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Urbanization & Sustainable Development: Evolution and Contemporary Challenges

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Abstract: This research starts with the evolution of urbanization from the pre-industrial revolution to the contemporary era. It elaborates on the contemporary sustainability challenges followed by a review of the recent concepts with an objective to get closer to partially identifying the balance that sustainable development may achieve. It concludes with the following contemporary sustainable development challenges: Changing of planners' skills over time; the change in framing the discipline; influence by non-planners on the discipline; the ongoing change of the built environment; introduced sustainable development solutions are not on-size-fit-all and the relatively weak connection between science and practice.

Key words: Urbanization, sustainable development, evolution of sustainability.

1. Introduction

Historical and archaeological evidence enables us to trace how, since humankind emerged from the hunting and gathering stage, people have gathered in permanent communities to live together and share their efforts towards modifying nature for a safer, efficient, and even a more pleasing way of life. They built shelters, cultivated the land, terraced hillsides, and constructed trails for movement. As ancient civilizations grew, they further amalgamated in communities that grew from informal groupings to villages, to market towns, and-eventually-to great cities, like those of ancient Egypt, the Greco-Roman empires, and China. Thus the process of urbanization is an ongoing evolution, but an evolution that accelerated rapidly in the developed world after the industrial revolution of the early 19th century and continues ever more rapidly today, changing the face of the world we live in.

It is possible to trace the evolution of landscape development, in the growth of parks and areas for public recreation among other installations. Before beginning a discussion of this matter, we must accept that it is erroneous to believe that new concepts are always phenomena of changing eras. For example, we cannot claim that there was no "sustainable development" before the term became part of the lexicon in the early 1970s. However, having said that, in the evolution of landscape development it is possible to agree on some outstanding milestones that are recognized by scholars as points of noticeable change. These milestones or eras are not necessarily at equal intervals[1] of time as shown in Table 1.

These milestones are adopted according to the overlapping of several time lines by different authors. Fig. 1 gives a comprehensive view of the most significant events that shaped the corresponding eras.

2. Eras of Urbanizations

[1]Some researchers prefer equal intervals of time periods (i.e. 30-40 years). Others prefer to classify eras based on themes relevant to the evolution of urbanization. The latter approach is adopted here.

Table 1 Different eras in the evolution of urbanization.

ERA	Time	Main themes
Pre-industrial revolution	18th Century	- Extravagant landscape focusing on aesthetic values - Landscape was a symbol of status - Landscape architects were also philosophers, artists and writers - Deterioration of cities and demand for public parks
Industrial revolution	19th Century	- Moving from a single park to park systems - Adding "Parkways" to park systems - The railway's influence on American cities - Preservation and conservation movements
Beginning of ecological planning	1920-1970	- Incorporating ecology in planning - Introducing typology for parks - Introducing the initial basis for GIS - Visual Image & Form of the City
Environmental cleanup and pollution mitigation	1971-1980	- National Environmental Policy Act (Government) - Government adopting environmental reform - Professionals getting involved - Refining GIS concepts
Sustainability & global environmental issues	1981-1998	- Sustainable development - Environmental Global Issues - Landscape urbanism - GIS became an essential planning tool
Post sustainability	1998-Onward	- Sustainability is insufficient - Planning as a wicked problem - MDGs will not be achieved by 2015

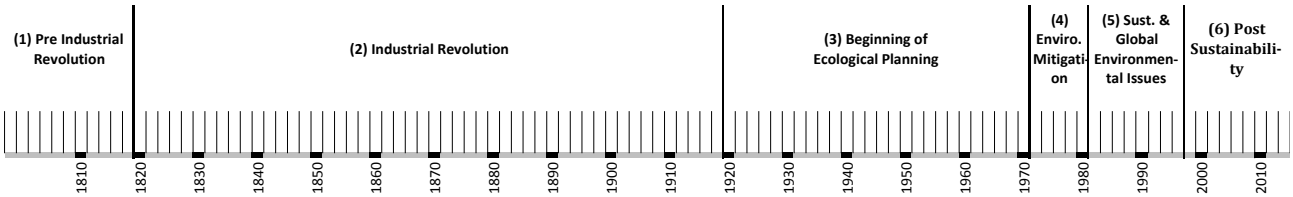

Fig. 1 Timelines for events that shaped the landscape (See the annex for a comprehensive detailed timeline).

2.1 Pre-Industrial Revolution (18th Century)

Nature is of significant importance to mankind and is crucial to his existence. Clever men altered nature by way of gardening and landscaping as a source of both beauty and production.

In Europe, landscape architects emphasized on the aesthetic and innovation to make the landscape beautiful and productive. Steinitz [1] highlighted that this era focused on elaborate and ornamental designing and planning of extensive grounds surrounding some of the most impressive estates and of public parks. He recognized William Kent, Charles Bridgeman and Capability Brown as key players in influencing landscape planning and design in Britain. Their work focused on landscape beautification and production, which is a trend the was also adopted in Europe and North America. There is significant evidence of European influence in landscape designing amongst the US scholars, practitioners and thinkers. Barlow [2] asserts that Burnham, McKim, Olmsted and Moor travelled to Europe to learn about architecture in main cities such as Rome, Paris and London. They carried back the knowledge and experience and influenced the discipline in the United States.

2.2 Industrial Revolution (19th Century)

The industrial revolution brought rapid changes in demand on natural resources (timber, water and coal) that resulted in a noticeable deterioration in the environment. And these, among other modernization processes, led scholars to create significant milestones in the landscape history. This era can be summarized in the following main concepts:

2.2.1 Deterioration of Cities and Demand for Public Parks

Schuyler et al. [1, 3, 4] confirm that the deterioration of cities post the industrial revolution was one of the main reasons for incorporating parks and recreational open spaces within the city limits to improve the quality of life and increase equal access to public spaces.

In both, Europe and the US, a section of the educated and the elite raised concerns regarding the deteriorating housing conditions in the lower class urban areas. Steinitz [1] confirms that Sir Raymond Unwin (1863-1940) reacted against the terrible conditions, especially the lack of basic services and together with Sir Ebenezer Howard (1850-1928) worked to alleviate crowded housing, formed the Garden Cities Association to introduce the garden-city concept, and encouraged shared use of green public spaces. Fig. 2 shows the poor housing condition in Rhondda, a coal-mining town in Wales (1920-1970).

Central Park was a significant project towards this goal of creating equal access to recreational space. One cannot disagree with Newton [4] that Olmsted was not only a great landscape designer but also a social reformer. His enthusiasm and courage to convey his ideas were crucial to his success in creating the Central Park in New York (Fig. 3).

Although Central Park is the most visited park in the United States[2], its importance in this context is due to its influence in improving livelihoods and the overall quality of life of the inhabitants. The Central Park idea

Fig. 2 Poor housing conditions in Rhondda (1920-1970).

[2]"About Us-The Official Website of Central Park", Central Park Conservancy. 2014. Retrieved March 25, 2014.

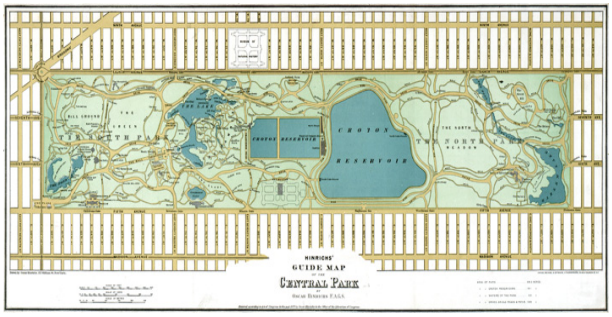

Fig. 3 Plan for New York City's Central Park.

was later replicated in Boston, Chicago, San Francisco, and other cities. Olmsted described himself as a Landscape Architect and expanded his work not only to build city parks but also to protect the natural landscape. He was instrumental in the creation of the first US national park—Yosemite Park in California—and worked on the design of the 4,000 hectare (about 9,900 acres) Biltmore estate grounds, for George Vanderbilt in North Carolina.

2.2.2 From a Single Park to Park Systems

Schuyler [3] confirms that Olmsted & Vaux emphasized and reflected through their work that no matter how large a park can be, a single park is insufficient to serve the public and thus brought forward the concept of a park network and influenced the city of Brooklyn to have the Prospect Park. Schuyler [3] and Steiner [5] asserted that park systems became a stand-alone goal. In fact, Newton [4] asserts that congress, in this regard, withdrew land from public domain and granted it to Californiafor public use and recreation. This step by the government shows that advocacy for environmental causes was prevalent in the 19th century and one may argue whether it was more effective than the 21st century.

2.2.3 Adding "Parkways" to Park Systems

Davis [6] says that Olmsted and Vaux are the first to use the term "Parkways" as a carriage way within and between the park system. It developed further as an important term in the American Landscape representing high-speed movement between different areas. Although these parkways were significant and acted as ecological corridors, but were challenged by both, highway engineers for practical reasons and by

public administrators for budget reasons. Both considered the aesthetic qualities around these "parkways" as too expensive and less practical to maintain, and with time the "Highway" concepts took over.

2.2.4 Railways' Influence on American Cities

Although railways were being developed to transport commercial products, it certainly shaped both the physical and the socio economic class structure in cities. Schuyler [7] and Barlow [2] clearly articulate the influence of the railways on the growth pattern of cities.

Fig. 4 shows the change in land use by the movement of social classes. The elite moved away from the city center to escape congested neighborhoods, which encouraged real estate development in the village, what is now called "suburbs". Moreover, middle class also moved away from the city, causing further urbanization of villages. On the other hand, railways brought labor to the city together with their social way of life. There are differing views on whether railways brought city to the country or the other way around, nevertheless, it did more than this dual socio economic shift and rather restructured the entire economy, land values, land uses and socio-economic settings.

2.2.5 Preservation and Conservation Movements

A number of scholars became whistle blowers against the real estate encroachment on agriculture land and its consequences on the overall environment. Newton [4] brought forward a comparison in approaches between the two key players: Gifford Pinchot, a conservationist, who believed that resources are managed more efficiently by top professionals; and John Muir, a preservationist, who emphasized that the protection of wildlife shall be regardless of its economic benefit.

Although the two approaches are distinct but reflect some similarities: both recognized the existence of environmental problems and shared many of the environmental protection principles, both scholars were public personas and recognized the extent of environmental destruction. However, at a certain point Muir started to condemn the conservation movement as he became more focused on making trees safe for managed harvesting.

Aside from Muir and Pinchot, according to Steiner [8], Marsh in 1864 was also one of the first people who emphasized on design to protect the environment. Similarly, Powell in 1879 stressed on comprehensive planning and legislative frameworks for redemption of lands in the US.

2.3 Beginning of Ecological Planning (1920-1970)

This era is the beginning of formalizing planning process and ecological values systematically and beyond personal initiatives.

2.3.1 Incorporating Ecology in Planning

Steiner [8] summarizes this era as the one in which incorporation of land and natural habitat in the planning occurred in addition to building a holistic approach to coordinate and collaborate for improved planning (including, landscape architects, engineers and scientists). Moreover, considering planning as a discipline that integrates human ecology and interrelationships of organisms to their environment, which Flores et al. [9] suggest yet another crucial part of planning within ecology as a dynamic system.

Celebrating highways as a sign of progress is one of the characteristics of this era [5]. However, compared to the previous era, this highway "celebration" can be seen as a downgrade of the "Parkways" concept. Moreover, over time the highway system provided more than just the connectivity, it was a catalyst for capital flow and accumulation in cities.

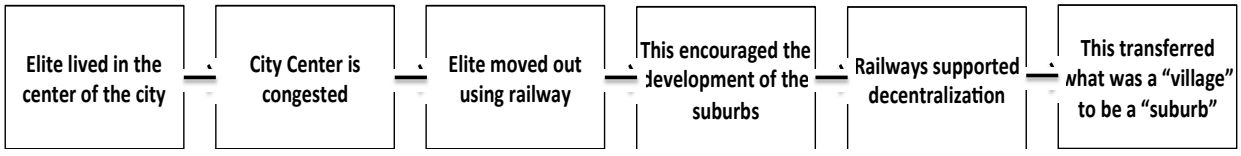

Fig. 4 Railways' influence on the physical landscape and socio economic pattern.

2.3.2 Introducing Typology of Parks

During this era, Olmsted Jr. and Nolen [10] carried forward the work on park systems but with an additional level of synthesis that is considered a park typology according to size. This distinction helped to extend the use of open grounds to serve different purposes, and confirmed the notion that open spaces are of great importance. These park types are: (1) Streets, boulevards and parkways; (2) City Square, commons & public gardens; (3) Playgrounds; (4) Small or neighborhood parks; (5) Large parks and (6) Great outlying reservations.

2.3.3 Introducing the Initial Basis for GIS

In this era, Warren Henry Manning (1860-1938), developed the overlay concept by using the tracing lamp to produce the first overlaid maps. Manning collected information about soil, landscape, topography, water, and infrastructure, then located them on multiple layers on a single scale map. This technique helped him in the landscape planning across the country, including urban areas and national parks as shown in Fig. 5. This overlapping technique was developed further and shall be explained in the coming eras.

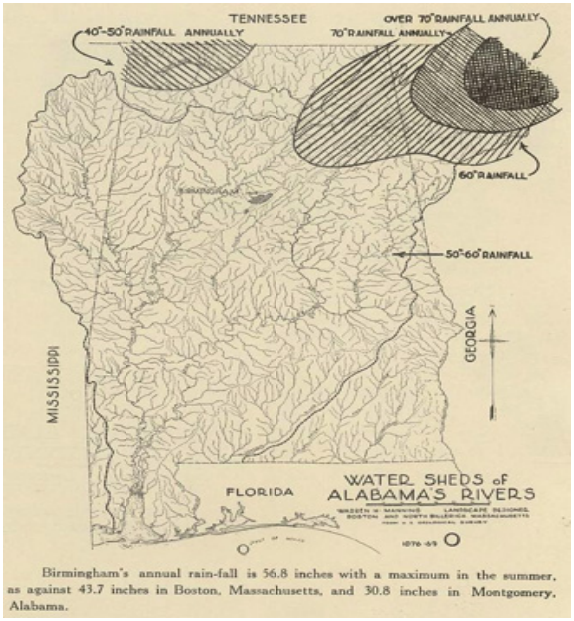

Fig. 5 Water Trends of some parts of Alabama drawn by Warren Manning using his overlay technique.

2.3.4 Visual Image & Form of the City

Lynch [11] provided seminal contributions to the field through empirical research on human perception of the physical form of cities and regions as the conceptual basis for good urban design. His books classified the city into paths, edges, gateways, nodes, and landmarks. He also explored the effects of urban environments on children.

2.3.5 National Environmental Policy Act (Government)

With urban and industrial development continuing, the development of systematic environmental protection processes was necessary. Although advocates worked during this era in bringing the importance of ecology to the decision makers' attention, it was the US Senator Henry M. Jackson (1996), who passed the National Environmental Protection Act (NEPA), which aimed to integrate environmental values into the developers' decision-making processes by requiring that they look at the environmental impacts of their proposed actions and, if those actions are deficient, seek reasonable alternatives.

2.4 Environmental Cleanup and Pollution Mitigation (1971-1980)

Daniels [12] argued that economic progress and public health is directly linked to the environment, therefore environmental mitigation became essential. This era thus focused on mitigation measures: arresting environmental degradation and trying to fix the damage already caused. Geddes [13] strongly emphasized the complexities and the comprehensiveness of ties between human actions and the environment, and how they shape and rely on each other.

2.4.1 Government Adopting Environmental Reform

Steiner et al. [5] bring forward several acts that demonstrate the government's role in the planning process. The most relevant two acts in this era are: (1) the Federal Land Policy and Management Act (1976) to improve management of the wilderness lands in the US; (2) the Coastal Zone Management Act (1972),

which called for consideration of environmental, economic and aesthetic values in developing management plans for coastal areas.

According to Steinitz [1], the issue gained political support only when the US First Lady Claudia Alta "Lady Bird" Taylor Johnson focused on the aesthetics of public spaces and public housing and made protecting the natural landscape a public issue.

2.4.2 Professionals Getting Involved

Enhancement of the landscape and consideration for ecological integrity gained popularity and leading professionals reflected a higher level of ecological awareness in their projects in order to maintain and restore the environment. Among other scholars, Steinitz [1] considers Hideo Sasaki a distinguished landscape architect whose projects showcased his aesthetic and ecological talent and integrity. In the early 1960s, Sasaki wrote: "The profession of landscape architecture stands at a critical fork in the road. One fork leads to a significant field of endeavor contributing to the betterment of human environment, while the other points to a subordinate field of superficial embellishment."

2.4.3 Refining GIS Concepts

Ian L. McHarg (1920-2001) helped landscape architects and land use planners to look at the landscape through the multi-layered cake system and give each one its relative weight; bedrock geology, surface geology, groundwater hydrology, the physical geography, surface water hydrology, soils, plants, wildlife, and finally micro-, meso-, and macro-climate [8]. McHarg's well-known book Design with Nature[14] established the foundation for modern Geographic Information Systems (GIS). Despite being recognized as a profession in North America in the 19th century (January 4, 1899), the American Society of Landscape Architects only began to flourish during this period and "provided a voice of authority in this new profession." By the end of this era, specialty programs within universities were started. For example, Richard Haag founded the Landscape Architecture Program at the University of Washington in Seattle, Washington. His efforts were recognized through awards for his design work on Gas Works Park in Seattle and the Bloedel Reserve on Bainbridge Island (Fig. 6).

2.5 Sustainability and Global Environmental Issues (1981-1998)

2.5.1 Sustainable Development

Although the concept of sustainability emerged in the previous era, it continued to be part of the underlying process of development during this period as well. Sustainable development, defined in the 1970s as "development that meets the needs of the present without compromising the ability of future generations to meet their own needs" rose to significance as a concept following its use by the Brundtland Commission in its 1987 report, "Our Common Future." [15]. Campbell [16] defined sustainable development as "the long-term ability of a system to reproduce".

Steiner et al. [5] and Berke & Conroy [17] argued that, during this era, critical global environmental issues of greenhouse gas emissions, loss of biodiversity and other human demands led to increased advocacy for more sustainable land use practices and the right balance between equity, ecology and economy (Fig. 7). Sustainability combined concern for the carrying capacity of natural systems with the social, political, and economic challenges faced by humanity. It was employed to describe an economy in equilibrium with basic ecological support systems. One may argue that sustainability, as a concept was not entirely successful, as it will be described in the coming era.

Fig. 6 Gas Works Park, Seattle (left) and Bloedel Reserve, Bainbridge Island (right).

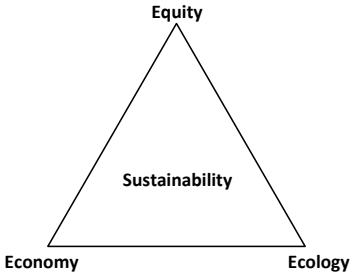

Fig. 7 Sustainable development triangle (ecology, economy, equity).

2.5.2 Environmental Global Issues

The relationship between the global and local scales is not fully apprehended by political leaders, decision makers and end users. For example, Gondo [18] argued that most countries have relentlessly adopted innovative land use planning practices in response to actual and potential climate change related risks and disaster. While the bulk of developed countries are making progress, developing countries, like Ethiopia, are still lagging behind.

These environmental issues shall be dealt with on both scales and planning is probably one of the tools to deal with them on the local scale. Daniels & Daniels [19] pointed out that environmental protection is a global issue that largely depends on effective and timely actions at the local level.

2.5.3 Landscape Urbanism

Although the term "Landscape Urbanism" first appeared in the mid 1990s, it capitalized on the work of Geddesm MacKay, Mumford, McHarg and other scholars in the previous eras [20]. It focused on the "living processes", "flows" and the importance of respecting the "ecological infrastructure". It anchors the city design around the landscape and ecological features, as against the built form, to provide better ecological integrity within the city. Turner [21] and Thompson [22] argued that Landscape Urbanism rejects the binary opposition between city and landscape. This concept was adopted by the Graduate School of Design at Harvard University, one of the most influential architecture academies in the country.

2.5.4 GIS becomes an Essential Planning Tool

Jack Dangermond capitalized on the existing sophisticated GIS tools and founded in 1969 the well-known Environmental Systems Research Institute (ESRI) as a land-use consulting firm, it now has the largest share of GIS software globally.

2.6 Post-sustainability (1998 Onward)

This era pushed planners to review where they stood on protecting the green city, promoting the economically growing city, and advocating social justice. Conflicts among these goals were neither superficially arising from personal preferences nor were they merely conceptual, among the abstract notions of ecological, economic, and political logic. Moreover, these were not temporary problems caused by the untimely confluence of environmental awareness and economic recession.

2.5.5 Sustainability is Insufficient

During this era scholars and professionals realized that sustainability alone is insufficient as a goal. Peter Marcuse [23] suggested that "sustainability" should not be considered as a goal for a housing or urban program—many bad programs are sustainable—but as a constraint whose absence may limit the usefulness of a good program.

In the current sustainability triangle (Environment, Equity, Economy), Campbell [16] argued that the balance cannot be reached directly, but only approximately and indirectly, through a sustained period of confronting and resolving the triangle's conflicts. In addition, he believes that to achieve this balance planners need to redefine sustainability because its current definition and understanding is too vaguely holistic.

2.5.6 Planning as a Wicked Problem

With incorporation of socioeconomic factors in the planning process, the problems became more wicked. Rittel & Wibber [24] asserted that planners' problems are societal and different from those that scientist and engineers tackle, therefore, the planning problems are inherently wicked. They also boldly argued that theory is inadequate for decent forecasting, our intelligence is

insufficient to our tasks and plurality of objectives held by plurality of politics make it impossible to peruse unitary aims.

2.5.7 MDGs will not be Achieved by 2015

Adopted by world leaders in 2000, several sustainability initiatives were started to help achieve the Millennium Development Goals (MDGs) by 2015. Despite the unprecedented efforts to achieve these MDGs, the United Nations (UN) declared that these goals will not be fully met and that the timeframe will be extended.

3. Contemporary Sustainability Barriers

The concept of "sustainability" in its modern sense emerged in the early 1970s in response to growing understanding that modern development practices were leading to worldwide environmental and social crises. The term "sustainable development" quickly became a catchword for alternative development approaches that could be envisioned as continuing far into the future [25].

As cities got more sophisticated with time, one may argue that the current sustainability barriers are due to very complex processes of city building. In the light of these complexities, one cannot attribute inherited urban problems solely to planners.

In light of the Rio+20 Conference, the current economic crisis and the perception that sustainability politics cannot be implemented efficiently, politicians have set their hopes on greening the economy. However, there are major problems with the aims and strategies linked to this concept. Specifically, if political, economical, and cultural constraints are not addressed, green economy strategies will suffer in their goal to end environmental degradation and poverty reduction [26].

Amongst the many barriers to achieving sustainability, the most pressing ones are: barriers inherited in the concept of sustainability, bad governance, lack of environmental justice, the continuous change of cities, privatization of public space, scale, and loss of authenticity.

3.1 Barriers Inherited in the Sustainability Concept

Campbell [16] asserted that in an ideal world, planners would strive to achieve a balance of all three goals (equity, environment and economy). The reality of practice however, drastically restricts planners to serving the narrower interests of their clients, authorities and bureaucracies. Fig. 8 shows the main sustainability principles and the challenges that are inherited in the model.

3.2 Governance Barriers

Governance can be a barrier towards achieving sustainable development. Harvey [27] argued that urban governance has become increasingly preoccupied with the exploration of new ways in which to foster and encourage local development and employment growth. So with population increase and high demands on services, the government's mandate might work against achieving sustainable development.

3.3 Barriers due to Lack of Environmental Justice

People are essential component of cities that may experience injustice in services and resources distribution, which is a core barrier to sustainability in cities. Soja [28] argued that justice has geography and that the equitable distribution of resources, services and

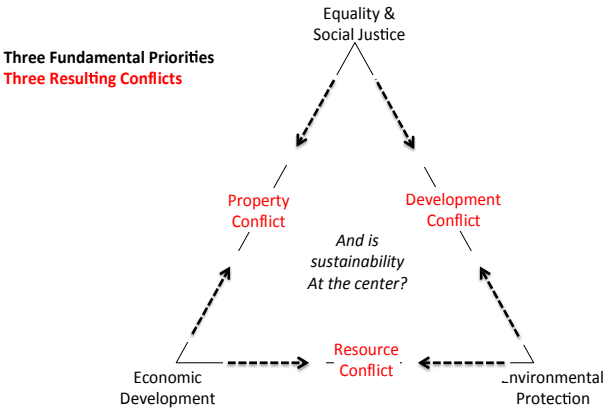

Fig. 8 Sustainability fundamental priorities and conflicts (Adopted from Campbell 1996).

access is a basic human right. According to Davis [29], at the neighborhood level, landlords, by allowing "good tenants" to use the space and kicking out the "bad tenants", are exercising a sort of discrimination which is based on "like-minded" class/groups getting together.

3.4 Cities are in Continuous Change

According to Harvey [30], people build and shape their cities, both the built form and public space and it influences their daily practices and life. Fig. 9 elaborates how the changes in people's private land lot (fences, additional cottages and trees) impact the experience of public space users. Although the physical width of the path in Fig. 9 (A & B) is the same, but the visual width is different and will influence the user and also the sense of privacy within their land lot.

Sara Lopez's [31] research on Mexican immigrants to the US highlights that the migrants: (1) Modified their houses in rural Mexico after they got influenced by the architecture in the US; (2) Transferred constitution knowledge and capital to an extent that competed with global construction companies and therefore influenced the way they built their homes.

3.5 Barriers due to Privatization of Public Sphere

The shrinking of open public space is a barrier to sustainability. This systematic trend of privatization of public space is occurring because mega structures and super malls have supplanted traditional streets and disciplined their spontaneity. Davis [29] asserted that Olmsted perceived public landscape and space as social safety valves, mixing classes and ethnicities in common boundaries. In light of this unsustainable privatization process, this reformist ideal of public space as emollient of class struggle is now obsolete.

Fig. 10 shows different examples of outdoor malls that were lost with time and replaced by indoor mega buildings. In their interest to change the public perceptions about "Malls" developers started calling these (lifestyle centers).

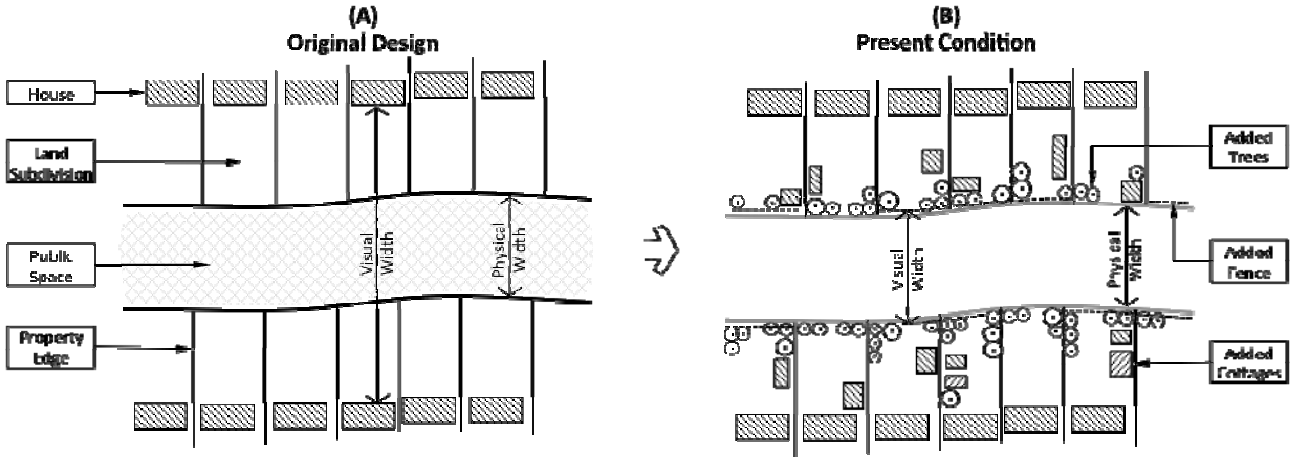

Fig. 9 Change in the private space affect the experience in the public space and vise versa.

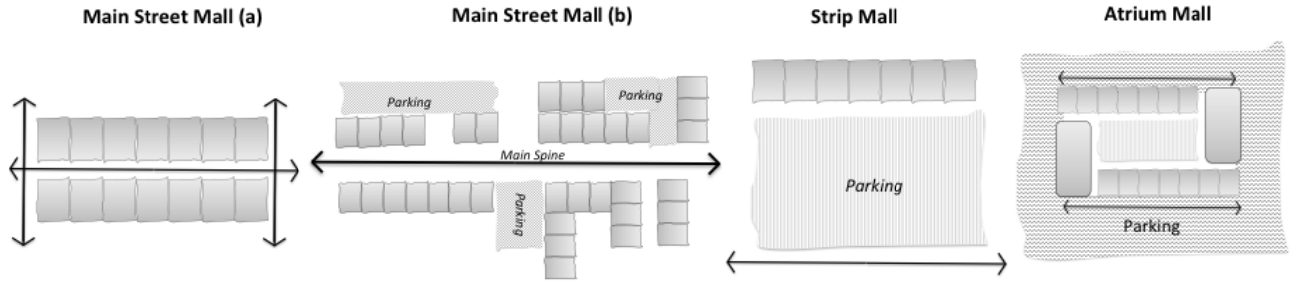

Fig. 10 Lay out examples of outdoor malls before the domination of indoor mega structures-adopted from Southworth [32].

3.6 Scale Can Be a Barrier

A sound and sustainable project on one scale might constitute sustainability barrier on another scale. This can be across government levels or geographical scales. For example, Fischer et al. [33] assessed environmental justice across multiple spatial scales and verified the West Oakland neighborhood as an environmental justice site as per the US Environmental Protection Agency. Flores et al. [9] provided examples to this phenomena such as an urban design scheme in a coastal area that is subject to shoreline change, or a land subdivision scheme that falls within mega fire or flood zone, but tend to ignore inputs from larger scales. One may argue that many of our global sustainability barriers (such as food and climate change) are driven largely by practices on local scale. Fig. 11 illustrates how, especially in developing countries, the lack of inputs to decision making at the national level affects the ecological integrity of local sites.

4. City Building & Achieving Sustainability

Sustainability is both an honorable goal for carefully defined purposes and a camouflaged trap for the well intentioned unwary [23]. Therefore, it is important to understand the key principles that, if not ideal sustainability, can at least get us closer to the center of the sustainability triangle.

4.1 Justainability

Justainability is an emerging concept that combines Justice + Sustainability. One may argue that in the absence of economic justice and political will, all sustainability efforts are wasted and would depend only on individual initiatives. Thus achieving racial and economic justice is not possible without fixing the unsustainable and inequitable economy [34].

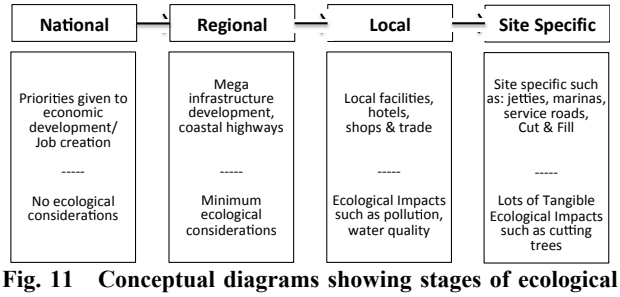

Fig. 11 Conceptual diagrams showing stages of ecological considerations on various scales.

4.2 Green Economy

Sustainability is critically linked to green economy. According to Brand [26], there are major problems with the aims and strategies linked to this concept. Specifically, if political, economic and cultural constraints are not considered, green economy strategies will suffer in their goals to end environmental degradation and poverty.

4.3 Citizen Participation

Citizen participation and negotiating conflicts is core to achieving sustainability. Berkey & Conroy [17] asserted that civic engagement in public and private spaces, and protecting spatial qualities of the built environment, is a way to support community's identity and sense of place.

4.4 Support Main Stream Vs Stand alone Initiatives

Serious individual initiatives often pass the basic difficulties and sometimes even endorsed by the public, however, they remain stand-alone initiatives that are less impactful than main stream sustainable projects that can be adopted by the government or large private sector organizations.

4.5 Integrating Ecology in the Planning Process

The dichotomy of whether man is a part of environment or not, seems not to be fully resolved, as aptly put by Dave Foreman that "an individual human life has no more intrinsic value than does an individual grizzly bear life" (Fig. 12).

Picket et al. [35] and Flores et al. [9] argued that to ensure the continued availability of environmental benefits: (1) Representative successional stages in different urban contexts should be planned and managed for; (2) When establishing large regional

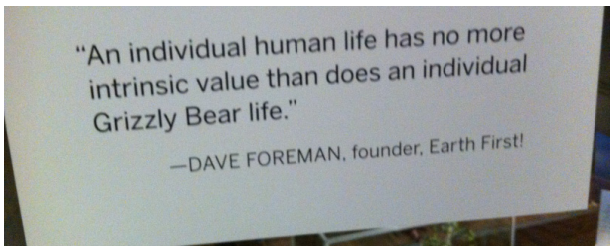

Fig. 12 Picture taken in Oakland Museum, California.

reserves, these should be of a sufficient size to withstand the impact of different disturbances; (3) The physical environment and organisms in a specified area shall be functionally linked. Fig. 13 represents a range of options where the more concentrated urban forest (to the left), reflect the continuity of ecosystem and healthier organisms. Whereas, fragmented greens within the built form (to the right), represent better serving to people.

5. Conclusion

5.1 The Changing Skills of the Landscape Planner

In the early days of landscape planning, professionals mastered a wide range of knowledge and skills including philosophy, art, journalism, planting, architecture, and even engineering. Moving forward to the 21st century, scholars became specialized in specific areas of the landscape—trees, public spaces, or exploring relationship with people such as the perception of the landscape. In addition, landscape has become more functional and practical due to economic limitations and scarcity of resources, while earlier landscapes were more elaborate and ornamental.

5.2 Factors Shaped the Discipline

It is difficult to attribute the final shape of the landscape to any specific action, practitioner or school of thought. The landscape is a result of a long-term cumulative process that we experience in contemporary times. One cannot make a clear distinction of or relate certain landscapes to—for example the advancement of scholarly work, invention of the railways, developmentof computer aided designs, environmental changes, or even degradation due to human actions, are all collective actions and not independent milestones. Therefore, it is crucial to understand that there are many underlying factors that formulate the landscape.

5.3 Contributors to the Profession are not All Landscape Architecture Scholars

The landscape has been shaped by very complex factors that make it difficult to attribute specific incidents solely to individual scholars. The evolution of the landscape has been significantly impacted by four different types of contributors: (1) Professionals who created the landscape and implemented parks and land use planning such as Charles Eliot and Patrick Geddes; (2) Scholars who made a significant change in the way the landscape is seen or made ground breaking advancements such as Warren Manning's map overlays; (3) Candidates who followed on the philosophy developed by their predecessors such as Jack Dangermond who capitalized on the cake concept

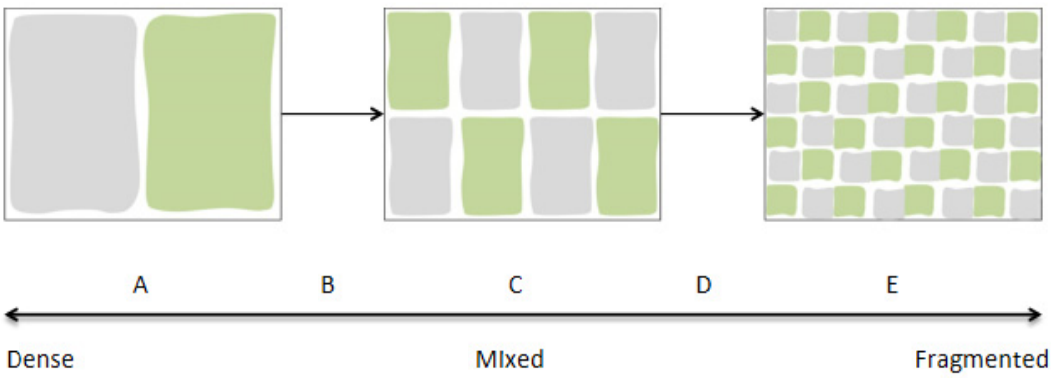

Fig. 13 Dense forest serves ecosystem whereas fragmented greens serve people.

from Ian McHarg and founded ESRI; (4) politicians who had the political will to facilitate landscape planning—such as Lady Bird Johnson.

5.4 Ongoing Challenges

The challenge of putting the built environment in harmony with nature continues to be constant. The discipline is moving towards huge future challenges: Some are man-made that constitute stress on vulnerable environments, such as those resulted from capitalism, greed, abuse of resources and other human activities, and others that arise from ecosystem such as the climate change and the rise in sea levels.

5.5 Solutions are not One-size Fit All

Since the sustainability balance is not a fixed balance that can be applied everywhere, it is important to find solutions specific to country, environment and geographical context.

5.6 Insufficient Links between Academia with Practice

Academic research in the field of sustainability is way ahead of actual implementation of projects. Majority of academics and professionals are working on two ends of spectrum, and as an applied discipline it is not an option to bring them together in order to help achieve sustainable future.

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