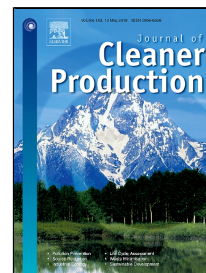


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Towards resilient flood risk management for Asian coastal cities: lessons learned from Hong Kong and Singapore



F.K.S. Chan, C.C. Joon, A.D. Ziegler, M. Dabrowski, O. Varis

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1 **Towards resilient flood risk management for Asian coastal cities: lessons**
2 **learned from Hong Kong and Singapore**

3

4 **Abstract**

5 Many coastal cities are experiencing growing risk to hydrological hazards through the
6 combination of uncontrolled urban development and exposure to natural phenomena
7 linked to climate change, including rising sea levels, intensified storms, and amplified
8 storm surges. This growing risk is particularly acute in Asian coastal mega-cities,
9 many of which have yet to develop adequate adaptation policies to address plausible
10 impacts of climate change. In this analysis, we review how Hong Kong and Singapore,
11 two of the most affluent coastal cities in East Asia, have initiated many flood mitigation
12 strategies policies that have allowed them to reduce the impacts flooding. These
13 strategies, once relying largely on building flood control structures, have now evolved
14 to include holistic flood risk management approaches that include socio-economic
15 factors. Arguably these two success stories provide inspiration for other coastal Asian
16 cities. However, as climate change and uncontrolled development are likely to
17 increase urban flooding in the future, general improvements could be made to
18 improve knowledge transfer: e.g., develop means to work across policy silos and
19 strike compromises between conflicting sectoral responsibilities, and develop long-
20 term integrated strategies using planning tools and practices to address growing risk.
21 While knowledge transfer cannot be direct because of different geographical settings,
22 socio-economic situations, and political situations, we encourage governments to look
23 beyond engineering-based flood control structures as to develop flood governance
24 programs.

25

26 **Keywords:** Coastal cities, climate adaptation, resilience, flood risk management,
27 Hong Kong and Singapore

28

29 **1. Introduction**

30 Coastal port cities in Asia have experienced some of the most rapid growth in the
31 world over the last few decades (Hallegatte et al., 2013; Chan et al., 2012). More than
32 325 million people are now settled along East Asian coasts; and population is
33 expected to triple by 2050 (Fuchs et al., 2011), in part, via migration of workers and
34 investors seeking attractive employment and business opportunities available at the
35 coasts (Seto, 2011; Bailey, 2011). Many of Asian coastal cities are predicted to be
36 vulnerable under climate change (e.g. sea-level rise) (Hanson et al., 2011), thus flood
37 risk will be significantly increasing alongside with rapid growth of socio-economic
38 developments (e.g. greater financial investments and increasing capitals in the flood
39 prone areas) in these cities. On the other hand, these Asian cities are also suffering
40 from an increasing frequency of typhoons, intensive rainstorms and storm surges from
41 the West Pacific (Webster et al., 2005). Evidently, numerous of Asian cities have been
42 impacted by severe floods. For example, cyclone Nargis in 2008 inundated to 75 km

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