



THE WORLD HOUSING ENCYCLOPEDIA: A MEANS TO STIMULATE SEISMIC RISK REDUCTION EFFORTS IN DEVELOPING COUNTRIES

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EXTENDED ABSTRACT

The World Housing Encyclopedia (WHE) is an internet-based tool that is being used to help build capacity in developing countries by sharing knowledge and experiences and engaging professionals in various countries in the development of tutorials and participation in specific projects. The author is an Associate Editor of this project and has been involved in various WHE-related activities, ranging from working with colleagues in developing countries to prepare reports on their construction types to participating in the WHE-PAGER project by collecting and providing fragility curves for several non-US construction types. The structure of the WHE project is only possible because of the widespread use of the internet, and in fact relies on email and the website itself as a way to share information and discuss ideas with participants who are in 50+ countries.

Often, the preparation of a housing report for the WHE represents a first step for young engineers in developing countries to collaborate with international colleagues and to work on a research-oriented report. The path, however, from taking the initiative to finalizing a report can be a bumpy road which is hampered by lack of communication as a result of language difficulties and misunderstandings, and unreliable internet connections.

Sharing information by e-mail and the internet is of course only a first step in making real and lasting change and improvement in construction practices. It has been proven that the WHE database contains much information necessary to understand the building characteristics and structural vulnerability of various engineered and non-engineered building typologies and thus may serve as an input source for seismic risk and loss assessment studies. The WHE thereby contributes to the direct and indirect building of capacities in these countries. This presentation will also discuss ideas for affecting change “on the ground” that could use the WHE network, including regional and local trainings based on WHE tutorials and the sharing of capacity and fragility curves for a wide range of construction types found in developing countries.

What information is available – What is missing

The WHE not only collects the well-known housing construction reports, but also provides a number of tutorials and guidelines for safer construction and serves as a platform for various initiatives within the earthquake engineering community such as the Confined Masonry Network.

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Table 1. Overview of the 154 available housing reports disaggregated by region and building typology (reference date: November 1, 2009).

Building typology	Continent, region											
	Africa	North America	Central America	South America	Western Asia (e.g. Iran, Syria, Turkey)	Northern Asia (i.e. Russia)	Central Asia	Eastern Asia (e.g. China, Japan, Taiwan)	Southeastern Asia (e.g. Indonesia, Malaysia)	Southern Asia (e.g. India, Bangladesh, Nepal)	Australia (incl. New Zealand)	Europe
Adobe / Earthen	6	1	6	4	2	-	1	5	-	7	-	-
Stone masonry	1	-	-	-	2	-	-	-	-	6	-	9
Unreinforced masonry	-	-	-	4	2	2	2	2	1	8	-	6
Reinforced masonry	-	-	-	1	-	-	-	1	-	-	-	-
Confined masonry	-	-	-	5	1	-	1	1	-	-	-	2
RC moment frame	1	1	1	3	4	-	-	3	1	3	-	7
RC structural wall	-	1	-	2	2	-	1	-	-	-	-	3
Precast concrete	-	-	-	-	-	1	5	-	-	-	-	2
Steel moment frame	-	-	-	-	2	-	-	-	-	-	-	1
Steel structural wall	-	-	-	1	-	-	-	-	-	-	-	-
Timber	-	4	2	-	-	2	1	1	-	2	1	1
Seismic protection systems	-	-	-	1	-	1	1	-	-	-	-	-
Other	-	-	-	1	-	-	-	-	-	1	-	1
Total	8	7	9	22	15	6	12	13	2	27	1	32

Since the WHE website reaches large parts of the scientific community worldwide through its connection to EERI and the International Association of Earthquake Engineering (IAEE), it is a suitable tool to easily disseminate information and material. As for the preparation and distribution of manuals, tutorials and guidelines, the WHE works efficiently and has succeeded in every respect. However, the Editorial Board has noticed a declining number of submissions of housing reports in the last 3 or so years, perhaps suggesting that the project has reached some kind of saturation in terms of current participants. Starting in 2000, the database soon filled up through the preparation and submission of various reports, while in the last 3 years only a small number of reports have been submitted. Since its start, a total number of 154 reports have been submitted and published on the web site (Table 1), of which only a small handful have been prepared and reviewed during the last 3 years.

Even though the database covers a wide range of engineered as well as non-engineered building typologies worldwide, reports for many countries (regions) and building types are missing. An overview of the available housing reports by region and building typology is given in Table 1. Of course, each report contains a lot of information and serves the initial goal to

disseminate information on the particular construction typology. However, in a wider scope, e.g. to provide basic information that can be used for earthquake risk and loss computations worldwide, only a 'complete' database will be useful. Therefore, it will be one of the main tasks in the next few years to increase both the quantity of housing reports as well as their quality. The latter is especially important for the needs and requirements of the earthquake risk community. The Editorial Board is considering enhancements to the reports including updating the building classification scheme and requiring more technical building fragility information (e.g. capacity curves, vulnerability functions, damage probability matrices, link to building damage databases of past earthquakes).

How to encourage new contributions

To further populate the WHE database and to achieve one of its goals to share knowledge about building typologies and practices, new contributions from various professionals, especially in developing countries are required. The Editorial Board has been exploring various suggestions for how to encourage these contributions. Since the WHE does not provide a full peer review process, no impact factor is given and consequently the scientific weighting of a WHE contribution is quite low. However, the preparation of a WHE report may be justified by the fact that the WHE reaches a large audience within the scientific-technical community which can be proven by the numbers of downloads from the WHE website as well as the number of citations and references in technical documents. Even though the reports do not undergo a strict anonymous peer review, quality control is ensured through an open review process. After a first quality check of the report by the Editorial Board, an independent professional who has ample experience with the respective building typology is asked to prepare an objective review and to improve the report in close collaboration with the authors. We believe that this type of review process increases the willingness especially of younger or inexperienced authors to contribute to the WHE. While the entire process increases the work for the Editorial Board and it protracts the process until the report's publication, we believe the added time is necessary to work with our authors to get the best information they can provide. It thus becomes necessary for the Editorial Board as well as external scientists who are interested in the WHE to serve as tutors or actively initiate reports for the WHE.

Especially in developing countries, the preparation of a WHE report often is the first step for a young engineer or architect towards working internationally and to making contact with the global community of earthquake engineering. Therefore, the WHE should especially focus on young academics, who, by contributing to the WHE, get in touch with other professionals and hence are given the opportunity to get involved in other project-related initiatives, such as the Confined Masonry Network.