



Damage and Loss Assessment

The Housing Sector



J. Roberto Jovel

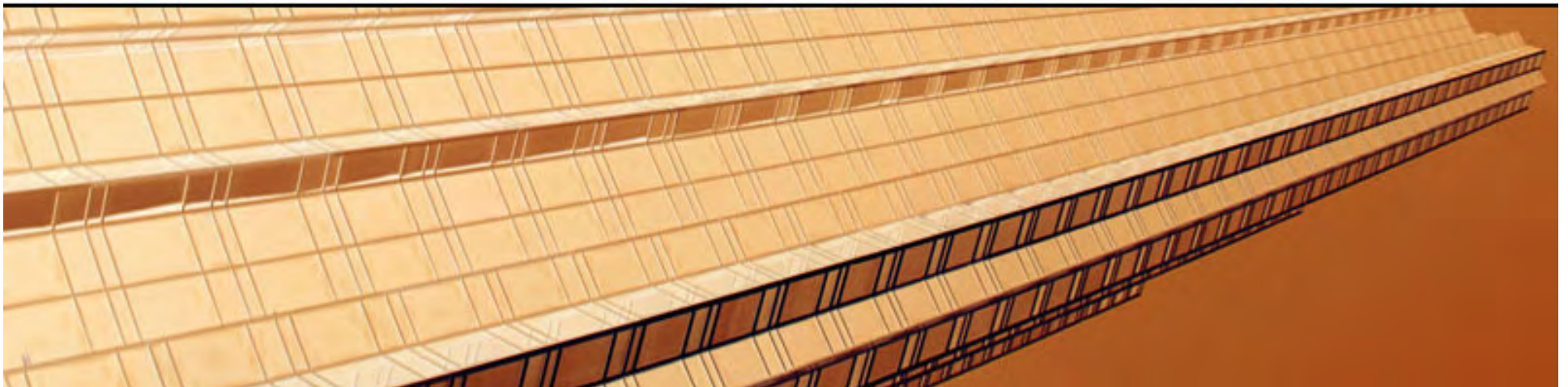


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Typical Effects of Disasters





Housing Sector and Disasters

Housing is by far the most affected sector in cases of disasters, especially in those events caused by earthquakes

In cases of disasters, the housing sector sustains

- **Damage to assets**
- **Losses in its economic flows during the period of time required for recovery and reconstruction**



Types of Damage

Total or partial destruction of

- Housing units and in-house components of electricity and water supply/sanitation systems
- Household goods
- Equipment and products of home-based, informal micro-enterprises



Types of Losses

Cost of demolition and rubble removal

Temporary loss of rental income (of houses under rental modality)

Cost of temporary housing scheme for homeless (met by government, international assistance and/or private sector)

Cost of associated transport to/from temporary camps and place of work



Procedure for Damage and Loss Assessment





Step-Wise Procedure

- 1. Pre-disaster baseline of sector**
- 2. Develop post-disaster forecast**
- 3. Estimate damage and losses**
- 4. Estimate effects on balance of payments and on fiscal budget**



Pre-disaster baseline

- **Define sector position in affected area: deficit or surplus of housing**
- **Develop typology of existing housing units, by**
 - **Size**
 - **Type of construction material used**
 - **Value of housing**
 - **Ownership of housing (private or government owned)**
 - **Rented houses**
- **Ascertain value of monthly rentals, and of monthly payment on mortgages**
- **Are there any unoccupied housing units in affected area or in nearby areas?**



Post-disaster forecast

- **Ascertain need to provide temporary housing facilities for people rendered homeless by disaster, and for how long**
- **Define preliminary plan of repair and reconstruction of housing units, taking into consideration**
 - **Capacity of construction sector**
 - **Availability of skilled labor**
 - **Availability of construction equipment and materials**
 - **Adequate/timely funding for reconstruction**



Estimation of damage

- 1. Using typology of housing units, and resorting to field survey of affected units, estimate number of houses**
 - Fully destroyed**
 - Partially destroyed**
- 2. Using data on current construction unit costs – obtained through interaction with local professional builders and government officials – develop average reconstruction and repair costs for each type of housing unit**



Estimation of losses

1. Define **realistic** calendar of housing repair and reconstruction, by stages
2. Estimate cost of temporary shelter scheme
 - Cost of land acquisition
 - Cost of building temporary quarters
 - Cost of water supply, sanitation and electricity
 - Cost of transport to/from work
3. Estimate cost of demolition and removal of rubble
4. Estimate loss of rental income

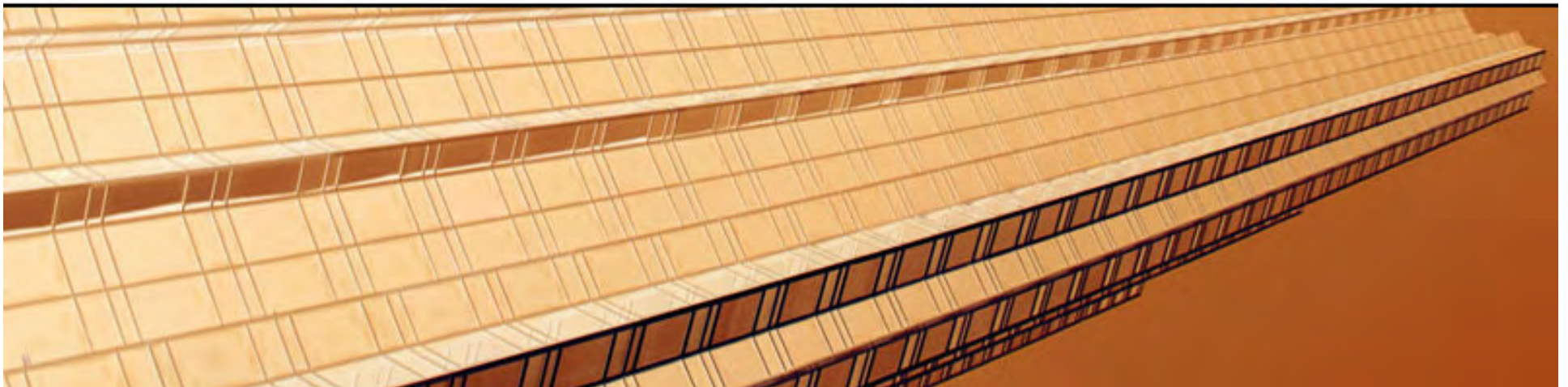


Who should make the assessment

- **Engineers or architects should make the assessment of damage**
- **Losses to be estimated by same in cooperation with economists**



Inputs for Macro-Economic Impact





Impact on balance of payment

After conducting in-depth analysis of construction sector capabilities, estimate

- Need and cost of importing construction equipment, materials and labor (imported component of damage)**
- Value of exports on above that will not be made due to full utilization of domestic capacity**

Impact on Fiscal Budget

Estimate amount of unexpected expenses made by government to meet temporary shelter costs

Estimate rental amounts that the government will not collect in case of government-provided housing schemes

Estimate tax revenues that will not be obtained in case of special tax relief programs (i.e. Tax not collected on private sector rental of houses).



Information Requirements



Sources and Information

Information required

**Most recent housing
census or survey**

**Most recent
household surveys**

Construction costs

**Construction sector
capacity**

**Value of monthly
rentals**

Sources

Statistical Office

Housing Ministry

Planning Ministry

Builders Associations

Building contractors

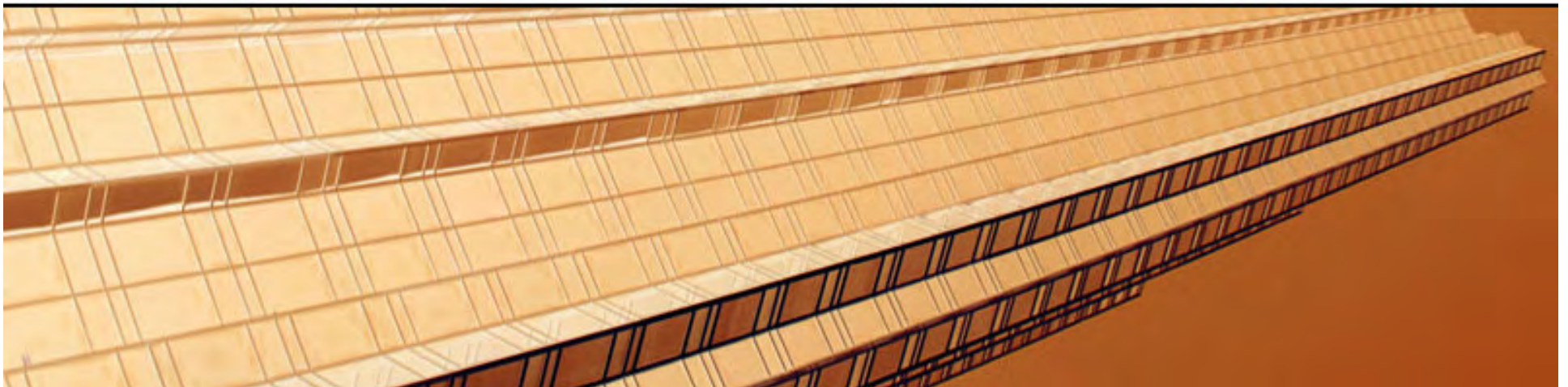
Private banks

Central Bank



Example of Assessment Results

Yogyakarta Earthquake





Damage and loss estimation

District	Rp Billion	
	Damage	Losses
Bantul	3,419	333
Sleman	1,723	175
Gunung Kidul	1,299	129
Yogyakarta	358	35
Kulonprogo	621	62
Klaten	6,278	627
Others	216	22
Total	13,914	1,383

Ownership of damage entirely in private sector domain; losses, on the other hand, are divided among both private and public sectors



A Reflection

	Yogyakarta Earthquake	Aceh Tsunami
Pre-disaster housing stock	984,058	832,208
Number of houses fully destroyed	154,098 (15.7%)	127,325 (15.3%)
Number of houses partially destroyed	199,160 (20.2%)	151,653 (18.2%)



