

Smart Eco Resort City Sustainable Framework

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Abstract—The development of sustainable framework of smart eco resort city is a concept that has been the subject of increasing attention in urban planning and governance during recent years. Numerous studies have highlighted the importance of sustainability concepts in smart cities framework, eco city framework and resort city framework. Hence, this article is an attempt to propose the sustainable framework combining the concept of smart city, eco city and resort city. To this aim, an extensive literature review was done. Then, a keyword analysis on literature was held against main research questions (why, what, who, when, where, how) and based on three main domains involved in the policy decision making process and smart eco resort city plan development: Academic, Industrial

and Governmental. This resulted in a conceptual sustainable framework for Smart Eco Resort City Framework. The result clarifies the definition of Smart City, Eco City and Resort City while providing a framework to define Smart Eco Resort City. This research is a preliminary step towards providing insights and significance of infusing sustainability in the development of smart eco resort city. The proposed conceptual framework can act as a practice guideline for future researcher to prepare themselves for sustainable smart eco resort city development.

Keywords—smart city, eco city, resort city

1. Introduction

Smart Eco Resort City have not yet had well-established definition. In general, it can be said that it is a concept that applies the principles of sustainable urban development using modern technologies. This to improve the quality of life and function of natural ecosystems also creating economic opportunity for locals that were unimaginable a generation ago.

Literature review

2. Background

a region in Pahang where its land above the clouds whereby tourism is key to the economy of that region. The forest traps passing cloud, it thus acts as a crucial catchment for large parts of lowland Malaysia (Barrow, C.J). The region is known for its

The framework o

Opinions on this concept also vary significantly not only among experts who have been dealing with this issue but also between representatives of cities, towns and municipalities. The concept proposed the combination of the concept of smart city, eco city and resort city, and to become the first framework of smart eco resort city

Cameron Highlands is

lush tropical rainforests as well as a nature reserve. (Gazette Notification). Cameron Highlands is also known for its sustainable development, agriculture, biodiversity conservation

and tourism. These activities have the potential to generate funds for sustainable development (Barrow, CJ).

A smart city is a city that functions in a sustainable and intelligent way, by integrating all of its infrastructures and services in a cohesive way using intelligent devices for monitoring and control, to ensure efficiency and better quality of life for its citizens. It has gained importance in urban development literature and there have been many initiatives and projects around the world implementing the smart city concepts. The concept incorporates ideas such as smart governance, sustainability, institutional context as well as management and organization. Smart cities, depending on the disciplinary area, considers this complexity both within the integration of data systems and governance approaches (Albino et al., 2015). Communities and neighborhoods make up the public space of cities where people are key.

An eco-city is an ecologically healthy city. Since each city is unique, there is no one-size-fits-all eco-city model. The concept of eco-city shares basic characteristics analogous to healthy ecosystems and living organisms. As such, a working definition was adopted by Eco-City Builders and the International Eco-City Framework & Standards (IEFS).

3. *The*

4. *Theoretical Background of the Concept Smart Eco Resort City*

The concept of the smart eco resort city can be described as a first model of its kind. The framework proposes for a city that use smart technology to make the city runs better. Examples include smart parking using a mobile application, which allows the driver to get to the nearest available spot more quickly, smarter waste management, energy-efficient public lighting, intelligent travel in public transport, urban renewal, local urban agriculture, low carbon and resort surrounding.

4.1. *Smart City*

It is seen as a new approach in urban management and development to make cities more sustainable and livable. This concept does not only apply to the technologies used but has a more profound meaning in the overall economic growth of the city and in improving the quality of the environment. It seeks to make maximum use of modern technologies, mainly information technologies, to influence the quality of life in a given city in such a way that there are synergies between different sectors (transport, logistics, security, power engineering, building management, etc.). Info Malaysia, government choose Kuala Lumpur, Kuching, Johor Bahru, Kota Kinabalu and Kulim as MySmart City Project. The research reveals that smart city variables include:

4.1.1. *Smart Living*

Smart living comprises smart energy services (e.g. smart metering to reduce energy consumption) as well as e-healthcare services (e.g. monitoring of elderly patients in their home to enable them living longer independently). The notion of smart living as it transcends the home boundaries and promises innovative services also outside the home. Smart living defines as a vision on bundle of ICT-enabled services offered to households, accessible within and outside the house that combine value drivers of health, energy, surveillance and entertainment services to facilitate comfort living for end-users.

advisory team on February 20th, 2010, in Vancouver, Canada which stated:

An Eco-City is a human settlement modeled on the self-sustaining resilient structure and function of natural ecosystems. The Eco-City provides healthy abundance to its inhabitants without consuming more (renewable) resources than it produces, without producing more waste than it can assimilate, and without being toxic to itself or neighboring ecosystems. Its inhabitants' ecological impact reflects planetary supportive lifestyles; its social order reflects fundamental principles of fairness, justice and reasonable equity.

A resort city, sometimes called a resort town or resort destination, is a city or area where tourism or vacationing is a primary component of the local culture and economy. Most resort city have one or more actual resorts in or nearby, although some places are considered resort city merely because of their popularity among tourists. Typically, the economy of a resort city is geared almost entirely towards catering to tourists, with most residents of the area working in the tourism or resort industry. Shops and luxury boutiques selling locally-themed souvenirs, motels, and unique restaurants often proliferate the downtown areas of a resort city (Basla carlos

4.1.2. *Smart Governance*

Initially, the concept of smart governance was primarily linked to the use of ICT, used as a synonym for e-government (Pereira et al., 2017; Scholl and Scholl, 2014), and it has been considered enhanced by the use of open data (Bartenberger and Grubmüller-Régent, 2014). smart governance has been considered a form of governance comprising principles and capacities appropriate for coping with the current challenges of society (Scholl and Scholl, 2014).

4.1.3. *Smart Economy*

Smart Economy is a concept that refers to policies that stimulate innovation and creativity combined with scientific research, superior technology and care for the environment, through the concept of sustainability. Bakici et al. (2013) claimed that smart economy involves the establishment of innovation clusters and mutual cooperation between enterprises, research institutions and the citizens in order to develop, implement, and promote innovation through these networks. Anttiroiko et al. (2014) approve that smart economy is a networking economy developing new cooperation models in production, distribution and consumption.

4.1.4. *Smart People*

The Human Development Index is considered to be the most important aspect. The next most important attribute is the graduate enrolment ratio. The third most important attribute is the level of qualification. Smart people should have a lifelong zeal to learn, and there should be social and ethnic plurality. Open-mindedness is another quality of smart people, as is having the flexibility to adapt to changes in the environment, as well as the creativity to contribute to education. Smart people possess a democratic nature and participate in public life.

4.1.5. *Smart Mobility*

Smart mobility means that the city should have national and international accessibility, using information and communication technologies (ICTs) to ensure that technology

has been used widely during the design of national highways and bridges. Metros, monorails, and an intelligent transport system should be used for daily commuters. The urban design should be such that it gives importance to last-mile connectivity. The transport system should be sustainable and innovative. It should also take care of the safety of daily and occasional commuters within and outside the city.

4.1.6. Smart Environment

Smart environment refers to an attractive natural environment with no pollution. Importance should be given to the carbon footprint and the natural resources available. It should have greenery in almost every part of the city. It should have waste management systems as well as natural resource management. The city should also have systems to protect the existing greenery of the city from any external factor.

4.2. Eco City

The term of eco city is used interchangeably alongside other words for sustainable city models such as “sustainable cities”, “low carbon cities”, “resilient cities”, and so forth, despite the underlying conceptual differences that may exist (de Jong et al., 2015). So the term eco-city may encompass a broad range of factors like carbon-neutral and renewable energy supply, a dense urban fabric supported by a public transport system, water and waste reduction and reuse, green buildings, decent and affordable housing for all socio-economic and ethnic groups, improved job opportunities, and voluntary change in lifestyle choices. The dimensions of eco city are:

4.2.1. Natural environment permeates

A widely cited definition of green infrastructure is “an interconnected network of greenspace that conserves natural ecosystem values and functions and provides associated benefits to human populations” (Benedict, 2002). In urban environments, this can include not only landscape patches and corridors but also other representations of nature (e.g., green roofs, street trees) that provide health-supporting ecosystem services without requiring the same level of consumption of finite urban land (Coutts & Hahn, 2015).

4.2.2. Freeway and road infrastructure

Road infrastructure can reduce transportation costs. The new economic geography theory (Krugman, 1991; Fujita et. al., 1999) explains that a low cost for transportation will create and establish trade relations between regions. (Rochana, Kombaitan, & Purwanda, 2016) recommends policy makers build sufficient road infrastructure to support trade relations. The freeways that connect regions directly with their markets will make trade relations more rapid.

4.2.3. Compact and mixed-use urban form

Compact urban form development becomes one of the approaches that seem to have the potential to play an important role in designing sustainable cities (Kotharkar, Bahadure, & Sarda, 2014). Irrespective of the type of urban form, management of the city is more important to achieve sustainability, and it is more complex in compact urban forms (Jabareen, 2006). Better connectivity with transport facilities and shorter trip distances encourage the use of non-motorized modes, which results in better air quality and imbibing a greater sense of belonging among residents: these are the desired ingredients of the compact urban form (Johnson, 2007).

4.2.4. High quality public realm

High quality, well designed and managed parks and urban public spaces play a crucial role in promoting individual well-being and contribute positive social, economic and environmental value to our towns and cities (Beck, 2009). A better understanding of the links between the quality of public spaces and quality of life is vital to justify, and incentivise, greater investment in regenerating and improving our public realm (Beck, 2009).

4.2.5. Physical structure and urban design

Design of built environment of cities and towns as well as creating places is the basic content of urban design (Zhang Min, 2002). Historically, urban design based on military requirement has improved military defense capability from city site selection, city form, road organization and design of city walls and city gates (Kaizhen et al., 1995). Urban design process has been critiqued in terms of its definitions, principles stakeholders, process and relationship with other disciplines.

4.2.6. Environmental technologies

With the increasing requirement for global environmental sustainability, the development of environmental technologies not only should enhance the capacity of pollutant removal but also avoid problems shifting from one environmental aspect to others (Golroudbary et al., 2019). Specific professional requirement of environmental technologies for pollutant removal, the technical efficiency ought to be maintained at favorable levels when efforts are made to decrease the environmental burdens.

4.2.7. Economic performance

Kotler and Armstrong (2013) describe economic performance as a factor that determines client satisfaction. Environmental and economic performance are pivotal to enhanced operational performance with respect to timely delivery of construction outputs and efficiency gains (Magon et al., 2018), and this to a very large extent guarantees clients satisfaction with the final product (construction project).

4.2.8. Future of the city

What states, citizens and companies collectively choose (adopt), given the specificities of their place, its resources and the interplay of urban dynamics, coagulates as the regime that shapes the future city. It involves a disposition that is experimental in the generation of knowledge’s of the future city structured by plural temporal rhythms and productions of space (Evans, 2011).

4.2.9. Central city and sub-centers

Model a central city where citizens differ by income, and housing confers benefits on neighbors. Zoning separates citizens into neighborhoods by income. This maximizes total surplus and facilitates redistributing gains to a majoritarian governing coalition of citizens, which changes from rich to poor as the city grows. Large cities will redistribute gains from zoning and other income downward until the upper middle class and the rich are indifferent between the central city and the suburbs, and the suburbs will be relatively well-to-do.

4.2.10. Decision-making (Jefrey R Kenworthy, 2006)

In "Simon Decision Model", developed by Herbert Alexander in relation to the decision making process in MIS and widely used, Decision-making process is discussed in three stages. These stages are research, review and select (Simon, 1960). This provide compatibility in the making collection of data and information in the organization, processing, analyzing and integration and compliance in decision making and provide planning and control functions in compliance. efine abbreviations and acronyms the first time they are used in the text, even after they have been defined in the abstract. Abbreviations such as IEEE, SI, MKS, CGS, sc, dc, and rms do not have to be defined. Do not use abbreviations in the title or heads unless they are unavoidable.

4.3. Resort City

The increasing rate of urbanization leads to an ever-increasing burden not only for the environment but also for cities comprehensively. The significant impact of resort city on other economic activities such as construction, transportation and small businesses led many researchers to recognize the positive contribution of tourism on the growth of small economies (Thacker, Mejia and Perrelli 2012). The variable for resort city were:

4.3.1. Constant demand

The growth of a resort destination based upon the conditions that must be in place in order for the area to achieve sustained increases in overall tourism demand. In doing so, it analyzes a resort region as a whole, as opposed to any one, specific development project. The volatility associated with the demand for resort products, which greatly complicates the resort developer's ability to accurately forecast demand for second home resort products.

4.3.2. Supply of tourism products

The main difference between the supply chain of a tourism product and the supply chains of other products lies in the fact that this is a customer who travels to the place of a product consumption and the product itself is composed of services to a greater extent. Therefore, people play a very significant role in this case as they directly provide services (Tapper and Font, 2004).

(Fournier, 1999: 281; Evetts, 2013).

5. Smart Eco Resort City Fram

6. ework

In the global context, smart cities are used as one of the approaches to resolve urbanization issues and improve the quality of life in the city. For the eco-city, low carbon city and low carbon eco-city have been used popularly to deal with the challenges. Resort city is an urban area where tourism or vacationing is the primary component of the local culture and economy. So to become a smart eco resort city, here are the dimension to be emphasized for the framework:

6.1. Smart logistics

Smart logistics is a necessary condition to efficiently provide urban areas and mobility of its residents. It's because of exponential development of the cities and increasing number of flows, causes congestion and lowers level of quality of life in the city. Technologies which increase level of innovation of the

4.3.3. Role of market segmentation

Equally important for resort management to address are questions such as whether a particular market segment is sizeable and lucrative enough to target; how far in time the demand from this segment would sustain; how inimitable the products sought by this segment are; and how much new investment would be required.

4.3.4. Media and service in tourism

Tourism corporations can enhance their interactions with customers by encouraging customer to vote and comment online or share their tourism experiences on social media channels (e.g. Facebook, Twitter, and Instagram) (Touni, Kim, Choi, & Ali, 2020). There are the tourism operations, where physical and social settings are organized to deliver services that affect tourists' experiences (Pearce and Zare, 2017; Tussyadiah, 2014).

4.3.5. Professional qualification

The qualifications in travel and tourism cover many aspects to help succeed in career within the industry, covering things like air fares, travel geography, tour guiding, resort representative's and ski chalet hosts. These qualifications contain units that are relevant to all sectors of the industry, whether entering into a career as a travel agent, resort representatives or tour operations.

4.3.6. Structure and education

Provision of a structured educational program helps in achieving this standard of practice. human capital theory and status attainment theory claim that education can improve personal happiness (Huang, 2013). Positive psychology claims that education changes an individual's cognitive abilities and provides greater emotional support, which results in higher happiness (Huang, 2013; Hu, 2017).

4.3.7. Labour organization

Fournier (1999) argues that professionalism can be deployed to regulate occupations and to rationalise organizational change by inscribing 'appropriate' work identities and practices within staff. In this Foucauldian sense, workers' conduct becomes self-adjusting, as professionalism has been extended as a disciplinary logic that serves to regulate workplace behaviour 'at a distance' via appeals to 'professional' conduct

cities, at the same time supporting development of the smart city.

6.2. Smart transport

The importance of transport infrastructure is essential in tourism development (Duval, 2007; Prideaux, 2000). In recent years, a growing body of literature has been focusing on the role of local transport networks and, more specifically, on public transport systems, to enhance a more sustainable tourism development (Le-Klähn and Hall, 2015). Therefore, it is key to acquire knowledge about the mobility patterns of tourists and attract/redirect them towards more sustainable modes of transport.

6.3. Smart tourism

A smart tourism destination should be an innovative place accessible to all visitors that can experience an improved, more

interactive and of higher-quality travel, it should also improve residents' quality of life. When aiming to create a smart tourism, a number of challenges arise such as how to personalize the content presented to a user, which are the most appropriate sources for data collection, how these data should be extracted for example implicitly or explicitly, privacy issues etc.

6.4. Smart local council

There is growing concern that implementing effective governance arrangements constitutes a major obstacle for cities becoming smart (Scholl & Alawadhi, 2016). Recent literature argues "to be embedded in all aspects of city governance" as opposed to "something that is added next to existing initiatives" (Kar et al., 2019). In this context, governance is identified as one critical barrier for cities transitioning to "smart" (Ruhlandt, 2018; Rana et al., 2018).

6.5. Smart forest

Hirsch et al. (2001) defined fire-smart forest management as an integrated approach primarily based on fuel treatments through which the socio-economic impacts of fire are minimized while its ecological benefits are maintained and maximized by lowering ignition likelihood and fire behaviour potential, fire suppression capacity is increased and forests and landscapes become more resistant to fire spread and more resilient to its occurrence.

6.6. Smart supply chain management

There is a simultaneous need to maintain a focus on the supply chain level implementation of the concept that industry 4.0 puts forth. Preindl et al. (2020) demonstrated that the digital transformation, and industry 4.0, have the capability to accomplish a fully digital supply chain through higher transparency in terms of the centralization of the processes.

6.7. Smart energy

Smart energy integrate multiple energy sectors are considered a promising paradigm for providing a comprehensive and optimized solution for an achievable, affordable, and sustainable energy system in the near future. The concept of smart energy is to describe the expected new paradigm of energy systems by integrating multiple energy sectors (Lund, Andersen, Østergaard, Mathiesen, & Connolly, 2012).

6.8. Smart electric

The emergence of the smart electric facilitates a green and sustainable energy-based society and mitigates the growing energy crisis. Meanwhile, it also makes the power systems more complicated than the existing one and the important to evaluate and officials to develop sustainable behaviours and planning. Smart eco resort city are no doubt capable of enabling environmental sensitivity among citizens..

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the reliability/availability of systems, which is not easy with the conventional approaches. the importance measures of the smart electric power grid system in the aspect of the system availability.

6.9. Smart environment

In scenarios of smart environments, factors such as the unavailability or intermittence of the wireless network, affect the entire control process, from data collection to the performance of devices in the environment. These factors can occur due to the presence of a variable noise level in the environment, distance from the base stations, or lack of access channels due to the high volume of users.

4.10 . Smart community

The development path of smart community is a configuration set including both information architecture factors and business model patterns. The successful of smart community depends on the integration between information architectures and business models, and different business models rely on different information architectures elements.

conclusion

The initiative of the smart eco resort city Cameron Highlands sustainable framework proposing an equal importance to the improvement and sustainability of towns and cities, which is major concern for various cities in Malaysia. In the present era it's clear that the cities are a hub of growth and opportunity, and therefore it is vital to adopt a smart eco resort city approach. In Malaysia, the citizens perceive 'smart city' as a term which is more suited for cities of developed nations. Altogether, it involves the application of sustainable solutions to overcome difficult problems and involves the use of sophisticated and expensive technology developed by the private sector. The governments and citizens would get benefitted enormously if a city are managed smartly. Moreover, the governments have a long way to go in attaining the objectives of transforming cities into sustainable habitats. Countries like Germany, France, Japan, US, Singapore, Netherlands, who have also pledged to contribute in various ways, including technologically and financially.

For the city of Cameron Highlands, a one definition of smart city will not be applicable. It is imperative to conceptualize a definition of smart city which is having diverse characteristics and the integration of the concept of eco city and resort city too. Smart eco resort city offer vast number of opportunities and smart solution to various needs and problems of the citizens and also help the citizens

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