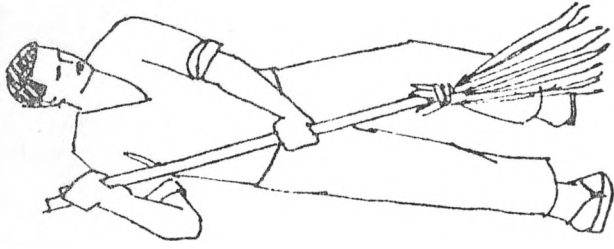
Have someone show you which part of the house this is. Ask what materials are used.



Have someone point to the part of the house shown in the circle.



Ask what these are. If recognized as wood joints, ask which is the strongest and which is the weakest.



Have someone describe the activities shown.