

Sample 2 (Form 1)

(Form 1) QUESTIONNAIRE SURVEY (Technology list on Implementation Strategies)
Category A: Technologies Developed under Implementation Strategies

(a) Features of the Developed Technology

(your name: _____, set no. _____)

Hazard (check one): () earthquake & tsunami, () flood & debris, () multi-hazard including both			
1. Title of Technology	Improvement of Seismic Design Method for Composite Block Masonry Buildings and Its Implementation		
2. Title of Project	Development of Earthquake and Tsunami Disaster Mitigation Technologies and Their Integration for the Asia-Pacific Region (EqTAP)		
3. Name & Organization	Jiro Saigai	4. Contact Details (Mailing address & e-mail)	(Mailing address & e-mail)
5. Contents of Technology with relevance to disaster management	In developing countries many people live in masonry buildings. When a severe earthquake attacked, great loss of human lives could not be avoided because of their vulnerability. The aim of this project was to develop technologies to improve their earthquake resistant performance and to mitigate the disaster by implementing the technology.		
6. Development process with specific focus on the implementation strategy	As a technology to improve brittle behavior of masonry structure the composite masonry structure was developed by Dalian University of Technology. Tohoku University, Akita Prefectural University and Dalian University of Technology decided to perform a cooperative study to investigate its seismic performance experimentally and analytically by applying high technologies in Japan. Furthermore exchange of information was made efforts with China Academy of Building Research in Beijing so that the developed technology would be applied in the Chinese national code in the future.		
7. Regional Perspective	This type of masonry structure is not approved in Japan because it has no reinforcement in the panel by reason of cost. When this joint study was put into practice, many information of design method and design condition and construction technique of test specimens were given from Chinese side sufficiently. As to concrete blocks actual ones were imported from Shenyang to make realistic specimens. In experimental studies Japanese high technologies were applied to this low technical structures. That is, loading system to simulate a multi-layered condition was adopted in static tests and pseudo-dynamic tests were performed to know response of the structures subjected to severe earthquake records. These sophisticated tests could not be done in Chinese side.		
8. Specific stakeholders' involvement	The obtained results were presented and discussed in Dalian University of Technology. To transfer them to Shenyang City was requested to Dalian University of Technology. Also they were presented in Institute of Earthquake Engineering, China Academy of Building Research. While this technique was proved to be applied in any developing country, it is expected to be adopted in many relevant countries.		
9. Free or Cost-incurred (purchase cost, royalty, etc.)	<i>free</i>		
10. Copyright and Ownership			
11. Cost incurred for application (application cost except 9. in US\$)¹			

¹ Please mention: 1) unit cost in terms of actual incurred cost, 2) name of the applied country.

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12. Time and Human Resources required for Technology Application <i>(in terms of person-month)</i>	
13. Maintenance and upgrading of technology <i>(Cost, human resources, others)</i>	
14. Other requirements for introducing / application	
15. Application Examples	Shenyang city (China), Nepal
16. Other features	http://www.archi.tohoku.ac.jp/labs-pages/kozo/s_apec/index.htm

(b) Next Step Developments

17. Proposed plan	Verification of Seismic Performance for Actual-sized Masonry Building by Large Shaking Table --- Investigation of Three-dimensional Seismic Performance Subjected to Two-dimensional Input Earthquake Motion ---
18. Effects of Technology Development with focus on implementation strategies	In the executed study the seismic performance was made clear for one panel in a building. But in an actual building confining effect by tie beams at each floor has much influence to total seismic performance and out-of-plane behavior of blocks with no reinforcement might be severe. These three-dimensional behavior could be investigated by shaking table test for an actual-sized masonry building subjected to two-dimensional input earthquake motions. If the seismic performance of an actual building could be verified, this developed technology is expected to be paid attention and be adopted in many developing countries.
19. Cost for Technology Development (US\$)	
20. Time and Human Resources for Development <i>(in terms of required person-month)</i>	
21. Regional Perspective of cooperative research	Tohoku University, Akita Prefectural University, Other Japanese Institutes China: Dalian University of Technology, China Academy of Building Research
22. Stakeholders' involvement	China: Dalian University of Technology, China Academy of Building Research, Construction Bureau of Shenyang City Nepal
23. Others	