During 2012, the pilot study was conducted in Mandi district in Himachal Pradesh to understand successes and challenges faced by IAY (Indira Awaas Yojana) beneficiaries in enhancing the resilience of their houses to local disasters. The survey was carried out using a questionnaire that was tested in the field; the questionnaire aimed at capturing perception of the homeowner / user with regard to the disaster vulnerability of their house as well as, the perception of a surveyor trained at making the necessary assessments in the field. An analysis of the data collected from the 101 houses surveyed in Mandi highlights the following issues: i. Locational Vulnerability of IAY houses: Although a majority of homeowners reported the location of their houses to be ‘safe’, the location of some houses was reported to be unsafe basically on account of the steep slopes without retaining walls that are in close proximity to their homestead. This has an implication with regard to larger settlement planning approaches. ii. Quality of soil of land for house construction: about 28% houses reported to have constructed on loose soil which can increase the vulnerability of houses manifold. iii. Condition of Foundations of houses: Although bulk of the houses surveyed used stone or brick as the main material for construction of foundations, there were several houses that have used mud as the binder for stone / brick. Although such foundations may respond satisfactorily to compressive forces experienced vertically, their seismic and landslide vulnerability under lateral thrusts experienced during such events may be serious. Homeowner interviews revealed that mud was used to save the cost of construction without realizing the limitations of mud as a binder. Interestingly, use of steel reinforcement was also reported by many households iv. Condition of Walls of houses: Bulk of the houses surveyed used stone or brick as the main material, concrete blocks (commonly known as cement blocks) are also a common material used for walls. Most of the walls have been constructed using cement as a binder while some parts of some houses were also constructed using mud as a binder. 79% houses were reported by the surveyors as having “safe” location of doors and windows, i.e. these openings were more than two feet away from the corners. The quality of construction of walls, quality of joinery and wall-to-wall connections were also reported to be good / safe by the surveyors in about 90% houses. However, it is interesting to note that majority households (76% households) reported to be investing in repairs of the corners of the walls. This fact may be an indicator of either ‘not good’ quality of masonry construction that may be covered by constant repair exercises. Nonetheless, this is an indicator of weak joinery or joinery weakened due to silent geological changes. v. Condition of Roofs of houses: Bulk of the houses surveyed used RCC as the main material for roofing. Most of the houses were reported by the surveyors as having ‘safe’ projection, i.e. less than 1.5 m cantilever. Connections between various members of the roofing system were also reported to be satisfactory in 87% cases. vi. Overall assessment of damageability: A cumulative analysis of different components of IAY houses surveyed in Mandi with regard to risk of landslides and seismic activity was compiled considering the specifications for foundations (30% score of total), walls (40% score of total), roofs (20% score of total) and, architectural specifications (10% score of total). The foundations were analysed for the material used, depth and width while the walls were analysed for the materials used, presence of lintel band, quality of masonry joints and quality of wall to wall connections. Similarly, the roofs were analysed for the materials used and quality of connections between the roof and the walls. This analysis reveals that 48 of the 101 houses surveyed are rather susceptible to serious damage due to earthquake and landslide forces as they scored less than 40%, 42 scored between 40-70 % and were moderately susceptible to damage and 11 were unlikely to suffer serious damage due to earthquake and landslide as they had scored above 70% in the final analysis. The houses that scored less and were therefore considered to be rather susceptible to damage were largely those that were located on unsafe sites along steep slopes. 42 households reported that the soil conditions of their plot were unsafe due the absence of hard rock. These houses were reported to be constructed on loose soil.
Many houses also did not have lintel bands; and use of mud mortar in foundations as well as walls was also found in some cases. A sizeable number of houses were reported to have weak wall to roof connections by the homeowners. These were the main factors that affected the safety perception of the houses. Lessons for the way forward: Devastating landslides in H.P. need more intensive scientific studies and engineering/bio-engineering measures focused on the problem of landslides. It will be necessary to prepare zoning maps of landslides and rockfall prone areas through geological and geotechnical studies to identify uninhabitable areas in the state. Landslide prone areas should be avoided while locating new settlements or buildings. The impact of landslides on existing buildings and settlements can be reduced through appropriate mitigation mechanisms, which include adopting safe construction practices. It was seen that some houses are situated on destabilized terraces, which hold the possibility of being completely destroyed due to continuous erosion of the terrace. Thus, areas vulnerable to landslides, floods and other natural disasters need to be identified, so that allocation of land for housing units can be done accordingly, to avoid these areas, thus reducing the risk of damage later on. GIS mapping shall comprise an eminent part of the habitat planning process, which would help conducting the overall planning of these units in a coherent manner. It is equally important to raise awareness among the household owners about safe construction practices, so that their dependency on external sources which emerges as a constraint during construction can be eradicated. The survey data has highlighted the struggle faced by homeowners with regard balancing safety with cost of construction. An additional indicator is the fact that none of the houses surveyed were insured, of which a sizeable number did not feel the need to insure their houses. While assistance for IAY construction has been a matter of consistent debate, surely the balance needs to be tilted in favor of constructing safe whether constructing big or small. The survey data also highlights the role of the artisan, mason in construction. These are the advisors and implementers of housing rolled into one. This reinforces the need to systematically build the capacity of mason and artisans on safe construction. In addition, it was observed in the pilot study that people spend approximately 2-3 times the amount of money they receive from the IAY funding, from their own end. It is essential to provide easier and additional options for funding to support the investment required for the construction of resilient houses under this scheme. For a copy of Report write to info@censud.org

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