GLOBAL INFORMATION SOCIETY WATCH 2020

Technology, the environment and a sustainable world: Responses from the global South

Association for Progressive Communications (APC)
and Swedish International Development Cooperation Agency (Sida)

Global Information Society Watch 2020
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APC would like to thank the Swedish International Development Cooperation Agency (Sida) for their support for Global Information Society Watch 2020.

Published by APC
2021

Global Information Society Watch 2020 – web and e-book
ISBN 978-92-95113-40-4
APC-202104-CIPP-R-EN-DIGITAL-330

MALAYSIA

SMART CITIES AND GENDER IN MALAYSIA

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Introduction

Cities occupy only 3% of the world's land mass, yet they are the home to more than half of the world's population. Rapid growth and urbanisation also see cities responsible for 70% of global carbon emissions and over 60% of the world's resource consumption.[1] As much as they contribute to global warming, cities are also expected to suffer the most as climate change intensifies and threatens livelihoods and infrastructure.[2]

In light of this, more cities are transforming into "smart cities", where city services are enhanced through the adoption of information and communication technology (ICT) solutions, allowing for more efficient energy use and resource management to reduce greenhouse gas emissions. Smart cities are now deemed inevitable as the world moves into Industry 4.0, pushing cities to develop their infrastructure and adopt new technologies to remain competitive and uphold sustainable development.

However, one of the biggest challenges for smart cities is ensuring inclusiveness.[3] In societies where digital, gender and other divides exist, it is uncertain whether the implementation of smart city solutions can be realised to achieve their intended outcomes without leaving anyone behind.

This report will look at some of Malaysia's smart city efforts and their interaction with stakeholders, their potential impact on women's rights, and the role ICTs can play to bridge the gap between Malaysia's marginalised and vulnerable communities.

1 https://www.un.org/sustainabledevelopment/cities

2 Elliott, K., & Borunda, A. (2020, 25 March). See which cities will feel the brunt of climate change. *National Geographic.* https://www.nationalgeographic.com/magazine/2020/04/these-cities-will-feel-climate-changes-effects-the-most-feature

3 Marrone, M., & Hammerle, M. (2018) Smart Cities: A Review and Analysis of Stakeholders' Literature. *Business & Information Systems Engineering, 60,* 197-213. https://link.springer.com/article/10.1007%2Fs12599-018-0535-3

Malaysia and smart cities

At the United Nations Climate Change Conference in 2009, Malaysia made its first pledge to reduce its national carbon emissions intensity of GDP by up to 40%, based on 2005 levels, by 2020.[4] Since then various policies, plans and legal frameworks have been developed to transition Malaysia into a low-carbon future; for example, the Renewable Energy Act,[5] the Low Carbon City Framework[6] and the Green Technology Master Plan,[7] among others. These provisions were further emphasised in the Eleventh Malaysia Plan (2016-2020)[8] which also included a focus on improving the nation's digital infrastructure and an emphasis on the development of smart cities. The Smart City Framework[9] (SCF) was then released in 2019 to support both national and global agendas such as the United Nations Sustainable Development Goals (SDGs) and New Urban Agenda (NUA). At the framework's launch, the government envisioned smart cities to be:

> [I]ntegrated with sustainable technologies in the cities' services such as 5G connectivity, cashless community, autonomous public transport, drone delivery, energy-efficient buildings, smart treatment of water and waste management and others, that can improve the public safety and the quality of life.[10]

4 Choi, T. W. (2009, 17 December). Malaysia aims for 40pc cut in carbon intensity per GDP. *The Star.* https://www.thestar.com.my/news/nation/2009/12/17/malaysia-aims-for-40pc-cut-in-carbon-intensity-per-gdp

5 http://www.seda.gov.my/policies/renewable-energy-act-2011

6 Ministry of Energy, Green Technology and Water. (2017). *Low Carbon Cities Framework (Version 2).* https://www.lccf.my/wp-content/uploads/2018/10/LCCF_Book-Version-2-2017.pdf

7 Ministry of Energy, Green Technology and Water. (2017). *Green Technology Master Plan 2017-2030.* https://www.mestecc.gov.my/web/wp-content/uploads/2019/04/9.-Green-Technology-Master-Plan-Malaysia-2017-2030-English.pdf

8 Economic Planning Unit, Prime Minister's Department. (2015). *Eleventh Malaysia Plan 2016-2020.* https://policy.asiapacificenergy.org/sites/default/files/11th%20Malaysia%20plan.pdf

9 Ministry of Housing and Local Government. (2018). *Final Report: Malaysia Smart City Framework.* https://www.kpkt.gov.my/resources/index/user_1/GALERI/PDF_PENERBITAN/FRAMEWORK/FRAMEWORK_SMART_CITY_FINAL_REPORT_190328.pdf

10 Loo, C. (2019, 23 September). Ministry launches Malaysia Smart City Framework. *The Sun Daily.* https://www.thesundaily.my/local/ministry-launches-malaysia-smart-city-framework-BN1395377

The SCF can be viewed as directly addressing carbon emission reduction in two main areas: energy efficiency and mobility.

Under energy efficiency, the framework proposes making government and commercial buildings comply with building energy efficiency requirements such as implementing renewable energy initiatives and building energy automation systems. It also proposes the implementation of smart grid technology and building up the nation's renewable energy capacity.

With regard to mobility, efforts will be put into establishing intelligent transport management systems. Real-time data on public transport services, traffic congestion, energy usage and air quality are gathered and processed daily using big data, internet of things (IoT) sensors, networks and applications by a Centralised Traffic Command and Control Centre which would allow cities to better monitor and increase the efficiency of their services while contributing to lower carbon emissions.

In 2019, five local authorities that have adopted the Low Carbon Cities Framework showed impressive carbon emission reduction, notably the Shah Alam City Council, which saw 6.15% reduction in total carbon dioxide (TCO_2) compared to 2018 levels through its implementation of building energy efficiency systems, electric buses and LED street lighting, among others.[11]

Iskandar Malaysia, the nation's "smart city template"[12] in development in the state of Johor since 2006, charted a 13% reduction of emission intensity per GDP in 2017 compared to 2010.[13] This was achieved through its various programmes, e.g. school awareness campaigns and building energy and monitoring reporting systems implemented by five of its local councils.[14] Through the use of ICT-based monitoring and tracking systems, Iskandar also saw an improvement in water quality of the once heavily polluted Segget River, one of the main rivers flowing through the city centre.[15]

As the nation's tech city, Cyberjaya is leading the smart city movement through its living lab initiatives, where it acts as a test bed for piloting new technology. A citywide implementation of the LoRa network, a wireless technology that offers long-range, low-power and secure data transmission for IoT applications, made Cyberjaya the first smart city in Southeast Asia to do so in 2017.[16] Through the LoRa network, information rendered by a network of IoT sensors that can detect particles of PM2.5 are fed into a dashboard monitoring the city's air quality, which is made available in real time to the public. Another critical initiative is its district cooling system, which supplies chilled water for the air conditioning needs of 40 multi-storey buildings within the city's flagship zone.[17] Utilising off-peak electricity at night to chill water for use during the day, the city has reaped the equivalent of 8.2 gigawatt hours in electricity savings and avoided 4,100 tonnes of CO_2 emissions.[18]

The provisions mentioned above indicate that the government has been proactive to not only reduce carbon emissions in its cities but also improve the quality of urban life. However, an important question remains: what are the implications of smart cities for women as well as other vulnerable and marginalised groups in Malaysia? Is inclusive stakeholder participation a reality in the development and implementation of the SCF?

Opposition to the current implementation of smart cities in Malaysia

With smart city-related projects on the rise, so are disputes between planners and communities. For example, the Penang South Reclamation Scheme is a highly controversial mega-project to build three smart city islands in the south of Penang. The project, which will see 4,500 acres of land reclaimed, is currently facing backlash from civil society and fishing communities whose livelihood would be affected by the environmental impacts of the land reclamation.[19] Although

11 GreenTech Malaysia. (2019, October 9). Building a Low-Carbon Metropolis. *GreenTech Malaysia.* https://www.mgtc.my/2019/10/building-a-low-carbon-metropolis

12 Harvey, F. (2012, 2 November). Iskandar Malaysia – the green mega-city rising above Singapore. *The Guardian.* https://www.theguardian.com/environment/2012/nov/02/iskandar-malaysia-green-megacity

13 Siambun, V. (2019). Introduction and Updates: Iskandar Malaysia Low Carbon Society. Paper presented at the 6th Asia Pacific Forum on Sustainable Development, GCoM SEA, 27 March. https://www.asian-mayors.eu/wp-content/uploads/2019/03/3.-Iskandar.pdf

14 Iskandar Regional Development Authority. (2018). *Laporan Tahunan 2018* [Annual Report 2018]. http://iskandarmalaysia.com.my/annual-report

15 Mohamed, Z. (2017, 12 April). Sungai Segget Capai Kelas IIB [Segget River Reaches IIB Class]. *Berita Harian.* https://www.bharian.com.my/taxonomy/term/2646/2017/04/270812/sungai-segget-capai-kelas-iib

16 Phoon, Z. (2017, 8 November). Cyberjaya in for exciting times as smart-city model. *Property 360 Online.* http://property360online.com/cyberjaya-exciting-times-smart-city-model

17 https://www.cyberjayamalaysia.com.my/about/clean-and-green

18 Zengkun, F. (2017, 17 May). Keeping it cool: Malaysia looks to district energy systems. *Eco-Business.* https://www.eco-business.com/news/keeping-it-cool-malaysia-looks-to-district-energy-systems

19 Pathak, M. (2017). *Whose Opinion Matters: Lessons from a Stakeholder Engagement Process for Penang, Malaysia*. Massachusetts Institute of Technology (MIT) and Universiti Teknologi Malaysia (UTM) Malaysia Sustainable Cities Program. https://malaysiacities.mit.edu/sites/default/files/documents/Pathak.pdf; Aiman, A. (2020, 20 January). Fishermen raise alarm over Penang's 3 islands project. *Free Malaysia Today.* https://www.freemalaysiatoday.com/category/nation/2020/01/20/fishermen-raise-alarm-over-penangs-3-islands-project

the Penang state government attempted a wide-scale stakeholder engagement exercise, this was done only after receiving opposition from the affected communities. As at the time of writing, the project has been put on hold pending the Department of Environment's approval of the project's environmental management plan.[20] This seems to bring some respite to the ongoing conflict, but many from the affected communities who oppose this project remain anxious.

If the project does proceed, it will be the second mega-scale land reclamation project after "Forest City", a four-island integrated "smart and green city" within Iskandar, which commenced in 2014 and is now partially completed. Like Penang, insufficient and inefficient stakeholder engagement led to conflicts with the local fishing communities whose livelihood depended on the waterways and mangrove forests that were lost due to reclamation.[21]

It should also be highlighted that a number of projects that were announced years earlier – for example, one of Iskandar's critical solutions to carbon emission reduction, the smart bus rapid transit system that was expected to be completed in 2012[22] – have yet to start in 2020. Access to current information on the progress of various smart city targets in Malaysia is also limited, which further alienates the potential users of these cities.

The above highlights one of the most common problems in policy making anywhere in the world: ensuring sufficient stakeholder participation throughout planning, development and implementation. For a developing country like Malaysia, which had for over 60 years been governed by the same ruling party, policies have been formulated by the Prime Minister's Department in a "top down"[23] way, and are typically approached as "decide, announce and defend".[24] Decision making in critical development projects such as the ones above are often politically motivated and driven by a limited interpretation of costs and benefits.[25] The objectives of the SCF will not be realised if this approach persists and relevant stakeholders, especially vulnerable groups, are continually excluded.

Smart cities and gender

With the extensive use of ICTs in smart cities, we believe that women and other marginalised communities are being left behind, although the blueprint by the Ministry of Housing and Local Government (2018) does recognise the need for a gender dimension in the smart city policy. It claims that "social inclusion, especially gender equality shall be given emphasis in smart city development."[26]

This policy aims to promote equality and inclusion for women and vulnerable groups in terms of providing supportive physical infrastructure and programmes during the development of a smart city. In addition, the participation of women and vulnerable groups in decision making will be necessary in ensuring a safe and inclusive city environment.

The government also stated:

> Gender sensitisation is not a major issue especially in terms of general bias and discrimination. However, there is still a need to focus on the gender equality in decision making for all aspects of smart city development such as the difference in infrastructure and facility needs for both gender, daily activities as well as safety requirements.[27]

This clearly demonstrates the lack of understanding of gender equality and its critical need to be mainstreamed into all development initiatives including the design of smart cities.

Gender mainstreaming should be the centre of developing smart cities. Women's lived experiences are different to those of men, and they vary across social classes, ethnicity, and educational background. This also means that women perceive and experience public spaces differently from men. Gender inclusiveness in design and implementation of smart cities will help the promotion of gender equality as this acknowledges the differentiated gendered experiences of men, women and gender non-conforming persons.

Many do not realise that an individual's experience of city living is largely shaped by gender roles and stereotypes. For example, gender roles

20 Carvalho, M. (2020, 24 July). No-go for reclamation project. *The Star.* https://www.thestar.com.my/news/nation/2020/07/24/no-go-for-reclamation-project

21 Williams, J. (2016). *Evaluating the Diverse Impacts of Megaprojects: The Case of Forest City in Johor, Malaysia*. Massachusetts Institute of Technology (MIT) Malaysia Sustainable Cities Program. https://scienceimpact.mit.edu/sites/default/files/documents/Williams.pdf

22 Iskandar Malaysia. (2010, 3 May). Sistem BRT Model di Iskandar Malaysia [BRT System Model at Iskandar Malaysia]. *Iskandar Malaysia.* http://iskandarmalaysia.com.my/news-20100503-6

23 Kho, S. N., Ibrahim, F., Mustapha, S. M., Mokhtar, A. H. A, & Shah, D. F. J. (2019). A reflection on the stakeholder theory: Impact of government policies. *SEARCH Journal of Media and Communication Research, 11*(3), 111-126. http://search.taylors.edu.my/documents/journals/2019-11-3/SEARCH-2019-11-3-J7-111-126.pdf

24 Pathak, M. (2017). Op. cit.

25 Thabrew, L., Wiek, A., & Ries, R. (2009). Environmental decision making in multi-stakeholder contexts: Applicability of life cycle thinking in development planning and implementation. *Journal of Cleaner Production, 17*(1), 67-76. https://linkinghub.elsevier.com/retrieve/pii/S0959652608000528

26 Ministry of Housing and Local Government. (2018). Op. cit.

27 Ibid.

and stereotypes contribute to differentiations in women's participation in the workforce and the division of labour within homes, contributing to the construction of unequal urban realities for women. Urban poverty has a disproportionately high impact on women, who form the majority of the urban poor, with limited access to essential services.[28] Smart cities cannot just focus on the effectiveness and efficiency of technology; rather they have to consider their impacts on the gendered experience. The transition to smart cities must acknowledge the different needs and capacity of the communities.

Conclusion

It is clear from the various plans and frameworks involving smart cities that Malaysia is keen in advancing the nation into the digital age, as part of adapting to climate change and improving the lives of its people. Since it began its efforts, Malaysia has seen considerable carbon emission reduction and other improvements in many of its participating cities. However, beyond these achievements, the larger hurdle of narrowing the socioeconomic gaps within this society remains. Insufficient stakeholder engagement throughout the planning and development of smart city initiatives would see women and vulnerable groups left behind due to the digital divide. Until these members of society are included in discussions, Malaysia will face difficulty in realising a true smart city that meets the objectives of the SCF.

Inclusivity and equity as key principles in the socioeconomic development agenda, such as the Eleventh Malaysia Plan, must ensure all citizens engage and participate in the development process. To achieve the objectives of equity and inclusion, significant effort is required to ensure that the needs of vulnerable groups are fully considered.[29] Using appropriate stakeholder mapping techniques to identify all stakeholders and their needs and expectations should form the basis for the engagement process.[30]

The New Urban Agenda[31] sets global standards in sustainable urban development and calls for cities to be secure, positive, respectful and safe places for all people to live and work without fear of violence or intimidation. Malaysia must uphold the standard by promoting civil engagement and participation. This with respect to especially ensuring women's full and effective participation and equal rights in all fields and in leadership at all levels of decision making, and eliminating all forms of discrimination, violence and harassment against women and girls in private and public spaces. This is also Malaysia's obligation under the Convention on the Elimination of All Forms of Discrimination against Women (CEDAW), to which Malaysia is a party. Malaysia has the obligation to ensure the participation of women on equal terms with men in political, social, economic and cultural aspects. Non-fulfilment of this obligation may hamper the growth and prosperity of society and the family, consequently hindering the full development of the potentialities of women in the service to the country and humanity.

Action steps

The following action steps are suggested for civil society organisations:

- Demand that the Malaysian government uphold its obligation under CEDAW to ensure that all policies and programmes implemented will promote gender equality.
- Demand that the government include gender experts when formulating any strategies and policies on smart cities. This can be done by lobbying elected representatives at both the state and federal levels.
- Advocate the use of comprehensive stakeholder engagement and mapping techniques by government and developers to address the needs and expectations of all relevant stakeholders.
- Participate in discussions related to smart city projects or the implementation of ICT solutions at all levels beginning from the planning stage.
- Engage and support planners, research groups and ICT providers to increase exchange of knowledge and improve the quality of local ICT solutions to meet the actual needs of their users
- Encourage the use of ICT solutions to improve stakeholder engagement efforts, e.g. the use of apps for feedback to local councils.
- Work to increase public awareness on the impacts of planned or ongoing smart city and ICT projects.

28 UN Women India Violence against Women Programme Team. (2017, 31 October). India's Smart Cities Mission. *UN Women*. https://asiapacific.unwomen.org/en/news-and-events/stories/2017/10/india-smart-cities-mission

29 Geurs, K., Boon, W., & Van Wee, B. (2009). Social Impacts of Transport: Literature Review and the State of the Practice of Transport Appraisal in the Netherlands and the United Kingdom. *Transport Reviews, 29*(1), 69-90. https://www.tandfonline.com/doi/abs/10.1080/01441640802130490?journalCode=ttrv20; Elvy, J. (2014). Public participation in transport planning amongst the socially excluded: An analysis of 3rd generation local transport plans. *Case Studies on Transport Policy, 2*(2), 41-49. https://trid.trb.org/view/1320317

30 Prell, C., Hubacek, K., & Reed, M. (2009). Stakeholder Analysis and Social Network Analysis in Natural Resource Management. *Society & Natural Resources, 22*(6), 501-18. https://www.tandfonline.com/doi/abs/10.1080/08941920802199202

31 https://unhabitat.org/about-us/new-urban-agenda

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The world is facing an unprecedented climate and environmental emergency. Scientists have identified human activity as primarily responsible for the climate crisis, which together with rampant environmental pollution, and the unbridled activities of the extractive and agricultural industries, pose a direct threat to the sustainability of life on this planet.

This edition of Global Information Society Watch (GISWatch) seeks to understand the constructive role that technology can play in confronting the crises. It disrupts the normative understanding of technology being an easy panacea to the planet's environmental challenges and suggests that a nuanced and contextual use of technology is necessary for real sustainability to be achieved. A series of thematic reports frame different aspects of the relationship between digital technology and environmental sustainability from a human rights and social justice perspective, while 46 country and regional reports explore the diverse frontiers where technology meets the needs of both the environment and communities, and where technology itself becomes a challenge to a sustainable future.

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2020 Report
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