Post-Disaster Reconstruction: Planning and Sustainability

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Shelter after disaster is a process as much as it is an objective
Classification of types of evacuation

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<th>Short-term</th>
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<td>Emergency protection</td>
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<td>Post-impact</td>
<td>Rescue</td>
<td>For reconstruction</td>
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TWO PHASES OF POST-DISASTER BUILDING INSPECTION

First survey
- IMPACT: short-term and spontaneous precautionary evacuation
- OUTCOME: return home, evacuate

Second survey
- slight damage (green) - return home
- restricted use (yellow) - repair
- serious damage (red) - rebuild
- very serious damage (red) - demolish

Reconnaissance survey

TOTAL NUMBER OF HOMELESS PEOPLE AND FAMILIES

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ATC-20: a standard for evaluation of building condition and safety

Reconstruction in the context of the 'disaster cycle'
Quiescence

Reconstruction

Mitigation

Preparation

Emergency management

Cumulative disbursement curve

Emergency management

Rehabilitation

Reconstruction

Post-disaster development

Unit cost

Disaster

1 mth

2 mths

10 yrs
Role of marginal costs in disaster mitigation

The anatomy of reconstruction
Reconstruction of Lisbon, 1755-95:

- land extensively regraded for rebuilding
- fire-breaks and wide streets
- accessible, rectilinear street plan
- shear walls in new buildings
- standardisation of architectural elements

BUT, authoritarianism and exclusion

The lack of 'architectural Darwinism' (survival of the fittest building) before the modern era is particularly striking.
Objectives of post-disaster reconstruction planning:

- timely restoration of normal activities and living conditions
- protection against the future impact of hazards
- multi-objective management
  - motivating the parties concerned
  - building coalitions to achieve collective aims.

WHO PAYS?
Financial issues
- government
- donors
- community
- combination

WHERE TO RECONSTRUCT?
Changing land use tenure
- same site
- new site

WHO DESIGNS THE PROGRAMME?
Decision-making process

WHO ASSESSES THE DAMAGE?

HOW IS INFORMATION DISSEMINATED AND COMMUNICATED TO THE PUBLIC?

WHAT KIND OF RECONSTRUCTION?
- contractor-based
- community-based
- both

HOW TO SET NEW STANDARDS OF QUALITY?
- local building codes
- national building codes
Major post-disaster reconstruction is a 10-to-25 year project

Conditions can change between its inception and its conclusion

• demographic composition of the area

• economic growth rate ("boom-and-bust economy")

• the value of money (inflation and base rates)

• community goals and objectives.
Attachment to place:
genius loci and
geographical inertia

What creates geographical inertia?

- existing patterns of land ownership
- existing patterns of economic activities and social relations
- genius loci, sense of place, attachment to place
- historical preservation
- gradual adaptation to hazards.
What determines the *genius loci* of a place?

- its historical character
- physical and natural site characteristics
- symbolic references that express some aspect of local, regional or national culture in the form of monuments or facilities.

Some problems to look out for
The wrong approach:

- restorable buildings demolished
- useful rubble, including reusable architectural elements, cleared away
- trees uprooted needlessly
- hasty and inappropriate repairs carried out
- historical and archaeological resources disturbed.

The wrong approach:

- different government agencies adopt conflicting strategies
- suspension of norms and design procedures
- inundated with requests for building permits
- poor quality inspection system (demand greatly exceeds supply).
The need for communication and collaboration

Planning and decision-making
Agency
Users

Implementation and construction
Agency
Users

Debris flow

Examples of good practice

After Kreimer (1984)
LESSONS

- utilised
- adopted
- learned

REGISTERED
- archived
- forgotten
- ignored

Urban and regional planning

Emergency planning

Post-disaster reconstruction planning
The hazard mitigation component of planning:

- hazard identification, description, evaluation
- risk estimation (assessment), analysis
- goals, objectives, mitigation strategies
- policy formulation and planning
- plan implementation, monitoring, evaluation, updating.

Axiom: good factual detail is essential to a well-organised reconstruction plan

Microzonation of hazards and risks is an expensive but worthwhile means of ensuring that plans are based on adequate factual detail

It should be an integral part of reconstruction planning
What is **sustainable** disaster mitigation?

- Is compatible with sustainable development
- Stands the test of time
- Adapts to new circumstances
- Does not harm the environment
- Combines structural with non-structural methods
- Has a broad basis of public support

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The role of time in reconstruction

- Consultation is democratically necessary
- If the intermediate stage becomes too permanent, temporary shelter may outlive its design life
- Over-hasty reconstruction may be unfunctional and may miss opportunities for hazard mitigation

**Conclusion:** time is socially necessary in reconstruction, but it is not limitless.
Significance of the post-disaster "window of opportunity" to the reconstruction process

WINDOWS OF OPPORTUNITY FOR VULNERABILITY REDUCTION

Disaster
Public tolerance level reduced

Disaster
Mitigated hazards lead to lower vulnerability levels

Disaster
Windows of opportunity for risk, hazard and vulnerability reduction

Time (years)
The four-stage recovery model of Robert Kates and David Pijawka

Kates and Pijawka reached the following conclusions:

- Each stage is characterised by distinctive functional and operational needs that have to be satisfied.
- The stages are more or less consecutive, with some overlap.
- Level of economic development is one of the determinants of speed of recovery.
- Financial institutions rebuild first and in the most central locations (land values are distorted by disaster).
The identification of monumental (commemorative) reconstruction was the most innovative aspect of Kates’s and Pijawka’s study.

Lisbon, post 1755: monumental reconstruction
Post earthquake reconstruction in Friuli, NE Italy, 1976-1990

The stones of Venzone, Friuli, post 1976 earthquake
Gibellina, Sicily: transformation of the town ruined by earthquake in 1968 into a gigantic environmental sculpture.

Town of Gibellina, Belice Valley, after 1968
An ambitious "social engineering" project to create a sophisticated post-modern town out of an agricultural settlement.
Why?

- preservation, safeguarding and celebration of local culture
- stimulus to the genius loci
- tourism as a source of economic regeneration
- cultural trait: eutopianism

Complications.....
Criticisms of the Kates and Pijawka model:

- it does not account for political or cultural factors that accelerate or retard aid and recovery
- it does not allow for local variations in rate of recovery from disaster
- phases are not always sequential

Example:
Belice Valley, western Sicily: 1968 earthquakes

- stop-start reconstruction; geographically very uneven
- political and social marginalisation of the area
- overambitious schemes
- role of other events, including disasters in stimulating eventual reconstruction
- the Kates and Pijawka model fits badly
The same problems recur with the April 2009 L’Aquila, central Italy, earthquake.

The "permanence" of temporary housing.
The "permanence" of temporary housing

Avezzano 1915

Messina 1908
When economic chaos or mismanagement follows disaster, it is not uncommon for fiscal policies to be regressive:

- if an economic free-for-all ensues
- if fiscal probity is not maintained
- because regressive taxes are relatively easy to create and apply

The financial bonanza often goes hand in hand with undisciplined urban development.

Hypothesis: the speed and success of recovery and reconstruction depend on how politically and geographically connected a settlement is.

Lack of a reconstruction blueprint reduces the opportunities to benefit from disaster and increases the suffering of survivors.
The contexts of shelter

- Social
- Cultural
- Political
- Economic
- Historical

The cultural context of disasters and reconstruction

- Culture is difficult to quantify or even pin down to something precise.
- It is innate in our way of doing things.
- Culture offers opportunities, if one works with it, or constraints, if one works against it.
"Culture and disaster" observations

The absence of "architectural Darwinism", or the survival of the fittest buildings, was notable until the arrival of reinforced concrete.

But, paradoxically, modern frame building permits both disaster-resistant construction and the erection of larger buildings that collapse more easily.

Can we create sustainable recovery from disaster?

Does that mean cultural mutation?
Sustainable reconstruction

- is compatible with sustainable development (symbiotic, mutually reinforcing)
- has a broad base of public support
- stands the test of time
- adapts to changing circumstances
- does not harm the environment
- combines structural and non-structural methods

But what is sustainable reconstruction?
What is sustainable reconstruction?

- It generates lasting local employment, through both the reconstruction itself and the regeneration of businesses.
- It preserves *genius loci* and the sense of attachment to place.
- It is not divisive and does not fuel conflict in the local community.

Role of the devolution-centrism dichotomy in recovery from disaster

- The *middle classes* have more access to the centre than do the poor.
- But even devolution is not necessarily favourable to the poor if it is squarely in the hands of a *local élite*.
- The ultimate form of devolution is the "informal" economy.
Rare instances of the middle class being primary victims


Disaster is a problem of the poor and marginalised: therefore so is reconstruction
Possible application of theory on vulnerability to problems of interpreting reconstruction processes.

A classification of vulnerability to disaster

**Total:** life is precarious in general

- **Newly generated:** due to changing circumstances
- **Delinquent:** due to corruption, etc.
- **Economic:** of the marginally employed
- **Technological/technocratic:** due to differential risks
- **Residual:** due to lack of upgrading
A further classification of vulnerability

**Vulnerability**

- **Deprived:** existing knowledge not utilised
- **Wilful:** existing knowledge deliberately ignored
- **Pristine:** hazards not yet reduced

**Conclusions**
Successful reconstruction plans:-

- have self-protective redundancy
- have a healthy diversity
- have mutually reinforcing components
- efficiently reduce waste and waiting times
- can operate independently of outside control, but are accountable
- adapt flexibly to changed circumstances
- exploit new opportunities by fostering collaboration and teamwork.

Reconstruction must be viewed in the light of the whole disaster cycle, in which there is much interconnectedness.

The 'disaster cycle'