

Application of Sustainable Development Principles in Developing Countries; Focus on Kabul City urban planning

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ABSTRACT

Cities need to build on their resilience to deal with the rapid growth of urbanization, geopolitical contexts, and climate change. The physical form of cities has significant implications for their capacity to deal with adverse events and changing conditions. This study attempts to highlight a set of criteria for future intervention and the management of sustainable development. The case study was chosen meticulously, located in Kabul, the capital of Afghanistan, with a focus on geographical and cultural context. Initially, the paper describes the general background, outlines the key problems, and highlights the characteristics of sustainable development. Next, it seeks to synthesize the principles of sustainability into an agenda for the design of built environment by identifying methodologies for efficient management of resources and how mobility and connectivity can be planned in pursuit to render the built environment more sustainable. The review of Kabul city experience compiles with an assessment summary showing to what extent sustainability principles have been incorporated in development planning strategies. The study concludes that Afghanistan needs to incorporate most of the major sustainable development principles extracted from the literature review. It highlights framework for implementing the principles at regional and local levels by various urban development actors and sectors such as housing, mobility, urban services and facilities, etc. would go a long way in achieving sustainable urban development in Afghanistan.

Keywords - Cultural Context, Developing Countries, Kabul, Sustainable Development, Urbanisation.

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I. INTRODUCTION

Cities are places which represent the most complex form of human settlement and their management deals with policies, plans, programs, and practices used in order to ensure that the accessibility of basic infrastructure, shelter, and employment is sufficient and efficient to the growing population in a city [1].

The establishment of new interim government in 2002 opened up a new spectrum of different challenges and issues in Afghanistan. Over the last 17 years of post-war reconstruction, the patterns of growth in major cities of the country have become dysfunctional, which have resulted in increased pollution and costs of land and resources.

Kabul, the capital of Afghanistan, has known several periods of prosperity and decline that shaped and re-shaped its spatial structure and urban image. Conflicts have tangible and intangible impacts on a city system. Tangible impacts of war and conflict on a city can be a breakdown of infrastructure, displacement of population and demolition of physical structures. On the other hand, intangible impacts can be a loss of the sense of ownership, the vanishing of cultural values, the

collapse of social networks, and above all interruption in the continuity of the urban development process. Reconstruction of visible damages by war is not the most challenging issue in a post-conflict situation. It is rather the social and institutional structures which cannot be easily rehabilitated. In an effort to guide urban growth and further modernize the city, the first Master Plan for Kabul was prepared in 1962-1964 with assistance from Soviet planners, designed to accommodate 800,000 people in an area of 23,780 hectares. With the help of Soviet planners and in collaboration with UNESCO, the Master Plan was revised in 1971; this time envisioning a population of 1.4 million spread out in the area of 29,900 hectares. The second revision of the Master Plan (the 1978 Plan) happened during the reign of President Mohammed Daoud Khan (1973-1978). It envisaged a population of two million in an area of 32,330 hectares [2].

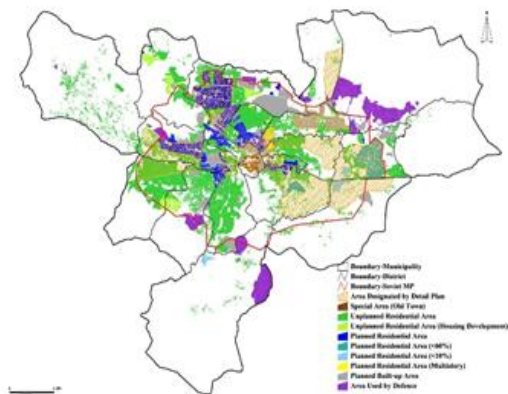


Figure 1. Kabul City Masterplan (Adopted from [12]).

Currently, international consultants and local developers are engaged in numerous urban planning projects, most of which prioritize infrastructural needs and symbols of economic opportunity over historical preservation efforts. The Study for the Development of the Master Plan for the Kabul Metropolitan Area (KMA) has been carried out since March 2008 under the technical cooperation of the Japan International Cooperation Agency (JICA). The study has been undertaken with close collaboration of the counterpart agencies of the Afghan Government represented by the Capital Region Independent Development Authority (CRIDA) and the Ministry of Urban Development and Land (MUDL).

Based on the literature review this paper studies the emergence of the concept of sustainability, its dimensions and under-pining, and how urban planning practitioners and institutions have attempted to integrate the basic principles into their practices. The objective is to examine to what extent the government in Afghanistan and its development agencies have internalized the prevailing notion of sustainability and the principles that entail the concept, particularly how the principles are embedded in development Planning strategies and policies.

II. BACKGROUND AND LITERATURE REVIEW

In order to examine why current trends in planning settlements are unsustainable and the lessons that can be drawn if they are to be planned more sustainable in the future, two main planning trends are examined: the dispersal of population and activities and the centralization of services and facilities;

The result of studies and research shows a continuing decline in population in rural areas and an increase in urban areas. The urban population growth, in Kabul city has tripled in size since late

2001, to approximately 4.5 million people, making it perhaps the world's fastest-growing city in the last eight years. Rapid growth has not been confined to Kabul, however; in 2002, only 22% of Afghanistan's population lived in urban areas. By 2009, the figure had increased to at least 30%, indicating unprecedented urban growth countrywide, a trend that will continue for the foreseeable future. Estimates indicate that roughly 60% of national population growth during the 2002–2009 period occurred in Afghanistan's cities.

Many different types of services and facilities have been centralized, where fewer, larger services and facilities have replaced a large number of small-scale one. Examples include shops, schools and hospitals [3].

Informal settlements form a huge challenge for urban planning at all stages, not only because cities are growing in an uncontrolled fashion that usually does not provide the necessary infrastructure, but also because of the land issues that arise from such settlements. And has led to a number of impacts on transport and the environment. These unsustainable trends need action to reverse, this requires action at all level, including local level decision about the planning of neighbourhoods. A package of land use planning measures has the potential to begin to reverse the unsustainable trends and improve the quality of life in neighbourhoods. One such package contains measures that address issues of development density, accessibility to public transport, the provision local employment, services and facilities, access to open space and parking restraints, which together form a strategy for concentrating development in transport corridors and nodes. The measures may reduce the need to travel and decrease the reliance on the car, whilst at the same time may contribute the improvements in environmental quality, making local neighbourhoods more attractive places in which to live, work, study and spend leisure time.

The neighbourhood is the fundamental increment for designing and understanding villages, towns, and cities. The neighbourhood is generally defined spatially as a specific geographic area and functionally as a set of social networks, in my opinion, the sustainable neighbourhood is an urban planning theory that concentrates growth to satisfy the ordinary daily needs within walking distance, including a full range of housing and facilitate mixed-use dwellings, workplace and civic buildings [4].

Firstly this paper draws distinctions between the two concepts 'neighbourhood' and 'community' examining their professional and academic resonance, following by the introduction to the equally slippery term sustainable development, and that leads naturally to the question

of what might constitute a sustainable neighbourhood or community.

a. Neighbourhood and Community

Basically, the idea of ‘neighbourhood’ has been introduced by Ebenezer Howard and Raymond Unwin early in the 20th century and subsequently gelled by the first generation British new towns. And later the neighbourhood is a discreet residential area with a population of 4-6000, supporting a primary school, and a local centre.

In this paper ‘neighbourhood’ is defined as a residential or mixed-use area around which people can conveniently walk. Its scale is geared to pedestrian access and it is essentially a spatial construct, a place. It may or may not have clear edges. It is not necessarily centred on local facilities, but it does have an identity which local people recognize and value. ‘Community’ is quite different, it is a social term which does not necessarily imply local, it means a network of people with common interests and the expectation of mutual recognition, support and friendship. Distinguishing the different facets of the neighbourhood as, the neighbourhood is base for home life, educational and employment activities, and another perspective is that the neighbourhood as a locus for community made by people.

b. Sustainable Development

The concept of sustainable development covers not only environmental goals but also social aspects such as greater equality and active public participation in decision-making. Sustainable development is also recognized as connecting local and global perspectives, providing a focus on protection of both the physical environment and human population, serving the goals of gender equity, and providing ways to integrate social and economic development (Gamble and Weil, 1997).

In use of the concept there has generally been a recognition of three aspects of sustainable development:

- **Economic:** an economically sustainable neighbourhood must provide affordable housing, attract business and create employment opportunity and facilitate better choices in transportation to decrease transportation budget.
- **Environmental:** and environmentally sustainable neighbourhood must maintain a stable resource base and protect the living environment to provide a healthy life for the residence.
- **Social:** a socially sustainable neighbourhood must achieve social equity and create a symbiotic relationship between the community and land development [5].

Clearly, these three elements of sustainability introduce many potential complications to the original simple definition. The goals expressed or implied are multidimensional, raising the issue of how to balance objectives and how to judge success or failure. The ingredient and technique for actively involving local people and businesses are to involve all stakeholders who are affected by a neighbourhood plan together in a guided debate which informs and helps to shape the decisions of the designers, developers and local authorities and essentially the effective collaboration between government, public, private and community sectors [6].

A goal of my current research is to ensure that all important facets of sustainability have been duly considered some checklists have to use;

Table. 1 A sustainability checklist applied to cities

Ecology	
Climate stability energy in transport	<ul style="list-style-type: none"> • The location that minimizes trip lengths are well served by public transport • Design that foster walking and cycling and discourage car reliance
Energy in building	<ul style="list-style-type: none"> • Energy efficient built form and layout • Development of community renewable energy
Natural resources	
Air quality	<ul style="list-style-type: none"> • Traffic reduction and air quality management
water	<ul style="list-style-type: none"> • Local surface water/sewage treatment, aquifer recharge
Land and soil	<ul style="list-style-type: none"> • Higher densities to reduce urban land rake
Local environment	
Image and heritage	<ul style="list-style-type: none"> • Design reflecting the distinctive landscape and cultural heritage
Social Provision	
Access to facilities	<ul style="list-style-type: none"> • Accessible, good quality health, educational and retailing facilities
Built space	<ul style="list-style-type: none"> • Affordable good quality and different choices of housing • Mixed use commercial and institutional spaces
Open space	<ul style="list-style-type: none"> • Accessible, parks/playgrounds and playing fields
infrastructure	<ul style="list-style-type: none"> • Easily maintained road and utility networks

Economic	
Employment opportunity	<ul style="list-style-type: none"> • Diverse and accessible job opportunities
Social sustainability	
Health	<ul style="list-style-type: none"> • Facilitate pollution-free environment
Community safety	<ul style="list-style-type: none"> • Safe traffic-calmed streets with good visual surveillance • Neighbourhood social balance and continuity
Equity and choice	<ul style="list-style-type: none"> • Access to housing for all social groups • All facilities easily accessed by foot or public transport with special attention to the needs of children and the disabled.

Source: HUGH B. Sustainable Communities, Adopted from [5].

There is a clear need to translate the principles enunciated above into strategies, policies and actions. Since cities and urbanized areas are the locus of human activities, it is in the urbanized areas where the maximum extent of conflict and confrontation between the natural environment and man-made environment takes place; and it here that the most immediate attention is needed. Sustainable urban development specifically implies achieving a balance between the development of the urban areas and protection of the environment; and at the same time achieving equity in employment, shelter, basic services, social infrastructure and transportation in urban areas. In principle, sustainable urban development is the one that improves the long-term social and ecological health of cities and towns [7], [8].

A city in order to be sustainable, must be proactively planned with a long term vision where the needs of all the citizens will be met satisfactorily not only for the present but also for the future. The strategic dimensions of planning should include:

- Protection of the natural environment and the ecology ensuring clean air and water,
- Provision of basic health services, housing and environmental sanitation for all.
- Appropriate and quality education, adequate employment opportunities and income.
- Facilities for recreation and cultural growth.
- A system of a democratic and participatory process of planning involving all segments of the population.

Clearly, the strategic areas of focus necessary for ensuring sustainable urban development listed above are ecologically aware, economically more rational, and socially more responsive. And as such should be considered as a

point of departure from what is currently being practised in many countries. [9].

III. METHODOLOGY

The purpose of this study was to identify sustainable urban Development dimensions for emerging cities and use these dimension as a basis for forming planning strategies. A brief literature review, archival records and content analysis was conducted In respect of actions to achieve sustainable urban development, there is not a single answer to all the complex questions posed the currents trends. Therefore, it requires different solutions and countermeasures at all levels, including local level decisions regarding the planning of neighbourhoods. A package of strong, complementary land use planning measures has the potential to begin to reverse the current unsustainable trends and improve the quality of life in neighbourhoods. One such package contains measures that address issues of development density, accessibility to public transport, the provision of local employment, services and facilities and parking restraints, which together form a strategy for concentrating development in transport corridors and nodes. These measures may reduce the need to travel and decrease the reliance on cars, whilst at the same time, they may contribute to improvement in environmental quality, making local neighbourhoods more attractive places in which to live, work, study, and spend leisure time [10]. Accordingly, the research suggests the following sets of actions that can be considered in support of sustainability:

a. Land Use Actions Toward Sustainability

Higher densities widen the range of services that can be supported in the local area, reducing the need to travel long distances. Ensure compact development to reduce average distances between homes, services, employment and other opportunities that reduce travel distance [11].

b. Accessibility to Public Transport

In conducting the research, I have gathered some data related to inner Kabul city transportation. This data shows that the different types of public transportation systems, along with walking and cycling networks, are dense enough to create traffic jams but not enough to support convenient travel, abundant jobs or amenities associated with very high densities. This is particularly true where there is a need for the introduction of strict rules necessary to guide new development to sustainable forms. Fig.2 shows the purposes of trips by Kabul inhabitants [12].

While the main transport mode in Fig.3 illustrates that among the transportation modes, "walking" has the largest share of 33% within the city area.

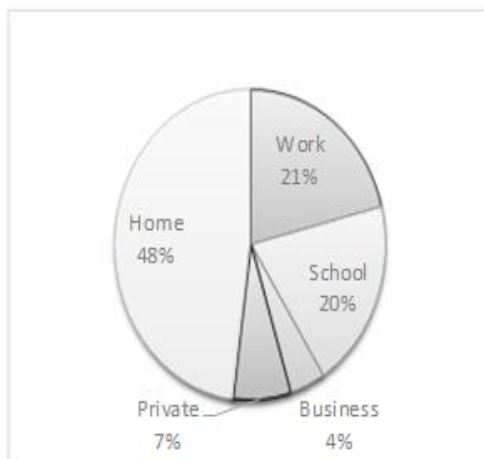


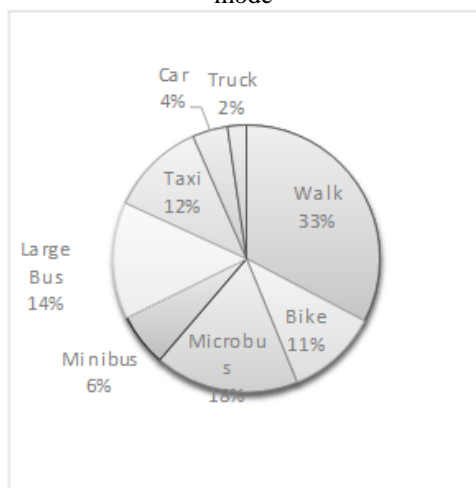
Figure. 2. Trip Composition by Purpose

Ensuring good accessibility to public transport, in combination with the provision of walking and cycling networks, is crucial to reducing reliance on cars and promoting more sustainable alternative travel patterns.

Good accessibility to public transportation also makes it

Possible to reduce the amount of parking for development, which in turn may help to promote the use of public transportation [12].

Figure. 3 Trip Composition by main transportation mode



c. Local employment, Services and facilities

This paper sets out a number of recommendations for promoting more sustainable travel patterns through the provision of local facilities, which include:

- Clustering of facilities to maximize convenience
- Ensuring the most convenient location for facilities to minimize average travel distance;

Giving priority to the design of high amenity footpaths and cycle-ways, providing direct access to facilities;

Providing high-quality environments in centres, emphasizing pedestrian comfort and constraining cars [13].

d. Administrative Management

i. Neighborhood Sustainability Assessment (NSA)

Neighbourhood sustainability assessment (NSA) tools are defined as a set of criteria and are used to (a) Evaluate and rate the performance of a given neighbourhood; (b) Assess the neighborhoods' position on the way towards sustainability, and (c) Specify the extent of neighborhoods' success in approaching sustainability goals. A number of NSA tools are currently operational around the world [14]. Regarding the context-specificity issues, this study argues that each assessment framework needs to be customized before being applied to a different context. One solution is to develop an assessment methodology and prepare a set of criteria related to sustainability at the neighbourhood level.

ii. Engaging the Local Communities

A wide range of techniques is available to designers and planners. Some of these techniques have become standard for use in the participatory processes, such as interactive group decision-making techniques that take place in workshops [9]. At the same time, designers and planners should use field techniques, such as questionnaires, interviews, focus groups, and group mapping to acquire information. The techniques can be classified as awareness methods, group integration methods, and indirect methods.

IV. DISCUSSION

Afghanistan is a country that is going through a process of rapid urban growth since 2002. The ratio of rural to urban population had reversed from 3:1 to 1:3 within a span of two decades (2002–2018). The population has grown at a high annual rate of 2.5 % change in 2017. In the year 2017 population of the country was recorded at 35.53 million, 30% of which live in urban areas by 2017 and 70% of the urban population live in six major city Kabul, Kandahar, Jalalabad, Herat, Mazar and Kunduz [CSO-2017]. These cities are passing through decades of high levels of public and private investment in housing, industries, infrastructure and services. Population growth and urbanization are expected to continue at high rates.

Apparently, the parameters of planning and development of Afghan cities do not fulfil the conditions for sustainability. Some of the issues that threaten sustainability are:

- Lack of coordination among the agencies, in planning, designing and implementing various projects.

- Expansion of urban boundaries, population growth and economic activity in some urban centres have increased environmental issues, including; pollutant emissions, increasing traffic congestion within cities.
- In regard to Municipal services, there are relative disparities in the standards between the planned areas and informal settlements.
- The harsh climate and lack of appropriate infrastructure are not conducive for walking (World Bank report-2017).
- Inadequate Green spaces in the built-up areas.
- Unsuitable architectural style of housing, commercial building and administrative offices which are a factor of high energy consumption.
- Lack of public awareness about the importance of sustainable development the important reduction in the use of energy and other natural resources [15] [16].

However, there are signs of increasing realization of these problems and steps are being taken to come out of the existing lethargy in taking appropriate actions. The United Nations human settlement organization works closely with the government and local authorities to encourage and promote the development of eco-friendly buildings (UN-Habitat-2017). The government has funded research on developing alternative renewable energy technologies and has ambitious plans to switch to solar energy to meet a significant share of energy demand [10a]. A mass transit facility Bus Rapid Transit (BRT) network has been initiated for the capital city Kabul, which has also been referred to as Metro-bus.

Relevant ministries are formulating plans and policies in the light of sustainability principles, although there are still weaknesses in the mechanism to translate the written statements into practical action. For example, Urban Growth Boundaries, which are intended to control urban sprawl, has become irrelevant because studies to determine the boundaries were far from being scientific or non-existent [18].

The high urban council comprised of ministry of Urban Development and Lan (MULD), Capital Region independent Development Authority (CRIDA), Kabul Municipality (KM), Independent Directorate of Local Governance (IDLG) and ministry of Finance holds meeting quarterly in a year. The council has recently recognized the urgency of setting a policies for sustainable cities, inclusive of “initiation of city planning through to revitalization of older cities and neighborhoods, adopting energy efficient programs in building management and developing sustainable, and locally appropriate transport systems. (Presidential Decree# xx) Also, the importance of mixed-use planning and of encouraging non-motorized mobility was

proposed. The council further noted that “Registering land rights in existing informal settlements can also play an important role in enabling transformation of current land use. By registering land, low-income households are given security of tenure beneficial to themselves that can allow for further investment in durable, better quality housing”. (Presidential Decree no. 3347 dated 2018-02-22) In short, urban development, in order to be sustainable, must be proactively planned with a long term vision where the needs of all the citizens will be met satisfactorily not only for the present but also for the future. This research set out the strategic dimensions of planning should consider the following criteria:

i. Housing and Neighborhood

In Afghanistan cities are formed by municipality (Sharwali) which is further divided into precincts, the number of precincts varies by cities area and population. The precincts are further divided into many neighborhoods. A neighbourhood plan focuses on a specific geographic area of a local jurisdiction that typically includes substantial residential development, associated commercial uses, and institutional services, such as recreation and education. The size of a neighbourhood may be defined by reference to population and/or access. According to urban planning settings in Afghanistan, the area size of each neighbourhood unit is within 50-130 hectares.

According to urban population density standards of Afghanistan, the calculated planned population is 9,363 people in a neighbourhood, illustrated in table 2.

Table. 2 Neighbourhood unit population density

No.	Population type	Number of
1	Estimated	9363
2	Average persons per residential unit	6
3	No. of residential	1517

Furthermore, a rapidly changing demographic makeup, environmental concerns and the emergence of new lifestyle trends have created demands for housing types that are small, flexible, and resource efficient. Therefore, it is necessary to develop different types of neighbourhood variations. This paper defines the following criteria for housing and neighbourhoods toward sustainability.

- Encourage community and housing developments that are socially cohesive, reduce isolation, foster community spirit, and sharing of resources.
- Create compact and clustered residential development, including reduced minimum lot

- sizes.
- Ensure housing that is affordable to a variety of income groups within the same community.
- Encourage a diversity of occupants in terms of age, social, and cultural groups.
- Choose location of housing areas near employment centers.
- Encourage use of regenerative energy including solar-oriented housing and neighbourhood design
- Ensure use of building materials with low "embodied energy" which are also chemical-free and toxin-free.
- Introduce ways of waste reduction and recycling of waste materials as well as of promoting recycling by residents.
- Formulate and use landscape design standards that minimize the use of pesticides and herbicides.
- Pure residential area with terraced houses and courtyard-style houses with smaller-sized apartments that can also be purchased by less wealthy residents [15].

ii. Passive Architectural Strategies for Energy Use and Conservation

The new building activities should recognize the natural energy systems that are at play in the built environment and aspire a symbiotic relationship with its surroundings so as the sites natural attributes need to be considered at the outset of a planning process;

a. Solar Energy

Considering and incorporating the effects of the sun on buildings into design may reduce energy consumption by as much as 30% (Brooks 1988).

Extremely cold winter and hot summers, typical of a semi-arid steppe climate, define Afghanistan's climate. In arid regions, moisture conditions are inadequate to support vegetative cover of the land surface. Hence, vegetation is scarce. In different parts of the country, people have applied different building strategies to cope with various climate conditions.

The proposed site at Kabul new city Phase-1 lies between Kabul city and Bagram airbase. For climate analysis, the data for Kabul is used in order to develop the building strategy for this site [17].

Kabul itself is located in the central east of Afghanistan, between the two extremes of hot and cold weather conditions. The psychrometric chart for Kabul summarises the dry bulb temperatures over a period of twelve months with an anticipated comfort range between twenty and twenty-four degrees Celsius. This comfort range defines the felt indoor

temperature inside of a building at which users feel thermally comfortable.

Usually, this target of felt indoor temperature is achieved by using mechanical back-up systems, (i.e., heating devices in winter and cooling mechanisms in summer). The chart clearly shows that the majority of days of the year are below comfort levels, indicating a large heat deficit period.

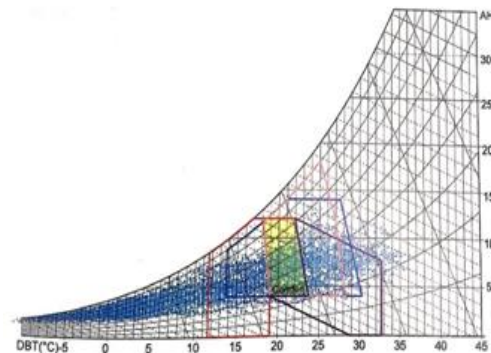


Figure. 2 Psychrometric Chart Showing daily Temperature ranges per year in Kabul. The range indicates that passive solar heating is the most effective climate responsive design strategy (Adopted from [20]).

b. Thermal Insulation of Buildings

There is a wide range of construction practices (i.e., building a dwelling) in Afghanistan because of a wide-ranging cultural diversity. Buildings, especially in rural areas, are typically constructed by their inhabitants and not by construction builders or a specialist. Afghan construction methods are parochial and limited to various regions and villages. The common local materials are adopted and used in the construction. Hereinafter, this part of the research introduces the Passive House Standard (PHS) for the construction of energy efficient neighbourhoods.

Passive House Standard stands for quality, comfort and energy efficiency. Passive Houses require very little energy to achieve a comfortable temperature year-round, making conventional heating and air conditioning systems obsolete. While delivering superior levels of comfort, PHS also protects the building structure. In a passive house, thermal comfort is achieved to the greatest practical extent through the use of passive measures listed below which can be applied not only to residential dwellings but also to commercial and public buildings [19].

- good levels of insulation with minimal thermal bridges
- passive solar gains and internal heat sources
- excellent level of airtightness

- good indoor air quality, provided by a whole-house mechanical ventilation system with highly efficient heat recovery

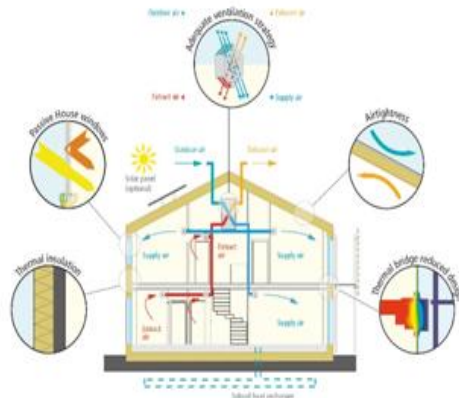


Figure. 3 Indicative Section through a Passive House (Adopted from [19]).

c. Wind

Wind direction is another element that must be integrated into neighbourhood design. For example, strong gusts of wind must be prevented, while an aerating breeze must be allowed to pass through the area.

At the scale of the neighbourhood, streets should be designed to avoid creating a wind tunnel along the route. High surface wind speeds occur when the wind is funnelled between sharp, aligned edges, along with a relatively wide path and following a straight line. To avoid this hazard, streets should be gently curving and houses should be closer to the street's edge. Setback should vary slightly from house to house to avoid aligning front facades. Ideally, plentiful vegetation should dot the neighbourhood to direct wind, and dwelling heights should be kept roughly consistent to avoid any abrupt change in elevation [18].

The wind is most often out of the North-West (20% of the time), with 19% coming from the north and 10% coming from the west. The least amount of wind is often out of the south west (4% of the time). The planning of the city was aligned to accommodate the wind movement by creating a continuous wind channels to ensure the best ventilation through the plots.

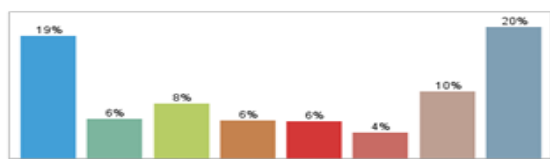


Figure. 4 Wind Direction over the Entire Year – Source: IHFD Feasibility Study for housing complex in Kabul 2012.

iii. Active Mobility

This paper promotes several major differences from the existing neighbourhoods. It emphasises connectivity, amenity and integration to achieve safe, efficient and attractive street networks. The priority is to develop a street network that not only works for vehicles and public transport provision but specifically aims to attract a high level of use by pedestrian and cyclists [14].

a. Walkable Streets and Cyclist Network

In the proposed neighbourhood plan, the streets are organized into an interconnected and hierarchical network. The main streets are connected to the urban centre, while shorter and narrower streets are for the local traffic at slower speeds. The street network provides multiple routes to the city centre from all destinations so that traffic is dispersed and avoids congestion. This multiple route option allows pedestrians and cyclist to travel more and drive less. Furthermore, evidence from research shows that blocks in neighbourhoods should range from (300-600 m) which is more convenient and attractive for walking.

Meanwhile, the speed of vehicles is critical to pedestrian safety and comfort. Thus, effective ways to control vehicular speed are by narrowing land widths, avoiding long straightaways, introducing on-street parking, and providing points of visual friction [19].

Clearly, the strategic areas of focus necessary for ensuring sustainable urban development listed above are ecologically aware, economically more rational, and socially more responsive. And as such should be considered as a point of departure from what is currently being practiced in many major cities.

Provision of Services and Facilities

The vast majority of urban Afghans live in underserved, informal housing with little tenure security and very poor access to basic services such as water and sanitation. This is the result of a lack of viable formal alternatives and underinvestment in basic urban services.

Access to improved sanitation is low, with only 29% of urban dwellers having improved sanitation facilities. No Afghan city has a comprehensive sewerage system. Access to improved water sources is better at 71%, yet this figure masks severe issues of water quality due to polluted wells and groundwater contamination. Only 14% of dwellings have piped water access.

While access to electricity is relatively high in cities (85%), it is irregular and unreliable.

Solid waste management is arguably one of the most pressing environmental issues in Afghan cities. Estimates indicate that only a fraction of solid

waste is collected and disposed. Even the most conservative estimates show Kabul generates over 600,000 tons per year, which would require roughly 50% of the current municipality budget if waste was all adequately collected and disposed [20].

Green space and forests account for less than 2% of land area in all but three Afghan cities. Planning for green space on vacant plots and other undeveloped land would bring multiple benefits related to mental health, flood risk reduction, increased opportunities for physical activity and improved air quality.

The urban poor, especially women and children, are the most vulnerable to the impacts of a poor urban environment. These groups often reside on the most hazardous land; are the most food insecure (34% of the urban population); drink from the most polluted water sources; use the most inadequate sanitation facilities; suffer the most from unaffordable and irregular energy supplies; and are the most vulnerable to the effects of natural disasters [21]

In order to improve access of water, there is a need for a comprehensive assessment of water resources, household demand and dwelling information, and regular monitoring for water quality. Sustainable and effective sanitation solutions need both improved infrastructure at the municipal level and household level interventions to improve health and reduce negative environment impacts.

There is an urgent need for sustainable solid waste collection and disposal to reduce pollution and improve health.

Strategic, comprehensive urban planning, which takes into account cities and surrounding regions, is needed to promote sustainable growth of cities that upgrades rather than degrades urban and rural ecosystems and tackles food security and water security for the growing urban population.

iv. Civic Engagement

Afghan cities contain considerable challenges including poverty, inequality, social exclusion, youth unemployment and gender inequality, which are a result of weak governance and insufficient focus on shaping an inclusive, pro-poor process of urbanization.

Civic engagement is the involvement of people in the creation and management of their built and natural environments. Its strength is that it cuts across traditional professional boundaries and cultures. The activity of community participation is based on the principle that the built and natural environments work better if citizens are actively involved in its creation and management instead of being treated as passive consumer.

Civic engagement plays two distinct roles in the context of sustainable city development [22]. First as the city development authority decides which specific projects and policies need to be enacted or modified to promote sustainability, local residents are instrumental. Second, many advocates of sustainability seem to believe that greater civic engagement is itself an integral part of what it means for a city to be more sustainable and that cities need to adopt policies that will promote civic participation.

V. RESULTS

Finally, this section attempts to sum up the review in the previous sections about the level of integrating sustainable development principles in the neighbourhoods. Table 3 itemizes major sustainability principles extracted from literature and the extent of their application in the Afghanistan National Development Strategy (ANDS-2013), Afghanistan Environmental Law-2007, Afghanistan National Housing Policy and Afghanistan Municipalities Law-2018 as well as the extent to which these principles are embedded in these strategies and plans policies [25]. The assessment is based on the subjective rating of the sustainable development goals. A low score indicates that the principle is present in just one of the four national plans/strategies. If a principle is found in two or three, then it is scored as moderate, while if it exists in all the four strategies then it is considered as highly incorporated at the national level [23], [24].

Table. 3 Application of Sustainable Development Principles in Afghanistan Development Strategy

Category	Principle	Extent Existence	Level of Application
Environment	Ensure Environmental quality	High: enforcement of environmental laws	AND S, EL, ANH P, ML
	Protecting and Conserve Natural Ecosystem	Moderate: insufficient waste disposal strategy and pollution prevention	AND S, EL,
	Sustainable Land-use planning	Moderate: access to land is impeded by variety of legal, institutional and policy constraints	AND SML
	Promote new urbanism	Low: new urbanism efforts impeded due to rigid and outdated master plans	AND S

Economic	Conservation of natural resources	Moderate: neglect natural resources, unbalanced development	AND SML
	Reduce, Reuse and recycle material	Low: lack of integration of enhancing technology for recycle	EL
	Expanding economic opportunities	High: encourage employment and business opportunities	AND S, EL, ANH P, ML
	Strategic Planning Support	Low: risk of eviction of informal settlements and high costs of production in housing.	ML

		resources to meet their immediate needs	
	Provision of services and facilities	High: The planned areas have access to municipal services and basic facilities, while in informal settlements it lacks.	AND S, EL, ANH P, ML

As table 3 indicated, the assessment of the level of incorporating the principles of sustainable development in Afghanistan shows that an effort is being made and the provision of these principles at the national level is high. The assessment indicates that most of the principles have been embedded into the national development plans, Afghanistan National Development Strategy, Afghanistan Environmental Law, Afghanistan National Housing Policy and Afghanistan Municipalities Law high or moderate levels. There is an existing framework that provides guidance to all sectors of urban development such as mobility, housing, basic services, facilities and infrastructure agencies, etc. However, what remains is for all these sectors is to use this framework to develop program and implementation action policies to put these principles into practice. How to implement these principles that have been mentioned in the national policies should be their main priority task in achieving sustainable development in Afghan cities.

VI. CONCLUSION

The concepts, principles and strategies regarding sustainability in general and their application in the field of urban planning in particular are still in a flux across the emerging countries. From the limited purview of this work it is clear that information in respect of concept, principles, strategies, and practical actions aimed at planning for sustainability abound. From the array of available written materials meaningful principles can be culled and action plans appropriate for each individual situation can be formulated.

The trend and pattern of urban development in Afghanistan have caused serious concerns in terms of sustainability. Sprawling pattern of urban growth, informal settlement upgrading policy, improper land use, increasing pollution due to Excessive burning of fuel, Smoke from Chimneys, dependency on private vehicles, unplanned and

Social	Equity and Equality regulations	Low: ignorance of income level in communities	AND S
	Active mobility	Moderate: High dependency on private cars and taxis	AND SML
	Affordable housing	Low: The government cannot supply affordable housing at sufficient scale to meet the need arising from the growing number of urban low-income and poor households.	ANH P
	Civic Engagement	Moderate: Establishment of Community forums to manage	AND SML

inadequate public transport system, lack of green space, are all serious issues that threaten the sustainability of urban development. However, studies similar to this research will provide an opportunity for the decision makers to review its existing strategies to address these serious sustainability challenges. The research concludes on the way forward towards more sustainable urban development initiatives in Afghanistan as bellow:

According to the analysis, the research proposes suggestions for a comprehensive type of plan. The suggestions are written based on the hypothesis that economic progress cannot always be based on urban development or continuous growth. In this situation, the urban plan must be focused on rethinking urban uses in the consolidated city, increasing efficiency and attraction.

It is clear that the significance of the concept of neighbourhood in people's lives has faded, but the wish to reverse the trend is very widely shared. However, only one neighbourhood plan cannot cover all issues of sustainability in cities. Therefore a basic plan complemented with other plans is needed. This paper sets out some of the spheres where action is an appropriate, emphasizing process rather than product through the following steps: first by empowering local communities and forming partnerships for action in the context of development action plan; second, to understand and realize the need to promote renewable energy, saving water, recycling waste, greening the environment. This, of course, would require education, both formal and informal; finally, the government has incorporated most of the major sustainable development policies that have been extracted from literature reviewed, practicing and implementing these principles in Afghan cities can be effective tools for demonstrating the theory, quality and application of sustainable development to urban areas. These integrated design strategies permeate various defining levels of communities, integrating its natural amenities with its neighbourhood context, residential, cluster, and dwelling units.

Adopting these recommendations in a systematic manner will provide significant long-term resource and monetary savings for communities and preserve the historical and cultural heritage of the cities.

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