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TACKLING SOCIETAL CHALLENGES

This is a monthly series on SMU research which aims to create significant impact by addressing these five societal challenges: *Economies & Financial Markets, Social Fabric & Quality of Life, Boundaries & Borders, Sustainability, Innovation & Technology.*

In this issue, SMU researchers offer insights on tackling the societal challenge of managing for sustainability.

Weathering the storm better

Cities and businesses should plan for extreme weather events to mitigate impact on infrastructure and the economy

Whether it's heatwaves, floods, or tropical cyclones, extreme weather events are happening more frequently as a result of climate change, with cities bearing the brunt of the impact of such occurrences.

This can include damage and disruption to physical infrastructure, such as power and transport grids that enable businesses to function, as well as the time and money it takes to recover from such calamities.

A study by Winston Chow, Associate Professor of Humanities at the Singapore Management University (SMU) School of Social Sciences, explores how a city's urban resilience can be maximised to better withstand the impact of extreme weather.

He notes that governments can create conditions for a city to become more resilient.

"Anticipating and adapting to extreme events specific to a city from the best science available, and forward-thinking planning, implementation and stakeholder support can make sure a city bounces back to normal from a disruptive event," he says. "Moreover, such an approach would also be financially sensible as ad hoc, or worse, post-hoc planning would undoubtedly be more expensive."

Singapore has not been spared the impact from climate events. The Republic is experiencing hotter days and nights, and more frequent droughts and flash floods from changing rainfall patterns stemming from climate change.

While the increased heat may not be immediately apparent due to the widespread use of air-conditioning, there is still a problem due to more energy being consumed from non-renewable fuels. This adds to the country's greenhouse gas emissions that drive climate change.

The changing rainfall patterns are more acutely felt, says Assoc Prof Chow, as dry weather in the region is a major problem when coupled with forest fires in Indonesia that leads to the haze conditions that Singapore has been experiencing recently.

Meanwhile, flash floods from heavy rainfall can disrupt local transport and cause flood damage to businesses.

This was what happened in 2010, when floods in Orchard Road ended up costing S\$23 million in insurance claims.

A resilient response

The response to these weather and climate events has largely been led by the government.

Some examples include engineering investments in drainage control and water technology from PUB to reduce flood and drought impacts, and the commissioning of research projects by government and academia aimed at reducing exposure to extreme heat in cities.

However, Assoc Prof Chow notes that not all solutions are technical in nature, and that the best options can involve including natural solutions that increase resilience, as these tend to have multiple benefits.



Associate Professor Winston Chow

For instance, naturalising the Kallang River cutting through Bishan-Ang Mo Kio Park has reduced the likelihood of flash floods in the immediate area, and also lowered temperatures for residents.

It also allows for a recreational space for visitors, a business space for F&B and spa outlets that benefit from the unique environment, and for flora and fauna – including migrating birds, local otters, and butterflies – to have a habitat.

Businesses need to get involved

Driving sustainable urban development to combat the impact of extreme weather requires leadership not only from government and academia, but also action from the private sector, argues Assoc Prof Chow.

"In recent times, there has been greater environmental awareness among consumers and other stakeholders in areas such as plastic pollution, zero-waste, and reducing personal carbon emissions.

Businesses slow to adapt to this change in awareness are very likely to lose out – the challenge is understanding sector-specific actions accounting for this raised awareness can benefit businesses," he says.

He urges the local business community to take the risks of extreme weather seriously.

Indeed, the *Global Risks Report* unveiled at Davos earlier this year indicated that extreme weather events and climate change issues are the two biggest risks facing economies in the future, continuing a trend since 2017.

"Not considering sustainability explicitly in business decisions would indeed not be in any private sector firm's best interests!"



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Not a wasted opportunity

Recycling electronic waste can yield multiple benefits for businesses

Electronic waste such as old mobile gadgets or computers is generally viewed by governments as a problem that needs to be managed. As such, many authorities seek to export such e-waste to developing countries which are paid to receive and process it. However, there are negative impacts of these practices on countries that take in these discarded materials. China, for instance, has decided to ban the import of waste.

At the same time, governments are being pressured by environmental groups to pay more attention to legislating e-waste. In Singapore, several initiatives – including the Resource Sustainability Bill – are aimed at managing the increasing volume of these materials.

It's a different story when it comes to businesses, however. In their effort to recycle, industry players have shown that they see the economic value of e-waste.

A study by Aidan Wong, Assistant Professor of Humanities (Education) at the Singapore Management University (SMU) School of Social Sciences, argues that "the value of e-waste forms the basis for further processing and re-introduction into production as raw material".

E-waste is recycled by breaking it down into smaller parts and then distinguishing between the serviceable and unserviceable components. Often, the useable portions end up being sold to electronic and electrical goods repair shops, while the unserviceable parts are further broken down into the components that contain precious metals. These components are then burnt to recover precious metals that undergo several rounds of purification.

Governments are starting to recognise the value of e-waste, but their motivation is often related to environmental sustainability issues. To this end, they give support to initiatives by industry to reap the economic benefits of e-waste recycling.

However, as industry is driven by a business imperative, they must be guided and regulated by governments to ensure that they do not ignore their environmental responsibilities in the pursuit of profit, says Asst Prof Wong. That said, overly tight regulation of the recycling industries by governments can stymie their growth, and hamper efforts towards environmental sustainability, he adds.

A competitive differentiator

By sourcing for raw materials from recycled e-waste, businesses can differentiate themselves in the market by being viewed as more environmentally conscious.

"Consumers may be motivated to purchase electronic and electrical goods that have components that are made from recycled precious metals. Besides expanding their customer base to include those who are motivated by environmental concerns, businesses may also turn to recycled precious metals as a means to supplement their raw material purchasing strategy by looking to recycled precious metals as a potentially more stable source of raw materials," says Asst Prof Wong.

To maximise the benefits of these efforts, companies need to expand their collection networks, and to increase their visibility to the general public. Companies should



Assistant Professor Aidan Wong

also invest in R&D-related precious metals recovery, and develop new technologies and solutions that increase the quality and quantity of precious metals that can be recovered from the process.

Asst Prof Wong also notes that labour plays a key role in the recycling process. In particular, *Karung Guni* – the colloquial term for the rag-and-bone men – have a wide network of customers whom they visit door-to-door on a regular basis. "In this sense, they are mobile labour who bring the e-waste collection point to the doorstep of waste producers, and subsequently act as an important economic actor by dismantling and sorting the waste before selling this on to e-waste recycling companies. While mechanisation may be possible at other stages of the recycling process, the significant role played by labour in the collection of the e-waste remains," he says.

Changing perceptions

However, there are obstacles to maximising the e-waste that can be recycled. Firstly, many consumers are anxious about parting with their e-waste because of potentially sensitive data that their discarded gadgets may contain. "Many of our laptops, personal computers, hard disk drives and smartphones store personal information and we are understandably anxious that it should not fall into the wrong hands," says Asst Prof Wong. "Thus, one key hurdle is to make readily available technology that scrubs clean the data stored on our devices." Furthermore, the public still has a negative view towards waste as matter that needs to be disposed of in the most efficient manner – most often into bins and incinerators.

"Thus, efforts need to be undertaken to create social awareness around the veritable 'gold mine' that resides in our drawers and homes, and embodied in our e-waste."



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