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Mosquito breeding place and container index are related to dengue hemorrhagic fever cases in uptown Semarang

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Abstract

The endemic status of Dengue Hemorrhagic Fever (DHF) in Semarang City has started since 1994 and continued to 2015. The DHF cases in 2015 were found mostly at the uptown region or hilly areas. The following research was carried out to determine the relationship between mosquito breeding place, container index and personal hygienic practice to DHF cases in uptown region of Semarang city. The DHF sample cases were obtained from several hospitals in Semarang city (n = 30), and the control groups were obtained from healthy respondents with matched age, sex, and district location (n = 30). The results showed that there were significant correlation between mosquito breeding places (p = 0.016; OR = 4.6) and Container Index (CI) (p = 0.030; OR = 4.0) to DHF cases. On the other hand, shower practice (p = 1.000; OR = 0.8) had no correlation to DHF cases. It can be concluded that the presence of mosquito breeding places and container index increased the probability of a person to get DHF from mosquito bites. It is recommended for community to minimize water containers around the house as it can be used as breeding places of *Ae. aegypti*. © 2017 American Scientific Publishers All rights reserved.

Author keywords

Breeding places; Container index; Dengue hemorrhagic fever (DHF); Personal hygienic practice

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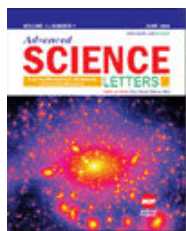
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The Sustainable Well-Being in the Medina of Tunis and Its Environmental Values

Majdi Faleh

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The Medina of Tunis, or the vernacular heart of the Arabic-Islamic city, has been known for centuries as an important center of Muslim civilization and a crossroad of Muslim and non-Muslim cultures in North Africa. Its urban fabric, its built environment, and its architectural patterns are a manifestation of a creative and a sustainable process whereby the environment has had an important effect on the planning of the Medina. By analyzing the structure of this vernacular settlement, this paper aims to explore the concept of sustainability in this settlement while referring to the studies of 14th-century master builder Ibn Al-Rami. Its environmental qualities are explored through the gradual exploration of its urban components from the level of the street to the level of the courtyard to explain their participatory role in enhancing cultural and social values of Islam.

Keywords: Tunis Medina, Universal, Sustainability, Islamic, Ibn Al-Rami.

1. INTRODUCTION

The Medina of Tunis, known among scholars as the Arabic-Islamic city of Tunis, is a dynamic urban structure, rich with a diverse fabric of tortuous streets, squares, residences, a wide range of Souks, and scattered parts of a remaining fortification. The scale of each urban component varies but the ensemble participates in defining a well-sustained urban structure. In this context, environmental, cultural and social factors that shaped this Medina will be analyzed to determine their effects on the urban form and on its spatial qualities.

The typology of the different paths inside the medina, their progression, as well as the typology of the courtyards, are important factors of analysis that will help the reader to understand how the physical coherence of shape and space helps to respond to principles of sustainability. In planning these structures, the gradual progression from a space to another generates a certain order while responding to human scale. In the 14th century, a master builder by the name of Ibn Al Rami wrote a building code that helped to understand and define the structure of the Islamic city based on the Maliki *Fiqh* or Jurisprudence.

The study of the architectural intricacies enveloped inside this Medina demonstrates how “modern” this structure is for its time. This analysis does not aim to reach a utopian dream of exclusively embellishing the sacred and the historical; However, the intention here is to compare the relationship of human beings to their built environment and later to question the architecture of Tunis in the global age. Modernity as a structural concept of most if not all societies will be questioned to reveal its hegemonic tendency as well as its limitation in the global context, and particularly in the context of the built environment of vernacular Islamic Medinas or Islamic cities. The evolution of planning

and design inside the Medina of Tunis was gradually achieved starting from the fifth century until it seized to evolve under colonialism and later globalization between the 19th and the 21st centuries. In this context, one might reflect on the values of progress where global forces continue to struggle with vernacular patterns in architecture.

2. METHODOLOGY

In this paper, we begin our analysis with a broad exploration of the Arabic-Islamic city of Tunis. To begin with, we consider the value of this vernacular “city” based on UNESCO reports that classified this settlement as a world heritage since 1979. The methodological analysis of traditional environments in this context is focused on understanding the material culture of human settlements and vernacular architecture by looking at its historical importance, its religious significance (Maliki *Fiqh*) and its social/cultural dimension. The method consists of explaining how both planning and architectural layers were historically informed by these three spheres and how both form and function were influenced accordingly to meet these values. All these factors will explain how the sustainable well-being and the environmental values of the Medina of Tunis evolved historically. Sustainability and environmental well-being will focus more on cultural and social principles.

3. THE UNIVERSAL VALUE OF THE MEDINA OF TUNIS

We begin this analysis by addressing the history of the Medina of Tunis and its importance on the African, Arab, as well



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The theme of ‘*Sustainable Well-Being in Architecture and Environmental Sciences*,’ for this special section edition would be the platform for scholars, researchers, and practitioners from the Built Environment profession to share ideas and expand networking. I believe that this special section is timely to address concern on sustainable well-being, which is the pursuit of having a ‘good life’ within Earth’s carrying capacity. This pursuit involves addressing ‘well-being’ in a holistic way and adjusting to the planetary boundary and can evolve in many directions when explored in different contexts.

Sustainable Well-Being highlights the importance of a lifestyle that is environmentally friendly and socially advantageous. The word ‘sustainability’ is synonym with progress and balance development and is defined by the United Nation as development that “*meets the needs of the present without compromising the ability of future generations to meet their own needs.*” On the other hand, ‘Well-being’ is also a researched area, mainly in the socio and psychology domains and concerns optimal experiences and functioning. However, studies suggest that a balance between the two approaches is ideal.

Particularly in line with the theme of this edition, “Sustainable Well-Being,” this special section focuses on the design and building of a harmonious living place with the environment. The contributions to the study of environmental sciences have come from a diversity of fields including architecture, town

planning, transportation, engineering, legal matters, community development and psychology, housing, among many others. Integration of economy, the environment and well-being need to be priorities and these elements cannot be tackled as separate entities. The environment must be commissioned and designed with the need of the current population and future generation in mind. Therefore, Sustainable Well-being and the ways to measure it are in urgent need of updating.

I believe that this special section of Advanced Science Letter, can be the platform for the experts and researchers to discuss on how we can achieve Sustainable Well-being in Architecture and the built environment and hopefully the articles in this special section would be a useful reference for future studies related to the disciplines of the Built Environment and sustainability.

Guest Editors

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Towards Sustainable Urban Form: A Comparative Analysis of Two Urban Neighbourhoods in Kano, Nigeria

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This paper presents an initial investigation into the idea of sustainable urban form through a study of urban neighbourhoods in Northern Nigeria. Two neighbourhoods, Birni and Nassarawa, in the city of Kano, were selected, primarily based on their physical and functional characteristics, and historical significance. For the last three decades, the government has made an effort to accommodate the rapid population and urban growth on a sustainable basis through the instruments of sub-division; infill development; and normalization. These criteria reflect those of many established theories, which propagate that two important aspects that have a profound influence on sustainable urban form are density and mixed-use. The study, therefore, seeks to determine the appropriateness of these policy instruments in promoting sustainability in developing countries. The aforementioned traditional neighbourhoods have been developed with different sets of priorities and yet still share certain viable and vital characteristics that are fundamental to a sustainable built environment. While Birni, which originated from the year 999 AD, promotes a sense of community through its scale; mixed-use; and pedestrian-oriented environment, Nassarawa established in 1904, has quality grid street networks, better connectivity with segregated use and recreational open spaces, but less pedestrian-oriented. The finding indicates that the inherent quality of the indigenous form more than the policy instruments has profound influence on urban form sustainability. This calls for further research into the efficacy of indigenous urban form in promoting urban sustainability.

Keywords: Sustainable Urban Form, Traditional Urban Neighbourhood, Viability, Vitality.

1. INTRODUCTION

The concept of Sustainable urban form has gained popularity worldwide since the adoption of sustainability development objectives in the early 1990s.¹ Sustainable urban form emphasises on making the community more compact with high or moderate densities, pedestrian friendly and of mixed-use urban form.² It is in reaction to urban sprawl, which is believed to be unsustainable, regarding the environment, economic and social-cultural aspects. Sprawl development threatens society health, increase the cost of infrastructure and public services provisioning and threaten the environment consequent upon automobile dependence as a result of increased daily commuting.³ Sustainable urban form, on the other hand, promotes density within built areas through intensification,⁴ thus increasing support for environment -friendly modes such as public transport, walking and cycling, better access and more efficient utilisation of facilities,

utilities and infrastructure.⁵⁻⁷ These aspects of sustainable urban form are expected to contribute positively to the social, economic and environmental objective of sustainable development.

In Kano, Nigeria there is an on-going attempt to apply sustainable urban form concept to existing developments to accommodate the rapid population and urban growth. This effort is targeted towards urban structuring principles through the instruments of sub-division; infill development; and normalization from metropolitan to the neighbourhood.

The methodology for the research is comparative in nature. Though the alleged impacts of urban form on sustainability appear to be at a city level, this study is neighbourhood based. Difficulties in identifying and encompassing all aspects of sustainable urban form led to the adoption of the comparative analysis as the methodology. The study rather than examines whether urban compactness through the instruments of sub-division; infill development; and normalization promotes sustainability analysis whether more compactness leads to sustainable urban form. Regarding method, the mixed method was employed for the

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Communities' Local Knowledge of Flood Disaster Management in Pakistan

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Disaster literature shows the trends and the events of natural disasters increasing across the world. These phenomena have linked with climate change, as a new driver of disaster risk, which increases both hazards and vulnerabilities. Pakistan has witnessed several major flood disasters affecting 40 million people since early 1970, due to its natural topography and human activities. Studies showed that the impacts of these natural disasters increase if the right information and knowledge development of local communities are not taken into account, particularly in vulnerable regions. This paper aims to find the level of community disaster knowledge in terms of disaster experience, risk perception, and readiness to determine the level of perception on disaster management in the flood-prone regions of Pakistani districts. The study assumes that the disaster preparedness and risk perceptions are interlinked because people with a high-risk perception vis-à-vis the right knowledge make adjustments to reduce risks. A semi-structure questionnaire was administered to 385 households living near flood-prone area along the River Indus in selected Pakistani districts. A multiple linear regression analysis was carried out to explore the contribution of all predictors and their influence to the prediction of disaster management. The finding revealed that the level of disaster experience and risk perception significantly predicted disaster management, however, the overall readiness of communities to manage flooding was not significant. The paper concludes that both disaster experience and risks perception knowledge have a strong relationship to disaster management. Overall readiness, however, is still not encouraging and will need to be strengthened to improve local knowledge.

Keywords: Flood Disaster, Vulnerability, Risk Perception, Readiness, Local Knowledge.

1. INTRODUCTION

Disaster literature shows the trends and the events of natural disasters increasing across the world.^{3,13} Especially for Asia and Pacific regions. The impacts of these natural disaster on people and property were tremendous, due to changes in people's social, economic, cultural, political, and environmental contexts. Annually, millions of people are displaced. During the 1960s and 1970s, the solution to natural disaster has been predominantly on the basis of technical approach. Although this approach saves lives when hazards strike, a disaster management should be complemented by taking into account the human dimensions which into account the human dimensions which include local knowledge, practices, and perceptions.¹ Studies have shown that communities having better knowledge are better prepared in dealing with hazards. Disaster preparedness and risk perceptions are interlinked because people with a high risk perception take actions to avoid risks.¹⁹ Therefore, if people are aware of

a disaster risk, they will adjust properly to the natural hazards. Pakistan has been known to experience natural disasters with devastating effect on people and properties. 90% of the population who are affected by any natural hazards are subjected to flood disasters.⁹ Although no major flood had occurred since 1995, the 2010 severe floods in Pakistan demonstrated the continuous presence of flood risks. Following the Hyogo Framework for Actions, it is imperative to underscore the risk assessment and preparedness to cope with disasters among local communities, particularly in flood prone areas. This study therefore, attempts to identify the local knowledge of the affected communities in terms of risk perception and readiness for future challenges in disaster management. We aimed to identify the relationship between the risk perception and readiness among the communities from seven districts located in flood prone areas of Pakistan. The next part of the paper discusses the concept of risk perception and preparedness in disaster management followed by a brief description of natural disasters in Pakistan. We also explain the method used in the research before discussing the results.

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Multivariate Linear Regression Model for Estimating Average Daylight Illuminance

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Window design and the selection of glazing system have significant effect on daylight illuminance. Occupants' productivity is highly dependent on daylight, as it associates with numerous health advantages. Hence conducting a systematic investigation considering the performance of various window designs and glazing systems is highly important at the early stage of design process. For this purpose, this study attempts to develop a multivariate linear regression model for estimating the average daylight illuminance. To perform the simulations, an office room prototype was modelled by COMFEN 5Beta software. The prototype is a hypothetical office room, as its size, HVAC system and envelopes construction are based on the common practice in construction in Sweden. Because average daylight illuminance is sensitive to window size, orientation, glazing system, design model and position, 544 simulations were performed based on these variable to create an extensive dataset. A multivariate linear regression model was developed based on 90% dataset, which was chosen randomly. The obtained R^2 value was exceeded 96%, which shows an excellent fit for the developed model. The interaction between variables was also studied. The remaining 10% of dataset was utilized for validating the developed model. The validity of the model was further compared with another multivariate linear regression model, developed based on 50% of the dataset. The results show the effectiveness of multivariate linear regression models in supporting architects and predicting average daylight illuminance in early stage of design analysis.

Keywords: Multivariate Linear Regression, Daylight Illuminance, Interaction Analysis.

1. INTRODUCTION

A diverse body of research in building design practice indicates that having window and introducing daylight into interior spaces has enormous influence in enhancing well-being.¹⁻⁴ Heerwagen (1990) showed that window in general has four important benefits;¹ it allows to access to environmental information;² changes of sensory which is fundamental to perception and may be essential for efficient functioning of the brain,³ presents a feeling of connection to the world outside and⁴ accelerates the recovery process.⁵ In addition, daylight helps individuals in self-controlling⁶ and having better social interaction by improving their mood.⁷ Apart from these psychological benefits by reducing the stress level and controlling seasonal affective disorder (SAD), daylight through windows also improves the physical health⁷ Allowing daylight into interior spaces has economic benefits as well Daylight increases the alertness and attention among the employees, which can boost work productivity by 15%.^{8,9} Increased work productivity leads to financial gains via increased

work quality, improved health condition and decreased absenteeism or sick leave.⁷ A study on Lockheed Martin company showed that the higher productivity pertaining to daylighting assisted them to win a \$1.5 billion defense contract in 1995.⁷

However designing a high performance daylight environment is a complex process due to involvement of various design variables, including window size, position, orientation, glazing and shading systems. The existing softwares such as COMFEN simulates changes in daylight penetration with changes in individual parameters such as window size, position etc., but is difficult to judge the best option (the combination of parameters for maximum daylight penetration) with increased number of parameters To overcome this a multivariate linear regression model approach is proposed for easier prediction of the average daylight illuminance with changes in various variables. This will assist the architects and designers in early stage of building design process. Available linear regression models in literature were developed to predict only the energy consumption,^{15, 17, 18} and they utilized a mathematical sampling algorithm, which requires programming skills. The linear regression model of this paper predicts average daylight illuminance without utilizing mathematical sampling algorithm.

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