

**International Conference on  
Architecture and Engineering in Urban Development 2013**

*Colombo, Sri Lanka 20<sup>th</sup> -21<sup>st</sup> December*

***ABSTRACT PROCEEDINGS***



## **Publisher**

International Center for Research and Development

No: 858/6,  
Kaduwela Road,  
Thalangama North,  
Malabe,  
Sri Lanka  
Tel: +94112744306  
Fax: +94112744306

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### Table of Contents

		Title	Name	Page
	1	Needs and approaches towards greening of the urban environment - The Indian Scenario	Aabshar U.K. Imam U.K. Banerjee	7
	2	Landscaped Landfills As A Sustainable Green Option For Solid Waste Management	Anilkumar P.P. Amritha P.K.	8
	3	Growth Of Micro, Small And Medium Scale Enterprises: A Creative Economic Base To Achieve Less-Vulnerable Livelihood In Developing Nations	Basudatta Sarkar HaimantiBanerji Joy Sen	9
	4	The Effects Of Shear Connector Arrangements On Composite Beam With Metal-Ribbed Deck Subjected To Combined Flexure And Shear	Ma.Bavan Shahrizan Bin Baharom SitiAminah Osman	10
	5	Form Based Coding Regulation – A Structured Approach To Urban Renewal	Bimal P.	11
	6	Adaptations From Architecture Of Animal Kingdom – A New Approach For Sustainable Architecture	Chithra. K.	12
	7	Introduction Of Sustainability In Super Tall Housing: Architectural Implications	DebashisSanyal	13
	8	Sustainable Development, Material Or Matter?-Case of rural housing in Algeria	HassibRehailia	14

9	Influence of window types on natural ventilation of residential buildings of Dhaka, Bangladesh	JiniaSharmeen Abontika Sara Israt	15
10	The Development of modeling techniques for biological wastewater treatment: A review	Musfique Ahmed	16
11	Spatial Re-Structuring Around Global City Visions:The Case Of The Delhi Metro Rail	AlokeparnaSengupta	17
12	Architecture and nature. Projects and productions of a Polish architect, MarekBudzyński – selected examples.	Julia Sowińska - Heim	18
14	The Landscape Of Contemporary Suburbs And The Concept Of Sustainable Development	DorotaWojtowicz- Jankowska	19
15	Perceived Efficacies and Collectivism in Multi-owned Housing Management	Yung Yau	20
16	New Orleans – Urban Development after Katrina	Martin Heintel	21
17	The Influence of Policy Decisions on the Wetlands of Bangalore	FathimaSamana S Rajesh Gopinath Anantha Krishna S	22
18	Planning For Sustainable Infrastructure Through Greening Efforts: Testing The Rhetoric	TendayiGondo Joseph Binala	23

## **NEEDS AND APPROACHES TOWARDS GREENING OF THE URBAN ENVIRONMENT - THE INDIAN SCENARIO**

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### **ABSTRACT**

The economic growth in India post 1990's has been associated with a high rate of urban densification often at the expense of urban greenery. The thermal mass per unit area and vehicular use in cities has grown resulting in increased emission of anthropogenic heat and greenhouse gases. Such changes often culminate in the urban-rural temperature differences leading to the generation of Urban Heat Islands. Elevation of outdoor temperatures initiates excessive consumption of electricity and the use of heating ventilating and air conditioning (HVAC) units for maintenance of indoor thermal comfort. As a consequence, CO<sub>2</sub> is discharged to the outdoor environment thus further exacerbating the thermal imbalance in the urban environment. Presence of urban hot-spots in Indian cities like Delhi, Chennai, Pune and Vishakapatnam has made it imperative to find cheap, efficient and long-lasting solutions to the climatic issues. Global warming along with the need to curtail carbon dioxide emissions as per the Kyoto Protocol has further increased the pressure on India for an effective and long lasting solution. Urban greening has often been sighted as an effective method of climatic restoration. This paper seeks to highlight the contemporary climatic problems prevalent in Indian cities and attempts to find a solution through the process of urban greening.

**Keywords:** Urban Heat Islands, Atmospheric pollution, Urban greening

## **LANDSCAPED LANDFILLS AS A SUSTAINABLE GREEN OPTION FOR SOLID WASTE MANAGEMENT**

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### **ABSTRACT**

A sustainable waste management system can be developed only by knowing the quantity and quality of the waste generated, available disposal methods and resources and the environmental conditions of a particular region or society. As part of an integrated waste management system this paper focuses on the innovative approaches and technologies that can be adopted treating waste as a resource to help in landscape development and planning of the city. This will in turn improve the quality of life of the people and will add value to the surrounding environment. Landfilling or disposing waste to open dumps is the most common or widely used disposal method presently adopted in many countries. Landfilling untreated or unsegregated waste can lead to emission of methane, long term emissions to surface and ground water, slope failure and soil erosion. Since a landfill is always characterized by its homogeneity and varied ecologies it is proposed that a redefinition of landfill can be done to create a more diverse, integrated and a healthy series of ecosystems through landscape development. Such a system would include defining a landfill management system for the soil type in the given context, a regime of plant species from the climatic/maintenance perspective, as a system of remediating existing open dumps. However the present paper discusses the different dimensions of integrating landscape development and its maintenance with/through landfills primarily using solid waste generated in the city as a green option for a sustainable waste management system.

**Keywords:** Sustainable waste management, Solid waste, landscaped landfills.

## **GROWTH OF MICRO, SMALL AND MEDIUM SCALE ENTERPRISES: A CREATIVE ECONOMIC BASE TO ACHIEVE LESS-VULNERABLE LIVELIHOOD IN DEVELOPING NATIONS**

Basudatta Sarkar<sup>1</sup>, Haimanti Banerji<sup>2</sup>, Joy Sen<sup>3</sup>

### **ABSTRACT**

The proneness to vulnerability is significantly noticed in the developing nations unveiling a need to identify the degree of vulnerability for understanding different shades of underdevelopment. Vulnerability is state of susceptibility of a system to different categories of shocks and consequent injuries generated by several causal factors. The causal factors confer different dimensions to vulnerability according to their characteristics and uniqueness. Characteristics of causal factors are represented by various development indicators which also reveal the state of underdevelopment of different regional systems. The degree of underdevelopment and consequent shades of vulnerability can be represented by the interdependence of these indicators. In recent days, it has been observed that particularly in developing countries like India, medium, small and micro scale enterprises (MSME) have significant impact on the creative regional economy and quality of life of people within the region. This significant relationship of MSME growth indicators with the other development indicators forwards an inverse interdependence of vulnerability and MSME growth which divulges the possibility of less vulnerable livelihood and better quality of life. The present paper illustrates the relationship of MSME growth with the socio-economic vulnerability based on a case study of West Bengal, a state in eastern part of India.

**Keywords:** development indicators; growth of micro, small and medium scale enterprises; nature of interdependence.

**THE EFFECTS OF SHEAR CONNECTOR ARRANGEMENTS ON  
COMPOSITE BEAM WITH METAL-RIBBED DECK SUBJECTED TO  
COMBINED FLEXURE AND SHEAR**

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**ABSTRACT**

The contribution of concrete slab in the shear capacity reduces due to the weaker concrete in the usages of metal-ribbed deck. The number of shear studs and its arrangements may influence the vertical shear strength of composite beam with metal-ribbed deck due to excess weakening of the area. Thus, this paper studies the ultimate strength of composite beam with metal-ribbed deck in combined bending and shear. Three dimensional non-linear material components of composite beams were developed in the finite element method (FEM) with various parameters of shear connector arrangements such as one stud, two studs in transverse direction and two studs in longitudinal direction. The developed models were then verified with available experimental data against moment-deflection responses. Afterwards, the models were included to study the effects of the shear deformability in the weaker section of concrete slab due to the metal ribbed deck at various load levels. The significant differences were predicted due to the substantial role of combined interaction of bending and shear. The effects of concrete slab and shear connection in internal actions at vertical shear strength and composite actions are presented in results. In addition, the failure modes such as concrete crushing and cracking, separation of metal-ribbed deck, shear connection failure and yielding of steel beam are thoroughly analysed.

**Keywords:** Non-linear FEM analysis, steel-concrete composite beam with metal-ribbed deck, combined bending and shear, shear capacity, parametric studies.

## **FORM BASED CODING REGULATION – A STRUCTURED APPROACH TO URBAN RENEWAL**

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### **ABSTRACT**

Globalization has generally resulted in sudden growth of economic activities of urban areas in developing countries like India and cities struggle to accommodate the morphological implications of the economic activity. Various problems like urban sprawl, congestion, loss of wetlands, and loss of cultural identity are some of the issues faced by such cities. A comprehensive and sustainable way of renewal of urban spaces is required for such cities to make them competent to survive in the future. Traditional method of urban design implementations has several limitations to operate in the cultural and democratic environment of developing countries. Form Based Coding Regulation is a new approach to plan, develop, implement and manage urban design through a set of coding regulations. Form based coding, because of its inherent participatory nature, and its clarity and unambiguous representation of the rules is a promising candidate for an effective mechanism to code and implement urban renewal in the democratic environment of developing countries. The participatory approach ensures reliance on traditional construction techniques and patterns and hence ensures that the evolved environment is unique and the most appropriate for the given context. FBCR can also limit reliance on large centralized planning, funding, technical supports etc.

**Keywords:** Form Based Coding, Urban Conservation, FBC, Heritage

## **ADAPTATIONS FROM ARCHITECTURE OF ANIMAL KINGDOM – A NEW APPROACH FOR SUSTAINABLE ARCHITECTURE**

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### **ABSTRACT**

Over time, man has tried to control nature by enforcing order and at the same time distancing him from it. There are attempts now to regain a close connection with nature through 'natural architecture' that aims to create a new, more harmonious, relationship between man and nature by exploring what it means to design with nature in mind. Best approach for this would be to draw parallels from nature itself and build accordingly by studying the cornucopia of sustainable structures that have developed and existed in the natural environment since time immemorial. It is a truth in nature is that animals and birds started constructing dwellings before man built his first hut. These structures have evolved over millennia of building and testing and hence are designed to best suit the bird or animal that built it. As such, they are structurally sound, climate responsive, to a large part weather resistant and in many cases, aesthetically pleasing. The construction techniques used in building most of these structures are unique and worth studying to understand its applicability on a larger scale. They are not completely different from what we humans build. Animal builders are patchily distributed through the animal kingdom, and little research has gone into studying them completely. More information and documentation is required in a number of areas, for example, on the composition and properties of materials, and mechanical properties of structures. The aim of this paper is to establish under these limitations, which of these structures can be reproduced by us and how, studying the properties of materials used and equating those to known construction materials and also evaluating the applicability of such structures in our everyday architecture.

**Keywords:** Sustainable building design, animal architecture, natural architecture

## **INTRODUCTION OF SUSTAINABILITY IN SUPER TALL HOUSING: ARCHITECTURAL IMPLICATIONS**

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### **ABSTRACT**

The vertical growth pattern of highly developed urban areas projects further development of taller housing in near future. As per trends experienced in 21 mega cities, soon super tall housing will be extensively used for all types of habitation and high-rise cities will come into existence. Environmental challenges, major energy usage, time/ money consuming factors are amongst many of the greater challenging aspects, besides other architectural aspects. In addition to similar basic socio-psychological requirements for other housing alternatives, these super tall housing can impose more problems socially and psychologically to its inhabitants. Some of these problems are identified as offering different quality of life, transportation of young children/ shopping bags, movement of elderly/ sick people, security concerns, ownership status, fear of earthquake/ disasters, etc. Increased use of synthetics as building materials, cleaning and renovation of buildings process, constructing airtight buildings to reduce energy costs, inadequate ventilation efficiency, enhance the number of VOCs in indoors. Use of renewable energy resources, sustainable & eco-friendly materials, and green building measures will reduce the negative environmental footprint of super tall housing in one hand; smart technological measures will ensure efficient use of available resources on the other hand.

**Keywords:** Super tall, housing, development, architectural, sustainable.

**SUSTAINABLE DEVELOPMENT,  
MATERIAL OR MATTER?  
-Case of rural housing in Algeria-**

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**ABSTRACT**

Sustainable development, which is a fashionable theme, is ubiquitous in the construction market. Unfortunately it is often understood as an opportunity to increase the consumption of materials both old and new. With the urban explosion, the intensification and globalization models invalidate the constructors' integrated approach in its natural environment if the choice of raw materials is not a priori thought in a thorough manner.

Therefore, to address the challenge of the architect faced with the choice of materials, particularly the problem of the production of buildings becomes intractable. Only the study and mastery of the handicrafts, industrial, economic and social processes allow the consideration of new practices capable of integrating the concept of sustainable development through a careful selection of material.

Drawing accordingly from alternative materials (eco-materials), represents a challenge and at the same time opens a new way for architects to reconcile design and sustainable development.

What is proposed for the new architectural designs is also valid in the rehabilitation of a home and even ancient cities and areas classified as national heritage. Subsequently, it is believed that architecture can contribute to raise this awareness.

Algeria, a country facing a housing crisis drama, has aggravated the environmental situation by stubbornly using only gray materials, whereas solutions respecting sustainable development are possible and economical.

The purpose of this paper is to present the appropriateness of an ancient building material (mud), that Algeria has a vested interest to use in order to combine the investment economy with rural housing sustainability.

**Keywords:** eco-friendly material, sustainable development, vernacular architecture, ecology, habitat.

## **INFLUENCE OF WINDOW TYPES ON NATURAL VENTILATION OF RESIDENTIAL BUILDINGS OF DHAKA, BANGLADESH**

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### **ABSTRACT**

Natural ventilation is most desirable for cooling and providing fresh air in residential buildings for better indoor air quality and thermal comfort. The natural ventilation performance is affected by a combination of internal and external factors. External factors include the location, the orientation, the prevailing wind speeds and the building forms of the residential development, which are subject to constraints beyond the control of site planners and architects. Whilst for internal factors like the openings configurations and window types, site planners and architects are always given free hand for a proper design. Dhaka, a city in the Tropics, has become such a city where with rapid urbanization users are moving towards mechanically ventilated buildings putting ever increasing demand on the dwindling energy resources. This paper focuses on the influences of window types on the natural ventilation of residential units in Dhaka in order to improve quality of indoor living environment. Primary objective of the study is an attempt to investigate the performance of different types of windows which is commonly used in residential buildings of Dhaka city. It is expected that the findings will immensely help design professionals practicing all climatic contexts where ventilation is an important design consideration.

**Keywords:** Performance evaluation, Residential building, Window types, Simulation study, Dhaka City and Tropics.

## **THE DEVELOPMENT OF MODELING TECHNIQUES FOR BIOLOGICAL WASTEWATER TREATMENT: A REVIEW**

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### **ABSTRACT**

The process of wastewater treatment is very complex and dynamic due to the fluctuating character of wastewater. Wastewater Treatment Modelling is very useful to design the proper plant capacity and to improve the plan operation system. Mathematical modeling and simulation in wastewater treatment processes is used to describe, predict and control the process and has become increasingly popular since its introduction to the real world. Different types of biological, chemical and mechanical processes are conducted in a typical wastewater plant. Proper conceptualization and background knowledge is needed to develop and run a model according to the objectives. In this paper different types of models which are used for biological wastewater treatment have been critically reviewed. These models have been categorized in three groups: models for aerobic process, anaerobic process and hybrid models. Different approaches have been adopted for different models depending on their objectives and purposes. A critical analysis is also presented regarding the limitation of these models which need to be improved through future research on model development.

## **SPATIAL RE-STRUCTURING AROUND GLOBAL CITY VISIONS: THE CASE OF THE DELHI METRO RAIL**

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### **ABSTRACT**

The paper looks at the spatial restructuring of the Delhi agglomeration, with respect to the processes of change induced by the Delhi Metro Rail. This work is positioned within the context of the paradigm shift from “Neoliberalism” to “Neoliberalization” and the consequential creation of “State Spaces” and their effects on the city. The construction of Delhi Metro Rail network, started when Delhi had already reached an agglomeration status in terms of both spread and population. The birth and growth of this infrastructure into a 189 Km length network, cutting through a complex territory within a relatively short timeframe of a decade, has enjoyed powerful political backing. Though the metro has served to provide speedy connectivity and mobility with clean air-conditioned trains and stations, the paper investigates, the mutations of the spatial structure of the city in response to this new “State Space” created with an agenda of achieving a “Global City” imagery and attractiveness. Is the quest for this imagery limited only to this giant infrastructure? What happens to the spaces around it in terms of urban quality and equity? The paper looks at the actors and organisations involved in re-defining the surrounding urban fabric, and if there is a selective repetition of project typologies being developed resulting in a further spatial restructuring.

**Keywords:** Delhi Metro Rail, Spatial Re-structuring, State Spaces

**ARCHITECTURE AND NATURE. PROJECTS AND PRODUCTIONS OF  
A POLISH ARCHITECT, MAREK  
BUDZYŃSKI – SELECTED EXAMPLES.**

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**ABSTRACT**

Marek Budzyński is one of the first 20th-century architects who have largely introduced greenery to their architectural projects, the example being important public buildings. Through his designs, he tries to restore disrupted, as he sees it, symbiosis between culture and the world of nature. In his designs, architecture is combined with greenery thanks to modern mechanical solutions. This paper presents selected projects, e.g. the Supreme Court in Warsaw with a garden on the roof and a “living ornament” in the form of plants on entablature of pilasters, connected with seriousness of neo-classical architectural forms, Białystok Opera House with building roofs overgrown with greenery, which blends architecture with the surrounding landscape or a very controversial design of the Temple of Divine Providence in Warsaw. In the latter, the body of the temple was shaped in the form of a symbolic mountain topped with a crystal spatial skylight.

Although Marek Budzyński’s uses latest technological solutions in his productions, he does not seem to be fascinated with modernity.

## **THE LANDSCAPE OF CONTEMPORARY SUBURBS AND THE CONCEPT OF SUSTAINABLE DEVELOPMENT**

Dorota Wojtowicz-Jankowska

### **ABSTRACT**

The article seeks to highlight the transitions observed in the landscape of suburban and rural areas in the vicinity of cities. The changes are strictly linked to intense development of market economy, societies becoming more affluent and the desire to live closer to nature. The aforesaid interrelation is not without bearing on shaping social awareness as regards taking care of space as living environment. The article indicates the underlying problem which consists in the lack of models and guidelines for developing the surroundings without degrading the landscape. Among the factors responsible for sustainable development of space is the knowledge (or a lack thereof) of applying construction technologies. The case studies from Poland serve to clearly delineate two divergent ways of thinking about space. One of them entails borrowing architectural design patterns foreign to local traditions, and the other consists in attempts to imitate regional architecture. Both phenomena pertain to architectural forms as such, and to the construction materials used, as well. The deliberations lead to the conclusion that spatial chaos and landscape degradation stem from identifying with space no further than the outline of one's own plot and they are the result of poor education as regards broadly defined sustainable development.

## **PERCEIVED EFFICACIES AND COLLECTIVISM IN MULTI-OWNED HOUSING MANAGEMENT**

Yung Yau

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### **ABSTRACT**

To make the housing stock sustainable, resident participation in housing management is essential. Previous studies on housing management collectivism have conventionally suggested efficacy perceptions as to play a significant role in predicting resident participation. Efficacy beliefs were presented in two dimensions: self-efficacy and collective (or group) efficacy. The former refers to an individual's belief about his ability to influence the collective outcome while the latter refers to one's belief about the group's ability to realize the collective good. The present study re-examines and goes beyond this two-dimensional view. It proposes that apart from self and collective efficacies, one's perception of the ability of an intermediary to achieve the collective good (i.e., proxy efficacy) also matters. With the adaptation of the collectivism interest model which has been commonly used to explicate political participation and environmental activism, this study empirically explore the factors affecting an individual homeowner's activeness of participation in multi-owned housing management. The explanatory analysis bases on the findings of a structured questionnaire survey in Hong Kong. In brief, apart from the value of collective good and selective benefits and costs of participation, individual residents' perceptions of self, group and proxy efficacies are significant determinants of their participation behaviour. These findings have far-reaching policy and practical implications for multi-owned housing governance.

**Keywords:** Collective action, resident participation, collective interest model, efficacy beliefs, proxy efficacy

## **NEW ORLEANS – URBAN DEVELOPMENT AFTER KATRINA**

Martin Heintel

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### **ABSTRACT**

August 29, 2005, marked a before and after for New Orleans. Hurricane Katrina had turned into the sixth strongest hurricane on record. After several levees had broken, the city's waterways inundated almost 80% of the municipal area, which had been built in places on land as low as 3m below sea level. Numerous public institutions such as schools, hospitals and universities were closed or offered limited services. Not only was hurricane Katrina the most devastating natural disaster in US history, its immediate consequence are among the most expensive to deal with.

The lack of planning in New Orleans became evident in the crucial issue of wetlands and levees and continues to be in the spotlight, leading to a variety of culturally framed discourses. “New Orleans, the city is fighting to come back,” can be seen on countless billboards and road signs. Sometimes it does indeed resemble a fight, a clash among different cultures and worldviews, or a fight for each and every hard-earned step in planning and implementation.

The so-called “cultures of planning” in the context of natural disasters will be examined from an international perspective. How does American society react and interact in the process of reconstructing New Orleans compared to similar practices that can be observed in Europe?

**Keywords:** Urban Development, New Orleans, Urban Planning

## **THE INFLUENCE OF POLICY DECISIONS ON THE WETLANDS OF BANGALORE**

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### **ABSTRACT**

Bangalore's urbanization process has impacted its natural wetlands, reducing number drastically. The conservation efforts started with the 1965-Master Plan, aiming to preserve certain lakes, developing them as parks and recreational spaces. Similar provisions were proposed in every Master Plan, where lake-restoration measures treated water-bodies as isolated elements and not as a part of the larger system. The government's policy decisions over the past, has led to the displacement of lakes for different infrastructural facilities like bus-terminals, golf-courses, stadiums, hospitals, parks and residential developments. The new developments were planned along the lakes, with roads around isolating them as 'traffic-islands'. This increased the impervious surfaces, impaired the natural capacity of rain-water infiltration into soil, and further impacted the natural drainage by blocking the sub-surface flow. As most of the lakes were seasonally fed by storm-water run-off, during the dry seasons these lakes-beds became receptacles of garbage and other urban wastes. Many urban-bodies have been set-up to maintain lakes, over a period of time. The absence of a single focused body, responsible for the upkeep of lakes resulted in bureaucratic tangles. 'Lake Development Authority' was setup in 2002 to manage lakes, but it leased them for commercial establishments. The privatization of lakes led to barricading the lake edges, and thereby loss of both physical and visual connection with the lakes. Due to this indifferent attitude of the government, even the public movements to safeguard the lakes have failed. Hence, there is a need for sustainable policies to conserve the water-network as a continuous system and not just preserve it.

**Keywords:** Bangalore, fabric, lakes.

## **PLANNING FOR SUSTAINABLE INFRASTRUCTURE THROUGH GREENING EFFORTS: TESTING THE RHETORIC.**

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### **ABSTRACT**

Greening efforts in some Ethiopian cities and towns can be seen as a manifestation of a broader movement among city agencies, planners, and community groups to expand green urban infrastructure and promote sustainability. The supposed link between green infrastructure intervention and sustainability planning in most developing countries has however remained under-theorized and largely untested. This article uses the lens of sustainability planning to interrogate greening efforts in a sample of Ethiopian cities and / or towns. It specifically determines the breadth of engagement with sustainability evident in various forms of green infrastructure interventions. This analysis first gives a conceptual clarification on sustainability planning as a concept. Building on this, it then employs *pattern matching* to characterize greening experiences from a sample of nine Ethiopian cities and / or towns. The generated empirical evidence is then used to decipher the extent to which employed greening efforts embrace sustainability planning. Study results reveal that greening efforts in Ethiopia are slowly becoming a high priority objective for urban planning and management. Such efforts however reflect a narrower commitment to select values of sustainability planning. Notable challenges are the divide that exists between environmental management agencies and urban planning institutions – in addition to a host of resource constraints that characterize the bulk of greening interventions. There is therefore a need to address such obstacles if sustainability is to be embraced in its fullest sense.

**Keywords:** Green infrastructure, sustainability planning, greening efforts.