1.4 **Chongqing as a case study**

Chongqing is used as a case study in this project. It is located in the Sichuan basin, a region surrounded by mountains, which are between 1000-3000m above mean sea level (MSL), in the southwestern China. Sichuan Basin is characterised by persistent cloud cover, with cool winters and hot, humid and wet summers (Klein and Hartmann, 1993). The prevailing wind of the basin is south-eastly and brings high warm water vapor to the area. There is a higher surface temperature in the basin related to the surrounding areas. Sichuan Basin is also one of the country’s main agricultural production bases, as this area is a flat lowland with fertile ground. The Sichuan Basin is vulnerable to climate extremes. For instance, the steep mountain slope geography, together with rapid rainfall in the area will increase the possibility of geological disaster like mudslides and landslides. As there might be more precipitation in the area already experiencing high rainfall with climate change (see section 1.1), Sichuan basin might suffer from more rainstorm and flooding. Thus, it is important to prevent climate-related risks on the dense and still growing population and economy in urban areas.

Chongqing is a city in the mountains with a relative high elevation of between 244m and 1,709m above sea level as well as has high-rises and buildings in graceful disorder. The area is controlled by tropical moist climate and is covered by large cloud cover all year around. Furthermore, there are plenty of heavy industry in the area as Yangtze river and Jialing river flow through the city. The high pollution emitted by heavy industry contributes to haze and smog in the city, which can reduce the visibility and harm the respiratory health. Chongqing is known as a ‘fog city’. Since Chongqing has over 30 million citizens, its environment, citizen and economic productivity is particularly vulnerable to the adverse impacts associated with future climate change.

Chongqing is stated as one of the hottest cities in China, with temperature more than 40°C for about 90 days between 1951 and 2017. The relative humidity of the city is between 70 to 80 percent (Chinese Meteorology Centre, 2015). There is always heavy precipitation between May and September, with an average of 1000 to 1350 mm/day (Bo, 2008). Summer (June to August) precipitation accounts for approximately 74% of annual rainfall, which can increase the risk of flooding. The hot and cloudy summer results in a more wet deposition while in winter, stable and low mixing causes poor dispersion of primary chemical pollutants. Furthermore, hot extremes will induce increases in droughts, floods and diseases and drought also happens in Chongqing during July to August.

Chongqing has been selected as an environment pollution control and enterprise reform region by Chinese government and World Bank. Therefore, many actions will be taken with the goal of assisting Chongqing Municipal Government (CMG) in significantly reducing air pollution in the metropolitan area (*The World Bank*, 2004).

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