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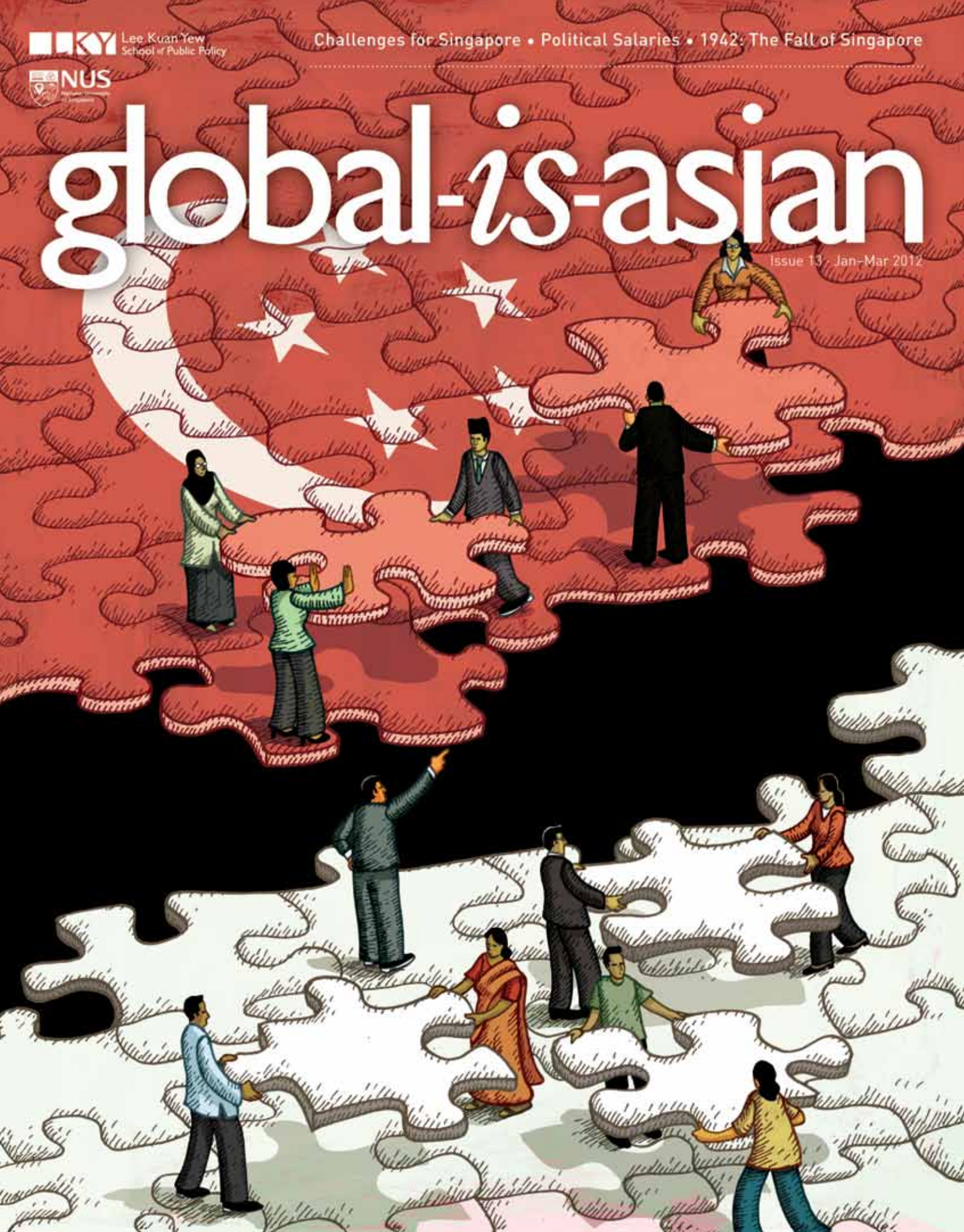

DROUGHTS OR FLOODS: *what is important for Singapore?*

by Asit K. Biswas

Having reviewed the current situation carefully, my view is that Singapore should be significantly more concerned with droughts than floods.

Flash floods that damaged high-end luxury stores and popular shopping malls in the main shopping district in Orchard Road and brought traffic to a standstill on a few major thoroughfares have hogged the headlines and forums in the blogosphere in the past two years. In the aftermath, the main water management agency, PUB, has been criticised severely for its flood control performance. Yet, the fact remains that Singapore has a world-class and cost-effective flood management system, which can, at best, be improved incrementally.

If one has to criticise the agency, the main point would be that it has not managed to convey successfully to the public the scientific and economic philosophy underpinning its flood management practices. Only then can we have an open and informed discussion on the fundamental issues. Put another way, Singaporeans are most likely to baulk at the high costs of paying for the additional flood protection measures when they realise that the benefits are likely to be incremental at best

Let us consider some of the scientific and economic facts behind flood management. First, floods can never be completely eliminated: this is a hydrological fact of nature.

Many have argued that Singapore should plan for a 200-year flood, like Hong Kong, rather than be satisfied with a 100-year flood buffer. What is missing from the public discussion is the realisation that this has become a subject of media hype, a matter of polemics, and does not constitute a serious dialogue on what is the needed for the long-term benefit of Singapore based on scientific facts and analyses. A 100-year flood does not occur every 100 years, and a 200-year does not occur every 200 years. Over a 2,000-year period, a 100-year flood may occur 20 times. However, a 100-year flood may occur each year for the next 5-years, and not occur again for the next 1,000 years.

Similarly even if Singapore is protected from a 200-year flood, there is no guarantee that it will not face a monstrous 500-year flood, or even a 1,000-year flood, within the next few years. Technically, the country can be protected from any flood, but the cost of this protection goes up exponentially if we move from a 100-year to a 1,000-year flood.

The productive capacity of any society is limited. If Singaporeans are to decide they need a protection from a 200-year or even a 500-year flood, the society will have to make a fundamental decision to invest an enormous amount bracing against flood —which may not come for several generations. This extra expenditure comes at a cost to other societal pillars such as education, health or transportation, which need regular investments for a productive and functional economy.

Over the past 31 years, the government has invested an estimated S$2 billion (US$1.59 billion) on drainage infrastructure and flood control measures. Currently, improving such infrastructure costs another S$150 million yearly. Consequently, unlike other Asian countries suffering from serious floods, Singapore's main problem at present lies with flash floods that last for less than 30 minutes on average. According to historical records, the last flood fatality was in 1978, when six people died during the December monsoon while a seventh was electrocuted by a falling street lamp. It is highly unlikely that death by drowning in a flood will be a feature of Singapore life in the future.

Let us put things in perspective. In my view, Singaporeans should be more concerned with droughts rather than floods, and spending on water management infrastructure should give adequate weight to droughts and also to floods. As night follows the day, it is simply a question of time when the country will face droughts for a prolonged period. Singapore's equatorial climate is governed by a northwest monsoon and a southwest monsoon punctuated by two dry seasons. Unlike the current floods, a serious drought will affect all Singaporeans for several years, including its high-tech industrial and commercial activities, all of which require reliable water supply. Investor confidence could be seriously damaged.

Singapore is a small island, and is still dependent on neighbouring Malaysia for much of its water supply until the agreement expires in 2061. Singapore has not been idle. She has made tremendous strides towards water self-sufficiency, including desalination and recycling. But recycling requires assured supply of freshwater to start with. If drought reduces freshwater availability in Singapore and Johor, new water production will suffer as well.

At the end of 2011, Singapore had 17 reservoirs after the addition of Marina, Punggol and Serangoon water bodies, and two-thirds of the tropical island is now left unmolested as catchment areas to shore up supplies, even as it has undertaken technologies to recycle water. NEWater, high-grade reclaimed water, now accounts for 30 per cent of the country's water needs, mainly for industrial use, and the goal is for it to meet 50 per cent of needs by the time the Malaysian agreement expires. Singapore also started desalination in 2005 to supplement water sources.

These are legacy policy lessons from an era of Singapore's development years amid a time

of drought, that threatened the pace of her industrial progress. A generation has grown up without experiencing the "Save Water Campaign" by the PUB in May 1971 to educate the public to curb consumption. Back in the 1960s, pre-independence Singapore suffered severe drought that threatened a growing population and nascent industrialisation. Not only were the reservoirs not being replenished, with very low water levels, the same was true across the border in Johor, which supplies water to Singapore. PUB records show that the government of the day had to impose water rationing over a four-and-a-half month period between September 1, 1961 to January 16, 1963 and again over a 10-month period from April 23, 1963 to February 28, 1964 in the aftermath of the drought.

Droughts cause attendant problems. The last recorded dry spell was in February 2005, which was the driest month in 29 years, causing 388 bush fires over a period of more than seven weeks and sending temperatures soaring above 34 degrees Celsius daily for five weeks, according to the National Environment Agency. Such fires cause lingering particle build-up in the city-state. In 1997, forest fires in Indonesia from the El Nino dry spell blanketed parts of Southeast Asia in general and Singapore in particular in a thick, acrid haze for weeks. For a small city without a hinterland, drought-induced bush fires have a disproportionately large impact on a densely populated urban society and service-based economy.

The longest dry spell in the agency's post-independence records was 35 days in 1976. If Singapore is to face a prolonged drought like the one witnessed recently in Australia which lasted several years, or even a decade-long drought, it could inflict major social, economic and reputational costs that merits careful attention.

A large country such as Australia endured a 7-year drought with considerably difficulty. However, water could be transferred from other parts of the continent through various means. This is a luxury an island simply does not have. Thus, Singapore should be more concerned with droughts and not floods, and prepare a comprehensive plan to successfully withstand prolonged droughts. GIA

Asit K. Biswas is a Distinguished Visiting Professor at the Lee Kuan Yew School of Public Policy, Singapore, and Founder of the Third World Centre for Water Management, Mexico. He received the Stockholm Water Prize in 2006, which is the equivalent of the Nobel Prize for work related to water.

Frequent incidences of flooding in Singapore in the past two years have diverted the key debate over the threat of drought and greater inherent risks for the city-state, Professor Asit Biswas argues.

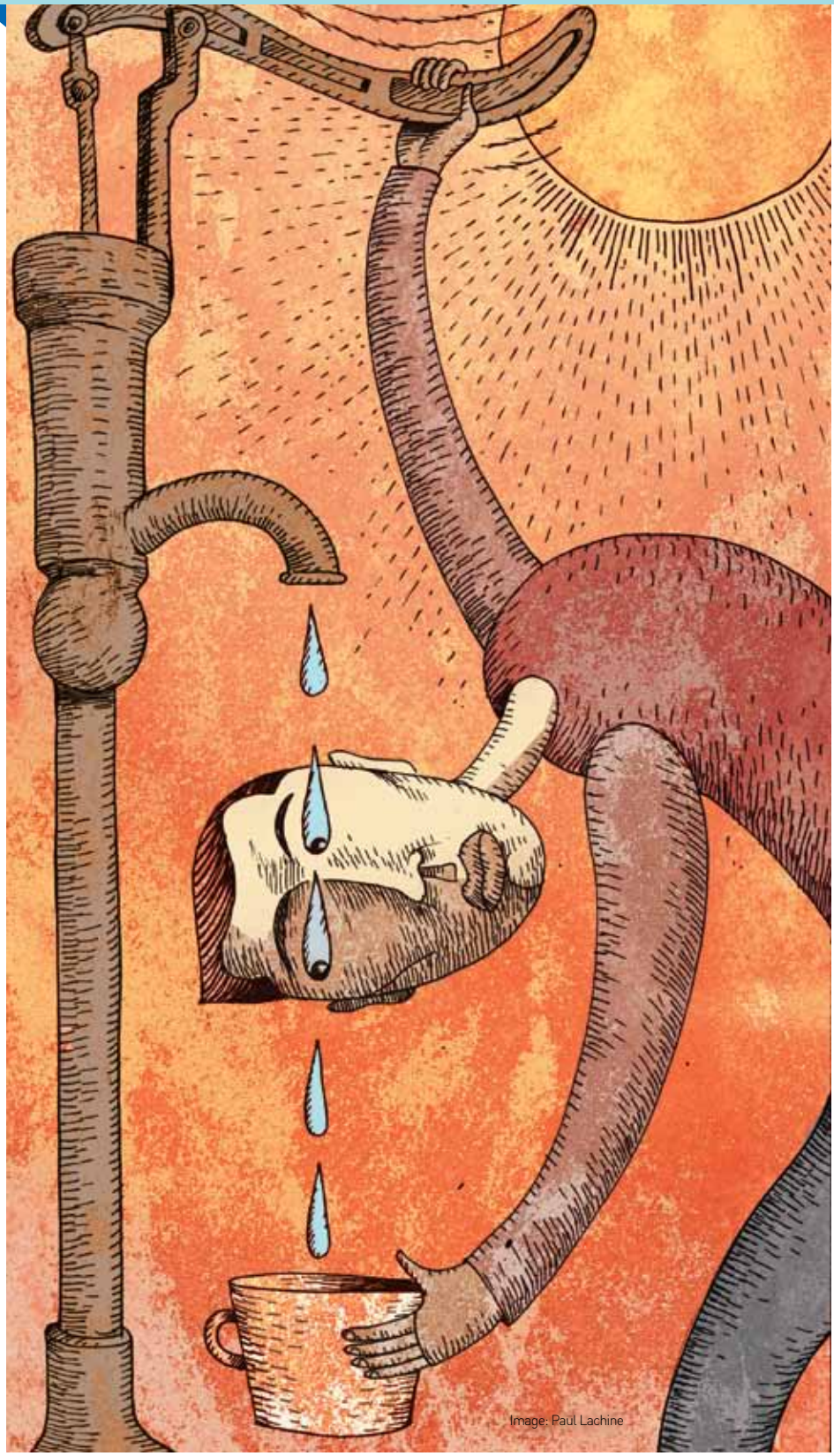

Image: Paul Lachine