“How a reconstruction after a powerful earthquake may be steered, funded and managed / A comparison between interventions in Peru and in Haiti “

HAITI - Port-au-Prince 12/01/2010

250.000 deads

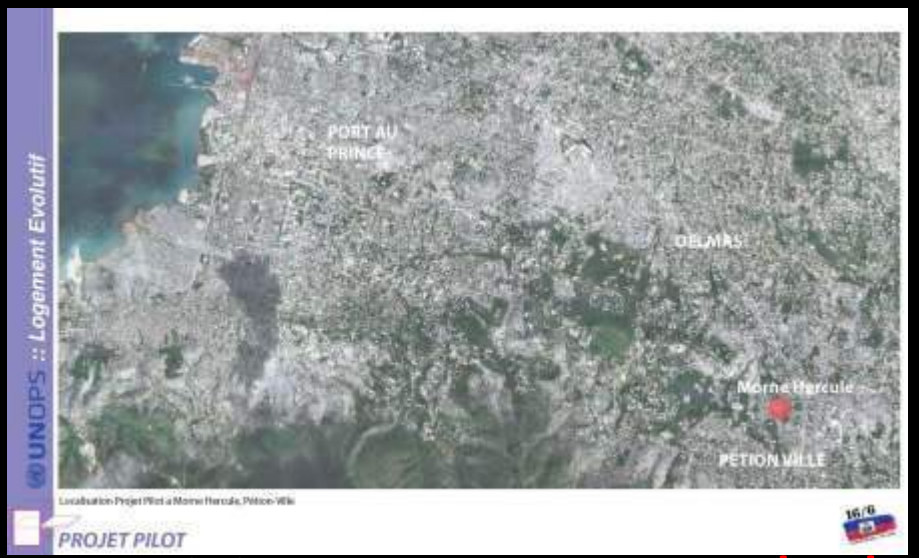
Two major earth-quakes hit the Caribbean and Latin America

PERU – Ica region 15/07/2007

500 deads

Why?

Peru: a purely rural setting



Haiti: an over-crowded urban setting

- How to respond to the urgent and dramatic needs?
- What the international community can do to relief the affected populations?
- Today's presentation, aims to shows two very different approches:
  - A more people-tailored one, made of little steps, door-to-door meetings, adapted to a rural community, saving every little cent to do more, and
  - A second option, more donor-tailored, powerful and technically over-sized, allocating a massive amount of money.

In the end, only people's satisfaction matters.

Let's move to Peru, first.

- **The Belgian Red Cross fundraised a 1M€ aiming at Ica-earthquake recovery programme, out of which only 400k€ to support housing**
- **Specifically aiming at the rural houses reconstruction, some 50 dwellings were planned, with a supposedly "easy and cost-effective" reinforced concrete and bricks technology...**
- **Then a bold, visionary architect arrived, bringing his bizarre ideas to rebuild with a "antisismic adobe tecnology", as studied with and supported by the local Universidad de Lima**
- **Thanks to the huge savings in terms of locally available materials and a robust Cash for Housing tailored programme, instead of planned 50, 97 houses were built instead, to the families' sincere satisfaction!**

WWWOOOWWW !!! So entirely sustainable!!!
(Greta would be proud of me!)
But, actually… what ***adobe*** is and, specifically, is it appropriate for a modern building, though in a pure rural setting ?

ADOBE needs «a good pair of boots and a large hat!»

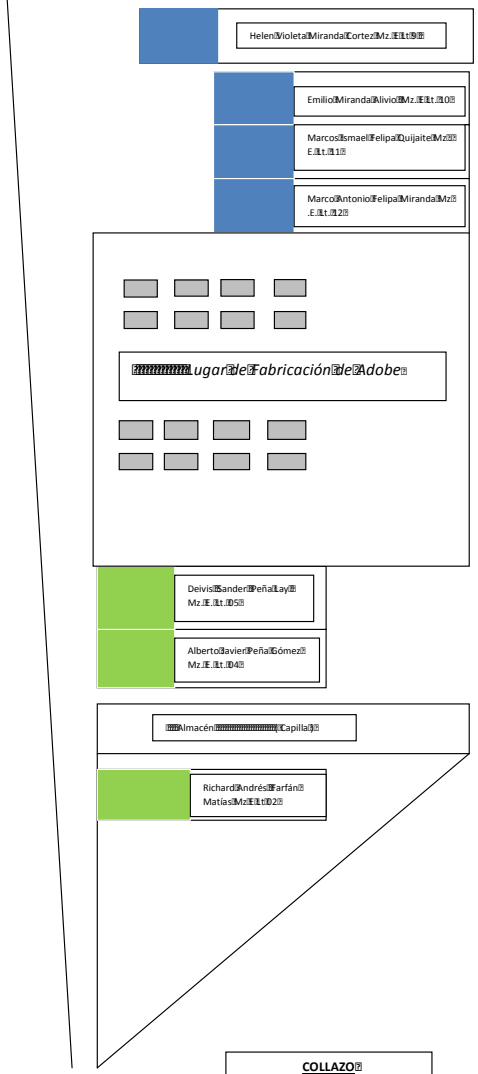
(Elizabeth II's proverb)

But in the Peruvian coastal area DOES NOT RAIN… so we are half-way done !!!

Samples of what *adobe* can be used for… if you are capable to do so!!!

Only, a huge issue is when beer-addicted people don't find a toilette near-by…

Traslation: dear Cuzco-friend, care your city… do not urinate here, (*adobe* may suffer it)



Well, ok, sorry! Now, back to the Belgian RC-funded houses reconstruction. As you can see, just very small plots, side-by-side each others

Let's get the house started ! All family helps: this saves a lot of money, motivates everyone and, especially, provides a huge sense of ownership, as the house… sorry, the home is NOT a gift but IT'S made BY ME !!! Women are also very happy, as they directly contribute and are free to scold their

River stones

In-situ manufactured adobe bricks, then you can double the **impact** and the **income** of the local population

WORKS IN PROGRESS !

Lintels are made of local wood-sticks

Safety?! Oh, please, just no comment…

The plastic net ensures a solid contituity between the foundation and the ring-beam level, so that in the end, you have kind of a unique 2,6 mt-high bearing-wall

Roof-structure is made of bamboo from Ecuador. A basic Water-proofing is ensured by a layer of pigeons' escrements, on top of a plastic layer

Some decent finishing …

Breaking the bottle… you never know!



97 families more than happy: solid, valuable and bio-climatic homes! But… another earthquake came, 2 years later and…

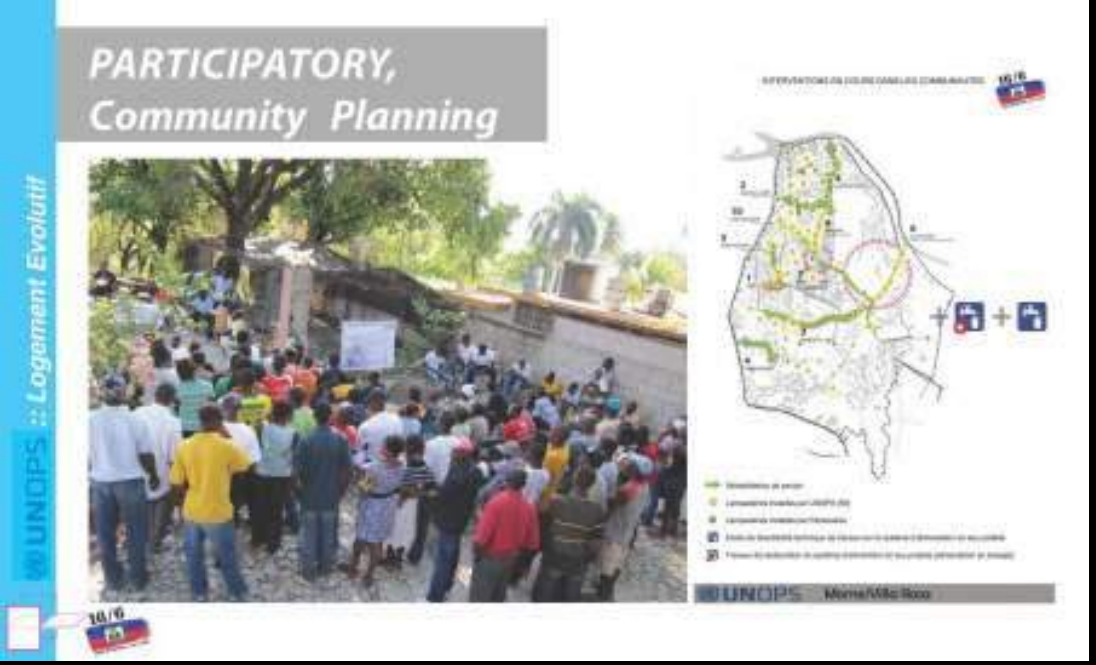

… only a few cracks at the plastering level appeared. A few cost repair, the houses resisted soundly!

Let’s move to Haiti, 2012-2013

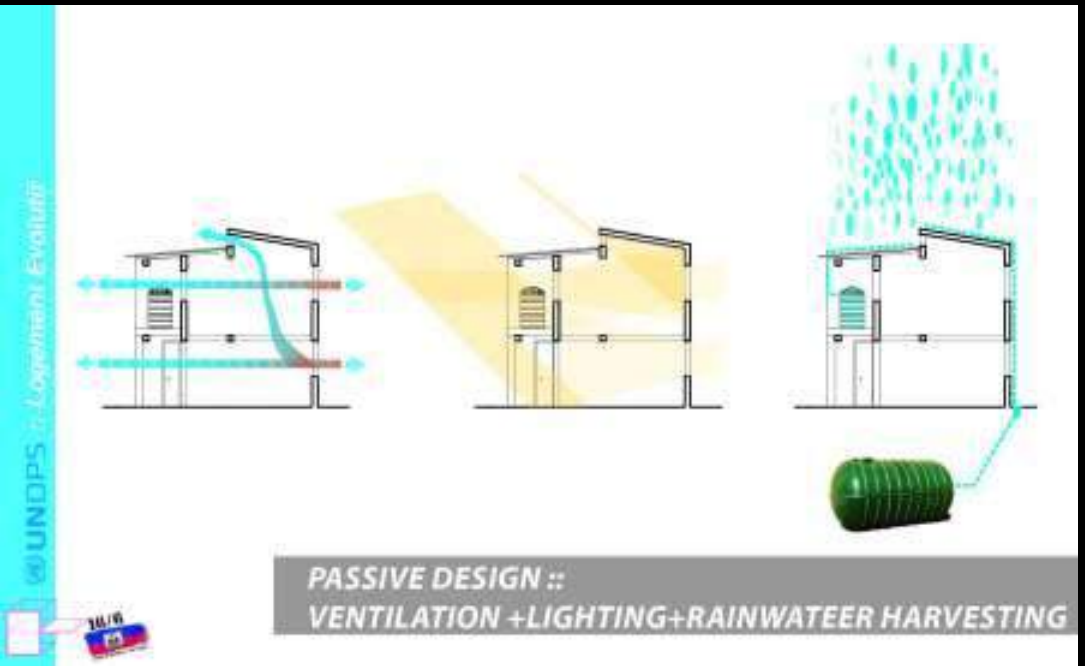
Haitian people call it: *GOUDOUGOUDOU*…

UNOPS strategically decided to rebuild the houses on the same hills where they collapsed.

Fair enough, but tremendously challenging. For such a large reconstruction programme, some 60M USD were invested. And people wasn't that really happy…



So, a thorough **social mobilsation** was needed and a massive Cash for Work (careful: not CfH…) Implemented. International engineering firms and consultants were also mobilised.



A valid incremental housing design was targeted, along with some environmental awareness and related solutions

UNOPS :: Logement Evolutif

Finally: nice outcome?
Sure, but how costly!

The costs?

UNOPS

BOQ-Devis estimatifs

MODÈLE 2 - deux étages 42m2 - bloc E, site pilote Morne Hercule

Bâtiment: longueur	6.4	Surface parket deck	0	Surface de murs de la maison	168.79	Surface béton toiture	20.65
Bâtiment: largeur	3.9	Surface parket maison	24.96	Nombre de poteaux	10	Surface en tôle toiture	5.58
Bâtiment: hauteur	6.01	Fond de fouille: longueur	30.9			N.bre des maison	1
		Fond de fouille: largeur	0.5			Portes en bois	5
Deck: longueur	0	Fond de fouille: hauteur	0.7			Fenêtres en bois	7
Deck: largueur	0	Chainage intermed. RDC: longueur	23.7	Nombre des raidisseurs	1	Œuvres en fer forgé	4
Deck: hauteur	0	Chainage intermed. étage: longueur	26.4			Surface portes	5.4
						Surface fenêtres	11.52

Longueur fondation déjà faite en ml	21.20	Surface mur en parpaing de blocs 20 ou en roche déjà faite en m2	16.80	Nbre de poteaux déjà utilisés en unité	6.00	Longueur de mur en maçonnerie de blocs 20 ou de roche déjà faite en ml	7.00

BLOC E / GERALD CENAT

Activités prévues	Unité	Quantité	Prix Un. USD	Prix Total USD	Montant main d'œuvre Prix Un. HTG	Prix Total HTG
FONDATION						
POTEAUX						
RAIDISSEURS						
MURS EN MACONNERIE DE 20cm ou 15cm						
CHAINAGES						
DALLE PLANCHER						
INSTALLATIONS						
PORTES, FENETRES, ACCESSOIRES						

Prix estimatif des matériaux	USD	6,362.99		
Transport 10%	USD	636.30		
Main d'œuvre	USD	1,908.90		
MODÈLE 2 - deux étages 42m2 - bloc E, site pilote Morne Hercule		8,908.19	USD	Gdes 60,648

Modalité de paiement			
	1 ère Etape	30%	payé le:
	2 eme Etape	30%	18,194
	3 eme Etape	40%	24,259

Matérielles inclus dans une maison: "Maison-type" (isolée)

Materiales	Unidad	Quantité	Cout unitaire EUROS	Cout total EUROS
Cemento: Base/Sobre Base/Tarrajeo/Piso	Un	130,00	4,25	552,50
AGREGADOS				
Piedra	m3	10,00	7,25	72,50
Ripio	m3	20,00	6,00	120,00
Arena	m3	10,00	7,25	72,50
Alquitran	Gln	6,00	3,13	18,75
Rafia	Conos	2,00	6,00	12,00
Geomalla	Rollo	1,50	250,00	375,00
CLAVOS				
Clavos de 2",3",4"	Kg	15,00	1,00	15,00
Clavos de 5"	Kg	4,00	1,25	5,00
Alcayata de 2"	Kg	3,00	4,50	13,50
alambre Nº 16	Kg	10,00	1,00	10,00
TECHO - MADERA				
Viga Collar de mt 4.60 x 0,03x0,03	Unitario	40,00	9,25	370,00
Dinteles de mt 1.50 x 0,22 x 0,03	Unitario	8,00	6,00	48,00
Dintel de mt 4,00 x 0,22 x 0,03	Unitario	1,00	20,50	20,50
Caña Redonda de 7 mts (diam. 4")	Unitario	25,00	4,75	118,75
Caña Chancada	Unitario	40,00	3,25	130,00
Esteras	Unitario	9,00	3,00	27,00
Plastico	Mts	35,00	0,25	8,75
Viruta	Unitario	10,00	0,75	7,50
Bloqueta de Vidrio	Unitario	5,00	1,75	8,75
Gasolina	Gls	2,00	2,49	4,99
Preservante para Madera- Yeso - Imprimante - Sika	Unitario	1,00	25,00	25,00
Instalación Eléctrica				
Tubos de Pvc sap 3/4	Unitario	20,00	0,75	15,00
Cajas Octagonales Pvc	Unitario	6,00	0,25	1,50
Cajas Rectangulares Pvc	Unitario	8,00	0,25	2,00
Codos	Unitario	20,00	0,13	2,50
Caja General de Luz Pvc	Unitario	1,00	3,25	3,25
Cerrajería				
Puertas de 2mt x 1 mt	Unitario	2,00	55,00	110,00
Ventanas de 0.80 x 1.20 cm	Unitario	3,00	27,50	82,50
Adobes y Mano de Obra				
Transporte, Retiro de Tierra por Asentado de Adobe		1,00	125,00	125,00
Adobes (incluida la paja)	UND	4.500,00	0,06	281,25
Mano de Obra	UND	1,00	1.000,00	1.000,00
Supervisión técnica				
Control diario de las obras; dibujos técnicos; almacenaje; seguimiento proveedores; licencias	UND	1,00	100,00	120,00
			ARRONDI	€ 3.800

PauP: 8.900 USD,
plus walls, Contractor's profit, running costs, Consultancies, wages, …

Ica: € 3.800,
all inclusive !

En forme!

Thanks all!

Ju Falemenderit !