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Japan ICOMOS National Committee

**Flash Report on the Situation of Damage on Cultural Properties and
Buildings, Scenery and Historic Sites**

(prepared by Dr. Toshikazu Hanazato, Japan ICOMOS/ISCARSAH member)

1. Overview of the Earthquake Disaster

Overall picture of the disaster of Tohoku Pacific Earthquake on March 11, 2011 has not been put together after 12 days. However, its characteristics are outlined as the followings:

- 1) Total number of human losses and missing caused by tsunami is about 23,000 as of March 22nd, and it could increase further.
- 2) Unlike Kobe in 1995, which was a devastating earthquake with a shallow focus directly underneath the metropolitan area causing the damage to concentrated area on the fault, this earthquake had an impact on a much broad range. It not only covers a massive area of Eastern Japan but also triggered nuclear disaster.
- 3) Most of the damaged areas of this 3.11 Earthquake has recently been experiencing great earthquakes of magnitude 7: Miyagiken-oki Earthquake of June 12, 1978 (M=7.4), Iwate Miyagi Nairiku Earthquake of June 14, 2008 (M=7.2), Chibaken-Toho-oki Earthquake of December 17, 1987 (M=6.7)
- 4) Most of the buildings were destroyed or washed out by tsunami and not much so by strong ground motions. Some traditional wooden buildings are reported to have collapsed but the percentage of collapsed houses due to strong motions is comparatively lower than Kobe Earthquake of M=7.3. This is due to the fact that the damaged areas had secured earthquake resistant capacity after experiencing recent large earthquakes (as shown on 3) of intensity scale X (Modified Mercalli Intensity Scale (MMI) corresponding to intensity scale 6 positive in Japan Meteorological Agency (JMA) Intensity Scale).
- 5) Damages were seen on reinforced concrete buildings built before the revision of regulations for seismic designs under Japan Building Code in 1981.

2. Features of earthquake ground motions

It was an interplate earthquake around plate boundary caused by subducting of Pacific Plate into North American Plate. Moment magnitude was 9.0, similar size to

Sumatra Earthquake of December 26, 2004, and rupture area of the fault is estimated to be 500km X 200km (after NIED).

Areas that experienced the intensity scale of X or greater (MMI) spread out from Iwate prefecture to the northern part of Ibaraki prefecture. Strong ground motions of which acceleration level exceeded 0.5G were recorded at a number of seismogram stations in those wide area. Furthermore, acceleration level of ground motions at some sites was as high as 1.0G. However, according to spectral characteristics of strong motion records which recorded intensity scale of X or greater (after Earthquake Research Institute of the University of Tokyo), component of period 1-2 seconds (which has great impact on traditional wooden houses) was about 1/3 of the Kobe Earthquake of January 17, 1995. On the other hand, component with short period less than one second was predominate compared to the Kobe earthquake, which connotes that progressive failure is unlikely to happen for the traditional wooden buildings. Distant places from epicenter, such as Tokyo, were affected by the ground motions with longer period. Tokyo Tower, a cultural heritage structure constructed in 1958 with a height of 333m suffered the bending of its tip.

3. Situation of Damage on Cultural Properties and Buildings, Scenery and Historic Sites

Due to the Earthquake, damages on officially designated cultural sites were reported in areas greater than 600km from Aomori prefecture to Kanagawa prefecture. As of March 22, total damaged designated sites reported are about 296 but the number will increase as the site surveys proceed. Ever since the Kobe Earthquake of 1995, earthquake devastation on historical buildings has drawn increasing attention in Japan. Therefore, after the Earthquake of 3.11, media reported damages on cultural sites immediately. Furthermore, “damaged buildings list” was also created in a few days by the Government, Agency for Cultural Affairs.

According to that list, most of the officially designated cultural sites averted major destructions. When excluding stone lanterns, mud-walled warehouses and gravestones, only two collapsed; one is Ibaraki University Goura Bunkazai Bijutsu Bunkazai Research Center Rokkakudou Hall (Ibaraki prefecture), lost in tsunami, and the other is Kyu Yuubikan (Miyagi prefecture), which recorded strongest intensity scale. One of the characteristics of this devastating Earthquake was a great magnitude with strong short period motions, as described in 2), which affected buildings with short natural period such as mud-walled warehouses. Most of the damage reported are cracks on mud-walls or on plaster finishing, descent of roof tiles, fractured glass windows and

ceilings falling down. In particular, Non-structural elements of such roof tiles, windows and ceilings, faced destructions. Protected areas of important traditional buildings (Makabe, Sarkurakawa City, Ibaraki prefecture) also had damages on mud-walled/stone warehouses. Same situation can be seen in the traditional townscape area in Kiryu City, Gunma prefecture, where many of the registered cultural properties faced collapse of mud-walled houses and roof tops. Areas recording intensity scale greater than X (MMI) were not reported to have major destruction because they do not contain historically valuable masonry buildings. On the other hand, heritage of industrial modernization such as powerhouse aqueduct were listed for the damages on government registered civil structures.

However, data collecting for damages on cultural properties and buildings registered by prefecture and municipality level is still underway. Damages on unregistered historically/culturally valuable properties and historical townscape have not been grasped yet. Site survey to comprehend the overall disaster of the cultural heritages would be needed as early as possible, with the cooperation of Institute of Architecture and the other organizations.

Tsunami devastated Pacific coast in Tohoku area had beautiful rias, of which the 200km coastline was registered as a National Park. Cities and settlements situated along the coast have long history of disastrous tsunamis in the past; not many heritage structures remained in the area.

State registered special scenic beauty, Matsushima was also devastated with the Earthquake. Matsushima was known for its beautiful natural scenery of tiny islands floating in the bay but is now disrupted with the great tsunami. Matsushima is a compound of both natural and cultural beauty and luckily the cultural sites escaped great destructions; both Zuigan-ji Temple, a national treasure built in 1609, and an important cultural property, Godaidou Temple, eluded tsunami.

4. Supportive Activities for Reconstruction Operation on Damaged Cultural Properties, Townscape and Natural Scenery

The supportive operation underway is for emergency rescue and lifesaving. At the same time, more than 200,000 refugees require help for their lives. However, in the future reconstruction period, restoration of historic sites and scenery will also need to be considered. State, prefecture, or municipal registered sites will be protected by law. On the other hand, the unregistered historical buildings damaged are likely to be demolished and dismantled. In 1995 Kobe Earthquake, many historical buildings were classified “dangerous” in the quick inspection of damaged structures and were

dismantled. Therefore, Hyogo prefecture established “Heritage Management Institution” to educate experts who can conserve historical buildings regardless of registration or non-registration to the state or prefecture. This institutional system is not yet introduced in the afflicted area of the Earthquake of 3.11. Current operation focuses on quick inspection of damaged structures for the wooden houses to cope with aftershocks but it needs to consider preserving historic sites and cultural scenery in the period of both restoration and emergency countermeasure. Japan ICOMOS decided on a policy to cooperate with ICORP and other international organizations to support restoration of damaged cultural properties, townscape and scenery and to correspond with international assistance and support.

5. Relating Information Websites

Agency for Cultural Affairs: Damages to cultural properties in the “2011 Tohoku - Pacific Ocean Earthquake” (As of March 24, 2011 at 5:00 am)

http://www.bunka.go.jp/english/pdf/2011_Tohoku_ver5.pdf

Contact

Japan ICOMOS National Committee

c/o Japan Cultural Heritage Consultancy,

Hitotsubashi 2-5-5-13F, Chiyoda-ku

Tokyo 101-0003, JAPAN

Tel & Fax: +81.3-3261-5303

E-mail: jpicomos@japan-icomos.org

Web: <http://www.japan-icomos.org/>