



Increasing Skyscrapers: Possibility of New Disaster

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Dear Editor-in-Chief

Human desires toward the heavens had been continued after Tower of Babel. Many high-rise buildings were constructed with technological progress in the 20th century. The tallest skyscraper of the world is Burj Khalifa (Dubai, UAE) with a height of 828 meters. Kingdom tower (Jeddah, KSA) would be tallest building with 1,000 meters about 2019 (1).

Skyscrapers have lots of problems in terms of disaster and safety despite its effectiveness. First, high-storied building is vulnerable to fire. Flame can quickly spread along elevator and steps. High jet stream on external walls of building makes it difficult for rescue by helicopter. An evacuation by extension ladder and emergency stair has limitation in high floors. Fires in high-rise building were common themes for disaster movies.

Second, structural weakness exists toward earthquake. The load of building itself and residents is considerable. The tall vertical structure could swing by shock despite an earthquake-resistant design is applied to skyscraper.

Third, possibility of aircraft clash is on the increase. Small aircraft and helicopter is popular as a transport method to avoid traffic jam. Skymap and warming light prevent an in-flight collision, but it is not perfect.

Fourth, falling objects from high place have a danger of injury because a falling object gains momentum as it falls. Freefall of 1 kg object on the height of 300 m gains the velocity of 276 km/h in the assumption of no air resistance. Small sized object can cause serious injury and destruction.

Table 1: Top 10 cities by number of completed skyscrapers over 150 meters (2)

Rank	City	Country	Buildings
1	Hong Kong	China	295
2	New York	United States	231
3	Dubai	United Arab Emirates	140
4	Shanghai	China	116
5	Chicago	United States	113
6	Tokyo	Japan	111
7	Guangzhou	China	78
8	Singapore	Singapore	70
9	Shenzhen	China	65
10	Seoul	South Korea	62

Fire, earthquake, air crash and falling are four kinds of main topics for safety of skyscraper. We hope that modern people receive the benefits of civilization without any tragedy.

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