

Water resources for urban water and food security: the case of megacity Hong Kong

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The extent to which urban dwellers consume resources is key on the path to reaching global SDGs. One of these resources is water, which is consumed in a direct and indirect way by city inhabitants, to achieve water and food security within city borders. In this study, we quantify the water resources required to provide these two essential securities for megacity Hong Kong. During the last years, this city has made large investments to make its urban water supply system more water efficient and sustainable. As such, its municipal water abstraction – often defined as direct water use – has decreased from 355 litres per capita per day (l/cap/d) in 2005 to 326 l/cap/d in 2013. Due to its political history, Hong Kong is unique in the world in data availability on urban food consumption. It is therefore the ideal case study to show typical urban food consumption behaviour and its related indirect water use. The current average diet in Hong Kong is very different to the average Chinese diet. It is characterised by a high intake of water intensive products like animal products and sugar, leading to a food related indirect water use or water footprint (WFcons) of 4727 l/cap/d. According to recommendations from the Chinese Nutrition Society for a healthy diet, the intake of some product groups should be increased (vegetables and fruit) and of other product groups reduced (sugar, crop oils, meat and animal fats). This would result in a reduction of the WFcons of 40% to 2852 l/cap/d. Especially the reduced intake of meat (including offals) from currently 126 kg per capita per year (kg/cap/yr) to the recommended value 27 kg/cap/yr would result in a substantial WFcons reduction. Meat consumption in Hong Kong is extremely high. A pescovegetarian diet would result in a reduction of 49% (to 2398 l/cap/d) and a vegetarian diet in a 53% (to 2224 l/cap/d) reduction. Hong Kong citizens can thus save a lot of water by looking at their indirect water use, through a change in their diet. Many of the products consumed, contribute to different levels of blue water scarcity (WS) in the regions of origin Hong Kong imports from. Most rice consumed in Hong Kong e.g., is produced under moderate to severe WS in Thailand, Vietnam, China, the USA or Australia. Other food items consumed in Hong Kong with a high blue WFcons contributing to local WS are wheat, sugar, selected treenuts (pistachios and almonds), oranges, grapes and livestock products. This poses, to some extent, a water-related risk to food security in Hong Kong. As all diet scenarios also result in a lower blue WFcons, they decrease this risk. In order to become sustainable, (mega)cities should reduce their dependency on distant resources and ecosystems.