Provision of Emergency Support for the Development of Master Plan for Reconstruction and Rehabilitation of Nepal following the Massive Earthquake and Resilience against Earthquake Disaster Risks

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1. Background and Purpose of On-Site Support Activities in Nepal

The Nepal earthquake occurred on April 25, 2015, with a magnitude of 7.8 Mw, killing 8,891 people and injuring approximately 22,300 people. Approximately 610,000 houses were completely destroyed, with approximately 290,000 houses, partially destroyed. The total economic cost of the destruction from Nepal's earthquake and aftershocks is estimated to total approximately US$7 billion, which is equivalent to approximately one-third of Nepal's gross domestic product (GDP). In order to promptly provide support for the reconstruction and rehabilitation operations in Nepal's earthquake affected areas by taking advantage of the insights that Japan has gained and lessons that it has learned to date through its own experience of reconstruction and rehabilitation from earthquake disasters, in response to the request of JICA (Japan International Cooperation Agency), NILIM has decided to send its four employees to Nepal for two months as short-term experts to provide practical technical support in a variety of areas.

Period of Investigation: Wednesday, May 20 through Wednesday, July 15, 2015 (57 days) Place of Investigation: The Federal Democratic Republic of Nepal Delegates: [NILIM] Hiroshi Kaneko, Director, Urban Planning Department; Hiroyasu Shingai, Head, Urban Facilities Division [Public Works Research Institute (PWRI)] Shigeki Unjoh, Earthquake Engineering Research Team [Building Research Institute (BRI)] Tomohisa Mukai, Senior Researcher (June 18 to June 28) Purpose of Delegation: Investigate the current situation in earthquake-stricken areas, support the holding of seminars, etc., Support the construction and exhibition of earthquake-resistant post-disaster housing models, Support the reinforcement of infrastructure and the development of policies for reconstruction, rehabilitation and resilience against earthquakes, etc.

Table: Overview of On-Site Investigation Team Organized for the Purpose of Providing Support to Nepal's Reconstruction and Rehabilitation Efforts

Figure: Locations of Major Earthquake-Stricken Areas in the City of Kathmandu and its Surrounding Regions

2. Main Technical Support Contents

To support Nepal government's reconstruction and rehabilitation efforts, we made an on-site investigation into the situation in earthquake-stricken areas, presented and shared Japan's insights and lessons learned concerning reconstruction and rehabilitation efforts from earthquake disasters at a variety of seminars, and supported the Nepal government's efforts to perform post-disaster needs assessment, among other support activities. In addition, as a big earthquake occurs frequently in Nepal, we offered the following advice and guidance based on the Build Back Better (BBB) concept[1]:

(1) Proposal on Earthquake-Resistant Post-Disaster Housing Models

As the current earthquake seriously damaged fragile masonry houses constructed of stones and bricks bonded with mud mortar, we proposed earthquake-resistant post-disaster houses in consideration of the current local housing conditions, available construction materials and local construction method, and we carried out a demonstration construction and exhibition of proposed earthquake-resistant post-disaster houses.

(2) Evaluation of Seismic Performance of Buildings and Recommendation on Technology for Renovation for Earthquake-Resistant Structures of Buildings

As we witnessed the story collapse of buildings, out-of-plane collapse of brick walls, etc., with respect to buildings of confined masonry construction with

reinforced concrete (RC) frame, we recommended the establishment of robust standards for seismic performance of buildings that govern all aspects of building construction from construction materials to structural members and buildings.

(3) Recommendation on Reinforcement of Infrastructure

We evaluated the seismic performance of road infrastructure, such as bridges, in the Kathmandu metropolitan area, extracted and proposed issues thereof, and recommended the establishment of unique standards for seismic performance of bridges, among other things.

(4) Support for the Development of Master Plan for Reconstruction, Rehabilitation and Resilience against Earthquakes

In order to help the Nepal government prepare for a larger earthquake in the future, we proposed a preliminary draft master plan for reconstruction, rehabilitation and resilience against earthquakes, which consists of the establishment of fundamental infrastructure networks in the Kathmandu metropolitan area, whose population has been growing rapidly, the implementation of urban disaster prevention measures in city centers where old buildings are densely populated, and the implementation of well-planned urban development initiatives in suburban areas, among other initiatives.

Photo: Proposing Preliminary Draft Master Plan for Reconstruction, Rehabilitation and Resilience against Earthquakes at the Meeting of Supporting Countries

3. Conclusion

We hope that the on-site investigation team's accomplishments will be incorporated in Nepal's national plan for reconstruction, rehabilitation, and resilience against earthquakes to help the Nepal government to achieve better results on the reconstruction and rehabilitation of the country.

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1) The BBB Concept is one of the four specific priorities for action in the Sendai Framework for Disaster Risk Reduction 2015-2030 that was adopted at the Third United Nations World Conference on Disaster Risk Reduction, which was held in Sendai, Japan in March 2015. The on-site investigation team's activities to support the reconstruction and rehabilitation of Nepal following the massive earthquake were the first practical initiatives since the adoption of the Sendai Framework for Disaster Risk Reduction.