EVALUATION COMMENTARIES

INTRODUCTION

The problem of housing reconstruction is an integration of many complex issues. To work towards an understanding of those issues, problems and benefits we will break down the total into areas similar to those addressed by each project summary. The order of evaluation will be from direct and concrete aspects to increasingly broader issues.

Our purpose is not to draw definative conclusions or propose any one solution because it is not possible or desirable. Rather by discussing the aspects with which we have become aware we hope that some basic issues will be clarified and future decisions facilitated.

METHOD OF CONSTRUCTION

In achieving the objectives of a housing program the selection of the proper method of construction is one of the most basic elements. The criteria for identifying a specific method of construction include

- the availability of materials
- rapid enough speed of construction
- an appropriate level of technology
  - availability of required work skills
  - availability of proper tools or equipment
- capacity for supervision and administration

These criteria are for rather physical and factual elements. Of great importance but more subjective in nature are the following:

- the organization and administration of the construction process works within the cultural context
- education and participation in the process of decision making and administration on the part of the beneficiaries
- the resultant house design is culturally acceptable

The following comments are our observations on the implementation of these criteria by some of the programs.

MATERIALS

The use of corrugated zinc has almost become the universal solution for roofing. The advantages are clear, light weight, inexpensive, easy to distribute, safe, and initially, available in Central America. The disadvantages are equally clear. Poor protection from the climate, esthetically displeasing to many and a limited number of sources.

Other than cement asbestos sheets the alternatives are few, however, some groups are encouraging the use of straw where it is accessible. Unfortunately, for those who would like to convert to straw if and when it does become more readily available will not have a roof structure of sufficient slope required for straw roofs.

Wood has the advantages that it is a very easy material to work with resulting in a high speed of production, requires only basic skills and tools. Enough wood was initially available to encourage many groups to develop their house systems based on its use. By now its scarcity has slowed many projects well below production capacity; there is extensive use of very green wood which, within a few weeks time, if not overlapped enough, results in houses with wide cracks between virtually every board. The depleation of Guatemala's timber supply is resulting in a deforestation problem that will have negative environmental consequences. In some areas the wood walls may prove unsatisfactory for protection from heat and cold.

A considerable amount of plywood was imported from Canada for use in their project areas. This helped reduce the demand on the local supplies and its use increases the speed of production over other types of wood

siding. Plywood also increases the structural rigidity of the house. However, to insure earthquake resistant construction, all future additions to these houses should be continued in plywood, but the home owners may not find it available or economical.

Where the agencies' objectives were to build a more permanent and climatically suitable house some choose to use either concrete block or stabilized adobe block. In all cases the concrete block house designs appear to be well engineered for earthquake resistant construction. But the production of block requires careful quality control in order to insure a block of adequate strenght. Some block production operations we saw do not use some basic techniques for proper production. Principally, problems were with the curing process of not keeping the blocks in the shade, keeping them moist, and using them before they had cured a sufficient time.

The various types of block making apparatus range from the simplest type packed by hand, costing few Quetzales, to a very elaborate, automated machine capable of producing 4,000 blocks a day, costing tens of thousands of Quetzales, and requiring a very sophisticated system of operation. The former machine is adaptable to large or small programs, the latter machine seems quite out of scale to the problem and of a level of technology difficult to support on a continuing basis.

The use of CINVA-RAM or similar block making machines to produce stabilized earth blocks is in use in four programs. In the Ladrillos para Guatemala project they are producing 80 blocks from each sack of cement. However, it requires about 28 man days to produce enough block for one 36m^2 house.

The choice of use of traditional materials is based largely on the advantages of low cost, cultural familiarity and acceptability, and in rural areas, availability. When properly constructed a house with adobe walls has the best climatic qualities in some of the colder regions of Guatemala. But these same materials of adobe, caña, and bajareque are considered by some as the least hygienic and may need constant attention for repair. Presently it is not lack of safe techniques but image and fear that prevent the reuse of adobe.

In summary the choice of building materials should depend on a combination of factors.

1. the location of the project whether rural or urban; hot or cold climate;
2. the families' resources of material, possible salvaged material, ability to make traditional material
3. future availability of the material
4. the economic base of the participating families and of the community
5. the use of materials within the understanding of natural resources and ecological consequencies
6. an appropriate level of technology to produce the material
7. the cultural acceptability of the material by the user each other to purchase the same materials. This suggests the possibility of coordination at the national level to avoid unbalanced demand. Perhaps an estimated census of all industrailized building materials could be made accessible to the agencies. They could then better decide what to use, where and how to get it.

SPEED OF CONSTRUCTION

Most agencies adopted a high rate of speed as an objective of their program.

To evaluate the relative success of these programs some assessment needs to be made of the overall problem. Approximately 200,000 families were left without homes as a result of the earthquake. If we assume a certain percentage were able to reconstruct their house without outside assistance, for example 10%, that still leaves 180,000 units to be constructed during a time period of approximately mid March to mid May. That is equal to 3,000 units a day for a sixty day period.

There are over 30 agencies of varying sizes and resources commited to the reconstruction of housing. In order to achieve the theoretical goal of 3,000 units a day, the average agency would have to produce 100 units a day. Of the 24 agencies included in this survey the total daily output is slightly under 300 houses or one tenth of the need. CARE is the only agency with a production rate of approximately 100 units. Oxfam/World Neighbors is also near that range, with the Canadian projects perhaps producing 40 a day. A more common rate is 10-20 units a day. Red Cross of Guatemala has an objective of producing 10,000 houses, but with two or three production centers making only 15 houses a day each it will take Red Cross approximately 8 months to complete their goal.

Speed of construction has not been the sole determinant of selection of construction method. But it does suggest that quicker methods of building basic shelter should have been a policy for some more groups.

This in turn suggests that a house type or design could have been used that consisted of a minimal shelter constructed during the first phase and a more complete formal house continued during a second phase.

The goal of 3,000 units a day does not seem unreasonable when one considers the facts that most housing solutions are of designs that require only about 10 man days per unit to complete and that there may be as many as 200,000 people capable of helping in the reconstruction.

TECHNOLOGY OF CONSTRUCTION

Many aspects of the technology of construction have already been discussed in the sections of materials and speed of construction. In this section we will only point out a few of the problems we have observed or some of the advantages that are unique to that system.

STRUCTURAL FRAME - INFILL MATERIALS

This is the system typified by the Oxfam/World Neighbors CARE USAID, and Save the Children described programs. As in the individual project reports these frames are built on earthquake resistant construction principles incorporating low cost traditional materials. These programs are building the most houses per day for the least per house cost while exerting the least demand per house on the industrial material supply market. Considering the nation's economy and time pressure, these factors are of paramont importance. Of further interest is that this technology is presented in a way intended to be easily understood by the campesino and easily communicated to other people.

Criticisms of the use of less than hygienic materials used and the required replacement of structural elements has been noted in other sections.

WOOD

There are no innovations or remarkable practices in the use of wood technology in the projects surveyed. The projects are using simple framing techniques, using 2" x 3" or 2" x 4" studs (pie derecho) from 60 cm. to (an unsatisfactory) 120 cm. on center. Many production sites are using jigs to facilitate rapid production. It is worth repeating from another section that the CEMEC designed house as used by them and Red Cross has no diagonal bracing in neither the walls nor the roof. Not only are the walls twisting out of alignment even now but the structure is hazardous in case of earthquake. Many of the wood programs are not giving serious attention to wood preservative treatment. Some agencies are perhaps excusing this negligence based on their assumption that the house will only be used for a few years. Experience shows that these houses will be used in one form or another, for as long as they still stand. Therefore, adequate preservative treatment could prolong that period significantly.

BLOCK

The programs that employed a concrete block or CINVA-RAM block technology had the objectives of building permanent houses with high cultural acceptability. Problems have been that not all groups are capable of making good blocks, that the concrete block houses are among the most expensive per M^2 and slow to build. The CINVA-RAM houses, though cheaper require even more time to build. The labor intensive technology seems appropriate for Guatemala but is in conflict with the need for rapid construction. Greater skills and more patience is required in laying of the block, building form work for the concrete structure, and placing the steel reinforcing than in wood construction.

PREFABRICATED HOUSING

The technology of prefabrication covers a wide range of sophistication, appropriateness of use and degree of utilization. The danger is in applying a prepackaged solution rather than using the understanding of the systemizatio and rationalization of the process as applied to the situation. Half of the 2 projects of this survey employ prefabrication technology. A few of them only use it to assemble certain compenents, for example Salvation Army prefabs their trusses, doors and windows, CEMEC precuts wood for panels. Generally, though the houses built with prefabrication technology are produced as total houses in a factory like setting, basically wood panels made on jigs.

This system has a number of apparent advantagous.

- It seems to centralize and clarify control of materials
- It equalizes the output, resulting in basically the same house
- It seems to capitalize on specialized labor thereby resulting in higher rates of production
- It allows for greater mechanization

In an emergency situation these reasons may be appealing enough to decide on setting up a prefabricating plant. But there are sacrifices made and not all assumptions are valid.

- Those projects producing the most houses a day operate on a decentralized system of distribution of materials
- Everyone receiving the same house may erode a family's sense of identity.
- Some houses produced with the least man days are in fact using prefabricated

parts but not all.

Our value judgement is that for little or no gain in efficiency the specialization of labor is less satisfactory to the worker who is not given the opportunity to contribute to the whole process. The scale of appropriate equipment should be seen as a trade off between short term results and long term applicability. Electric saws may be necessary now but larger more expensive equipment is poor replacement for many houses.

There are further issues that are created by the employment of a total prefabrication system especially of low cost housing. After the reconstruction period of aid is over and the factory possibily dismantled and the particular materials may not be so readily available what happens? For those who seek to modify or expand their house they will no longer have access to the same technology. The other serious problem is that frequently total prefab products are least adaptable to the cultural and specific situations.

DISTRIBUTION

The central issue of distribution is getting the houses to the people that need them, or from another point of view enabling people to provide housing for themselves. These two approaches underline a very basic philosophical difference in the process of the reconstruction of housing. Consequently the issues and problems raised by one approach are different from the other. Some of the more general issues include the following.

Criteria to be Beneficiary

There is a wide range of equitability or justness in the distribution of houses to individuals. The example of Canada giving a house to all families in San Andrés Itzapa simplifies the problem of selecting beneficiaries enourmously and all families are treated equally. However, by maintaining a criteria based on need, presumably resources for several houses could have been reallocated to areas with little reconstruction support.

One of the stated criteria for FEDECOAG is that houses will go to those who do not have a house. But it will take a year to complete their housing program. In the meantime the majority of people who have resources will be forced to provide a house for themselves, on the other hand it encourages people to wait until the program comes to them.

As well as other criteria to receive a house some agencies require a certain performance from the recipients. In effect they say " if you conform to our standards" we will reward you with a free or below cost house. The line between this and being a self-improving participant in the process is sometimes narrow. The effect of how aid is distributed may create future dependency relations. And what is required of the recipient may force them to violate some personal or cultural principle in order to receive the needed house.

CARE and OXFAM/World Neighbors appear to have similar programs regarding the construction of houses but the relation between the corrugated zinc distribution and educational programs of the two agencies is very different. The first is conditional on performance, the second is independent. The other extreme would be a donor agency distributing materials without making information available. This could be considered not carrying through on a responsibility of explaining its safe use and ownership.

The only way agencies have addressed the problem of providing housing to non-land owners is to accept the concept of non-official occupancy.

Most agencies require some form of title before placing the house on the site. Most state that if they did not require such that they may actually be helping a landlord without guaranteed housing for the occupant. While the legal problems of tenancy are serious the issue of not providing aid for renters or non-property owners can be more serious. The effect of the requirement to own land leaves out a significant portion of the population and aggravates the differences between the groups.

Elderly and Widows

Almost every program has a mechanism to provide houses for widows, the elderly or people not otherwise able to build their own houses. For example, Ladrillos para Guatemala requires each team of 10 family representatives to build 11 houses, that is, one house for someone who could not build it themselves.

Who Distributes

The channels of distribution that the groups have chosen to go through include the Municipality officials, newly formed local committees, existing cooperatives or local groups, the local church, a hired promoter or directly from donor staff to the recipient. Each of these had advantages and disadvantages and each can be abused. The power of determining who receives aid is lessened if the criteria are very clear and the amount of aid resources known. This, however, should be balanced against the freedom to be sensitive to a particular local or family situation.

Methods of Facilitation

If the goal is to enable people to determine and provide their own housing there are at least three ways to approach it.

- By providing financing the family decides on what and how they will spend it.
- By providing materials plus education the family then can apply the ideas as understood or desired.
- By providing a decision making process strategy then the families can apply it to analyze needs and seek resources.

The cost and organization for each is different. Examples of the first two of these approaches are Rotary Club and OXFAM/World Neighbors. The assurances of particular results are much less measurable or controllable by a donor when using the third approach.

COSTS

A relief agency's lack of knowledge of the real costs to provide a house for a family after a disaster, at least implies a set of priorities where economics is not first and indicates cost effectiveness studies for total costs of various designs have not been pursued. This unknown aspect sometimes allows houses to be built that if examined thoroughly would not be considered wise use of the resources. Choices are made without following through on other implications than material cost which is only a portion or looking at other approaches than completed houses.

In Honduras there were examples of houses economical in material terms but completely unrealistic if the cost of a major piece of equipment or the land purchase cost had been included. In Guatemala examples such as the Salvation Army block machine and the transportation costs for Canada resemble such problems.

In no case surveyed was the cost of the land included as virtually all the houses were built on the property of the recipient or the Municipality. If land cost had been included then the difference of the total cost to provide housing for non-land owners would not have been out of the range of the programs.

Labor costs have also been discounted in the majority of the projects. Most recipients are required to work partly to reduce the cost of the house. Sometimes food is also given so that in the absence of other income during this work period the family has this subsistence support. Six programs distributed food for work, some on a limited basis, because of the recent harvest. To calculate properly the costs of the houses the equivalent food cost should be included.

In some cases the transportation costs were part of delivered material purchase price. But as sources for wood and corrugated zinc became increasing distant the increased delivery price was paid because of the need;this difference should be recognized. If the unusually high costs of transportation were considered more serious some might turn to other local materials or coordinate transportation so the sources are more equally distributed.

Administrative overhead is often the cost most difficult to get accurately. Most agencies don't have available information on what it costs to run the housing part of their operations. To cite the cost of volunteer labor as zero, as some agencies represent it is inaccurate when there are often considerable costs to fly foreign workers or supervisors to Guatemala plus providing living expenses. Not relaying more on the capacity of Guatemala professionals and workers was a serious oversight on the part of some international agencies.

Other costs include the expense of setting up the housing production, construction tools, and staff vehicles and trucks. The tendency to be generous in purchasing several thousands of dollars worth of these items looks strange in relation to the cost of the house and an unknown future use. The necessary items should be considered in other terms than purchase of new equipment and then be calculated as part of the house cost.

The educational materials printed and distributed are indirect costs but generally are of considerable long term value in proportion to the expense.

It is only relatively possible to make comparisons of total costs among projects. But we felt it important to try to make some estimates to illustrate the wide discrepencies among the differences of material cost and total cost. For a few projects there was virtually no difference between the figures. For a few others the difference was 30%. The differences usually relate to professional versus voluntary administration, high cost equipment and vehicles versus no use of special equipment or purchased vehicles, paid laborers versus volunteer labor.

BENEFIT TO THE LOCAL ECONOMY

As criteria for developing the design of their housing programs few agencies have as an objective the improvement of the local economy. However during the post disaster period the nation's economy is probably as much in need of recovery assistence as any other facet.

Most agencies have, however, tried to purchase locally out of convenience and time pressure. The inflationary pressure on local prices and the actual lack of some essentials should also be part of a more realistic purchase decision especially when there is such a disaster created demand. Before anything is brought in however alternatives should be considered along with the future implications such as repair.

Hogar y Desarrollo has an established factory production of houses with substantial employment. If agencies selected to support such local industries rather than setting up others there might be a mutual benefit. It was however necessary to set up productions in other locations. The futures of these are critical to the future economic base of the community and the housing systems now being built. The products could change to reflect components or additional modules but the equipment and some employment base should remain.

The most encouraging economic benefit is the repayment into a future fund for municipal jobs and improvements as proposed by the USAID program. There may be some who did not benefit directly by housing aid but will receive a job. It remains to be seen, however, if the peer pressure to pay back and the management of the funds will produce the intended results.

FINANCING

Perhaps the most notable aspect of an overview of the various methods of financing is the lack of uniformity of approach. Although there are similarities among some it seems no two are alike. The cause of such diversity is probably based on the wide variety of philosophy that governs the policies of the many groups. Within certain limits, for example national governmental policy, donor agencies have a right to spend their money they way they want. However, the consequencies of such a range of individually determined approaches creates problems between residents.

It may not seem fair for one recipient to have to work one month for a house which has a material value of Q150 and then be required to repay Q100 while in the next town a recipient works two weeks receives a house valued at Q700 and pays back nothing. When similar discrepancies occur within the same town, tensions, frustrations and confusion are likely to result. Because of these problems several issues present themselves for discussion.

Is a national government in the position, when fearing the lose of aid, to require a common approach from donor agencies especially when some have previously determined policies? Perhaps the principal of the prevention of present or future dependence and a common equivalent for labor input could be stated and then applied to each program.

While house repayment made to the municipality is a good way to create future public improvement funds it involves setting up a banking function. The other side of it is a new debt pattern for some families.

The repayment required of low income beneficiaries should be based on their ability to pay, no more than 5-10% of the annual cash income. For example a family with an annual income of Q150 would pay Q1 a month. The difficulty is that many families do not have a steady cash inflow so other arrangements need to take this into considerations. The Fundación del Centavo seemed to be the only group cognizant of the reality for campesinos. With a minimum monthly payment which is seemingly very low (Q3-5) there is definately a group in the society that needs housing and can pay this amount but the question of those who can't is left open. The other problem may be that over time the house may not appear to the resident has something for which they should still be paying. Previous patterns were adding on to a house when one could, rather than paying back for a bigger initial house. The change may cause some difficulty for some of the recipients and slow their ability to be able to afford the additions needed.

SITING CONSIDERATIONS

In reviewing the housing projects it is apparent that there has been a concentration on the provision of shelter with minimal consideration of the implication of where the shelter is located. As has been noted throughout the surveys, most recipients locate their house on the same site they had before the disaster in any way they choose. There was only limited advice available to those in the educational programs.

The problem of dealing with the issues of siting and urban infrastructure was then left in the hands of the Municipalities. That is presumably where it belongs but they appear overburdened or unprepared to resolve the problems at this time. It seems a valuable service, then, would be performed if the municipalities could be beneficiaries of an education program of how to approach reconstruction planning.

Before the disaster whenever an individual family or business built and sited their house or store they conformed to a set of rules, usually unwritten. In a specific town, for example, the person conformed to the use of plastered walls and tile roof. He also conformed to the general practice of placing the house right up on the edge of the sidewalk, having a variation on basic windows and door, painting the outside wall one of the acceptable colors, etc. Inside there was more variety of options on how the house was laid out, but still within an established set of customs.

Now, after the earthquake, many of the rules have been discarded, for reasons of safety among others, but a new set has yet to be established. Consequently when individuals are left on their own to decide where to put their new house they make up their own new set of rules.

Sometimes where the house is located depends on what area of the site has been cleaned off, where they want the door in relation to the rest of the lot or the street, whether they regard their house as temporary, permanent or as a back addition to a more formal house. These decisions not only affect the family involved but also their neighbor and, by extension, the appearance of the entire town.

While the importance of immediate shelter tends to overshadow future considerations, there are some simple factors which should be available for recipients to consider and help clarify their decisions on where to locate their house. The following such factors, among others, could be communicated to recipients who could then judge their relative usefulness to themselves and their site.

1. geological risk and topology
2. convenience of access
3. relation of house to outdoor activities
4. relation to water supply and sewage disposal
5. possible expansion of unit
6. adequate present and future light and ventilation considering location of possible expansion
7. level of privacy needed from the street, neighbors and within the house

Some municipalities may very well have codes or ordinances regulating these factors, but especially during a time of emergency enforcing them is very difficult. The responsability then tends to fall on the donor agency to provide information to the residents and offer technical assistance to the municipalities.

PUBLIC SERVICES

We noted in our introductory summary that only five agencies were involved in providing assistance for public services. Several more will by the long term financing mechanism. There is, though, an absence of approaching reconstruction as an integrated and comprehensive process to developing community environments. Rebuilding houses within the same system of roads and land uses, repairing water systems and replacing public buildings is more easily done than reconsidering the basic organization and making changes. The earthquake presented an opportunity and it will shortly be lost.

At the other extreme it has been shown, for example after the earthquakes in Managua and Peru, that large, long term and detailed plans are counterproductive. We would suggest that encouraging resident participation with the officials and professionals in the making of basic decisions concerning basic community physical changes would be advisable.

It is very difficult to change or widen streets for example or change the previous use of land from commercial or housing to public or open space. These are so tied to land ownership that without strong authority, clear decisions and understanding and acceptance by the residents such actions are not taken.

Besides the siting booklets for residents and short courses on planning for Municipal officials suggested before the use of meetings which have clear physical design choices presented and some technical advice could be made available.

The various programs' efforts at providing some public buildings seem to be done as though the buildings are isolated projects. There is, however; considerable significance in how some of these functions are replaced. Some may be as important to the daily activities and culture as the form of housing. This country has a rich tradition of monuments, important community functions such as the markets, and cultural patterns which provide an image, pride and identity which to rebuild must be done with great care. The difference between what is needed now for the functioning of public services and the permanent replacement of the buildings should be understood before designs are made.

The lack of involvement on the part of donor agencies in the reconstruction of infrastructure components can probably be traced to four causes. They are trying to focus on the critical issue of providing shelter as quickly as possible; they may be operating with funds that are only allowed to be spent on emergency programs and reconstruction of infrastructure falls out of their definition of "emergency", they are unacquainted with the technology of infrastructure; or consider the rebuilding on previous sites not the same issue as starting a new colony and, therefore, stay away from such work.

As a result this facet of reconstruction goes largely ignored. (Care's ongoing water program is a notable exception) The status quo of previous limited services remains.

However, it seems to us that in communities where the need for improved water, excreta treatment or streets is obvious, the most effective time to provide these improved services is obvious - during reconstruction. It is a time of opportunity and as is the case with new community development, a cheaper and easier time to install the services, possibly even applying new ideas.

By considering the entire process to get a community functioning again as an emergency perhaps some agencies would be able to raise more resources for such expenses or approach reconstruction as a more integrated process.

CULTURAL SUITABILITY

Evaluating the acceptance of various housing solutions in a particular culture can only be done accurately when it includes extensive interviews of the residents. Consequently without sufficient time or socialogical analysis available the following is not definative and is only our view from physical indicators.

The particular aspects we looked at are summarized in the introduction. Preliminary observations on these aspects point out problems that should be considered in the process of determining a housing program, not just looking at the results in retrospect. The following are some of the issues as addressed by the 24 projects.

It has almost become dogma by now that the more a resident is included in the process of determining his own living environment the more likely of its long term success as a housing program. In this regard projects such as OXFAM/World Neighbors and Save the Children Alliance promote the involvement of the recipient. The resident is then responsible for the suitability of the house in fitting their cultural needs.

The typical rural one room house does often have only one door. But as the community becomes more settled the lots are smaller and the activities often focus on the backyard. A front door is more formal, the back door is the key to the daily functions. A surprising number of house designs for urban and semi-urban areas had only one door. The most serious are the concrete block houses. The exception is the Adventists' house possibly because it was designed by a Guatemalan.

Any division of the house space has been left up to the resident in all except the projects of Canada, Fundacion del Centavo and Scouts where the size is considerably larger. The most probable modifications that will be made are a division into two rooms and an area for cooking of some partially enclosed manner in the back.

Most people are grateful to have a roof for the rains, but if given a chance to choose, a two sloped roof is preferred generally by most to one slope. As studies on the subject have shown all classes and cultures of people have conceptions of what a house is to look like - what it means to have a house rather than an enclosure of materials. Fortunately, with the exception of the North American garden sheds that have been imported the odd shapes and unusual housing types have not plagued Guatemala as they have other countries after previous disasters.

The thickness of the wall and kind of doors and windows are two major considerations of residents for the sense of physical security in their house. This seems to be one reason why the concept of having the door swing out has not been easily accepted. A wall not as thick as traditional adobe is a major change both in image, sense of security and climatic comfort. Materials such as cement asbestos or plywood is feared to be easily broken or taken off the panel for illegal entrance.

Few project designs directly addressed climatic comfort. Those that did include the Canadian which placed plywood under the zinc roof and the CEPA,

Zacapa, project by replacing zinc with cement asbestos and allowing ventilation by leaving the top of the sides under the roof slope open. The least successful example adapting to basic climatic factors is the Mexican house which is a design transferred from a hot climate to cold and only replaced insect netting with sheets of plastic.

In that most families have located the house on their property as they personally desired they may have based the decision on conscious consideration of the house's relation to neighbors, to the street and within the lot. However the overall effect does not have the unity of approach to the street that was typical before of the adobe structure right up to the sidewalk. This change from the traditional public appearance and a private inward orientation to the more suburban mixed character of what is public and what is private is a major change in a physical sense of a social relationship.

PROGRAM OBJECTIVES

A review of the program objectives clarifies that the variety of housing results reflect a variety of basic approaches. Presumably all donor groups were addressing the same problem, that is, how to use the available resources to contribute towards the reconstruction of housing. The conclusions were different and a majority did not seem to systematically determine or elaborate the objectives. The definitions of the problem and contributions were quite differently perceived.

Some groups such as Fedecoag and Caritas, seem to make the provision of housing an indirect objective. Of primary concern is the overall social and economic development of the family and community. They are in effect taking advantage of the opportunity to integrate housing into a larger social process. That idea seems good and proper as long as the means to get the house is not used as bait to promote the donor's other objectives if they are not desired by the recipient.

For those whose program objectives were more direct in terms of building houses there is variety as well. That difference is based most generally on housing quality. A few groups identified what they interpret as the cheapest, smallest, fastest house to build that is adequate for the immediate future. These are typically wood structures.

The other approach was to use the opportunity to provide the family with a house of quality construction that is a permanent structure. Typically these are the block houses.

In short you build more with the first attitude and better with the second. Caritas' house is something of a compromise, a small house but with framework for permanent expansion. We think there is considerable merit in this approach.

Another type of objective is the notion of facilitating the recipients to build their own houses instead of organizing the whole process and building it for them. This kind of approach sees housing more as a process than a product. It encourages the use of an individual's resources and involves him in the decisions. It points out the important aspect of the recipients being a part of the overall program objectives and the implementation of the house construction.

The need to act and the complex concerns of long term development appear to be at conflict after a disaster. Somehow though it would be useful to have previous experience and a decision process outlined at hand so the resulting program could be effective in both immediate and long term results. When there is a desire for immediate impact and accountable results the more ambiguous and developmental concerns are overshadowed. There is a need for visable momentum but, especially understood by the locally based groups, also required is a commitment beyond the emergency and early reconstruction phases. Most of the donor groups discussed in this report will be around in some form to see the results of their efforts for housing reconstruction.

FUTURE IMPLICATIONS

It has been noted before in this report that one of the most significant criteria of the evaluation of a housing program is to assess future problems and potentials. This evaluation then falls back to the original concept and design of the house.

Regarding considerations for future use the design of the house should consider at least these characteristics:

- minimal maintenance required to preserve and use the structure
- the possibility of making additions or modifications using the same materials and technology as the original structure
- anticipate future installation or improvements of water, sewage disposal and electricity so they can be made as cheaply as possible
- ability to modify the house so that some personal identity can be expressed
- in the event of major modifications to the house - original materials or components should be reusable

Some of the future implications we are able to draw at this time are obvious others tend to be guessed.

Paint and/or preservatives are needed on most of the wood projects. Preservative treatment is perhaps most critical on the braced structural frame projects of OXFAM/World Neighbors and Care.

The numerous projects where making a homegeneous addition to the original structure may be quite difficult have been identified. The ability is primarily one for need of safety but also of esthetics. The other problem of cutting braces for door connections has been mentioned.

Only the Comite Fratelli D'Italia made a conscious attempt to begin with individualized housing. A good design of which many are made should allow a diversification to result that actually adds interest and improves the appearance of the neighborhood. The safe frame with a variety of infill materials is the basic approach. The wood houses are also more easily changed in small ways than the block houses.

Only those projects that begin with a structural frame and roof including the Caritas first phase, have an explicit potential of future improvements. However, the OXFAM/World Neighbor and Care models may change materials but to add on requires a separate unit. The Canada porch is an implicit opportunity and the Fundacion del Centavo details permits future changes.

Those houses with a single sloped roof if sited in such a manner may imply an addition to complete the more desirable two sloped roof line. Very little information is available on how to make additions, especially for kitchens, in a safe manner.

Project Alpha is the only design conceived of as a basic component to be reused when resources of the owner permits. Along with the distribution of the corrugated zinc sheets examples of a safe structure using zinc on all sides for short term immediate protection could have been illustrated. The zinc would later be dismantled to be used as the permanent roofing of a larger structure. The frame and roof systems (CARE) are basically seen as permanent with change of wall

materials from temporary to permanent.

Most houses were conceived as complete designs, in a sense closed systems. Since many are also minimal in size and materials, the more mallable the house, yet remaining safe, probably the more usable it will become. The critical importance of future implications is only underlined by the tradition of evolutionary structures in this and other cultures. Most projects in effect inhibited rather than encouraged that process.

RECOMMENDATIONS

We have made various suggestions or recommendations throughout the report. Only the basic key conceptual ideas are repeated here.

- All proposed housing programs and plans should result from interactive determination with a significant cross section of actual intended users in each geographic area.

- All donor groups building housing should be acquainted with alternative earthquake resistant construction techniques, incorporating them in their design and communicate them to the recipients.

- Unify financing and repayment procedures based on ability to pay. Payment into a community project fund when feasible.

- Provisions need to be made quickly for sites, services and shelter for the displaced families who are not land owners.

- Immediate technical assistance in the form of educational programs and manuals should be offered to municipalities concerning the basic planning for reconstruction.

- The house construction might best be phased and facilitates alternative choices to infill a safe structure.

- The provision of services, land use changes and public facilities should be integrated with the initial housing efforts.

ORGANIZACION DE LOS ESTADOS AMERICANOS
PROGRAMA DE DESARROLLO URBANO
SEDE: GUATEMALA

DATOS SOBRE LOS TIPOS DE VIVIENDAS PROPUESTOS
DESPUES DE LOS SISMOS DE FEBRERO DE 1976 EN GUATEMALA

A. DATOS GENERALES

1. Entidad comprometida _____

1.1.. Dirección en Guatemala _____

1.2. Dirección permanente de la oficina principal _____

_____

1.3. Nombre del Director en Guatemala _____

1.4. Personas entrevistadas:

_____

_____

1.5. Lugares visitados·

_____

_____

B. PROPOSITOS DEL PROGRAMA

2. Cuál es el propósito del programa?: _____

_____

_____

_____

_____

2.1 Cómo fue determinado el programa? _____

_____

_____

_____

_____

2.2. Cómo escogió el tipo de vivienda y cuáles fueron los criterios utilizados para la elección? _____

_____

_____

2.3. Cuál es la organización adoptada para ejecutar los proyectos

D. VIVIENDA

4. Caracteristicas:

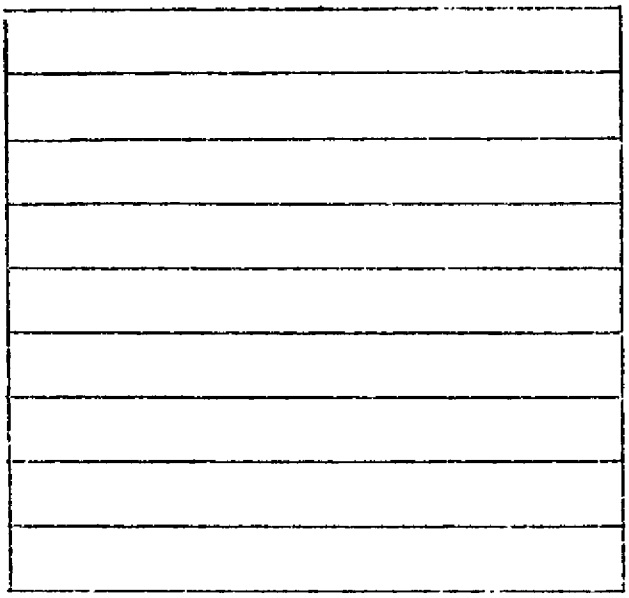
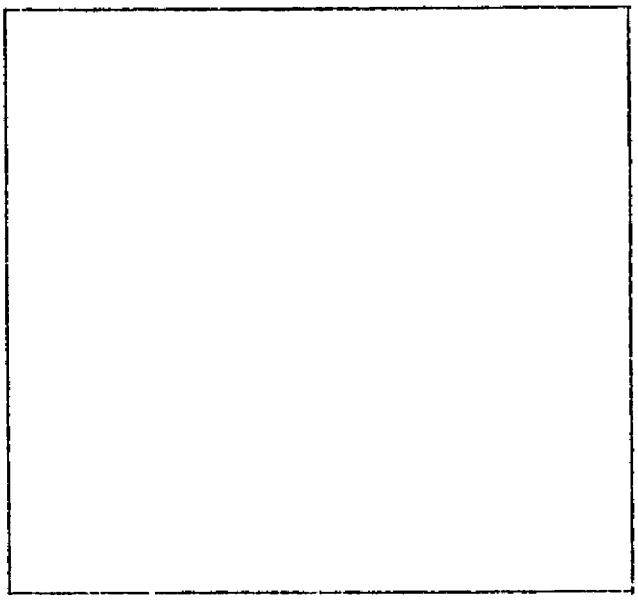


Foto o descripción



Planta medidas _____

_____ m^2.

E. MATERIALES

5. Tipo

	Piso	Paredes	Techo
Material			
cantidad			
costo por unidad total			
origen			
medio de transporte			
distancia			
peso			
costos de transporte			

COMENTARIO (ventajas o problemas, materiales tradicionales, beneficia a la economía local).

_____

_____

_____

_____

_____

_____

Usos anteriores de este diseño de vivienda: _____

_____

_____

F. INFRAESTRUCTURA

5. Características

Lotificación	Area del proyecto _____
	Densidad _____

5.1 Existencia y costo

	Agua Potable	Desague/Drenaje	Vías	Electricidad
Disponibilidad				
Escala del sistema				
Costo estimado por unidad				

5.2 Tamaño del lote _____ 5.3 Tenencia_____

5.4 Relación con espacios abiertos (plazas, vías peatonales, áreas de recreación) _____

5.5 Relación con edificios públicos (escuelas, iglesias, centros de salud)

_____

5.6 Relación con servicios comerciales (comercio diario)

_____

COMENTARIO (ventajas o problemas, ambiente vecinal, eficacia de los servicios)

_____

_____

_____

_____

_____

_____

_____

G. COSTOS (promedio por unidad)

1. Materiales : 1.1 Importado _____

1.2 Local _____

2. Terreno _____ 3. Mano de obra_____

4. Transporte _____ 5. Servicios _____

6. Administración _____ 7. Otros costos _____

8. Necesito equipo especial SI/NO 9. Cuál es su costo _____

10. Total _____ 11. Por m^2 _____

COMENTARIO:

_____

_____

_____

_____

_____

_____

_____

H. FINANCIAMIENTO

7. Criterios que se adoptan para ser considerado beneficiario _____

_____

_____

8. Forma de financiamiento

	Cosequio	Venta (que precio)	Préstamo (condiciones)	otro
Materiales				
Terreno				
Mano de obra				
Servicios				

COMENTARIO:

_____

_____

_____

_____

_____

_____

_____

I. METODO DE CONSTRUCCION

9. Quién construirá la casa: damnificado ☐
equipo vecinal ☐
contratista ☐
extrangeros ☐
Otro ☐

10. Habilidades requeridas

_____

_____

11. Se proporcionará entrenamiento?

Quién _____

De qué manera _____

El entrenamiento fué especial SI NO

Cuál fué la especialidad _____

12. Herramientas requeridas _____

_____

_____

_____

13. Supervisión necesaria

_____

_____

14. Tiempo de construcción

_____

14.1 Hombres por equipo _____

14.2 Hombres/días por vivienda _____

COMENTARIO (ventajas o problemas, método de construcción, educación, rapidez)

_____

_____

_____

_____

_____

J REQUERIMIENTOS FUTUROS

15. Mejora de la estructura _____ costo posible_____

Ampliación_____ costo posible_____

Servicios de utilidad _____ costo posible_____

COMENTARIO (potenciales ventajas o problemas)

_____

_____

_____

_____

_____

_____

K. CULTURAL (relación de aspectos físicos que podrían contribuir a la aceptación o adaptación de la vivienda)

Su construcción es asísmica _____

Su construcción responde a las condiciones del clima?_____

Aguas del techo _____ Pendiente del techo_____

Ancho de paredes _____Función interna_____

Ubicación de la cocina_____ Ubicación del baño o letrina____

Relación de la vivienda con otras viviendas_____

Relación de la vivienda con la calle_____

Relación de la vivienda con áreas públicas_____ _____

COMENTARIO:

_____

_____

_____

_____

_____

_____

The Thompsons will be continuing their research on reconstruction of housing after natural disasters in Honduras, Nicaragua, Chile and Peru. They will be doing a comparative analysis over time focusing in on the following aspects: 1) the evolution from emergency to permanent housing, 2) the introduction of safe construction methods, 3) the innovations in the provision of infrastructure, 4) the implication of immediate decisions concerning basic planning on the future environment, and 5) the criteria and process for appropriate international aid. Their final report should be available in late December, 1976.

Any questions, comments, additional information, corrections, or requests for the final report should be addressed to:

Paul and Charlotte Thompson
SINDU
Apartado 6209
Bogotá, Colombia