



THE ROLE OF TOURISM AND SUSTAINABLE ARCHITECTURE IN ACHIEVING SUSTAINABLE DEVELOPMENT



By

¹Amkyes Fwangmun Irmiya, ²Dowell David Ikpokini, ³Mohammed Yusuf,

¹²Department of Architectural Technology, Federal Polytechnic Nasarawa, Nasarawa state

³Department of Applied Chemistry and Bio-Chemistry, Federal Polytechnic Nasarawa, Nasarawa state

ABSTRACT

One of the fundamental issues in the 21st century is sustainable development. This work focuses on the actualization of sustainable development through sustainable tourism which promotes sharing of local product with tourist thus enhancing economic growth and stability. Sustainable architecture is aimed at ensuring design and construction of energy efficient and environmental friendly buildings. Some existing structure around the world built with the concept of tourism and using sustainable architecture approach were reviewed. The methodology adapted was the review of related literature and concepts that has proven successful in achieving sustainable development in other countries. The buildings revealed that Sustainable Architecture in tourism have been adopted in various countries such as Germany, China, Denmark, Brazil among others with various environmental benefits and growth. It was therefore concluded that the duo of discursions were made after the findings and it was concluded by pointing at the important role of the duo (tourism and sustainable Architecture) plays important role in sustainable development. It was therefore concluded that the diverse ways of using tourism and sustainable Architecture to achieve sustainable development as highlighted in the review should be explored and used to boast the achievement of a sustainable environment in the Nigerian society.

Keywords:

Architecture, Sustainability, Tourism Sustainable

Architecture, Sustainable Development

1.0

I

INTRODUCTION

Sustainability generally means continuity in the progress of work while Sustainability in Urban development can be the set of conditions that lead to the desired situation (Shen, *et al.*, 2011). Due to the fact that each society is different, the concept of stability depends on the needs, place, and time. For the status of sustainability to be properly analyzed, three dimensions of public policy, historical aspects and values are needed to be considered as an alternative (Brantingham, 2017) Achieving sustainability directly or indirectly promotes high health and productivity of people within that environment. Therefore, the goal of sustainability is not only to change but is improving the characteristics of the environment. In this study, sustainable architecture, tourism concepts and their effects on development were clearly stated. [Mensah 2019]

The idea of sustainable development is very versatile and needs imputes from different professions because of its direct and indirect effects on all.

It therefore becomes mandatory to use sustainable Architecture to achieve sustainable development through energy efficient buildings that reduces waste by using renewable energy sources and also tourism as it fosters economic stability and ensure the creation of a habitable and sustainable environment.

2.0 Literature Review

There are several meanings of sustainable development that have been put forth by some experts, including:

- ✦ The World Commission on Environment and Development defines sustainable development as a development that satisfies present needs without endangering the ability of future

generations to satiate their own needs (Borowy,2013).

- ✦ According to The United Nations Environment Program, Sustainable Development (SD), promotes the quality of human life concerning the maintenance of system capacity that defines life on Earth (Brown *et al.*,1987)
- ✦ Sachs (1999) believes that development without sustainability and sustainability without development will have no meaning
- ✦ Sustainable Development is a kind of human activity that openly promotes the survival of all species. It strengthens and perpetuates the planet throughout history (Reid,2013).

Now, according to these definitions. SD has the following points and features: .

- ✦ It is considered a process.
- ✦ Progress is required.
- ✦ It should be balanced and all-around.
- ✦ No damage.

2.1 Tourism

The tourism industry in developed countries is considered a positive economic activity due to the need for low capital, and the short payback period to the preference for better service quality and gain enhancing tourist satisfaction while encouraging regular visit and patronage of such tourist centers. The concept of the tourism industry itself has issues such as accommodation facilities, catering facilities, transportation equipment, etc. Tourism in the traditional way has negative consequences that cause damage to the environmental and ecological structure of the region. (Kuenzi & McNeely, 2008) asserted the importance of formulating and implementing a sustainable tourism program.

2.1.1 Ecotourism

Ecotourism is the name given to responsible or green tourism in areas of natural beauty, with a particular focus on ecological conservation. The aim of ecotourism is to protect the natural environment find ways to benefit local communities – while respecting their culture – and to educate travelers about the importance of responsible travel. Energy efficiency, water conservation and protection of wildlife and indigenous people are all key in ensuring ecotourism.

2.1.2 Sustainable Tourism Structures

Some examples of sustainable tourism edifice in the world are discussed below

✦ Feynan Ecolodge – Jordan

Feynan Ecolodge is located in Dana Biosphere Nature Reserve, Jordan, and has developed a reputation as one of the best examples of sustainable tourism in the world. The accommodation operates in partnership with the Royal Society for the Conservation of Nature, and is solar-powered, greatly reducing the overall carbon footprint. As a result, guests can stay in the lodge knowing that they are doing their part to protect the environment. (Leung, *et al.*,2018)

✦ Sustainable Tourism in Bhutan

Bhutan in South Asia is one of the most unique tourist destinations in the world and the entire country operates a “high value, low impact” model, in order to maximize economic benefits while minimizing any negative impact. To enforce this, the country has strict entry requirements and charges a daily tariff. Some of the money generated from this policy then goes to conservation efforts and investment in the country’s infrastructure, culture, and public services.(Banerjee and Bandopadhyay,2016)

✦ Luxury Sustainable Safari Tours

Safari tours have the potential to be exploitative, but a number of tour operators are now operating more ethical and sustainable safari tours, which give back to the local area. One example of this is the tour company and Beyond, which offers luxury safari tours in Botswana, Tanzania, Kenya and various other locations. The company installs electrical micro-grids to make energy consumption more sustainable, while also investing in local land, animals and people.(Kirubi *et al.*,2009)

✦ Sustainable Hostel in South Africa

Mdumbi Backpackers is a hostel that is specifically aimed at those with an interest in sustainable tourism. Situated in South Africa, the accommodation serves as an ideal base for hiking, whale watching and various other activities. However, crucially, the hostel has adopted a number of eco-friendly practices, including a more sustainable waste management system, the use of solar power, and an ownership model that allows local employees to own shares. (Morway and Gvozdenac,2011)

✦ Sustainable Transport On the Water

Transportation is a major focus area for sustainable tourism in general, but water-based

transport has arguably lagged behind other methods and often still relies heavily on fossil fuels. Fortunately, this is starting to change and companies like Soel Yachts and Naval DC have created more sustainable water transport in the form of solar-powered, electric vessels, which are carbon neutral. As this trend continues, water transport should become increasingly sustainable. (Mihic, *et al.*, 2011)

✦ **Solar Driven Six Senses Resort in Fiji**

The Six Senses Resort in Fiji is a five-star luxury resort, which operates in accordance with sustainable tourism principles. For instance, the resort is entirely powered by solar energy and it includes its own rain capture and water filtration facilities, helping to reduce the use of plastic bottles. Additionally, the Six Senses Resort promotes recycling and re-use of materials and supports a number of causes that help the local community. (Prasad and Raturi, 2020)

✦ **BomBom Water Project – Principe**

Finally, the Bom Bom Water Project is operated by the Bom Bom resort on the island of Principe, off the west coast of Africa. The luxury resort introduced a recycling scheme, where 50 used

water bottles would be replaced by a refillable, stainless steel bottle. The resort claims the project led to the removal of 300,000 used plastic water bottles from the island, and the resort also contributed to a number of water purification fountains too. (Becker, 2004)

2.2 Sustainable Architecture

Generally, sustainable architecture can be considered architecture responsive to the characteristics, environmental and spatial conditions. It makes optimal use of its capabilities to create favorable environmental conditions. *“In addition, it is adaptable and sustainable to changes, requirements and needs, in other words. While paying attention to aesthetic needs, it is also compatible with its bed's natural and ecological capacities”* (Baker and Steemer, 2003).

Several crucial components of sustainable architecture include: *“Energy-efficient lighting fixtures and appliances; Efficient heating, cooling and ventilation systems; Water-saving plumbing fixtures; Windows placed strategically to maximize natural light; Rainwater harvesting; Greywater reuse”*.



Plate 1. Sustainable Architecture: Design, Material and Construction

(SOURCE ; <https://edition.cnn.com/style/article/green-buildings-world-sustainable-design/index.html>)

2.2.1 Some Sustainable Architecture Edifice

✦ **Pixel Building (Melbourne, Australia)**

Opened: 2010 | Use: Offices | Design: Decibel Architecture

When it opened a decade ago, the Pixel Building was Australia's first carbon-neutral office building, generating all its own power and water on site.

Among energy-saving features are colorful, eye-catching panels that provide shade and maximize

daylight as needed, supports that help process wastewater, a roof that captures rainwater, and a series of vertical wind turbines. (Zuo, *et al.*, 2012)

✦ **One Central Park (Sydney, Australia)**

Opened: 2014 | Use: Residential | Design: Ateliers Jean Nouvel with PTW Architects

The innovative city that brought you the Sydney Opera House also thinks green -- take One Central Park for example. A park at the foot of the building literally continues up the structure, as vegetation of 250 species of Australian plants and

flowers cover One Central Park, according to archdaily.com. They look pretty, shade the building and send an undeniable environmental friendliness to the people.(Munn,1996)

Its hovering cantilever, which holds the taller tower's most luxurious penthouses, is a design marvel. Skyscraper.com says it has 25% less energy consumption compared with a conventional building of its size.(Lehmann,2016)

✦ **Bahrain World Trade Center 1 and 2 (Bahrain)**

Opened: 2008 | Use: Offices | Design: Atkins
Reaching an incredible 787 feet, the futuristic towers of Bahrain's World Trade Center complex are optimally positioned to take advantage of the island nation's desert winds, with three turbines mounted on sky bridges between the towers to generate electricity.

The towers' shapes, reminiscent of the Arab dhow sailing ships, help funnel wind to the turbines, which supply about 15% of the buildings' electricity. Reflective pools at the towers' base help with cooling via evaporation(Smith and Killa,2007)

✦ **Museum of Tomorrow (Rio de Janeiro, Brazil)**

Opened: 2015 | Use: Science museum
| Design: Santiago Calatrava

With its distinct cantilevered roof, reflective pools and skeletal structure (a signature of architect Santiago Calatrava) Rio's Museum of Tomorrow is a testament to future possibilities.

It's sustainable design features include adjustable, fin-like solar panels that add to the building's neofuturist aesthetic, and a pumping system that takes cold water from the bottom of nearby Guanabara Bay for use in its air-conditioning system(McEwen and Pimentel,2015).

✦ **Vancouver Convention Centre West (Vancouver, Canada)**

Opened: 2009 | Use: Trade shows, conventions, events | Design: LMN Architects

Great things are happening on the roof of the Vancouver Convention Centre West, the first building of its kind to get a double LEED (Leadership in Energy and Environmental Design) platinum designation. So what's creating the buzz? For starters, four hives of European honey bees have been installed to pollinate the roof's plants and grasses, which in turn help reduce heat build-up in summer and retain it in winter. On

top of that, the roof's sloping shape also assists with water drainage and the distribution of seeds but not all the action is on the roof. Some of the project is built over the water on piles (columns) that help support a marine ecosystem that includes native crabs, salmon and shellfish. (Kaplanidou and Karadakis,2010)

✦ **Shanghai Tower (Shanghai, China)**

Opened: 2015 | Use: Offices, hotel and retail
| Design: Gensler

The world's second tallest building at 2,073 feet, Shanghai Tower is an architectural wonder as well as a sustainable one.

A transparent second skin wrapped around the building creates a buffer of captured air that serves as natural ventilation, reducing energy costs, and 270 wind turbines incorporated into the facade power its exterior lights.

Thanks to measures like these, the tower uses significantly less power than other skyscrapers and has a platinum LEED certification (Chen, 2022)

✦ **CopenHill (Copenhagen, Denmark)**

Opened: 2017 | Use: Power plant, sports facility
| Design: Bjarke Ingels Group (BIG)

CopenHill, also called Amager Bakke, might be the ultimate mixed-use project.

It's both a power plant that burns waste to generate electricity, and a sports facility where you can take on one of the world's tallest climbing towers. But it's most spectacular offering is an artificial ski and snowboard slope.

Beneath the wintertime fun, 440,000 tons of waste is yearly converted by furnaces, steam and turbines into clean electricity and heating for 150,000 nearby homes, according to Architect Magazine. (Kohl and Andersen,2021)

✦ **Marco Polo Tower (Hamburg, Germany)**

Opened: 2010 | Use: Residential | Design: Behnisch Architekten

Like its trailblazing namesake, Marco Polo Tower in Hamburg ventured where few buildings had gone before.

Each floor of the apartment building is turned a few degrees away from the one below, around an axis. This allows for recessed facades that protect residents from direct sun and negates the need for electrical air conditioning.

Other green features, according to Behnisch, include a heat exchanger on the roof that turns warm air into a cooling system, and natural

ventilation that means residents can sleep soundly without being disrupted by outside noise.(Bahadori,2016)

✦ **Bosco Verticale (Milan, Italy)**

Opened: 2014 | Use: Residential | Design: Boeri Studio

Architect Stefano Boeri designed these deluxe apartments in the sky with plenty of spaces to accommodate large, full-grown trees, and a variety of ground cover plants and shrubs. The effect is "one of the most intensive living green facades ever realized," according to Skyscrapercenter.com. All this greenery helps improve air quality in Bosco Verticale and the city more broadly (Saravanan, *et al.*, 2017).

✦ **Suzlon One Earth (Pune, India)**

Opened: 2009 | Use: Offices | Design: Christopher Benninger

It should come as no surprise that wind turbine supplier Suzlon has a top-tier green headquarters. According to MGS Architecture of India, the Suzlon One Earth campus has a platinum LEED certification, generating some of its electrical needs on site -- 80% of this power comes from wind and 20% from solar. The rest of its electricity comes from its off-site windmill farms, making it a net zero energy building.(Kulkarni and Pammar, 2019)

✦ **ACROS Fukuoka Prefectural International Hall (Fukuoka, Japan)**

Opened: 2009 | Use: Offices | Design: Christopher Benninger

It should come as no surprise that wind turbine supplier Suzlon has a top-tier green headquarters. According to MGS Architecture of India, the Suzlon One Earth campus has a platinum LEED certification, generating some of its electrical needs on site -- 80% of this power comes from wind and 20% from solar. The rest of its electricity comes from its off-site windmill farms, making it a net zero energy building (Mabon *et al.*, 2019)

3.0 **Research Methodology**

The methodology adopted for this research involved the review of relevant examples of the application of Sustainable Architecture in developing countries as all, the inculcation and importance of such applications for tourism in Nigeria.

It was noted that Tourism Systems and spaces can be designed using the principle of sustainable Architecture Development. Adhering to some of the concepts used as specified by the review which has proved the how sustainable tourism and sustainable architecture have been used to achieve sustainable development in the developed countries as well as the application of some of the Nigerian scenario.

4.0 **Discussions and Findings**

4.1 **Sustainable Tourism**

This is a term used to describe tourism that is intended to minimize the negative impacts on the environment and local communities while making the industry itself more viable in the long term.

Tourism helps small businesses (SMEs or minor owned businesses) attain financial stability. Local products are shared with tourists thus enhancing economic growth and facilitating cross-cultural understanding and the promotion and acknowledgement of local content.

The environmental, economic and socio-cultural aspects of tourism development have to be balanced to guarantee a long time sustainable development.

4.1.1 **Urban Tourism and its Consequences**

The development of tourism with its complexities has positive and negative effects as well as different results. The most critical dimensions of these effects are in three areas: environmental, economic and socio-cultural.

The field of environmental tourism can have positive effects such as the following

- ✦ Researchers pay more attention to natural resources such as seas, mountains, forests, and etc.
- ✦ Increase the activity of interest groups that research in the field of environment.
- ✦ Preservation of unique plant and animal species that are endangered.

Economists see the positive effects and consequences of tourism on job creation, foreign exchange earnings, introducing assistance to regional development and even contribution to the public sector (Zaci, 2013).

Also, some beneficial effects in the socio-cultural field can be summarized in the following cases: *“Increasing employment, revitalizing poor or non-industrial areas, reviving local arts and crafts and traditional cultural activities, improving the social and cultural life of the local community, modernization of local architectural traditions and increasing the need to protect extraordinary areas*

and beauty that has aesthetic and cultural value".(Klein et al.,2021).

4.1.2 Factors Affecting Urban Tourism and Tourist Attraction

To attract a group or individuals as a tourist for the first time, it must have some potential. These can include religious, geographical, cultural, historical, and characteristics. For example, travelling to countries for directions visiting seas, mountains and forests are among the geographical features. Religious features and visits to the pyramids of Egypt and Persepolis can be considered historical features (Smith, 2015).

In addition to these issues, other minimal and significant elements are involved in this category, which Urban growth, unique branding, geopolitical features, architectural design of cities, cultural and traditional products. The people's moral characteristics and attitude, urban management, and the formulated policies can be considered as other factors affecting tourist attraction (Carmona, 2021)

4.2 Sustainable Architecture

The basic objectives of sustainability are to reduce consumption of non-renewable resources, minimize waste and creating a healthy productive environment. Sustainable Architectural designs seems to reduce negative impacts on the environment, and health and comfort of the building occupants thereby improving the building performance

The Architects role here is basically that of creating, preserving and improving quality built environment under definite conditions. The obligation of the Architect is to bring sustainability into the environment as citizens of the environment.

4.2.1 Sustainable Design principles

Sustainable plans need to be created if sustainability is the anticipated goal. Certain principles should be adhered to in sustainable designs.

Resource savings consider three strategies, each with a specific type of resource required in construction and utilization to emphasize and aim to minimize.

- ✦ Energy conservation
- ✦ Conservation of matter
- ✦ Water conservation

In life cycle design, there are two models: the traditional building life cycle model and life model stable construction;

The third and possibly most crucial element of sustainable design is human design. While life cycle design and resource conservation deal with

effectiveness and upkeep, human design deals with the viability of all components. The three categories below can be used to group together the general objectives that we wish to see from sustainable architecture:

- ✦ Minimize the use of non-renewable resources.
- ✦ Nurture the natural environment in accordance with the intended objectives.
- ✦ Eliminate or reduce the consumption of toxic substances harmful to humans and nature.

4.3 Sustainable Development

4.3.1 Characteristics of Sustainable Development.

- ✦ It is beneficial to local; economic development
- ✦ Ensure tourist development benefits (both community and the environment)
- ✦ It should be both profitable and viable
- ✦ It becomes part of the local culture

4.3.2 How to Achieve Sustainable Development (SD)

✦ Indicators and actors of SD

Achieving sustainable development is one of the fundamental issues in the 21st century.

The subject can be referred to these components: atmospheric protection, children, culture, education, environment, dynamics and sustainability, Human, Poverty alleviation and pattern change consumption with various factors included. For sustainable development and its implementation to be made feasible, it is ideal to considering these three dimensions (Malik,2018)

- Governments
- Non-governmental companies
- International organizations

Among the broad responsibilities to achieve this, the Government must have the desired plans to implement this goal at all levels and to motivate the entry of the department private to try in this category either directly or indirectly. International organizations that most governments have considered since World War II for various reasons can play an essential role in establishing this concept by planning in this field and paying double attention to sustainable development. For example; The United Nations in 1992 held a summit called Earth, a turning point in sustainable development. It was

followed by the adoption of delegations and resolutions in this regard (Leck and Simon, 2013), Companies and non-governmental organizations, given a famous structure, can be very influential. They are practical and can also operate at urban, provincial, national or even transnational levels. That's one of the best ways to increase public information in this field and interact more with the people or form such companies and organizations. (Leck and Simon.2013)

✦ Goals and dimensions of SD

SD main goals can be summarized as follows: Renewal and change of growth quality, necessities for jobs, food, energy, water, health facilities, providing a stable population level, maintaining and increasing resources, combining environment and economy in international economic decision-making and communication [Wu et al.2018]. The three SD development in the economic, social and environmental fields are stated below:

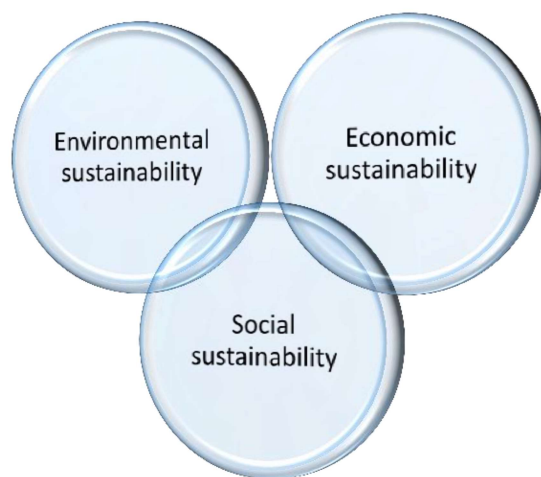


Fig. 2 The major goals of Sustainable Development.

(Source:

<https://conceptdraw.com/a2058c3/p1/preview/640/pict--venn-diagram-sustainable-development>)

4.3.3 Environmental Sustainability

Paying attention to natural facilities and their proper use, and not disturbing the balance and improper use of resources (Chapia et al., 2009).

Environmental protection includes:

- ✦ Conservation of certain geographic and ecological systems (sea and forest)
- ✦ Conservation of living environments (village and city)
- ✦ Conservation of living environments (village and city)

4.3.4 Economic Sustainability

The goal of social sustainability is effective economic survival. It also involves the management of public financial resources for the benefit of the people. It is also imperative to note that the equitable distribution of income and wealth to reduce the class gap also affects economic stability. (Dable, 2015).

4.3.5 5 Social Sustainability

Social justice can be brought about by this goal called social sustainability. Focusing on cultural characteristics of communities and finding suitable development methods appropriate to that community's intellectual, social, and artistic attributes. The children, women, the environment, education, science ethics are also the components involved in this concept. (Sandford 2017).

4.4 Sustainable Urban Development

The suitable social, cultural and economic conditions for the daily life of the people brought about by technological advancement and population growth in the world. The local, regional and rural standards can be raised on the concept of integration (Kuru and Ansell, 2020).

4.4.1 Sustainable Urban Development Planning and Goals

The following are the Seventeen Sustainable Development Goals (SDGs) to change the universe: *“No Poverty; Zero Hunger; Good Health and Well-being; Quality Education; Gender Equality; Clean Water and Sanitation; Affordable and Clean Energy; Decent Work and Economic Growth; Industry, Innovation and Infrastructure; Reduced Inequality; Sustainable Cities and Communities; Responsible Consumption and Production; Climate Action; Life Below Water; Life on Land; Peace and Justice Strong Institutions; Partnerships to achieve the Goal”* Source

(<https://www.un.org/development/desa/disabilities/envision2030.htm>)

Sustainable urban development pillars are based on integrated urban planning and management, urban economic sustainability, productivity, high urban capacities, socio-cultural cohesion of urban society, environmental sustainability of the city and its surroundings, physical sustainability. The town is the stability of urban functioning and the stability of the rights and responsibilities of citizens (Kaur and Garg, 2019).

4.4.2 Sustainable Urban Development Objectives and problems

Some of the most critical goals in sustainable urban development planning can be human, social and cultural goals, health, politics, and the future of the young generation mentioned that by focusing on these outlines, we can have a plan to meet these needs. Each of these needs has its details. For example, to meet human needs can be goals from economics, which has direct impacts on the standard of living and education and meets many conditions such as basic needs (food, clothing and shelter) named. Also, socio-cultural needs can be the category of employment and the degree of persistence. There should be freedom of expression

in political needs, independence, and the ruling system. It noted the level of pollution in the city or even the fair distribution of educational facilities. But one of the most critical goals in this program is to look to the future of the young generation, or future generations that we must use the resources correctly or structurally expand the cities in such a way that the end does not need to be destroyed to solve problems, as well as the preservation of drinkable resources and the use and popularization of the use of resources recyclable is one of the activities that must be done to achieve this goal. Also, in line with the problems of achieving SD, we can address poverty and discrimination, economic instability and unemployment, pollution. And stress, family breakdown, social issues, and lack of recreation should be noted. To achieve sustainable development, thought of solving these problems

5.0 Conclusion and Recommendations

Tourism has played a very important role in sustainable development in many countries and regions around the world. In developing countries tourism development has been used as an important strategy for increasing economic growth, alleviation of poverty, job creation and improving food security. Similarly, sustainable Architecture has played its part in sustainable development by ensuring and encouraging the construction of energy efficient buildings that has no destructive environmental impact on the users thereby making development sustainable.

In the light of this, it is therefore very important to see the need for tourism and sustainable architectures a very significant contributor in the achievement of sustainable development.

It is therefore recommended that the diverse ways of using tourism and sustainable Architecture to achieve sustainable development (as clearly spelt out in this review) should be explored and used to boost the achievement of environment that is not harmful to the users (directly or indirectly).

REFERENCE

- Bahadori, M. N., Dehghani-Sani, A., & Sayigh, A. (2016). *Wind Towers*. Springer International Pu.
- Baker, N. and K. Steemers, *Energy and environment in architecture: a technical design guide*. 2003: Taylor & Francis.
- Banerjee, A., & Bandopadhyay, R. (2016). *Biodiversity hotspot of Bhutan and its sustainability*. *Current Science*, 521-527
- Becker, K. (2014). *São Tomé and Príncipe*. Bradt Travel Guides.
- Brantingham, P.L. and P.J. Brantingham, *Environment, routine, and situation: Toward a pattern theory of crime*, in *Routine activity and rational choice*. 2017, Routledge. p. 259-294.
- Brown, B.J., et al., *Global sustainability: Toward definition*. *Environmental management*, 1987. **11**(6): p. 713-719.
- Borowy, I., *Defining sustainable development for our common future: A history of the World Commission on Environment and Development (Brundtland Commission)*. 2013: Routledge.
- Carley, M. and I. Christie, *Managing sustainable development*. 2017: Routledge.
- Chapin III, F.S., et al., *Principles of ecosystem stewardship: resilience-based natural resource management in a changing world*. 2009: Springer Science & Business Media.
- Chen, S., & Li, Y. (2022). Comparative Analysis of Two Energy-Efficient Technologies Used in the Shanghai Tower. *Energy and Power Engineering*, 14(1), 1-12.
- Carmona, M., *Public places urban spaces: The dimensions of urban design*. 2021: Routledge.
- Dabla-Norris, M.E., et al., *Causes and consequences of income inequality: A global perspective*. 2015: International Monetary Fund.
- de Oliveira Neto, G.C., et al., *A framework of actions for strong sustainability*. *Journal of cleaner production*, 2018. **196**: p. 1629-1643.
- Kaplanidou, K., & Karadakis, K. (2010). *Understanding the legacies of a host Olympic city: The case of the 2010 Vancouver Olympic Games*. *Sport Marketing Quarterly*, 19(2), 110.
- Kaur, H. and P. Garg, *Urban sustainability assessment tools: A review*. *Journal of cleaner production*, 2019. **210**: p. 146-158.
- Kirubi, C., Jacobson, A., Kammen, D. M., & Mills, A. (2009). Community-based electric micro-grids can contribute to rural development: evidence from Kenya. *World development*, 37(7), 1208-1221.
- Klein, M., et al., *Creative and Culture Industry in Baltic Sea Region Condition and Future*. *Sustainability*, 2021. **13**(8): p. 4239
- Kulkarni, M. P. V., & Pammar, L. S. (2019). An Initiative Towards Implementation of Rating System in Green Building. *Atmosphere*, 37, 36.
- Kohl, U., & Andersen, J. (2021). The Copenhill Crisis: A Dark Side of Municipal Planning for Clean Energy Futures. In *Energy Futures-Emerging Pathways in an Uncertain World!(Online)*
- Kuenzi, C. and J. McNeely, *Nature-based tourism*, in *Global risk governance*. 2008, Springer. p. 155-178.
- Kuru, K. and D. Ansell, *TCitySmartF: A comprehensive systematic framework for transforming cities into smart cities*. *IEEE Access*, 2020. **8**: p. 18615-18644.
- Leck, H. and D. Simon, *Fostering multiscalar collaboration and co-operation for effective governance of climate change adaptation*. *Urban Studies*, 2013. **50**(6): p. 1221-1238.
- Lehmann, S. (2016). Sustainable urbanism: towards a framework for quality and optimal density? *Future Cities and Environment*, 2(1), 1-13.
- Leung, Y. F., Spenceley, A., Hvenegaard, G., Buckley, R., & Groves, C. (2018). *Tourism and visitor management in protected areas: Guidelines for sustainability* (Vol. 27). Gland, Switzerland: IUCN.
- Mabon, L., Kondo, K., Kanekiyo, H., Hayabuchi, Y., & Yamaguchi, A. (2019). Fukuoka: Adapting to climate change through urban green space and the built environment?. *Cities*, 93, 273-285.
- Malik, R.S., *Educational challenges in 21st century and sustainable development*. *Journal of Sustainable Development Education and Research*, 2018. **2**(1): p. 9-20.
- McEwen, M., & Pimentel Walker, A. P. (2015). Brazil: Twenty-first-century architectures of the MegaEvent. *The Avery Review*, 9, 1-12.
- Mensah, J., *Sustainable development: Meaning, history, principles, pillars, and implications for human action: Literature review*. *Cogent Social Sciences*, 2019. **5**(1): p. 1653531.

- Mihic, S., Golusin, M., & Mihajlovic, M. (2011). Policy and promotion of sustainable inland waterway transport in Europe–Danube River. *Renewable and sustainable energy reviews*, 15(4), 1801-1809.
- Morrison, A.M., *Marketing and managing tourism destinations*. 2013: Routledge.
- Morvay, Z., & Gvozdenac, D. (2008). *Applied industrial energy and environmental management*. John Wiley & Sons.
- Munn, N. D. (1996). Excluded spaces: The figure in the Australian Aboriginal landscape. *Critical inquiry*, 22(3), 446-465.
- Pickett, S.T., et al., *Evolution and future of urban ecological science: ecology in, of, and for the city*. Ecosystem health and Sustainability, 2016. 2(7): p. e01229.
- Prasad, R. D., & Raturi, A. (2020). Solar Energy for Power Generation in Fiji: History, Barriers and Potentials. *Translating the Paris Agreement into Action in the Pacific*, 177-199.
- Sachs, W., *Sustainable development and the crisis of nature: On the political anatomy of an oxymoron*. Living with nature, 1999. 23(1): p. 23-42.
- Sanford, N., *Self and society: Social change and individual development*. 2017: Routledge.
- Saravanan, J., Jayadurgalakshmi, M., & Karthickraja, R. (2017). China's Nanjing vs India's Delhi—a perspective for vertical forest. *International Journal of Civil Engineering and Technology*, 8(12), 115-123.
- Shen, L. Y., Ochoa, J. J., Shah, M. N., & Zhang, X. (2011). The application of urban sustainability indicators—A comparison between various practices. *Habitat international*, 35(1), 17-29.
- Smith, R. F., & Killa, S. (2007). Bahrain World Trade Center (BWTC): the first large-scale integration of wind turbines in a building. *The structural design of tall and special buildings*, 16(4), 429-439.
- Smith, S., *A sense of place: Place, culture and tourism*. Tourism Recreation Research, 2015. 40(2): p. 220233.
- Trepci, E., P. Maghelal, and E. Azar, *Effect of densification and compactness on urban building energy consumption: Case of a Transit-Oriented Development in Dallas, TX*. Sustainable Cities and Society, 2020. 56: p. 101987.
- Reid, D., *Sustainable development: An introductory guide*. 2013: Routledge.
- Wu, J., et al., *Information and communications technologies for sustainable development goals: state-of-the-art, needs and perspectives*. IEEE Communications Surveys & Tutorials, 2018. 20(3): p. 2389-2406.
- Zaei, M.E. and M.E. Zaei, *The impacts of tourism industry on host community*. European journal of tourism hospitality and research, 2013. 1(2): p. 12-21.
- Zuo, J., Read, B., Pullen, S., & Shi, Q. (2012). Achieving carbon neutrality in commercial building developments—Perceptions of the construction industry. *Habitat International*, 36(2), 278-286.
- <https://conceptdraw.com/a2058c3/p1/preview/640/pict--venn-diagram-sustainable-development>
- <https://edition.cnn.com/style/article/green-buildings-world-sustainable-design/index.html>