

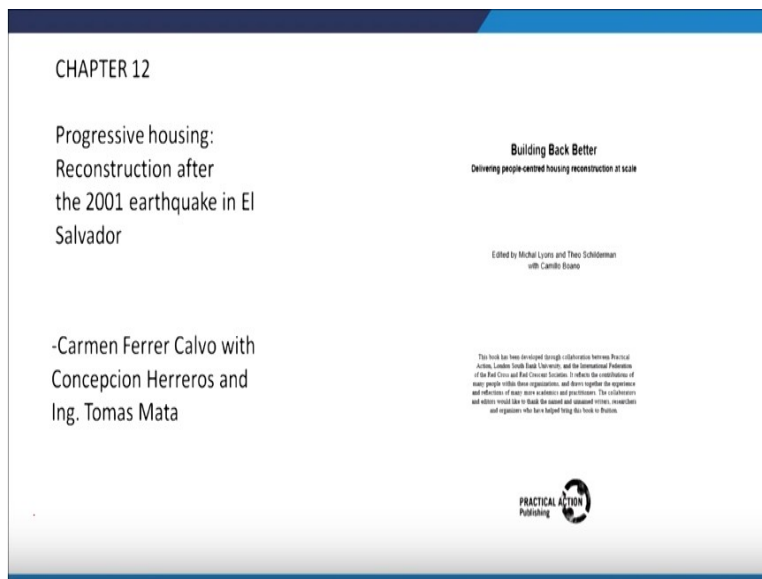
**Disaster Recovery and Build Back Better
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**Lecture – 25
Progressive Housing in EL Salvador**

Welcome to the course, disaster recovery and build back better. My name is Ram Sateesh, an assistant professor in Department of Architecture and Planning, IIT Roorkee. Today, we are going to discuss about the build back better practices especially, in the case of progressive housing in El Salvador. This is also one of the important chapter which has been compiled in the build back better which has been edited by Michal Lyons and Theo Schilderman and Camillo Boano.

And, it is from the practice side of it how they brought all the lessons from practice and this is where its been edited by Carmen Ferrer Calvo with Concepcion Herreros and Tomas Mata.

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So, this is a chapter, I am going to discuss on how after 2001 earthquake in El Salvador, how the reconstruction activities have started and what are the processes that they have implemented and what are the learnings we are taking back for that how it has informed the other practices also and in that region and it is also giving us some kind of guidance what to do and what not to do and how community participation is also very relevant.

And what are the stages of the participation and what are the roles of each organizations and there is a participation, partnership and also the coordination and the supervision of it. So, all these things collectively put into the kind of management of the project. So many of you at least from the Asian geographies, many of you may not have heard of El Salvador.

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Where is El Salvador?

- smallest country in Central America
- 48 per cent of the inhabitants of El Salvador live in poverty or in extreme poverty

Existing Housing shortage + 2001 Earthquakes destroying more than 2,00,000 houses

Increased housing deficiency

Source: <https://www.dentons.com/en/global-presence/latin-america-and-the-caribbean/el-salvador/san-salvador>

Which is the smallest country in the Central America so, it is about the 48% of inhabitants of El Salvador live in the poverty or in extreme poverty. So, its almost if you look from the North America and so, this is where El Salvador comes and many of you have to understand that the America, the North America and the South America was very diverse even within North America there was very great diversity exist and great challenges exist.


Within the North American region and in South American though they have the richest mining sector and the richest natural beauty but they also have been unequally distributed with various challenges especially, with the earthquakes which is very common in South American caves. In other classes, we have also discussed in the case of Peru, how it has been dealt and today we are going to discuss about the El Salvador.

So this particular disaster 2001 and this has been destroying more than 200,000 houses and already there is also vulnerable component of existing housing shortage you know, plus the earthquake the disaster adds on to it.

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Disasters that hit El Salvador

1978-92	a cruel civil war killed more than 125,000 people and ravaged the economy and major infrastructures.
1986	a severe Earthquake hit San Salvador, more than 40 thousand houses destroyed.
1998	hurricane Mitch produced serious floods, killing 250 people and affecting the most successful experiences of the post conflict reintegration process.
2001	in 30 days two major earthquakes (7.9 & 6.6 Richter), affected 85% of the national territory



In the M=7.7 earthquake in 2001, thousands of landslides were triggered in El Salvador.

<http://temblor.net/earthquake-insights/offshore-el-salvador-earthquake-strikes-location-of-deadly-m7-7-event-6712/>

So, what are these existing shortages, existing vulnerabilities, from 78 to 92 there is a very cruel civil war which has killed more than 125,000 people and the moment you are talking about a civil war it have impact on the economy and the major infrastructures. In 1986, then again, a severe earthquake has hit the San Salvador, more than 40 thousand houses has been destroyed and prior to 2001 and 1998.

This hurricane Mitch has produced the serious floods killing 250 people and affecting the most successful experiences of the post-conflict reintegration process. So, in 2001 again, it has one is a major earthquake which has been affected within a span of 30 days it has affected 6.6 points Richter scale earthquake has been hitted and about 85% of the national territory has been under impact.

And now, you can see here, there is a multiple disaster being a hilly areas, a mountainous areas you can see the landslides along with it not only the earthquakes the ground is not just moving around there is hills landslides on the other side, you have the Hurricanes which is again. So, this

is a multiple hazard phenomenon which existed in El Salvador geography and one is after the earthquake obviously, with many NGOs come into the picture.

And they want to give their helping hand or the support or the technical expertise or a kind of financial supports so, that is how this is the time different red cross associations like one is a Spanish red cross along with the Salvadoran red cross.

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Cruz Roja

CRUZ ROJA SALVADOREÑA

Image: a) Spanish redcross b) Salvadoran redcross

Progressive housing as a solution

- House developed in different stages in incremental way
- Core house approach v/s progressive housing

A project by Elemental in Chile. On the upper image, the housing units as delivered to dwellers, for each "L" there is a ground floor home and a two storey home on top. The lower image shows the buildings after some time

Source <https://methusanic.com/2019/03/20/housing2-progressive-housing-in-chile/>

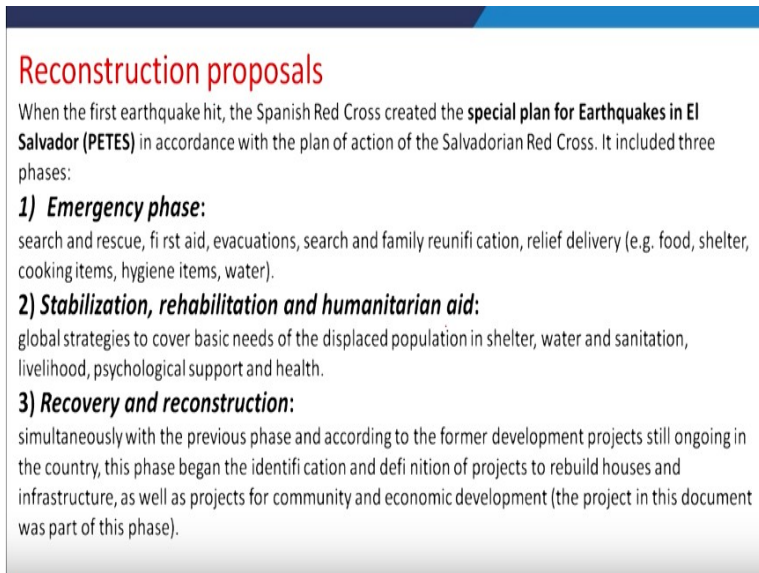
How they have also associated with in the red cross associations, how they have also associated with each other so, that they can learn from other, you know, practices which they have already learned from different parts of the globe. So that is how they have come together and they have come up with rather than a core housing concept they started with a progressive housing as a solution.

Because they have considered a different experiences what they have learned and that is where they have come up with a progressive solutions. So one is, what is progressive approach, these are the houses developed in different stages in incremental way, right and many people gets a core house approach versus with the progressive housing. In a core house approach, we give a core dwelling unit and then people add on to it.

So, they try to make in a kind of bigger like what you can see here, is you provide some basic things and then people add on to it you know like here the Alejandro's work which has been in Pritzker award and you can see his work in Chile. So, what it has been provided and what the people have made incrementally, how they are modified these places but here one has to understand it is like the incrementality is almost like 100 percent of increase.

But, this is something whether it is possible or not that one has to look into it but whereas, in progressive approach it is unlike the core dwelling is not making a house bigger but were making a house finished you know, to the complete manner, that is the most important aspect of the progressive approach.

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Reconstruction proposals

When the first earthquake hit, the Spanish Red Cross created the **special plan for Earthquakes in El Salvador (PETES)** in accordance with the plan of action of the Salvadorian Red Cross. It included three phases:

- 1) Emergency phase:** search and rescue, first aid, evacuations, search and family reunification, relief delivery (e.g. food, shelter, cooking items, hygiene items, water).
- 2) Stabilization, rehabilitation and humanitarian aid:** global strategies to cover basic needs of the displaced population in shelter, water and sanitation, livelihood, psychological support and health.
- 3) Recovery and reconstruction:** simultaneously with the previous phase and according to the former development projects still ongoing in the country, this phase began the identification and definition of projects to rebuild houses and infrastructure, as well as projects for community and economic development (the project in this document was part of this phase).

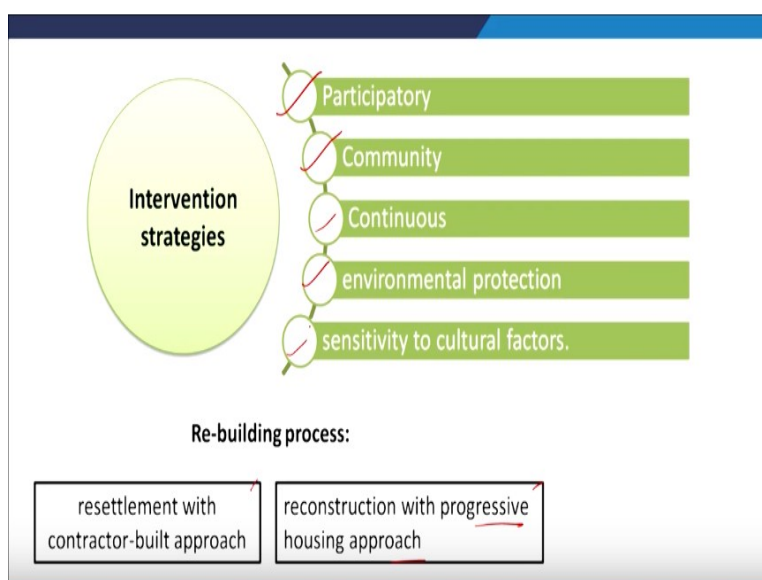
And, when the first earthquake hit in 2001, the Spanish Red Cross has created the special plan for earthquakes in El Salvador which has PETES in accordance with the plan of action of Salvadorian Red Cross and included three phases, one is the emergency phase, the stabilization and the rehabilitation and humanitarian aid and recovery and the reconstruction phase which is the final phase.

So, in the emergency phase it talks about because after earthquake and landslides removing the debris with search and rescue and the first aids providing health, evacuations, search, some family reunifications have been taken up a relief delivery like food, shelter, the basic needs, the

hygiene conditions, the epidemic and endemic disease controls in the relief camps. So this is the whole part contributes to emergency phase.

Once, people gradually stabilize and rehabilitation the humanitarian phase this is where the global strategies to cover basic needs of displaced population in shelter, water and sanitation, livelihood and also the psychological support for mental health. And in recovery and the reconstruction phase so, it is a follow up on to the previous phase and this phase is the identification and definition of projects to rebuild the houses of infrastructure and as well as, the projects for community and the economic development.

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So now, this is how they come up with one is, the various intervention strategies, how the partnership of this Red Cross associations have brought together and one is, they had 2 options of resettlement with the contractor-built approach and reconstruction with the progressive housing approach how they come together and how they make it in a progressive approach. One is, in the rebuilding process they have given one of the important aspect is the participatory aspect.

And, the community and it has to be a continuous process, it is not that the important lesson they learnt is you deliver and you move away so, it has to be a continuous effort, how one can raise

their capacities and take it in a continuous approach. Environmental protection and the sensitivity to cultural factors.

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The progressive housing approach

the concept of progressiveness did not end with the construction of the dwelling, as the original design was conceived so it could be extended and improved by the users in their own time depending on their resources and needs.

The general principles that guided the progressive housing approach were:

- The houses were built on the same land on which they had existed before the earthquakes, provided conditions permitted this and provided the site was not at risk of flooding or landslides. Thus, it was possible to avoid uprooting the population. The families held the ownership of the land.

So, it did not just only this progressive approach it did not ended only with construction of the dwelling but the original design was conceived so that it can be extended and improved by the users in their own time depending on their resources and needs. So, how they can expand with their own feasibilities on the resources. So, there are some general guiding principles of this progressing housing approach.

The houses were built on the same land on which they have existed before the earthquakes, one of the reason they have to think about this because first of all, they should make sure that this provided this is not at risk of flooding or landslides. So, they have to ensure that whatever the land the nearest possible vicinity so, they need to build on the same land or at least in the nearby vicinity.

And the families held the ownership of the land because in this aspect the main important aspect and the Gujarat recovery also we did discussed about the catholic relief services how they manage the housing in their own land because first of all, the sense of ownership is retained as it is okay. The most important part in earthquake resistance is you have to ensure that this is going to be an earthquake-resistant building.

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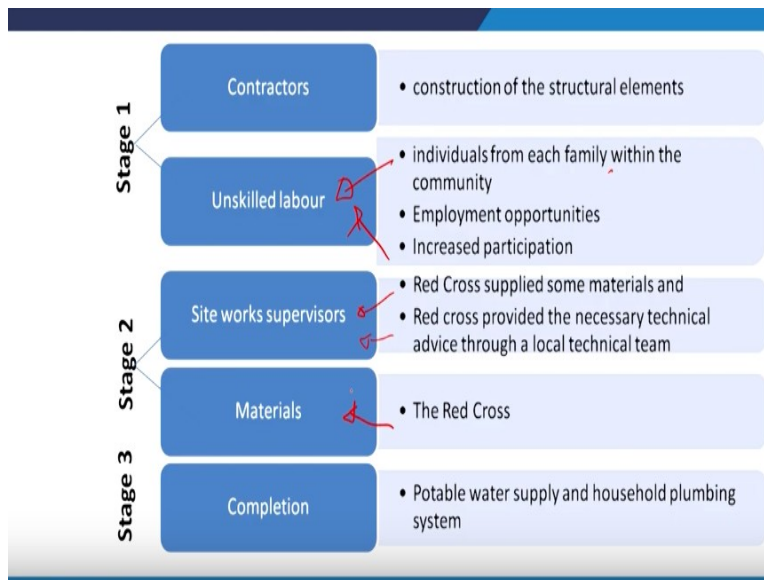
The structure of the buildings was designed to be earthquake resistant, capable of withstanding an earthquake similar to those that had occurred without collapsing. The aim, in this case, was to ensure no loss of human life and to ensure that the damage produced would be repaired by the users themselves.

- The constructed area per house would be 42 sqm, 36 of which would be roofed, divided into three rooms with a porch measuring 6 sqm outside. Participatory design methodology took place.
- Community involvement was essential during the whole process, from the design of the house to the handover.

And it could be capable of withstanding an earthquake similar to those that has occurred without collapsing. So, it has to ensure that there is no loss of human life and the damage that the damage produced would be repaired by the user themselves. So that it could be repaired by minimal interventions and the community themselves can repair it as quickly as possible and the constructed area per house was about 42 square meter and 36 of which would be roof.

Divided into 3 rooms with a porch measuring of 6 square meter outside. So this have been implemented the participatory approach where the communities were involved in the process so, anyways I will discuss with you with, the process how the community was involved and how it has related to the built form and the project management and community involvement was essential during the whole process from the design of the house to the completion of the house.

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So there are 3 stages, one is the first stage the basic construction of the structural elements we talk about any structural elements like the foundations, the columns, the structure, the basic structure of it and then these individuals from each family within the community have contributed the unskilled labour that has created some kind of employment opportunities and this has also enhanced the participation.

And now, in this the moment, the community is coming forward to provide some kind of unskilled labour to make their own houses, where they feel dignity about making their own house. In the stage two, there are associations the Red Cross supplied some materials, like for example in terms of hollow concrete blocks or any other which are not locally available and it also have provided the necessary technical advice through the electric local technical teams.

So, then the site supervisors and again the materials, how the Red Cross has provided the materials, which are not available locally and the stage three, which is talking about the completion which has the portable water supply and the household plumbing systems which onto the service mechanism part of it.

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Social organization

 Social organisation to facilitate channelling, coordination and communication between the community and Red Cross personnel

Criteria for selecting the users

9 out of 14 communities in San Vicente

Now, how this whole process the community participation has been approached one is, they talked about approaching through the social organizations, the communities, the local communities through their own networks so, because the Red Cross personnel will be coming from somewhere else who may or may not be familiar with the local communities and that is where the Adesco which is a kind of community organizations.

Become a kind of interface between the local communities and the various NGOs coming and working in it. In that process, what happens is communities establish a trust on these agencies which can actually negotiate and may create an interface between both the groups. So finally, after having a thorough analysis of the 14 communities in San Vicente they have selected 9 communities within that 14, for the reconstruction process. So, for this progressive housing project.

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Target communities

Table 12.1 Progressive housing project

Community	Municipality	Department	No. of houses
1 El Arco ✓	Tecoluca	San Vicente	141
2 Llano Grande	Tecoluca	San Vicente	37
3 El Puente ✓	Tecoluca	San Vicente	24
4 Santa Cruz de Paraiso ✓	Tecoluca	San Vicente	30
5 San Pedro ✓	Tecoluca	San Vicente	40
6 Sand José de Borjas ✓	Verapaz	San Vicente	29
7 H. Nuevo Oriente ✓	Verapaz	San Vicente	68
8 San Antonio Jiboa ✓	Verapaz	San Vicente	105
9 San Isidro ✓	Verapaz	San Vicente	108
		Total	582

Mainly, they have covered in the two major municipalities, one is a Tecoluca and Verapaz, within the department of San Vicente and each community includes El Arco, Llano Grande, El Puente, Santa Cruz de Paraiso, San Pedro, Sand Jose de Borjas, Nuevo Oriente, San Antonio Jiboa, San Isidro so, these are all concluding about 582 houses.

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LAND TENURE

People who were legal owners of land, or had land ownership which was being processed (reconstituted families, caretakers, etc.), in some communities received help from the town hall and were provided with the professional services of a lawyer, which brought down the cost of the process.

There were also families whose houses were located on land that belonged to the railway company, or to other private individuals. These people were excluded from the project for reasons of ownership.

Now, the all issue to do with the land tenure so, the people who were already a legal owners of the land or had a land ownership documents so that, these particular communities have been processed and these communities have received help from the town hall and were provided with the professional service of lawyer which brought down the cost of the process. So once, they have a legalized document legalized process of it.

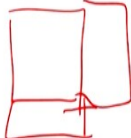
So, it can actually have you know, brought the regulatory framework into the process so that it can cut down some cost. But, there were also some families whose houses are located on a land that belonged to a railway company because you know, you have the revenue land, you have the railway land or in some cases you have the mining authorities land, so but in this case the people who are residing on the railway land so or to other private individuals.

So, these people have been excluded from the project for reasons of ownership so this is how this has been considered. But, obviously one has to look at it obviously, what happens to these you know what kind of NGO support they give because the basic tenure also makes a big difference in the criteria of the selection of the you know, the beneficiaries.

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Implementation process: Participatory design methodology

- Community collectively prepared house design.
- outlining on the ground the walls of the house, using just two lines of blocks in order to help a real space simulation to a scale of 1:1.
- The houses consisted of a unit with a gabled roof and walls made of concrete hollow blocks reinforced horizontally and vertically.
- The gross floor area was 42 sqm, divided into two bedrooms of 9 sqm each, a common area of 18 sqm, and a porch measuring 6 sqm.



And, how it is implemented as I said to you, it is a participatory design methodology the communities have collectively prepared a house design so a think tank process has went to the bottom level interactions and what they did was to get a real scale understanding so, they made about the outlines with just two lines of blocks you know, that this is going to be your space so you have this is your room and this is the veranda this is another room you know.

So basically, they made a mark out plan with keeping this two lines of the block so that they get a real space understanding with one is to one scale. Then the house is consisted of a unit with a

gabled roof and walls of made of concrete hollow blocks reinforced horizontally and vertically. So horizontally and vertically when we need to refer with the earthquake seismic course which recommends that have a vertical reinforcement and as well as the horizontal bands.

The sill band, the lintel band, the roof band and the plinth beam and the diagonal bracing all these things they are talking about the earthquake-resistant futures and as we inform the gross floor area is about 42 square meters divided into 2 bedrooms 9 square meter each and a common area of 18 square meter and a porch of 6 square meter.

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Stage one:
Partial construction

Stakeholders

1. Communities
2. local builders
3. construction supervisors (one for 30)
4. social promoters (one for 50-70)

The work carried out during this initial stage was:

- excavation and laying of the foundations;
- the resistant structure was built and the walls were built up to 1.70 m in the bedrooms and 1.10 m in the remaining areas;
- the roof was built and covered;
- paving.




Figure 12.1 House at the end of stage one

So, as I discussed with you about 3 stages stage one which is a partial construction so here, the communities who are these stakeholders. The communities they also provided some kind of informal the unskilled labour at this process and the local builders because for a group of the some of the local builders were hired by the contractors and the construction supervisors for every group of 30 so, you have one supervisor who is looking at it.

There is another which is a social promoter, who is looking at the whole community level and for 50 to 70 households is one of the social promoter has been appointed. In that way, there is a clear transparency and there is a clear the flow pattern of the communication from starting from a household to group of households to the community level and also, you know across various smaller communities.

So, what they did was in the initial stage they done the excavation and laying of the foundations as per the course, the earthquake-resistant structure has been built and the walls were built about sill level about 1.7 meters in the bedrooms and 1.1 meter in the remaining areas. So, the roof was built and covered, paved so this is a stage one as you can see the vertical reinforcement and the stage one is completed with a half-finished product with a small roof walls on the basic structure. There is no windows, there is no doors nothing.

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Stage two:
Completion by owners

Stakeholders

1. Communities
2. social promoters
3. master builders and bricklayers
(provided training for communities)

The following work was carried out by the owners themselves:

- The lintels of the doors and windows
- The walls were finished off
- waterproofed walls by rough coating all the outside walls.
- Finishing touches applied to the whole house.




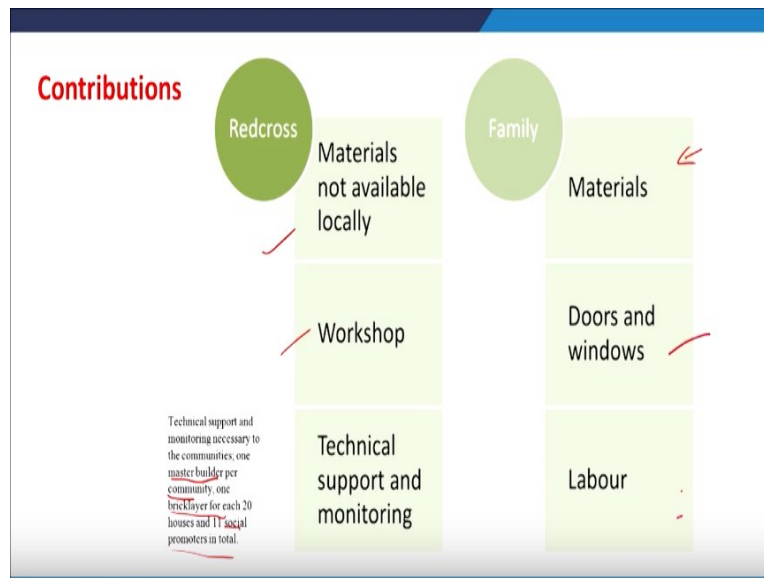
Figure 12.2 House painted at the end of stage two in San Antonio Jiboa

Then in stage two, this is where the completion by owners so, communities also have provided so, in the earlier stage the materials were provided because these concrete blocks were not available locally so the agencies have provided the concrete blocks but in here the communities as per their feasibilities as per their available resources they have developed they brought the doors and windows.

And here, the master builders apart from the social promoters, the master builders and the bricklayers have provided training for the communities so that you know, they understand the basic construction techniques because that will help them tomorrow, if something happens they can do by themselves and the lintels of the doors and windows and the walls has been finished with all the plastering and the waterproofing part of it.

By rough coating on outside walls and finishing touches applied to the whole house. So, this is a stage 2.

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But then, if you look at the contributions, the Red Cross have provided the materials which are not available locally and they also provided some kind of workshops to organize this whole process and in a technical support and monitoring because they have even they need to provide the technical support to the communities and one master builder per community so for each community they have given one master builder.

One bricklayer for each 20 houses and 11 social promoters in total of the whole 582. So, in family they have provided the materials like the gravel, sand and things like that and also the doors and windows and they also provided the labour which got training later on.

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Stage three:
Water supply and sanitation

Community needs identified using participatory diagnoses were:

- 1) Describing the community
- 2) Knowing our needs
- 3) Analysing the current community's situation

Work involved were

- install a sink with two taps
- system for removing grey water connected
- system in each house for the excreta disposal.
- **Workshops conducted**

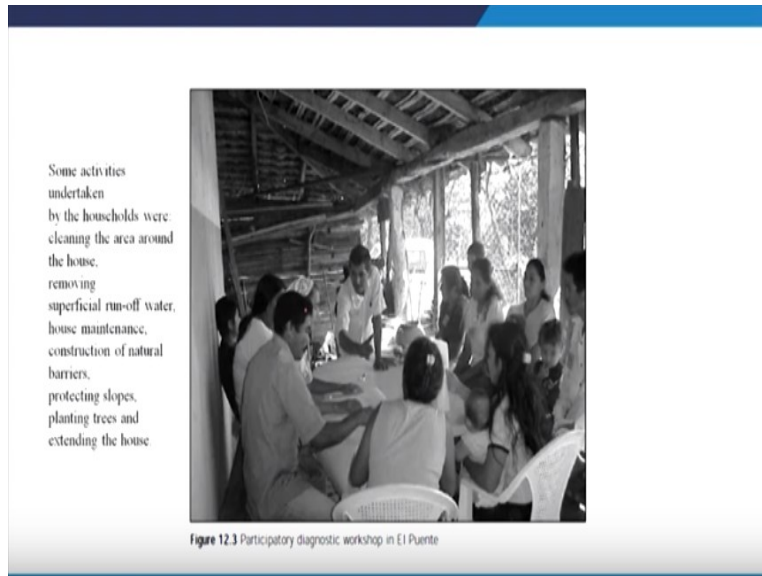


Figure 12.2 House painted at the end of stage two in San Antonio Jiboa

On the stage 3, the service completion of it, the water supply and sanitation. So here, they installed a sink with two taps, a system of removing grey water connected, a system in each houses for the excreta disposal and there has been also some workshops which has been conducted for the community the training and you know interactions so the community needs how are these identified.

Because this is where the participatory diagnosis have been implemented to describe the community what the community was and how they are learn about their needs and analysing the current community situations. So, this has been the descriptive lure of a community have actually given a significant understanding of their needs and wants and the feasibilities.

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And even, after this construction, people have been engaged in certain training process because they need to get into understanding how to maintain these service aspect, how to maintain the greywater take off or the water supply aspect, the sanitation aspect or the waste disposal. So, they have been got training on the cleaning the area around the house removing superficial run-off water, house maintenance.

Construction of natural barriers, protecting slopes, planting trees and extending the house you know, some kind of awareness has been programmed with the community.

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Other construction projects;

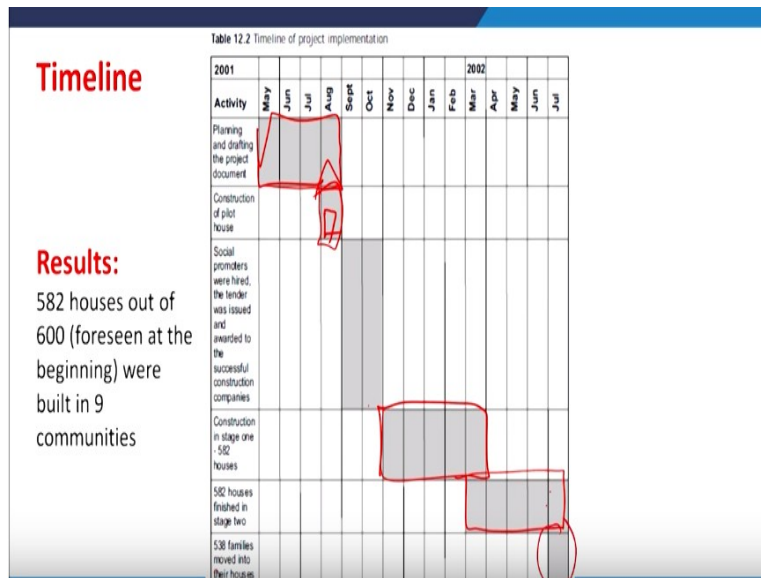
- 6 educational centres



Hogar del Niño (a house for people with physical and mental disabilities)
<https://www.youtube.com/watch?v=P3EXqghC19c>

And with this, there has been various public projects like schools, like this one school of Hogar del Nino which has been developed on a house for people with physical and mental disabilities which has been constructed and there is 6 educational centres which has been constructed to cater the needs of the community.

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And looking at the timeline, we have about 500, what are the results starting from the 2001 from May onwards it is about the planning and drafting of the project document so it looked at analysing the needs, the combination of the cooperation of different agencies and how to go ahead with it and then in August somewhere, the construction of the pilothouse have been constructed.

And since September, October we see the social promoters were hired and the tender documents were issued and awarded to successful construction companies to carry on with the construction aspect and this is where, the stage one which we discussed about the unfinished structure the basic skeleton of the house and here we talked about the stage two, where the communities have come forward and they put some materials.

And they raise some funds together to for buying some materials and this is where the stage two have occurred and the stage two in the last stage when they are about to get so they looked into the service infrastructure as well.

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Results

- Participatory workshop
- Constant community involvement

Learn as you work

Users themselves played an active role in their own recovery.




Figure 12.4 Community team meeting very early in the morning

So, what are the results now there has been a constant community involvement and a participatory workshops have been like you can see that every morning the community is, team is meeting and learning different aspects of their housing project and how to go ahead with it so that is what they worked on a motto learn as you work and the main here, the one thing is main users themselves have played an important role in their own recovery.

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The direct impacts of the progressive housing approach are as follows:

- ✓ 97 per cent of the population covered
- ✓ new employment
- ✓ improving the standard of living.
- ✓ strengthening social networks.
- ✓ Breaking cultural stereotypes by woman involvement
- ✓ The El Salvador Red Cross active role

And, what are the direct impacts of this progressive housing, 97% of the population have been covered, new employment have been generated and improved the standard of living, strengthening the social networks because they start working together, breaking cultural

stereotypes of women involvement because woman has been a major asset and where people were came forward to be part of the recovery program in terms of decision making in the construction and the El Salvador Red Cross as active role the local Red Cross.

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Figure 12.5 Houses that have been simply finished in Hacienda Nuevo Oriente, five years later

And, even after five years, one can see that you know, how they are able to maintain their gardens the fabric of the house.

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Constraints

- Difficulty for communities for finding finances for second stage
- Specific deadline for project
- Legal procedures regarding land ownership

What are the constraints? You know, every project will have its downturns, difficulty for communities for finding finances in the stage two because what they do is in order to procure the materials some people are able to afford some people may not and then they used to collectively

do someplace or shows to gather some funds and that has also has an impact on the specific deadlines of the project?

And the other thing we did discuss about the tenure and the ownership the legal procedures regarding the land ownership which also took some time.

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Conclusion of casestudy

- active participation from the community – is a viable alternative
- families able to meet their economic obligations, as they will be expected to make a hefty contribution
- participative design : extensive knowledge of the country, culture and its way of life is paramount.
- The remaining building work should be managed by the users
- optimize the time taken to carry out the project.
- Families' 'amateur supervision',
- role of the social promoters from the Salvadorian Red Cross was of crucial importance, as they created a feeling of trust between the community and the Red Cross office
- training of local people in social and technical areas (construction).

And the study concludes that active participation from the community is a viable alternative because that is more flexible in many of the cases in this course what we are studying is a participation, participation and participation. Families able to meet their economic obligations and they are expected to as they will be expected to make a hefty contribution so in that way they have been organizing themselves.

And extensive knowledge of the country, culture and its life is a paramount, so one has to work with the local communities the trust has to be developed and only a part of it has been developed in the remaining part has been developed by the users and how to optimize the time taken to carry out the project. There is some constraints how the families have a very amateur level of supervision.

You know, that is also because they may not be building from the building background, role of social promoters was a crucial importance because they had developed a trust between the

community and the Red Cross, training of local people in social and technically so that has given them some kind of employment scope that they can work as a masons they can work as a skilled persons.

So, these are some of the understanding from the El Salvador case and how it slightly deferred from the cold-core building approach to a progressive housing approach and how communities are involved in the process of it. I hope this helps you. Thank you very much.