2.2. Lesson from Central Java Earthquake May, 2006 and the Reconstruction Project (Kazushi

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ジャワ島中部地震の被害と復興の取り組み(白川和司)

Lesson from Central Java Earthquake, May 2006

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Capacity Development for Seismic Resilience

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My opinion through the recognizing the activities after the earthquake

Even non-engineered house



The house should **install the technology** of building engineers

Non-engineered house

The word " non-engineered house" I use in the presentation means below

●Workers have no knowledge regarding building structure

(Mostly workers have experiences to construct. It means workers have a certain skill such as skill for bending rebar, mixing concrete which is not assured in terms of quality, placing formwork, digging grand, so on, for the processing the construction.)

●Owner have no knowledge regarding building structure

After the earthquake,
the government of province
released the subsidy to the people
with the conditionality
aided people should comply with
building law/regulation



They thought that as people complied with law then the people could get good quality House against earthquake

The order reminds me of how technology can be installed to houses

(To imagine simple house, not complicated house)

1)The simplest way

High class engineers design and supervise houses based on the knowledge such as building structure, materials, how to check, detail design for some structure have expected ability, and so on engineers have.

High class engineers conduct the work execution on house construction site.

The order reminds me of how technology can be installed to houses

(To imagine simple house, not complicated house)

2The second way

Engineers design and indicate the work execution method to workers.

Workers construct the house in accordance with the work execution method.

The order reminds me of how technology can be installed to houses

(To imagine simple house, not complicated house)

• 3The third way

To standardize the several portions of design which need engineering knowledge (especially the portions which are effective to realize the structural ability against earthquake.)

Standardized design/technology are described on the regulations government declared.

After the earthquake

- "Key requirement" was developed.
- "Key requirement" was enforced.
- Check list for "key requirement" was developed.
- Check list for "key requirement" was installed into building permission system.
 - "key requirement" is so-called standardized design I explained on previous sheet.

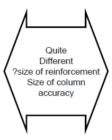
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Table 6.1 Check list for safer housing							Table 6.2 Check list for the building permission application these list of haldest Permission nationals in a Social Property.				
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_		_	_				1	Attaching of Floor alon Oraning of Shearline	Politico Politico	7	
	CTION MATERIAL	-		_			7		FYSINE N	1	
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-						section 2 and		Minimum distance between the building and reads	Not over the appointed distance	T	
-	 Materiols are well mixed like Pules and poured to farm work immediately. 	_	_	_		District governor's decision notice letter	1		1	ı	
_	 Form work is hard and no bleeding. Any date and vaid is autoded by using a stick to corrosed concrets when it is: 	\vdash	_	_		164.404			1	ı	
pouring.	or such Reference area on management angul to page to could have concess about a tr	ı	1	1		section 2 and	10	Minimum distance Embaren like tence and made	Not over the appointed distance	1	
2. Mortar	1 pertion of portional coment and 4 portions of clean sond	-				District governor's dominion notice better	ı			ı	
	Spen. Hard stone or rock is used.					191414	1		1	ı	
4 Wood	Hard, dry, dense fiber, well cared, no crack, and straight					section 5 (1)	11	Ninimum distance between building and let horder in case the building does not coincide	2 m and over	+	
							-	uith the lot Strimen lend was	91 -2 minor	4	
C FOUNDATI	ON a. Foundation depth is at least 60cm.					section 5 (4)	15	Solmen led and Springer height of the building		t	
_	Base width minimum is 60cm. Steel reinforcement is sechoned at least 40 cm from a column to a					section 1 (ii)		Minimum distance between the roof and the fence	height Ann and cone	4	
Sourcistics	L. JAMES THE MANAGEMENT OF SECURITY OF SECURITY	ı	1	1		Section 6 (A.P. A.V.)	15	Maximum height of the Fence is found of the building that flores the shreet	1. Sim or less	+	
		-	-			section 7 (ii)	99	Minimum size of a private house	27m2	+	
D TE BEAM	a. Minercure dimension is 15cm x 25cm.					section 18	11	Construction materials to be used	in contomity with the	1	
	 Main stool reinforcement is four steel bars: of 10mm diameter. 					sector 15 (Th	19	Target land to implement future projects	Not ediated	t	
Someter of	 Stimps of time dameter at 15cm intervals or stimps of not less than 6mm. T2cm intervals. 					number 15 (Tpl.	-	The land	Not uninvestile to become	1	
		-	_	_			19	The land		+	
E WALLS	Minimum wall area framed with to bears, column and ring beam is 9 m2,	-	-			section 19 (1).	20		Not under dispute 80 cm and over	4	
1						toly requirements.	21	Foundation dayth Foundation have well to	60 on and over 60 on and over	+	
F COLUMN	a. Minimum dimension is 15cm a 15cm.	-				1	25	Sinesco of te tean	15 cm x 20 cm and own	4	
	b. Main shool coinforcement is four shool bars, of 12mm diameter.						1	Say of the stimp and the distance between the stimps	The attrasp is 0 mm	4	
Same of the last	 Stimps of 8mm dameter at 15cm intervals or stimps of not less than 6mm. 12cm intervals. 	1	1			1	ı			1	
and folial co	d. Stackbars are anchored from a column to a Se beam and a ring beam at	\vdash	-	_	$\overline{}$	1	21		intervals, or the strop is not less than 5 mm at 12	12	
Second set 40	OF THE PARTY OF TH	1				1	ı		on recover.	1	
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-	E room toward or most	-					30		eterosis, or the strop is not imp turn than at 12	3	
I ROOF FRA	ME a Minimum dimension of wooden beam is Gon x Clore.	-					1		on intervals.	1	
	b. Steel hook is used in every joint connection.					1	<u> </u>	Dimension of coscode public real	12 on a 15 on and own	4	
							54				

After the earthquake, Government requested people to get building permission if they wanted to get subsidy.

(At the same time, government dispatched engineers to support people)

If regulations regulated by law was highly respected, Government did not need to such request to the people.







Left side picture

Even non-engineered house, using the regulations/system regulated by law/decree, technology was installed to the house.



Compliance is infrastructure to realize the ability if we use such system

After the earthquake, provincial government gave incentive not only restriction.

To prevent the people from future disasters we should consider how to install the technology to each non-engineered house

We have to preserve their smile, their life from earthquake



