5. PROGRAM EVALUATION

Eventhough the objective of the program was disseminate a new technology through its application in the field, it is natural that its success depends not only on the techinicities of the new constructive system, but on the conditions that said technological change impose to the reconstruction program and viceversa.

5.1 The Administrative System

The community selection, number of beneficiaries, management of funds and acquisition and distribution of material were responsability of CORDELAM. This government institution was not prepared to manage a reconstruction program with communal participation and did not take in consideration the socio-economic conditions in planning the program.

The number of beneficiaries was overestimated in Nuevo Tupac Amaru, many of them belonged to one family (father and sons) and others had left the area moving to other towns. Approximately only 50 percent of the 140 houses were needed in the town. This could have been avoided with a preliminar socio-economic study.

The bureaucratic requirements that had to be fulfilled for the acquisition of materials delayed its delivery to the beneficiaries in approximately three months, in spite of the emergency situation.

The program was planned as an aid to reconstruction, giving the beneficiaries a minimun housing module to start the construction of their house. But due to the delay in its execution (one year after the emergency), some people had already built basic houses in the traditional way and other had adobes to initiate the construction. For these individuals the program was not convenient because it did not take in consideration the previous work they had done in making their adobes or partially building their houses.

5.2 The Social and Economic Influence

The results obtained in the three rural towns in terms of house units built with the new technology were very different. In Canasloche, not a single house was built with the new technology, in Tupac Amaru only 14 houses (10%) were built and in Chochope, 69 houses (69%) were in construction at the end of the project.

The amount and the condition of the aid were the same for the three communities, but the socio-economic reality was different in all of them. In all the

communities the main economic activity is the agriculture. In Canasloche and Nuevo Tupac Amaru which are located 4 Km apart in the same area near the coast, the agriculture activity had not been yet restored to normality after the floods. Also because of the type of farming, their activity is continuous all the year. In Chochope, located in a different site at higher altitude, the agriculture activity is seasonal, demanding only seven months a year. This activity was almost normal and the people had a more stable economic situation.

Canasloche and Nuevo Tupac Amaru are closer to the main city of Chiclayo (40 Km) and therefore have a permanent contact with regional authorities which had promissed repeatedly the aid from the government in the reconstruction of their houses. When the conditions of the project were known by the people, many of them felt defrauded with the amount and conditions of the aid.

In Nuevo Tupac Amaru and Canasloche, the settlers did not have much confidence in the technicians and engineers due to a recent bad experience in the construction of a water system for the farms, which resulted in a unused construction because the opinion of the farmers was not taken in account. In Chochope,the presence of the engineers was more appreciated.

The case of Lagunas was unique, in the aspect that the people remained in the isolated town until they were massively relocated at Canasloche. They were able to take all building materials from their previous house specially the roof, doors, windows, etc., this aspect had to be considered when planning the reconstruction of houses in this town. The people also had a very acute problem of water supply which made impossible any atempt of construction. This situation remained during all the year of project execution.

One of the main objections to the project was the reduced size of the module which was against their traditions, and one of the reasons for the greater acceptability of the project in Chochope was to allow the participants to increase the size of the module provided that they assume the increase in the cost.

5.3 The Perception of the Natural Hazards

The perception of the earthquake hazard was very low in the area since they have not experimented a strong earthquake in more than 50 years. This was the reason for which the settlers in Nuevo Tupac Amaru objected the use of the mesh of cane inside the walls, the lectures given to the community explaining the need of the reinforcement against earthquakes did not convince them to assume the increase in the labor cost. It was noticed that in spite of the heavy rains experimented, which collapsed many unprepared roofs, the people who had build their adobe houses used

the same type of roof. These attitudes demonstrate that the rural people in this area do not easily invest in long term mitigation measures as earthquakes.

5.4 Community Participation

It was determined that communal participation is possible only in cases of constructions which benefit to the community and when exist a primary need for it, this was the case of the construction of a water system for the farms in Nuevo Tupac Amaru. Housing construction is an individual task where the participants are members of the same family. Being basically farmers, they buy the adobes and then hire a mason to build the house with the aid of the family members available.

5.5 The Influence of the Technological Innovations

The technological innovations refer to the fabrication of adobes and the construction process, and are oriented to improve the seismic resistance of adobe houses.

The innovations in the fabrication of adobe demanded the use of a mold different from the traditionally used and the inclusion of a considerable amount of straw in it, this meant more work and thus less production resulting in an increase in the unit cost. For this reason it was decided that the beneficiaries fabricate the adobe in the traditional way since it was not of a primary importance in the house quality.

The concrete foundation specified in the project was highly appreciated by the beneficiaries and being the most expensive part of the construction many times is out of their economic possibilities.

The mesh of cane used as reinforcement demanded more work in the construction of the walls. It was determined that in spite of the lectures given to the settlers, they did not fully understand the necessity of the reinforcement against the seismic actions.

The roof specified in the project was similar to the commonly used in the area, but some objections were made to the quality of the wood. Due to budget restrictions, the wood used was not the most appropriate for that area, needing a treatment for preservation and eventually the replacement of the roof after 8 to 10 years.

In general, it was noticed that the settlers relate the quality of a house to the type of materials used and not to the construction process. The general idea is that adobe constructions cannot be improved, and as result of a wrong interpreted economy has a characteristic of degradating quality.

Fig. 9 New location of Chochope in September 1984.

Fig. 10 New houses built in Chochope at the end of the project, May 1985.

6. CONCLUSIONS AND RECOMMENDATIONS

In spite that this dissemination experience has its own characteristic, many of the conclusions can be applied to general housing programs with communal participation. The main conclusions and recommendations are the folowing:

- Adobe constructions are a real possibility in rural areas, in spite of the damage suffered by this type of housing due to natural hazards. It must be shown not as a forced solution for the poor, but as an authentic alternative if it is technologically well used.

- Including mitigation measures represent an increase in the cost of the house that many times cannot be afforded by low income people. Any project implementing mitigation measures, must be linked to other development programs from which such cost can be covered.

- A socio-economic study and a housing survey is necessary for an adequate planning of the program. The real housing demand and the possibilities of the families to participate in the program must be known in advance.

- The technological solution and the administrative system should be sufficiently flexible in order to make possible a wide participation of the community and the families in the program. This have to be done from the stage when decisions are taken, which will determine not only the possibilities of their participation in the program but the conditions in which their lives will develop in the future.

- Permanent and massive actions toward mitigation in rural housing, necessarily includes the support and participation of the State. This make necessary to disseminate improved technologies between the governmental housing institutions and official regulations for this type of constructions.

- Finally, field experiences must feedback the laboratory reserarch work in order to diminish the existing gap between this two disciplines.

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