

# KEY ISSUES ON LANDSCAPE PLANNING IN THE CONTEXT OF ENVIRONMENTAL SUSTAINABILITY

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## Abstract

This paper presents key issues on landscape planning and environmental design. The paper is more descriptive than analytical and has the objective of bringing out the interrelationships between landscape planning and sustainable development. It begins by looking at the theoretical and conceptual issues in landscaping, sustainability and environmental impact design. It then goes on to assess the intensity and scale of environmental impacts from landscape planning. It argued that landscaping is a pre-requisite to environmental sustainability. Hence the paper asserted that unsustainable use of landscape elements leads to environmental problems like biodiversity loss, climate change, global warming, soil and coastal erosion, and pollution. The paper identifies the negative and positive impacts from landscape planning. Findings from the study show that the positive impacts outweigh the negative impacts. Hence, the paper proposed that sustainable landscape planning should be given a huge priority in development projects. The paper concludes by recommending that stakeholders should be actively involved in environmental decision making, policy formulation and implementation, for the achievement of the most desired environmental sustainability

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**Keywords:** Aesthetics, environment, landscaping, planning, resources, sustainability

## Introduction

Landscape planning is one of the preconditions for environmental sustainability. It is interrelated to landscape architecture, horticulture, landuse planning, and environmental management. It is otherwise called site beautification. It is a process concerned with activities geared toward the articulation of existing open space for the purpose of enhancing the quality of the environment (Essaghah, 1997). The articulation process may include

the rehabilitation of the open spaces as well as the coordination of existing relationship between and among them (Magnus, 2005). Landscaping is an innovative method of urban planning and management.

The New International Webster's Comprehensive Dictionary of the English Language (2013) described landscape as a picture representing natural scenery. Consequently, it depicted landscaping as the act of improving or changing the natural features or appearance of a terrain. In essence, landscaping encompassed the process of making use of available elements or characters in order to enhance the quality of the environment. To this end, Fatunsin (2011) defined it as the work of planning, designing, and supervising of beautification works in the area usually containing a building. He opined that landscaping spaces are organized through the use of the basic principles of unity, balance, accents, focalization, scale, proportion, harmony and rhythm, variety, sequence and emphasis. He also classified the elements of landscape design under structural and plant materials. The structural materials include sculptures, rock outcrops, bricks and tiles, concrete, water fountains, walls and fences. On the other hand, the plant materials can be classified under the major groups of trees, shrubs, ground covers, palms, grasses, vines and hedges.

Olwen (1977) likened landscape planning to environmental planning. This according to him embraces a broad field of activities within the ambit of the outdoor scene and other components of man's environment. From the foregoing, landscape could be described as a portion of land (within our environment) which the eyes can comprehend in a single view towards a station. The ethics of landscaping connote the beautification of the environment. In his own ecological point of view, Singh (2009) viewed a landscape as a large area that includes one or more ecosystems. From this point of view, he perceived the environment (and invariably the ecosystem) as something that should be taken care of and protected. Landscaping is the act and process of taking care of the environment.

Landscaping activities are carried out in open spaces, industrial, recreational, residential, commercial and institutional areas. In the process of landscaping of residential areas, cognizant is given to right of way, public space, service space, as well as outdoor living space. Whereas, in the landscaping of public buildings, schools and industrial areas, preference is always given to driveways, walkways, parking, trees for shade, dividing islands of greenery, as well as boulevards. Generally, landscaping is perceived as the art of caring for the environment. Hence the cliché – landscapes of care. The landscapes of care are spatial manifestations of the interplay between socio structural processes and structures that shape experiences and practice of care (Christine and Janine, 2010:739). The art of caring for the environment is a good method of making it sustainable.

In environmental literature, sustainable development means the use of environmental resources in perpetuation of existence (see Wright, 2008; Singh, 2009; Kanagasabai, 2010; Joseph, 2009; Jay and Scott, 2011; Harris, 2006; Gabriela and Ronnie, 2009; and Ashana and Ashana, 2010). Sustainability means leaving for our children and grandchildren a world as rich as and full as the world we live in now. It means conserving Earth's resources so that our descendants will enjoy them as we have. It means developing solutions that work in the long run (Jay and Scott, 2011:19). From environmental point of view, therefore, sustainability means the use of environmental resources in perpetuation of existence. That is, making use of the resources in such a way that it will be useful for the present and future generations.

The development of an aesthetically pleasing landscape is a prerequisite to a sustainable environment. Landscape planning has been recognized as a major tool in the achievement of environmental sustainability (Crowe, 1995; Winchester, 2003; Duncan and Duncan, 1988; Ingegnoli, 2002; Jacobs, 1003; Nassauer, 1995; Simond; 1995; and Steiner, 2000) . Landscape planning helps in city development, architecture, urban planning, recreation and tourism. It helps to avoid unbalanced, unhealthy and unsustainable growth of human settlements. For sustainable landscape planning therefore, it is necessary to promote land use patterns that encourage the meaningful and purposeful use of environmental resources.

### **Landscape Planning**

The term landscape planning has been used synonymously with other terminologies like landscaping and landscape design (Crowe, 1994). It refers to the functional arrangement of landscape elements or characters in order to attain efficiency, functionality, compatibility and aesthetics. It entails the human interference with the biotic and abiotic components of the environment. Hence, it is the art of tampering with the environment in order to suit man's purpose. Landscaping means the creation of an environment that is enabling, convenient and comfortable for living, working and circulation. It is on this premise that Tandy (1975) summed up the art of landscaping as the creation of a replica of paradise. That is, an environment that is full of delight, felicity and pleasure.

Santra (2005) perceived landscape as a geographical and ecological integrity and resilience of a particular land area, including human, cultural and traditional values that are associated with the land. Consequently, landscaping is the art of tampering with the environment in order to suit man's purpose. It involves the changing of natural features of the environment so as to make it more attractive. The fundamentals of landscaping include conservation, accentuation, destruction, and alteration.

Furthermore, in landscape planning, spaces are organized in order to create any or a combination of impressions like tension, fright, dynamic action, sensuous love, humility, pleasure, and gaiety. Essentially, landscaping deals with the protection and/or improvement upon the aesthetic value of the environment.

Landscape planning is an appropriate way of conserving the biodiversity and other components of the landscape. From this point of view, Kanagabsabai (2010) perceived landscaping as a means of maintaining a healthy, clean and pure environment. He emphasized the importance of involving people actively in the protection of the environment and the management of the natural resources. Also, from ecological point of view, Jay and Scott (2011) declared that the landscape structure affects the abundance, distribution, and interaction of organisms. Hence, he concluded that landscape planning is useful for scientists, citizens, planners, and policy makers in planning for sustainable regional development.

In landscape planning and environmental impact design, spaces are contrived in order to suit man's taste. In this process, as many characters as possible are used. These elements are classified under hard and soft impressions. Broadly speaking, they include buildings, plants, water, railings, cenotaphs, sculptures, and other art works. They are used in landscape planning and environmental impact design in order to achieve some required functions like softening, accent, shading, and framing. All these are used in putting forward proposals for future developments of the landscape. They are arranged in order to produce standardized environment.

Landscape planning is not only about flowers or parks and gardens, it also deals with architecture of beauty, remodeling of houses, roads, and other engineering components of the environment. It is concerned with the seasoned wisdom of how to carefully beautify our environment with the most cheerful landscape elements. It involves the creation of breath-taking vistas with symmetric and asymmetric volumes. Landscaping encompasses the accentuation, conservation, destruction or alteration of environmental component in order to create a positive and promising artificial landscape. Appropriate landscape design makes planning proposal to be more analytical, it is used to measure minimum and maximum standards, and it indicates the need for the respect, upbringing and maintenance of environmental ethics and values.

### **Environmental Impacts From Landscaping**

Landscaping impacts (Economic, physical, socio-cultural, psychological, and environmental) vary both in intensity and scale from one place to another, depending on the magnitude of landscaping projects or the available characters or elements that are used for environmental

beautification. The priority areas in landscape planning and environmental management include water resources management, transport, waste management, maintenance, as well as the overall design for sustainable development. Landscaping has both negative and positive impacts on the environment. The negative impacts include deforestation, pollution (air, water, and land), as well as the modification of the ecosystem.

The positive impacts of landscaping include the socio economic effects, as well as the provision of contact with culture and nature. The environmental advantages are actions for environmental conservation, initiatives for waste management, improved concern for urban appearance, improvement of environmental condition, as well as making the most of professionals like landscape architects, planners, curators, sculptors, estate managers, horticulturists, artists, and environmentalists. Environmental impact assessment, auditing and quality control initiatives have proved that advantages of landscaping in terms of physical, biological, social, economic, psychological and infrastructure by far outweighs its negative consequences on the biodiversity (see Clouston, 1979; Duncan 1995; Eckbo, 1969; Fairbrother, 1974; Forman and Gordon, 1986; Lesurur, 1949; Little, 1999; Lucas, 1992; Simond, 1995b; Urich, 1979; Weddle, 1988; and Wylie, 2007 for greater details).

Moreover, some unquantifiable impacts are made on the environment through landscaping. Examples of them are social welfare improvement, amenities, cultural heritage, and environmental change. Harris (2006) established that there is a significant relationship between landscape planning and environmental impact design. He opined further that landscape protection is a possible way of combating the changing perspectives on the earth, as well as the associated problems like pollution, depletion of earth's protective ozone layer, deforestation, species extinction, global warming and climate change. Landscape planning is very important in order to cushion the effects of environmental hazards and risks. It affects the well being of man and his environment. It also affects the psychological and physical health of man.

Furthermore, Environmental Cost Benefit Analysis (ECBA) have provided the framework for long-term evaluation of landscaping projects and it has been discovered that the potential gains resulting from landscaping by far outweighs the capital cost of such projects (see Countryside Agency, 2002; Ahern, 1995; Goldfinger, 1991; Howard; 1946; Jellicore and Jelicoe, 1971; and Rapuanco, 1984). Also, landscaping projects have caused tremendous improvements on transport networks, deteriorated urban structures, as well as decayed buildings. In developed countries, landscape planning and environmental impact design goes hand in hand with the provision of basic amenities like parking areas, external lighting, street

furniture and utilities, sanitation and engineering services like water supply, sewerage and sewage treatment, refuse disposal, electricity supplies, communication system and underground utilities.

Given, the importance of landscaping to the society, it is not surprising that the need to incorporate landscape consideration into environmental decision-making has been recognized for some time. It has however grown in importance as the emphasis on sustainability has increased (Countryside Agency, 2002). Landscaping and renewable technologies can help in the reduction of urban heat island, green house effect, pollution, thermal stress, and other environmental hazards (see Ogunsote and Prucnal – Ogunsote, 2004 for greater details). Landscaping is a catalyst to sustainable environment and development. The essence of landscaping is to enhance people's comfort through the improvement of environment quality.

### **Sustainable Development**

Sustainability has multiple meanings and interpretations although most advocates would probably agree that it involves a holistic approach to solving complex, interrelated, and multi-dimensional problems (Gabriela and Ronnie, 2009). It has been defined and discussed by several authors and their definitions revolve around the same centre. For instance, Wright (2008) defined sustainable development as that type of development that provides people with better life without sacrificing or depletion resources or causing environmental impacts that will undercut the ability of future generations to meet their needs. From this definition, we can rightly say that sustainable development bestow upon us the opportunity to use environmental resources in perpetuity of existence.

Issues surrounding sustainable development have been discussed in details by many authors and it has been considered from many sectional and professional points of view (see Cranz and Boland, 2005; Borrini – Feyerabend and Buchan, 2000; Bromley, 1998; Harris, 2006; Cristofferson, 1998; Pezzey, 1992; Ribson, 1998; William, 2007; Wright 1008; and Thayer, 1994). For instance, looking at sustainable development from biological point of view, the convention on Biological Diversity (1992) defines it as the use of the components of biological diversity in a way and at a rate that does not lead to long-term decline of biological diversity, therefore maintaining its potential to meet the needs and aspirations of present and future generations. From this point of view, sustainable development implies the use of the flora, fauna and other components of the ecological environment in a judicious way. To Joseph (2009), sustainable development is a pattern of social economic development which optimizes the economic and societal benefits available in the present, without spoiling the likely potential for similar benefit in the future.

From economic point of view, Harris (2006) perceived sustainable development as “economic development that provides for human needs without undermining global ecosystem and depleting essential resources”. This suggests that sustainable development is futuristic in its perspective. It also indicates that whatever we do to the ecosystem at a local level will have regional/and global effects. Hence, sustainable development considers the short run as well as the long run effects of development projects on the bi-geo physical environment. The most comprehensive and probably the most commonly used definition of sustainable development was given by the World Commission on Environment and Development (1987;43) as that which meets the needs of the present without compromising the ability of future generations to meet their own needs. This definition makes sustainable development to be relevant in all sectors of the economy-social, cultural, economic, environmental, industrial, institutional, recreational, and agriculture.

Considering the issues trends and projections in sustainable development, Ribson (1998) opined that sustainable use is not the same thing as commercial use, consumptive use, an alternative to protected areas, harvesting of charismatic mega fauna, or being managed by local communities. He opined that sustainable use is not determinate – there are a multitude of configurations of biological, social and economic factors that constitute it. Sustainable development is a collective responsibility. It requires the unrelenting efforts of stakeholders, decision makers and individuals in the realization of the goals and objectives. To this end, Bromley (1999) declared that each successive generation has a duty to ensure that the expected welfare of its offspring is no less than its own perceived well-being. He stressed further that sustainability is about a prior-constructed order defining a socially acceptable provisioning program now and into the future.

Sustainability is an outlook and approach relevant to every environmental issue - and indeed, to every aspect of our daily lives. Sustaining our society in a healthy and functional condition requires sustaining our natural environment in a healthy and functional condition (Jay and Scott, 2011:396). In this paper, sustainability is considered from environmental point of view, and the discussion is narrowed down to landscape planning and environmental impact design. Environmental sustainability encompasses the presence of resources management system that allows for the regeneration or replenishment of the resources base overtime, the maintenance or improvement of people’s well being overtime, as well as the inter-generational compromise by which present resources users can guarantee future generations the right to a similar resources base and lifestyle (Borrini – Feyrabend and Buchan, 1997). From the foregoing,

therefore, environmental sustainability means the process of upholding, supporting, keeping up or maintaining renewable environmental resources in a manner which does not eliminate or degrade them.

### **Landscape Planning and Environmental Sustainability**

Sustainable development is now a buzzword in environmental literature. It is defined in different ways by different people. It is perceived from social, economic environmental etc points of view. Jacobs (1993:8) conceived it as buzz-phrase that is meant to hit the planning profession. Specifically, it is now a catch-phrase in environmental literature, where it is recognized as the idea of ensuring a better quality of life for everyone, now and for generations to come (see Williams, 2009:286). Landscape planning is a strategy of achieving the social, economic and environmental objectives of sustainable development. The social objectives include participation in environmental monitoring and management, promotion of cultural identity, institutional development, as well as empowerment. Also, the economic objectives include growth equality and efficiency, while the ecological objectives include biodiversity conservation, retention of ecosystem integrity, as well as management of global resources.

Sustainable development of human society has environmental, material, ecological, social, economic legal, cultural, and psychological dimensions (Bossel, 1999:2). Landscape planning could be viewed as an environmental approach to the attainment of sustainable development. For instance, from landscape ecological approach, many landscape planners have perceived the conservation of plants as a means of enhancing the quality of the environment, (see Given 1995; Bell et al., 1994; Haines – Young, 2000; and Clouston, 1979). Specifically, Beddal (1950) emphasized on the role of conservation of hedges in enhancing environmental quality. Also, Bove (1949) explained the importance of trees and shrubs in botanical gardening and environmental design. Likewise, Waston (1951) elaborated on the use of grasses in landscape planning.

Long term sustainable development requires an understanding of the interaction between human activities and natural processes (Joseph, 2009). Rising rate of urbanization has inflicted several problems on the environment. Many human activities have caused assaults on the environment, while other dangerous practices have resulted to disasters like desert encroachment, flooding, accelerated soil erosion and other associated problems like biodiversity loss, global warming, ozone layer depletion, deforestation and pollution (See Harris, 2006 for greater details). Given, the foregoing scenario, the ameliorative intervention is the sustainable use of environmental resources. While there will always be a need for general environmental awareness-raising, there is today an even more urgent priority



– namely to demonstrate how the concept of sustainable use can be applied to real life situation (Christafferson, 1998).

Stressing the role of man in protection and sustainable use of the environment, Kanagasabai (2010) noted that healthy, clean and pure environment is a precious gift of nature to humanity. Hence, he noted that the best way to arrest environmental degradation and promote sustainable use of environment is to ensure citizen's participation in the control and management of nature resources. A good way of doing this is through landscaping planning. Good landscaping is a powerful tool for the achievement of a pleasant environment. Landscaping contributes to visual satisfaction, which has a profound effect on the psychological nature of man (Kingsley and Napoleon, 2007:76) Embedded landscape planning arguable has the potential to enhance environmental sustainability. In order to enhance environmental sustainability through landscape planning therefore, we can not under-estimate the use of other tools like ecological sensitivity analysis (ESA), Geographic Information Systems (GIS), Remote Sensing (RS), Environmental Cost-Benefits Analysis (ECBA), as well as Air Photo Interpretation (API).

### **Summary**

This paper examines the key issues on landscape planning and environmental sustainability. Landscape planning is the aspect of physical planning which deals with the improvement of the aesthetic environment. Landscaping enhances city design and urban architecture. It is a futuristic approach to land use planning. Landscaping is concerned with environmental modification and beautification. It helps in the creation of functional and aesthetically pleasing environment for living, working circulation, and recreation. Landscaping helps in the organization of space so as to achieve sustainable development. Overall, the value of landscaping can be summarized under the broad headings of commodity, amenity, ecological, ethical, and option values.

One of the widely recognized approaches for ensuring sustainable development is landscape planning. Sustainable development cannot be attained without due consideration to the quality and preservation of the environment. Landscape planning has a significant role to play in the protection of the rich variety of natural biological and physical resources that are available in the environment. For the attainment of sustainable landscape planning therefore, it is necessary to promote land use pattern that encourage the meaningful and purposeful use of environmental resources.

## **Recommendations**

The benefits from landscape planning are numerous. They include the provision of facilities for recreation and tourism, provision of medicinal plants, and other valuable products, maintenance of soil fertility, protection of the ecosystem, as well as the regulation of the earth temperature. Given, the social economic, ecological, cultural, recreational, ethical and an esthetical values of landscape planning, it has been recognized as a major tool in the attainment of environmental sustainability. Also, it is used as an ameliorative intervention to environmental problems. Consequently, for landscape planning to be continually sustainable, the use of landscape resources should be given consideration in all development activities.

This study recommends that boulevards, parks, gardens, and open spaces should be transformed to beautiful landscapes while taking the full advantage of the culture, climate and the cherished tradition of the environment. Also, different garden ideas and features (like lawns, hedges, walkways, topiary, picket fences, water fountains and rock gardens of different sizes and shapes) should be introduced to courtyards so as to add more styles and glamour to the environment. Also, there should be the accentuation of positive and promising elements or characters into the environment so as to transform front yards from barren to beauty.

Arising from the fact that landscape planning improves the aesthetic quality of the street and makes it friendly to residents and passerby's, this study recommends that privately owned mountains, parks and garden should be encouraged. Also, tourist potentials provide a haven for natural landscapes. Consequently, they should be well planned and properly landscaped. The conservation of plants and its subsequent protection from extinction is a requirement for sustainable development. Thus, landscape designs should focus on horticulture, arboriculture, as well as urban and peri-urban agro forestry. For the purpose of environmental beautification, improved varieties of plants with distinctive shapes and sizes, rare colors, and eye-catching accents should be selected for landscaping in order to break the monopoly of green foliage.

Furthermore, this study recommends the introduction of illumination, street furniture, sculptures, art designs, street hardwares, as well as sustainable circulation system. Also, sustainable landscape planning should promote the training of environmental management and landscaping at higher institutions of learning. Besides, in the implementation of landscape designs, variable like cost, acceptability, functionality and safety should be taken into consideration. Above all, emphasis should be placed on key areas like citizen participation, monitoring of land tenure, and land values in sensitive areas, strengthening of local institutions for resources management, biodiversity monitoring information campaign, as well as conflict

management. Other key areas are environmental cost-benefit analysis, addressing of local needs and the assessment of local uses of natural resources. All these are fundamental to the attainment of sustainable landscape planning and management.

## **Conclusion**

The development of an aesthetically pleasing landscape is a prerequisite to a sustainable environment and it is pivotal to productive human employment, recreation, social and economic integration. Landscape planning is a necessary tool for environmental protection. It preserves the environment from the fierce assaults of man on the environment. It is useful for the enhancement of the aesthetic value of the environment. Accordingly, for the achievement of sustainable development through landscape planning, environmental resources should be used in such a way as to meet the need of the present without compromising the ability of future generations to meet their own needs.

Sustainable development is the key to our future and one of the best ways of achieving it is through integrated landscape planning and environment impact design. There is need for sustainability and environmental awareness in the acquisition, stabilization, rehabilitation, protection, restoration, presentation, and reconstruction of the landscape. All these require the collective effort of landscape owners, decision makers, politicians, urban planners, architects, managers, engineers, preservation planners, contractors, builders, project reviewers, horticulturists, individuals, government, non - governmental organizations, community - based organizations, as well as international organizations

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Alexey Yaroslavtsev and Giovanna Sala, researchers at the Smart Technologies Laboratory for Sustainable Urban Development in the context of global changes, shared their experience with the application and development prospects of Tree Talkers technology for continuous monitoring of the state of green spaces in the city. Paolo Viskanic, director of R3 GIS, spoke about the benefits of the software he developed to optimize green space management in cities, and shared news about his current work: "We are currently working on creating a tool for quantifying ecosystem services, studying metrological data for optimize water use and work with satellite data to determine the condition of trees. However, planning regimes oriented to-wards "urban sustainability" can be adapted from approaches formulated in cities and regions where problems of infrastructure, social equity, and ur-banization of the environment have been cre-atively addressed. Visionary planner Jaime Lerner has designed urban planning solutions for the Brazilian city of Curitiba that meet the service needs of the gen-eral public while enhancing the naturalness of the urban environment." Agenda 21 also proposes a number of tangible strategies to bring about "sustainability" in the environmental realm. Agenda 21 calls for appro-priate technology, transport reform, and urban renewal. This paper presents key issues on landscape planning and environmental design. The paper is more descriptive than analytical and has the objective of bringing out the interrelationships between landscape planning and sustainable development. It begins by looking at the theoretical and conceptual issues in landscaping, sustainability and environmental impact design. It then goes on to assess the intensity and scale of environmental impacts from landscape planning. It argued that landscaping is a pre-requisite to environmental sustainability." Ibimilua Adewale Festus. KEY ISSUES ON LANDSCAPE PLANNING IN THE CONTEXT OF ENVIRONMENTAL SUSTAINABILITY, European Scientific Journal, 2014, Volume 10, Issue 2 The effects of future development plans from municipalities on landscape connectivity were then analyzed in the scaled temporal and spatial frame to identify in which urban condition the connectivity value would most likely to decrease. The results demonstrated that tremendous amount of lands will be dedicated to future urbanization, and especially urban agricultural lands will be likely to be vulnerable. The metro-level analysis focuses on a group of species that represent urban desert landscape and have different degrees of fragmentation sensitivity and habitat type requirement. It hypothesi