REVIEW ARTICLE
MAPPING OF LITERATURES AND INDICATORS TO SUSTAINABLE DEVELOPMENT GOALS

HAR WAI MUN*, LEE SIN YEE AND TAN KOK ENG

Universiti Tunku Abdul Rahman, Faculty of Accountancy and Management, Jalan Sungai Long, Bandar Sungai Long, 43000 Kajang, Selangor.

*Corresponding author: leesiny@utar.edu.my

Abstract: Sustainable development is the contemporary global megatrend guided by the United Nation's Sustainable Development Goals (SDG). Sustainable city, the Goal 11 of Sustainable Development Goals (SDG-11) aims to make cities inclusive, safe, resilient and sustainable. It has seven objectives and 11 indicators to be achieved by 2030. Despite its importance, conceptual researches are ambiguous in terms of definition of city and sustainable while no mapping of literatures and indicators to the objectives of SDG-11. These give motivation to this study to fill the gap. The study has three objectives. Firstly, it aims to review the concept of city, sustainable and therefore sustainable city. Secondly, it aims to map past researches and relevant theories into SDG framework. Thirdly, this study aims to identify critical issue regarding SDG's sustainable city.

Keywords: Sustainable development goals, sustainable city, Malaysia, life cycle thinking (LCT), urban planning.

Introduction

Sustainable city is Goal 11 of United Nation's Sustainable Development Goals (SDG). This goal aims to make cities inclusive, safe, resilient and sustainable. Justification for this goal is that cities are nucleuses for human social, cultural and economic activities. The importance of cities is not new. In ancient China, the legendary military strategist Sun Tzu sees attacking city as not worth, thus worst of all strategies. However, his equally brilliant strategist grandson Sun Bin has a whole chapter dedicated to attack city due to growing significant of city's economy to the nation (Sun Bin, 2003). Back to modern era, half of global population live in cities despite covering only two percent of world's surface. Cities consume 75% of energy while accountable for most of carbon dioxide emission (Ratti, 2016). Establishment of international organizations based on city issues also proves growing important of city (Albertí, *et al.*, 2017). Examples of such organization are "Cities Climate Leadership Group" on climate changes in megacities, "Energy Cities" on lowering carbon emission in European cities and World Cities Network on resilience of cities towards climate change. Therefore, city is the centre for governmental administrative, nucleus for economic activities and benchmark for human civilization. Its importance extends beyond producing output and creating jobs while sustainable city in general encompass the aspect of welfare and perpetuity of progress of city.

Previous Millennium Development Goal (MDG) has a target for sustainability (Target no. 7) but focuses on environmental sustainability, not sustainable city. Four objectives under the Target 7 of MDG are (i) retrogressive the damage to environmental, (ii) decreasing biodiversity damage, (iii) halve the fraction of the population with no safe water to drink and basic sanitation, and (iv) attaining substantial progress to the many slum dwellers. The SDG replaces MDG, covering those four objectives in more details under different goals. SDG Goal 13 (Climate Action), Goal 14 (Live below Water) and Goal 15 (Live on Land) collectively cover the first and second objectives. SDG Goal

6 (Clean Water and Sanitization) covers the third objective. Surprisingly, SDG did not have follow up goal for continuous improvement of slum dwellers or development of rural area. The Millennium Development Goals Report 2015 (United Nation, 2015: 61) claims target achieved globally but acknowledges need of continuous improvement due to growing number of slum residents. In contrast, the SDG has a specific goal on sustainable city. Upgrading slums is merely part of its first objective. Perhaps, issues of slum or rural are mainly regarding poverty and access to necessity needs like clean water and sanitization, safety and health which covered in other goals. Meanwhile, more and more pressing issues of development and sustainable raise in city. For example, poverty not only in rural or slum but in urban due to increasing standard of living not matched by raise of income. Housing scarcity and unaffordability, congested traffic, raising crimes and eroding cultural identity in city space justify for more attention.

Goal 11 of SDG has seven objectives to be achieved by 2030. It aims to encompass challenges to overcomes problems of sustainable development such as adequate, safe and affordable housing and basic services (sub-SDG 11.1); accessible and sustainable transport systems (11.2); and public spaces (11.7) especially for women, children, persons with disabilities and elderly; inclusive and sustainable urbanization (11.3); safeguard of cultural and natural heritage (11.4); disaster risk (11.5) and environmental externalities (11.6). Each of these objectives has their own indicators, which acts as performance measurement. The objectives and indicators of Sustainable City goals are listed in Table 2 and Table 3. However, there are critical conceptual and technical gaps regarding the sustainable cities goal. These gaps have motivated this study to review critical issue regarding SDG on sustainable cities. Specifically, this study has three objectives. Firstly, it aims to review the concept of "city", "sustainable" and therefore "sustainable city". Secondly, it aims to map past researches and relevant theories into SDG framework. Thirdly, this study aims to identify critical issue regarding SDG's sustainable city.

Environment

Environment is the main focus of most literatures on sustainable cities. Heat-island phenomenon is among environmental problem in cities (Tsilini *et al.,* 2014). Suggested method to overcome it is reducing the temperature using bioclimatic design. According to Mirzaei and Haghighat (2010), the constant rising level in cities agglomeration is likely to upsurge habitants in cities by 60%. This caused exposure to microclimate in cities. Heat island affects smaller cities areas but causing great concern due to its rising intensity (Gobakis et al., 2011; Papanastasiou & Kittas, 2012). Energy poverty refers to struggle in sustaining suitable temperature or various energy amenities such as the lighting, transport and electricity. European Union (EU) trying energy market liberalization and improve competitiveness as a solution to the problem (Tsilini *et al.,* 2014). Besides city, researches on SDG do cover other areas such as ocean (SDG-14) by Blanc, Freire and Vierros (2017) and agriculture (SDG-1, 2, 6, 7 & 15) by Nhemachena *et al.* (2018).

Some literatures voice out against exclusion of climate mitigation goals in the urban planning. The reluctant of urban policy makers to invest in low-carbon projects is due to lack of cities' capacity and knowledge (Homsy & Warner, 2014; Ryan, 2015). Moreover, the advanced terms used by climate change scientists regarding the climate policies and the impacts always created misunderstanding among private and public investors, causing the ignorance of low-carbon projects in city-level environmental planning. Thus, sustainable or "green" designs are encouraged to be considered in building construction (Jalaei & Jrade, 2015).Tax can either be designed to reduce the tax burden of companies with environmental friendly or give more burden to a companies that increase environmental damaged (Morris, 2014).

Transportation issue is another hotly debate issue relating to sustainable city. Transportation connects employment, education and health care opportunity. Therefore, poverty often associates with remote rural that lack of proper transportation system as in city (Starkey & Hine, 2014). Higher density development appears to be gathered around a network of public transport (Banister, 2005). However, common assumption is higher vehicles leads to higher pollution in city. Successful improvement in local air quality arise from congestion charge and emission levels of CO2 decrease by 19% due to less stop-start driving, fewer cars and high speed driving (Banister, 2007). This has prompt development and thus researches on role of sustainable and efficient urban transportation planning to attain all social, economic and environmental objectives (Litman & Burwell, 2006). Urban planners commonly believe transportation advancement is linear, comprising newer and faster methods. Sustainable planning epitomizes a parallel model, where each mode is competent and attempts to generate balanced transport systems which synergized the best of each other. Nonetheless, sustainable transportation planning encourages decreasing vehicle usage due negative externalities such as greater expenses, bigger needs of transportation facilities, congestion, accidents and other negative externalities (Litman2012). Sustainable city research areas also encompass community livability, which includes local environmental quality, quality of community interactions and community unity or cohesion which means whether community residents work together and encourage each other and their ability to fulfil basic necessities like food and education (Gustavo & Manor, 1998).

The Concept of City, Sustainable and Sustainable City

Conceptually, researches on sustainable cities are ambiguous in terms of definition of city and sustainable. Contrasting to dualism economy school, there are variety spectrums of development level between rural and city in actual economy. Dualism economy assumes urban equals city which is developed with modern industries. Rural is subsistence sector with agriculture as main economic activity. It sees both categories as mutually exclusive (Todaro & Smith, 2015). In reality modern economy, there are grey areas such as sub-urban and semi-rural. What philosophy is used to define sustainability and therefore, sustainable city? Technically, what indicator to measure city, sustainability or sustainable city? What is the cut-off point to be considered as city under SDG framework? How do past researches qualify a settlement as city? What framework and theory apply to research on sustainable city topic? Inconclusive conceptual studies and empirical evidences in past researchers on sustainable cities put more burdens on the needs to study on the ambiguity on city and sustainability and the way civilization can achieve sustainable cities goals under the United Nation's SDG objectives.

There is no internationally agreed definition for city. The most basic conceptualization of city is physical characteristic and socio-economic activities of the settlement. Examples of common physical characteristic are size, building, infrastructure and landscaping. Socio-economic benchmarking of city include food, energy, water and transportation which collectively referred as metabolism of city (Anna *et al.*, 2017), environmental impacts (Kennedy *et al.*, 2012), economic growth, population density (Ding *et al*., 2015), cultural and institutional aspect (Allenby, 2009). Albertí *et al*. (2017) categorized variety definitions for city from international institutions (such as United Nation, World Bank and BSI) and academic writings into administrative centre, geographic morphology, population density, services provided and economic. City itself may consist three layers (United Nation 2016: 1). The core layer is city proper, usually defined by administrative boundary. The second layer enlarges city proper into urban agglomeration and further enlarges into metropolitan area. These enlargements of boundaries from city proper are based on population size, economic and social interconnectedness through interlinked commerce or commuting patterns. There is also

no consensus on minimum population size to make a city. However, megacity term is coined for city that has minimum 10 million of inhabitants. There were 31 megacity in 2016. This number is expected to increase to 41 megacities by 2030. Latest list of top ten megacities is in Table 1. Surprisingly, majority of them (7 countries) are from Asia. Only two megacities are in Japan with the rest in developing Asian countries. The remaining three top ten megacities are from developing world, namely Brazil, Mexico and Egypt. Hence, is city or megacity a symbol of wealth and development? In these cases, high population size is a more dominant determinant of city.

Concept of sustainability is extended from economic development by adding time dimension. Development itself is an extension to Keynesian economics from government intervention to promote economic growth to redistribution of growth to ensure welfare and justice (Har & Sek, 2011). Albertí *et al.* (2017: 1054) evaluates sustainability within three dimensions of economic, social and environmental. Hence, "sustainable city" should encompass elements of certain physical characteristics, economic strength and social welfare with government policy or political wills plays an important role. It also encompasses perpetuity of welfare and development. Despite no definite or conclusive,

these conceptualizations are overall consistent with scope of sustainable cities within United Nation's SDG framework.

Mapping Sustainable Development Gold Framework

Life Cycle Thinking (LCT) can apply to analyze city's sustainability. LCT encompasses environmental, social and economic aspects in four methods to analyze sustainable city. The four methods are Life Cycle Assessment (LCA) that measures the environmental effects, Life Cycle Costing (LCC) that quantifies economic impacts and Social-LCA (S-LCA) and Life Cycle Sustainability Assessment (LCSA) as extension to LCA. Using the LCT, Anna *et al.* (2017) chooses eight areas of city sustainability, namely building, energy, food, green spaces and landscape, mobility, urban planning, waste and water to do a literature mapping as in this study. They concluded that more than two-third of relevant literatures used LCT, particularly on the environmental aspect of sustainable city. They highlight lack of studies on complex urban issues and multi-indicators for future research. Meanwhile, Albertí, *et al.* (2017) also apply the specific LCA. Studying 37 different indexes related to sustainable city, they claim that sustainable evaluation still short of holistic view, various environmental impacts, comparative

Table 1: Top 10 megacities in the world

Rank	Megacity, Country	Population (thousand) in 2016
1	Tokyo, Japan	37,468
2	Delhi, India	28,514
3	Shanghai, China	25,582
4	São Paulo, Brazil	21,650
5	Ciudad de México (Mexico City), Mexico	21,581
6	Al-Qahirah (Cairo), Egypt	20,076
7	Mumbai (Bombay), India	19,980
8	Beijing, China	19,618
9	Dhaka, Bangladesh	19,578
10	Kinki M.M.A. (Osaka), Japan	19,281

Source: United Nation (2018: 4)

studies between cities and application of Life Cycle perspective in studying sustainable city. Their application of LCT is mapped to SDG Sustainable city's (SDG-11) objectives in Table 2 and SDG-11 indicators in Table 3.

Urban area's efficiency of form is a concept to reflect sustainable of city by judging the effective use of ecosystem. City clustering, compactness, connectivity, density, growth and energy usage are important aspects. Ogle *et al.* (2017) applied and quantified this concept using algorithmic analysis to city of Pocatello, Idaho (north-western region of the United States). His

analysis is mapped with SDG-11 objectives and indicators in Table 2 and Table 3 respectively. Density analysis is based on population per existing built up taking into consideration household size but exclude certain infrastructure and public sphere. This is contrast to Brussel *et al.* (2019) who focused on density of infrastructure in city within the scope of SDG-11. Connectivity analysis in Ogle *et al.* (2017) uses road intersection points within city space as important input. Cluster analysis measures on proximity of building to building and their clustering around the town centre. Studies

Table 2: Mapping theory and concept to SDG-11 objectives

No.	SDG Objectives	Anna *et al.* (2017) Life Cycle Thinking (LCT)	Ogle, Delparte and Sanger (2017) Urban Area's Efficiency of Form	MURNInet Urban Planning	Number of Other Literatures as Mentioned in Section 2
11.1	Adequate, safe and affordable housing and basic services and upgrade slums.	√	√	√	
11.2	Safe, affordable, accessible and sustainable transport systems.		√	√	5
11.3	Enhance inclusive and sustainable urbanization and capacity for participatory, integrated and sustainable human settlement planning and management.	√	√	√	1
11.4	Protect and safeguard the world's cultural and natural heritage.			√	
11.5	Reduce the number of deaths and direct economic losses due to disasters.			√	
11.6	Adverse per capita environmental impact of cities.			√	9
11.7	Provide universal access to safe, inclusive and accessible, green and public spaces.	√		√	

Table 3: Mapping Methodology to SDG-11 Indicators

No.	SDG Indicators	1	2	3
11.1.1	Proportion of urban population living in slums, informal settlements or inadequate housing.	buildings	Density analysis	KT1-P1
11.2.1	Proportion of population that has convenient access to public transport by sex, age and persons with disabilities.		Connectivity analysis	IT3-P1
11.3.1	Ratio of land consumption rate to population growth rate.		Density analysis	GT1-P1 & GT2-P1
11.3.2	Proportion of cities with a direct participation structure of civil society in urban planning and management that operate regularly and democratically.	urban planning	Cluster analysis	UT1-P1 & UT1-P2
11.4.1	Total expenditure (public and private) per capita spent on the preservation, protection and conservation of all cultural and natural heritage by type of heritage (cultural, natural, mixed and World Heritage Centre designation), level of government (national, regional and local/municipal), type of expenditure (operating expenditure/investment) and type of private funding (donations in kind, private non-profit sector and sponsorship).			GT4-P2
11.5.1	Number of deaths, missing persons and directly affected persons attributed to disasters per 100,000 population.			ST2-P1
11.5.2	Direct economic loss in relation to global GDP, damage to critical infrastructure and number of disruptions to basic services, attributed to disasters.			KT4-P1
11.6.1	Proportion of urban solid waste regularly collected and with adequate final discharge out of total urban solid waste generated by cities.			ST3-P1, IT2-P2 & IT4-P1
11.6.2	Annual mean levels of fine particulate matter (e.g. PM2.5 and PM10) in cities (population weighted).			ST1-P1 & ST1-P2
11.7.1	Average share of the built-up area of cities that is open space for public use for all, by sex, age and persons with disabilities.	green spaces and landscape		GT2-P2 KT2-P1
11.7.2	Proportion of persons victim of physical or sexual harassment by sex, age, disability status and place of occurrence in the previous 12 months.			

Note:	ST2-P1 Flood Prone Area
GT4-P2 Tourist Attraction & Recreation Center	ST1-P1 Cleanliness Level of Rivers
IT3-P1 Integrated Public Transport Terminals/ Stations	ST1-P2 Environmental Air Quality Conditions
	ST3-P1 Solid Waste Generation
GT1-P1 Land Use Change Rate	IT2-P1 Domestic Solid Waste Collected on Schedule
GT2-P1 Urbanization Rate	
GT2-P2 Public Open Space	IT4-P1 Homes with Centralized Sewerage Services
KT1-P1 Percentage of Affordable Quality Housing	UT1-P1 Residents' Satisfaction Level on Local Authority Services
KT2-P1 Percentage Residential Coverage within 400 Meters of Community Facilities	
	UT1-P2 Community Programs Implemented by Local Authorities
KT4-P1 The Ratio of Index Crime Cases	

on urban density are also linked to various fields such as carbon emission (Gudipudi *et al*., 2016), quality of life (Cramer *et al.,* 2004) and exploratory study on Hong Kong (Forrest *et al.,* 2008) and Shenzhen (Ye *et al*., 2016). Other researchers applied urban connectivity to various aspect of their analysis. Examples are Xun *et al.* (2014) and (LaPoint *et al.,* 2015) on ecology connectivity; Wei *et al.* (2018) and Rolf *et al.* (2018) on green infrastructure; and, Zaki and Ngesan (2018) on economy of a Malacca night city.

The Federal Department of Town and Country Planning Peninsular Malaysia uses Malaysian Urban-Rural-National Indicators Network on Sustainable Development" (MURNInet) to assess sustainability of city. It has six dimensions (and its match-up with relevant SDG), namely competitive economy; sustainable environmental quality (11.5 & 11.6 of SDG); sustainable community (11.1, 11.5 & 11.7); optimal use of land and natural resources (11.4 & 11.7); efficient infrastructure and transportation (11.2 & 11.6) and effective governance (11.3). It is surprising that MURNInet completely matched SDG-11 objectives and all its indicators except indicator number 11.7.2 "Proportion of persons victim of physical or sexual harassment by sex, age, disability status and place of occurrence, in the previous 12 months. Different literatures as in Section 2 also mapped to SDG-11 framework. As in Table 2, most past literatures on topic of sustainable city overly focused on adverse environmental impact" (SDG objective 11.6)

and sustainable transport system (11.2). Thus, future researches have many areas for study.

Critical Issues

SDG covers a lot of area for its goals in achieving sustainable cities and its communities. However, there are six critical issues worth discussing. These six issues are regarding (i) disability and public transport, (ii) enlargement of scope for "cultural and heritage", (iii) prevention of terrorism in city, (iv) international or cross-boundaries pollution like haze from Indonesia to Southeast Asia, (v) psychology harassment in city, and (vi) reversed migration.

Disability and Public Transport

Disability persons could be treated as second class users and face extra challenges in using public transport. It could be either public transport facilities are not built to cater for them, lack of civic manner in communities or both, this group of people often marginalized. SDG-11 objective 11.2 and indicator 11.2.1 do provide framework to cater for disability but problem often like in the political will of implementation. In 2010, Malaysia through Ministry of Women, Family and Community Development has research collaboration with United Nations Development Programme (UNDP 2010) on international best practice on accessibility of public transport for disabled persons. Various international best practices and recommendations on variety of aspects from vehicle design, bus/train station design, signage and pedestrian environment

have been documented. However, no record of achievement on how many of such international best practice and recommendations been implemented successfully. There are various acts and regulations to safeguard the welfare and equality of the disabled person (see Hussein & Yaacob 2012 for details) but their enforcements are slack. A survey on public transport friendliness to disabled person in Malaysia by Soltani *et al*. (2012) reviewed very inconvenient outcome to the disabled users. Thus, this issue of disability and public transport, especially in cities could remain a conceptual or theoretical rather than practical unless emergence of strong political will to support.

Enlargement of Cultural and Heritage Scope

Developed Western countries seem more tendency to preserve cultural and heritage than developing countries. The later less hesitate to ignore heritage for the sake of development, which is termed as rootless growth by UNDP (2016). Preservation of cultural and heritage in the city in developing countries more possible if those cultural and heritage can serve as tourist attraction, thus have economic value. Hence, no research on sustainable city directly touches on preservation of cultural and heritage in the city. Indeed, cultural and heritage scope in SDG could be enlarged not only to building, but also food, dialects, traditional handcraft (like batik), festival and local history. For years ago until contemporary, Malaysia, Singapore and Indonesia has been aggressively claiming ownership of *Nusantara* heritage such as *satay*, *batik*, *nasi lemak* and variety of local desserts (for examples, see The Star 2013 & 2015, Mohd Rusli 2017). Sustainability should extend to preservation of local history in original name of road, school and other places. In Malaysia, occidentalism wave saw many roads, school, port and places with colonial Western names being replaced local names (Lim & Har, 2008). This unofficial but rampant national-wide trend is critical as it is inconsistent with SDG goals.

Prevention of Terrorism and Hate Crime Violent in City

SDG objective and indicators do concern on economic losses due to disaster, which commonly refer to natural disaster such as earthquake, flood and typhoon. However, since September 11 tragedy, terrorism has been targeting city resulting potential risk and huge loss of life and economic value. This issue is more pressing after recent hate crime violent of mass shootings in United States (Pittsburgh synagogue and El Paso) and Christchurch, New Zealand. SDG goals should include city planning that can mitigate (if not eliminate) the risk of terrorism attack in city. Researches on this aspect are scarce with Borrion *et al.* (2014), Abbas and Awan (2015) and Estevens (2018) are among the few. The loss could be disastrous while knowledge about terrorism and hate crime violent are limited. Hence, this is a critical issue that needs more attention and further research in developing sustainable city.

International or Cross-boundaries Pollution

Environment has been the most popular issue concerning sustainable city. SDG indicator 11.6.2 for sustainable city has specific focus on fine particulate matter pollutants in city. In Southeast Asia, a particular case needs attention. It is the international or cross-boundaries haze pollution from Indonesia to Southeast Asia (see examples of recent news in The Star 2019a & 2019b). Authority in Indonesia seem cannot settle the issue while other effected cross borders countries like Malaysia, Singapore and Thailand have no right to interfere in forest and/or plantation clearing open burning. There is a Transboundary Haze Pollution Agreement in 2002 between Association of South East Asian Nation (ASEAN) members but still fail to resolve this issue due to lack of enforcement and coordination (Nazeer & Furuoka 2017; Ghani *et al.,* 2017). Perhaps, a partial exception is Singapore who strictly imposing fines on companies convicted in contributing to the haze (Kamaruddin *et al.,* 2017). In addition, ASEAN also has a joint policy on no burning

in replanting palm oil in 1999 but also failed to enforce and become ineffective (Kamaruddin *et al.,* 2017). As a result, haze seems like a critical but unsolvable annual affair in Southeast Asia that could jeopardize achievement of SDG objectives. More attention, international dialogs and research should be given to this particular case of cross countries borders haze issue.

Psychology Harassment in City

SDG concerns about physical or sexual harassment in city. That is important but equally important is psychology harassment. This type of harassment may not be inflicted by certain individual but caused upon by pressure of live due to high cost of living (Embong, 2011) and high expectation in work and social life in pressurized living in the city. It may result in suicide rate, family breakdown, aggression, depression and variety manifestation of stress and psychology related diseases. Mokhtar *et al.* (2018) did a comparative scientific test on physiological and psychological impact of a bustling street and a city park in Kuala Lumpur. The results are higher stress level in city life as compared to life in green lung park.

Reversed Migration

Urbanization is a good symptom of country developing and improvement, but rapid urbanization especially in developing countries has caused certain targeted cities to be overpopulated and social problems may start rising. Consequences of overpopulation are pressure or harm to nature sustainability, biodiversity, weather and natural resources. Thus, SDG goal may wish to consider the issue of reversed migration from city back to rural. Perhaps, bringing development to rural area may eliminate the push-pull factors like job opportunity, entertainment, healthcare facilities and education opportunity. It will lead to more holistic development as well. China has been creating satellite cities outskirt of city centre to draw out population from over-crowded in big city since years ago (Atash & Wang 1990). Reversed migration in Japan has been known

as I-turn since late 1990-s, a phenomenon of shifting from urban to rural which is not the migrants' hometown. For examples, see past studies on Japan I-turn (Obikwelu *et al.,* 2017) and Spain (Paniagua, 2002). In Malaysia, five economic regions development plan are utilizing areas in between main cities to further develop. Population in big cities (usually state capital) can spread out to surrounding sub-urban area, which would be developed with selected industrialization or service sector development.

Political Will

Realizing the SDG with those six critical issues required strong political will, both domestic and international. The last goal of SDG (Goal 17: Partnerships for the goals) clearly emphasize the need of international political influences through government-to-government collaboration. Nilsson *et al*. (2018) emphasized the needs of international coordination and interaction, the lack of it as a serious limitation to achieve the SDG. Based on the flowchart in Figure 1, political will is needed in coordinating and achieving SDG-11, solving critical issues, enforcing and reviewing local indicators such as MURNInet and facilitating international collaboration.

Conclusion

Sustainable city, the Goal 11 of United Nation's Sustainable Development Goals (SDG-11) aims to make cities inclusive, safe, resilient and sustainable. It has seven objectives and 11 indicators. There is no international standardized concept for sustainable city but most common characteristics to define city is population size. A megacity is defined as settlement with more than 10 million of inhabitants. SDG-11 covers many areas of sustainable city including housing, transportation, public space, cultural/heritage, disaster risk, environment, inclusiveness and safety particularly women, children, elders and disabled. There are previous literatures and theories on sustainable city but mostly focus on environment and transport. Malaysia's MURNInet, an indicator of sustainable city
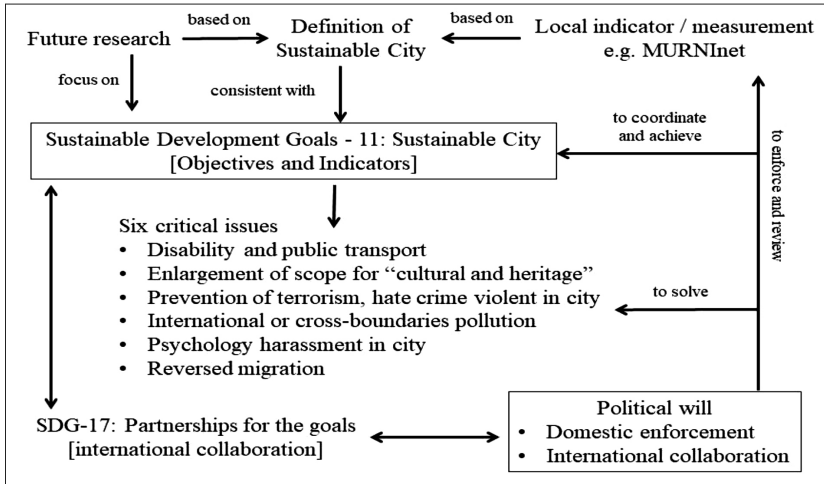
Figure 1: Flowchart on SDG-11 and political will

seems remarkably follow the SDG-11 most closely. Taking current and practical happening, there are six critical issues regarding sustainable city worth our attention. These six critical issues are regarding: (i) disability and public transport, (ii) enlargement of scope for cultural and heritage, (iii) prevention of terrorism in city, (iv) international or cross-boundaries pollution like haze from Indonesia to Southeast Asia, (v) psychology harassment in city, and (vi) reversed migration.

Acknowledgements

References

Abbas, T., & Awan, I. (2015). Limits of UK counterterrorism policy and its implications for Islamophobia and far right extremism. *International Journal for Crime, Justice and Social Democracy*, *4*(3), 16-29.

Albertí, J., Balaguera, A., Brodhag, C., & Fullana-i-Palmer, P. (2017). Towards life cycle sustainability assessment of cities. A review of background knowledge. *Science of the Total Environment, 609,* 1049-1063.

Allenby, B. (2009). The industrial ecology of emerging technologies. *Journal of Industrial Ecology*, *13,* 168-183.

Anna, P. B., Pere, L. M., David, S. D., Jorge, S. P, Elisabet, V., Xavier, G., Joan, R., & Esther, S. M. (2017). Application of life cycle thinking towards sustainable cities: A review. *Journal of Cleaner Production*, *166,* 939-951.

Atash, F., & Wang, X. (1990). Satellite town development in Shanghai, China: An overview. *Journal of Architectural and Planning Research*, *7*(3), 245-257.

Banister, D. (2005). *Unsustainable transport: City transport in the new century*. London: Routledge.

Banister, D. (2007). The big smoke – congestion charging and the environment. In H. Richardson & C. Bai (Eds.), *Congestion Pricing*. Cambridge: CUP.

Blanc, D. L., Freire, C., & Vierros, M. (2017). *Mapping the linkages between oceans and other sustainable development goals: A preliminary exploration*. ESA Working Paper No. 149S T/ESA /2017/DWP/149.

Borrion, H., Tripathi, K., Chen, P., & Moon, S. (2014). Threat detection: A framework for security architects and designers of

metropolitan rail systems. *Urban, Planning and Transport Research*, *2*(1), 173-194.

Brussel, M., Zuidgeest, M., Pfeffer, K., & Maarseveen, M. V. (2019). Access or accessibility? A critique of the urban transport sdg indicator. *International Journal of Geo-Information, 8*(67), 1-23.

Cramer, V., Torgersen, S., & Kringlen, E. (2004). Quality of life in a city: The effect of population density. *Social Indicators Research, 69,* 103-116.

Ding, X., Zhong, W., Shearmur, R. G., Zhang, X., & Huisingh, D. (2015). An inclusive model for assessing the sustainability of cities in developing countries, trinity of cities' sustainability from spatial, logical and time dimensions (TCS-SLTD). *Journal of Cleaner Production*, *109,* 62-75.

Embong, A. R. (2011). Pembandaran dan kehidupan bandar di Semenanjung Malaysia. *Akademika: Jurnal Sains Sosial dan Kemanusiaan Asia Tenggara*, *81*(2), 23-39.

Estevens, J. (2018). Migration crisis in the EU: Developing a framework for analysis of national security and defence strategies. *Comparative Migration Studies*, *6,* 28.

Forrest, R., Grange, A. L., & Yip, N. M. (2008). Neighbourhood in a high rise, high density city: Some observations on contemporary Hong Kong. *The Sociological Review*, *50*(2), 215-240.

Ghani, F. A., Redzuan, N. I. N., Nasir, N. F. M., & Salamat, M. (2017). Review on ASEAN Transboundary Haze Pollution Agreement 2002: Problems and solutions. *Journal of Humanities, Language, Culture and Business*, *1*(1), 153-161.

Gobakis, K., Kolokotsa, D., Synnefa, A., Saliari, M., Giannopoulou, K., & Santamouris, M. (2011). Development of a model for urban heat island prediction using neural network techniques. *Sustainable Cities and Society*, *1(2*), 104-115.

Gudipudi, R., Fluschnik, T., Ros, A. G. C, Walther, C., & Kropp, J. P. (2016). City density and CO_2 efficiency. *Energy Policy*, *91,* 352-361.

Gustavo, S. M., & Manor, O. (1998). Social ties, environmental perception, and local attachment. *Environment and Behaviour*, *30,* 504-520.

Har W. M., & Sek S. K. (2011). Impasses to sustainable development: Oriental-occidental juxtaposition: 1-22. In Har, W. M., Ong, S. F., & Sek, S. K. (Eds.), *Sustainable development Weltanschauung: Beyond theories into reality*. Kuala Lumpur: Pustaka Prinsip.

Homsy, G. C., & Warner, M. E. (2014). Cities and sustainability: Polycentric action andmultilevel governance. *Urban A-airs Review*, *51*(1), 46-73.

Jalaei, F., & Jrade, A. (2015). Integrating Building Information Modeling (BIM) and LEED system at the conceptual design stage of sustainable buildings. *Sustainable Cities and Society*, *18,* 95-107.

Kamaruddin, H., Ahmad, R. A., & Shapien, R. M. (2017). Transboundary haze pollution: Legislation and enforcement in Malaysia and Singapore. *Kanun*, *26*(1), 160 -197.

Kennedy, C., Baker, L., Dhakal, S., & Ramaswami, A. (2012). Sustainable urban systems: An integrated approach. *Journal of Industrial Ecology*, *16*, 775-779.

LaPoint, S., Balkenhol, N., Hale, J., Sadler, J., & Ree, R. V. D. (2018). Ecological connectivity research in urban areas. *Ecology of Organisms in Urban Environments*, *29,* 868-878.

Lim, K. H., & Har, W. M. (2008). Sanitising and satanising Malaysia's cityscapes: Cultural power from Malay de-colonialism to Islamic Occidentalism and beyond. *Asian Social Science*, *4*(11), 44-52.

Litman, T. (2012). *The Costs of Automobile Dependency and the Benefits of Balanced*

Transportation. Victoria, Canada: Victoria Transport Policy Institute.

Litman, T., & Burwell, D. (2006). Issues in sustainable transportation. *International Journal Global Environmental Issues*, *6*(4), 331-347.

Mohd Rusli. (2017). Malaysia-Indonesia cultural spat: A kin long forgotten? August 2018 from https://www.malaysiakini.com/news/401652.

Mokhtar, D., Aziz, N. K. A., & Mariapan, M. (2018). Physiological and psychological health benefits of urban green space in Kuala Lumpur: A comparison between Taman Botani Perdana and Jalan Bukit Bintang. *Pertanika Journal of Social Sciences & Humanities*, *26*(3), 2101-2114.

Morris, D. (2014). *Slaying the dragon, vanquish the surplus and rescue the ETS: The environmental outlook for the EU Emissions Trading Scheme*. United Kingdom: Sandbag Climate Campaign.

Nazeer, N., & Furuoka, F. (2017). Overview of ASEAN environment, transboundary haze pollution agreement and public health. *International Journal of Asia Pacific Studies*, *13*(1), 73-94.

Nhemachena, C., Matchaya, G., Nhemachena, C. R., Karuaihe, S., Muchara, B., & Nhlengethwa, S. (2018). Measuring baseline agriculture-related sustainable development goals index for Southern Africa. *Sustainability*, *10,* 2-16.

Nilsson, M., Chisholm, E., Griggs, D., Howden-Chapman, P., McCollum, D., Messerli, P., Neumann, B. Stevance, A. S., Visbeck, M., & Stafford-Smith, M. (2018). Mapping interactions between the sustainable development goals: Lessons learned and ways forward. *Sustainability Science*, *13,* 1489-1503.

Obikwelu, F. E., Ikegami, K., & Tsuruta, T. (2017). Factors of urban-rural migration and socio-economic condition of i-turn migrants in rural Japan. *Journal of Asian Rural Studies*, *1(*1), 70-80.

Ogle, J., Delparte, D., & Sanger, H. (2017). Quantifying the sustainability of urban growth and form through time: An algorithmic analysis of a city's development. *Applied Geography*, *88,* 1-14.

Paniagua, A. (2002). Urban-rural migration, tourism entrepreneurs and rural restructuring in Spain. *Tourism Geographies*, *4*(4), 349-371.

Papanastasiou, D. K., & Kittas, C. (2012). Maximum urban heat island intensity in a medium sized coastal Mediterranean city. *Theoretical and Applied Climatology*, 107: 407-416.

Ratti, C. (2016). These four numbers define the importance of our cities: 2, 50, 75 and 80. *https://www.weforum.org/agenda/2016/12/technology-and-the-future-of-our-cities on 11 December 2017.*

Rolf, W., Peters, D., Lenz, R., & Pauleit, S. (2018). Farmland – An elephant in the room of urban green infrastructure? Lessons learned from connectivity analysis in three German cities. *Ecological Indicators*, *9*(2), 151-163.

Ryan, D. (2015). From commitment to action: A literature review on climate policy implementation at city level. *Climatic Change*, *131*(4), 519-529.

Soltani, S. H. K., Sham, M., Awang, M., & Yaman, R. (2012). Accessibility for disabled in public transportation terminal. *Procedia - Social and Behavioral Sciences*, *35,* 89-96.

Starkey, P., & Hine, J. (2014). *Poverty and sustainable transport: How transport affects poor people with policy implications for poverty reduction*. A report for UN-Habitat, chrome-xtension://oemmndcbldboiebfnladdacbdfmadadm/http://www.slocat.net/sites/default/files/u10/odi-unhabitat-slocat-transport-poverty-review-starkeyhine-141022-submitted.pdf.

Sun Bin. (2003). *Sun Bin: The art of warfare: A translation of the classic Chinese work of philosophy and strategy*. Translated with commentaries by Lau, D. C., & Ames, R. T. Albany: State University of New York Press.

The Star. (2013). Hands off our heritage food, it belongs to everyone. 7 July.

The Star. (2015). Popiah is Indonesia's heritage, claims group. 21 February.

The Star. (2019a). Malaysians brace for hazy days. 2 August.

The Star. (2019b). Malaysia calls on Asean to fight haze. 6 August.

Todaro, M. P., & Smith, C. S. (2015). *Economic Development*. Boston: Pearson.

Tsilini, V., Papantoniou, S., Kolokotsa, D., & Maria, E. (2015). Urban gardens as a solution to energy poverty and urban heat island. *Sustainable Cities and Society*, *14*, 323-333.

United Nation. (2016). *The World's Cities in 2018*.

United Nation Development Program (UNDP). (1996). *Human Development Report 1996*. Oxford University Press.

United Nation Development Program (UNDP). (2010). *A Review of International Best Practice in Accessible Public Transportation for Persons with Disabilities*. Kuala Lumpur: UNDP.

Wei, J., Qian, J., Tao, Y., Hu, F., & Ou. W. (2018). Evaluating spatial priority of urban green infrastructure for urban sustainability in areas of rapid urbanization: A case study of Pukou in China. *Sustainability*, *10*(2), 1-14.

Xun, B., Yu, D., & Liu, Y. (2014). Habitat connectivity analysis for conservation implications in an urban area. *Acta Ecologica Sinica*, *34(*1), 44-52.

Ye, Y., Li, D., & Liu, X. (2016). How block density and typology affect urban vitality: An exploratory analysis in Shenzhen, China. *Urban Geography*, *39*(4), 631-652.

Zaki, S. A., & Ngesan, M. R. (2018). Concept of night city: A new dimension to a city's economy. *Asian Journal of Environment-Behaviour Studies*, *3*(7), 31-37.