



Draft Guidelines for Mainstreaming DRR into the Housing Sector

1. The floods damaged 1.67 million houses across 65 districts of the country; of these almost 50% were completely destroyed. The housing sector caseload focuses on 827,380 destroyed houses (DH), mainly in the four provinces of KP, Balochistan, Sindh and Punjab. The losses in the housing sector run into billions of dollars. While the early recovery needs have been calculated taking into account only the completely destroyed houses and provision of one room shelters, it is extremely important that the said room is constructed in such a way that it is disaster resistant and can later form part of the permanent housing unit. Meanwhile many of the affected people are constructing their houses at their own and need to be educated on safe construction practices. Constructing houses in depressions, heavy roofs on weak walls and use of substandard construction material are some of the reported practices which need to be controlled through enhancing awareness, introducing safer but cost effect designs, community mobilization and enforcing the building codes through an institutional arrangement.

2. Objectives of Disaster Risk Reduction Initiatives in Housing Construction

- Ensure adherence to guidelines on hazard resilient construction in hazard prone areas.
- For successful implementation of housing, usage of land use zoning plans which takes into consideration information on risk from natural hazards.
- Introducing amendments and revisions for land sub-division process considering the natural surface drainage path, contour plans and its approval procedure.
- Utilization of national building codes that have special provisions for enhanced design standards for buildings in areas affected by natural disasters.
- Compliance and enforcement of local building laws requiring prescribed standards under natural building codes in urban hazard-prone areas.

3. DRR Measures for Housing Sector

- **Choose hazard-resistant housing designs and construction technologies.** For housing, design standards exist internationally and are readily available for various types of construction and disasters. Building codes are the most common regulatory instrument for ensuring safe construction methods, although they may not be promulgated or enforced.
- **Relocate housing.** DRM considerations should be applied in site selection for both temporary and permanently relocated housing. While reconstruction should not

occur in areas frequently affected by hazards, this is admittedly difficult where non-vulnerable alternatives are scarce or land use regulations do not prevent it. Reconstruction guidelines should include the topic of site selection, as should the reconstruction communication program, so that both agencies and individuals are educated about the importance of these decisions.

- **Rehabilitate and retrofit housing.** Rehabilitation deals with structural and nonstructural modification of buildings and infrastructure facilities. Since new zoning laws and updated design and construction codes usually can't be applied retroactively, it is important that, to reduce the impact of disasters, the safety and structural integrity of existing buildings and infrastructure facilities is improved during the rehabilitation process.
- **Train builders in DRM.** The training program should provide an understanding of how the hazards may affect the household and community and of recommended mitigation strategies for the specific affected region.
- **Mitigate the existing site.** The location or structure of a building can greatly increase its vulnerability. Mitigation measures should address the specific causes of a building's or infrastructure's vulnerability. Removal, relocation, or elevation of in-place structures in highly hazardous areas, especially those built before building codes were established, is frequently the only option. A community must prioritize options based on the importance of a structure and its relative vulnerability.

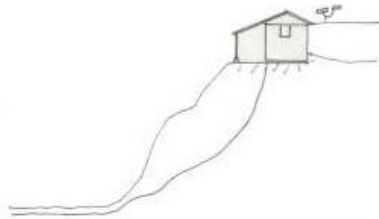
4. **Universal Design.** Universal design entails the design of products and environments to be usable by all people, to the greatest extent possible, without the need for adaptation or specialized design.

- **Equitable Use.** The design is useful and marketable to people with diverse abilities.
- **Flexibility in Use.** The design accommodates a wide range of individual preferences and abilities.
- **Simple and Intuitive Use.** Use of the design is easy to understand, regardless of the user's experience, knowledge, language skills, or current concentration level.
- **Perceptible Information.** The design communicates necessary information effectively to the user, regardless of ambient conditions or the user's sensory abilities.
- **Tolerance for Error.** The design minimizes hazards and the adverse consequences of accidental or unintended actions.
- **Low Physical Effort.** The design can be used efficiently and comfortably and with a minimum of fatigue.
- **Size and Space for Approach and Use.** Appropriate size and space is provided for approach, reach, manipulation, and use regardless of user's body size, posture, or mobility.

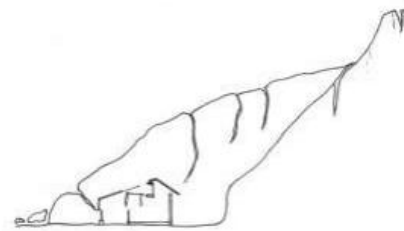
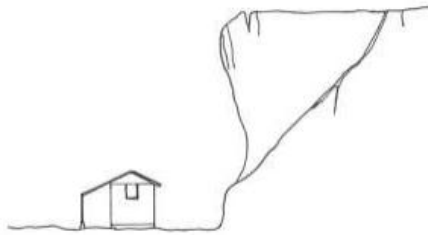
5. **Important Construction Considerations.** Source: *Disaster Risk Reduction in Practice The Architecture of Earthquake Resistant Housing in Pakistan* by Dr Victoria Harris, CEO of Article 25

DONT BUILD: On steep/ unstable slopes or loose ground

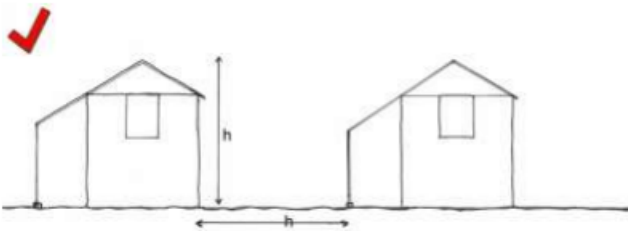
Development + Disaster Relief



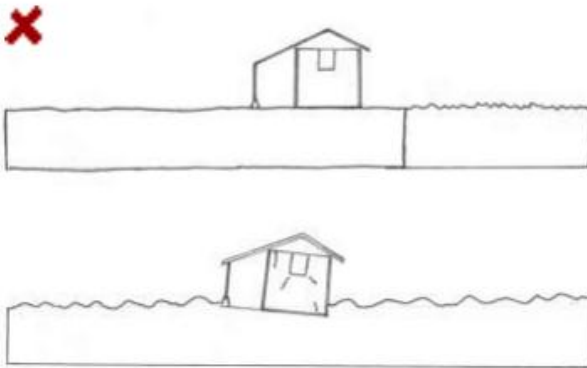
DON'T BUILD: On areas susceptible to landslides and rock fall



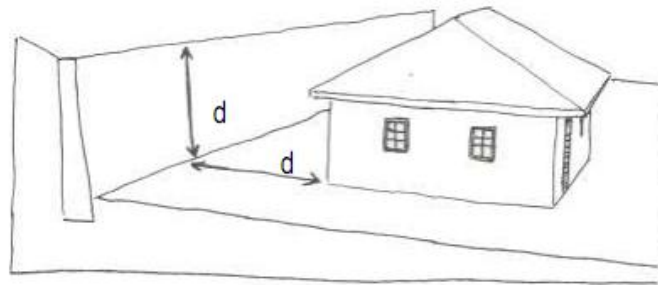
DO: Place buildings a good distance between each other (at least equal to height of tree or house).



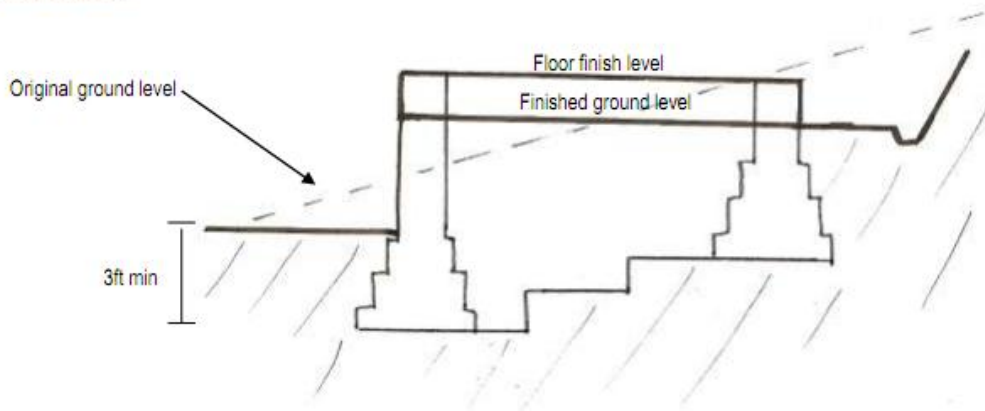
DON'T BUILD: Near rivers as water saturated soils can lose bearing capacity during ground shaking (this is termed liquefaction) and flooding can be a risk.



If building near a slope position house a minimum of 4ft from the slope and provide a retaining wall if necessary.



If building on a sloping site terrace and level the land prior to beginning house construction.



Possible Shortfalls, their Impact and Mitigation Measures for Housing

	Shortfalls in the Facilities/Activities	Potential Negative DRR Impact	Proposed Mitigation Measures
1	Absence of land use plans leading to siting of houses at land vulnerable to natural hazards	<ul style="list-style-type: none"> • Siting of the houses at slopes/ land sliding areas can render them vulnerable to damage in case of earthquake or heavy rains/ floods. • Siting in low laying areas / depressions can render them vulnerable to flooding and unusable following heavy rains / floods. 	<ul style="list-style-type: none"> • The Location should not be at the edge of a slope, near the foot of a mountain vulnerable to landslides, near creeks, rivers or bodies of water that could erode its foundation, on top of or in proximity to active fault lines (less than 10 meters away), near the river banks and areas prone to storm surges. The houses should have appropriate provisions for addressing hazards related to location such as rainwater drainage and dikes • Adopt slop stabilization measures including bio engineering.
2	Non-environment friendly designs and lack of institutional arrangements for enforcement of building codes.	<ul style="list-style-type: none"> • The designs may not suit the local environment and culture. • Too heavy timber based designs can result in deforestation. • Unsafe building codes can endanger the habitants. 	<ul style="list-style-type: none"> • Develop designs suitable to local environment and customs. • Develop and enforce safe building codes for multiple hazards like floods, earthquake and windstorms.

3	Construction of single exits and doors opening inwards.	<ul style="list-style-type: none"> • In case of single entry and exit it is likely to be choked during an emergency and result in casualties. • Similarly the doors opening inwards are likely to be choked in an emergency specially following an earthquake. 	<ul style="list-style-type: none"> • Construct multiple emergency exits and create DRR awareness among the residents. • Ensure that doors open outwards.
4	Additional engineering works for improving the safety of the houses	<ul style="list-style-type: none"> • A house needing retrofitting can be unsafe residents. • A habitation located in low lying area may be vulnerable to flooding unless an embankment is constructed around it. • A house located at slop will be vulnerable without the support of a retaining wall. 	<ul style="list-style-type: none"> • There should be no major structural cracks on structural members. Minor or hairline cracks should be investigated by a qualified civil or structural engineer and determined to be localized and repairable. • Carry out proper retrofitting and ensure quality control through regular monitoring. • Construct an appropriate bund / embankment to make the habitation. • Construct an appropriate retaining wall to provide required protection to the house.
5	Lack of awareness and Capacity building of the community.	<ul style="list-style-type: none"> • Lack of capacity / awareness about possible disasters and capacity to respond appropriately can result in a paralysis during a disaster situation. • The community may not be trained to resiliently during / following a natural disaster. 	<ul style="list-style-type: none"> • Educate the community about possible hazards and required risk reduction measures. • Build response capacity of the community through training workshops and short courses. • Involve the local government and NGOs in CBDRM.

6. Guiding Principles for the Social Dimension of Housing Reconstruction

- The housing assistance scheme should support the objectives established for the reconstruction program in the reconstruction policy.
- Each disaster will require its own housing assistance scheme; there is no “one size fits all” approach.
- Decisions regarding eligibility criteria and housing assistance must be objectively applied and transparently disclosed.
- Post-disaster housing policy must consider the situation of people in all categories of housing tenancy, including squatters, although all members of all categories may not receive assistance.
- Assistance schemes should be tailored to different levels of damage. Avoid incentives to exaggerate damage that then result in overpayment.

7. Guiding Principles for Relocation

- An effective relocation plan is one that the affected population helps develop and views positively.
- Relocation is not an “either/or” decision; risk may be sufficiently reduced simply by reducing the population of a settlement, rather than by relocating it entirely.
- Relocation is not only about re-housing people, but also about reviving livelihoods and rebuilding the community, the environment, and social capital.
- It is better to create incentives that encourage people to relocate than to force them to leave.
- Relocation should take place as close to the original community as possible.
- The host community is part of the affected population and should be involved in planning.

8. Relocation Recommendations

- Avoid relocation if at all possible. Especially avoid relocation to distant sites. Work hard to keep communities together.
- If relocation is being considered, carry out a detailed participatory assessment of the environmental, social, and economic risks of relocation and of the cost of risk mitigation strategies for alternative sites.
- Governments should not only avoid relocation in their own housing programs but should also regulate relocation in the reconstruction projects of nongovernmental agencies (private corporations and nongovernmental organizations [NGOs]), which often opt for relocation to gain visibility and for managerial convenience.
- If relocation is unavoidable, involve the community in the decision-making processes by creating a community relocation committee, among other means.

- Agencies should engage the services of qualified and experienced relocation specialists to design and implement relocation plans.
- The technical, financial, and institutional feasibility of providing basic services such as water, electricity, health services, schools, markets, policing, and public transport in the relocation site must be demonstrated during project planning, and all arrangements put in place in advance of the relocation.
- Use the relocation plan to carefully define, with the assistance of experts, how people will be assisted to restore their livelihood activities or develop alternative livelihoods in the relocation site.
- Plan for the relocation of individual or collective cultural properties.
- Assess and mitigate the impact of relocation on the hosting community, and be prepared to prevent social conflicts and problems of crime, delinquency, and secondary displacement.
- Design, budget for, and implement measures to prevent the return of the relocated community or others to the site from which the relocation took place.
- Be conservative when estimating the time a relocation program will take and the costs entailed.