ANNEX III. THE WORLD'S GREATEST KNOWN FLOODS

World-record and near-record floods are listed in Table A.3.1 and Table A.3.2, respectively. The relation between peak floods and size of watersheds in Table A.3.1 is illustrated in Figure A.3.1. An enveloping curve equation is also given as follows (Wang G. and others, 2006):

For A < 300 km^2 $\quad Q_m = 154\ A^{0.738}$

For 300 ≤ A ≤ 3 000 000 km^2 $\quad Q_m = 1830\ A^{0.316}$

Where Q_m is the peak flood (m^3/s); A is the area size of the watershed (km^2).

Maximum peak flow in Table A.3.1 and Table A.3.2 can be used to decide the general level of PMF for certain places. Like the world's greatest known rainfalls, however, those flood values are mostly from areas whose geographic locations and topographic conditions are favourable to the formation of extraordinary floods, so they should only be used with caution.

The sources of flood values in Table A.3.1 and Table A.3.2 fall into five categories:

(a) The World's Roof, Asia, the Eastern Hemisphere: the southern side (India, Bengal, Myanmar, Cambodia and Pakistan) and the south-eastern side (the Yangtze River, China) of the Tibetan Plateau. Extreme storms with long durations and large area sizes occur frequently here. The world's flood extremes with collecting areas between 60 000 and 1 700 000 km^2 all occur in this area.

(b) The east of Cordillera – a high mountain range along the Americas and on the east coast of the Pacific Ocean – and Brazil, the United States of America and Mexico on the west coast of the Atlantic Ocean in the Western Hemisphere. Floods in the Amazon River Basin, Brazil, are prominent, which might be related to its sector-like watershed area shape.

(c) The Lena and Yenisei rivers, two large rivers in Russia. Extraordinary floods there are mostly caused by melted ice and snow (Duochino, 1991).

(d) Island countries and coastal ones that are in the tropical zone or the subtropical zone and that are affected by typhoons (hurricanes), such as Australia, Madagascar, the Philippines, the Democratic People's Republic of Korea and the Republic of Korea, Japan, as well as Taiwan Province of China and Hainan Island, China.

(e) Most flood extremes with small area sizes in the subtropical zone are caused by strong thermal convections (thunderstorms). Examples include the United States and China.

As a result, in PMF estimation, specific analyses must be made in combination with the specific conditions of the design watershed if flood values in Table A.3.1 and Table A.3.2 are to be compared with or used as indicators for PMF.