



## Analysis of Green Areas and Population Space requirement in Jimeta, Adamawa State, Nigeria

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**Abstract:** This paper aimed at analysing available green space in Jimeta town against the space requirement for the urban population. Spatial data for the study was obtained from Adamawa state geographic Information systems comprising ward boundaries and land covers. The population requirement standard for green areas was obtained from natural England N.E. descriptive statistics was employed in the analysis of the data. It was revealed that unutilised and abandoned green areas were more compared to utilised and organised green space. It was also revealed that Doubeli, Karewa and Gwadabawa wards have the highest space area requirements of 16.8%, 10.6% and 10.1% respectively needed to meet up with the green space requirement for the benefit of the urban residents. It was recommended that unutilised green areas should be appropriately utilised along side the recapture of degraded open open space along road sides, institutions among others for effective sustainable development of Jimeta.

**Key words:** Green Area, Green infrastructure, Jimeta, Open space, Urban Area.

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### 1.0 Introduction

Urban green areas are now widely perceived to be major contributors to both the quality of the environment, and to human health and well-being in urban and suburban areas. When people were exposed to natural environment, the level of stress decreased rapidly, whereas when people were exposed to the urban environment, their stress level remained high or even increased.

Green Area can be viewed as interrelated chain of multifunctional green spaces provided across the geographical area set within urban and rural areas. It strengthens to a high quality of

natural and built environment which aims to deliver livability of existing and new communities. Urban green spaces assists in creating aesthetically pleasing and functionally efficient built environment (Demuzere, Orru, Heidrich, Olazabal, Geneletti, Orru, ... Fehnle, 2014). It promotes social cohesion in neighborhoods by bringing the community together and establishes a sense of identity (Kaźmierczak, 2013; Richardson, Goss, Pratt, Sharman, & Tighe, 2013).

Urban planning as a strategy in promoting health status of urban residents could be traced to post-war period (1850-1900). American and European cities were experiencing rapid industrialization that was characterized as antecedents capable of causing urban degradation (Corburn, 2007). The resulting overcrowding and pollution increase contagious diseases. Thus, urban renewal was advocated in cleansing the decayed cities. Also the creation of urban parks was equally advocated in order to provides the cities with a breathing spaces (Corburn, 2007). Urban design can promotes health status of urban residents by bringing social services in close proximity to urban residents (Badland et al., 2014); thus, provision of accessible public urban green spaces can promote active living (Giles-Corti et al., 2013). However, the 21<sup>st</sup> century diseases were highly related with the way our present cities were designed and developed. The cities were argued to promote sedentary living resulting from lack of adequate urban green spaces that promotes active living. Thus, urban areas are growing in line with sprawling system of development that consumed urban land unsustainably. This development pattern reduces the amount of urban green spaces in our urban areas; thus, affects the quality of urban live (Ewing et al., 2014). In spite of this, urban green spaces are resources for promoting recreational activities which encourage active living (Jim & Chen, 2006). Therefore, systematic provision of urban green spaces would have positive influence on the health status of urban residence. Thus, urban green spaces must be properly design and manage; so that they can ameliorate some of the environmental negative impact associated with urban development. The role played by green spaces in urban environment can no longer be ignored by today's policy makers as indicated by some countries effort in recognizing the importance of making collaboration between health agencies and town planners (Stockholm Resilience Centre, 2012). Planning Institutes of Australia (PIA), in its 2010 report highlighted how the collaboration between the two agencies reduces health expenditures.

Urban green space may fulfill anthropocentric and biocentric functions. The anthropocentric function includes the hygiene function, such as recreational function, climate control and pollution control. The biocentric function is represented by the ecological services and those functions offered by these green spaces. The economic gains attached to green spaces are also important. (Ewing 2014) states that green spaces provide economic benefits to municipalities and citizens, increase attractiveness of the city and promote its tourism destination, and at the same time the property value in the city also goes up due to amenity. This also boosts the productivity of the citizens through their psychological morale gained.

Since it has been stipulated that approximately half of the world's population will be living in cities (United Nations 2004) expecting reverberating consequences such as increased settlement isolation from experience of nature, threat to mental health and wellbeing, the maintenance and planning of green spaces can be seen as a panacea (Naumann et al., 2011). Hence, the task at hand for urban planners is indeed a demanding one. The present physical appearance of Jimeta Metropolis depicts limited provision of urban green spaces, which facilitated the creation of high increase in temperature exposes the habitat in the study area to heat related health challenges and the reduction of comfort zones. The study focused on the total urban green areas in the different wards of Jimeta vis a vis the urban green requirements for urban residents.

## 2.0 Study Area

Jimeta is a part of the twin settlement usually referred to as Jimeta – Yola (or Greater Yola in planning parlance). The old town of Yola where the traditional ruler (*Lamido*) resides is the traditional city, but the new city which is about 5 km north western Yola is Jimeta. It lies between latitudes  $7^{\circ}$  and  $11^{\circ}$ N of the Equator and between longitudes  $11^{\circ}$  and  $14^{\circ}$ E of the Greenwich Meridian. It shares boundary with Girei Local Government Area (LGA) at the North and Yola South LGAs at the East, West and South. It is the administrative and commercial headquarters of Adamawa State, Nigeria. It was established to accommodate immigrants into the older Yola Town. Situated at the bank of River Benue, it eventually subjugated Yola commercially, industrially and administratively. Jimeta and few villages constituting the 11 political wards of Jimeta LGA, it covers a total land mass of 2,514,300 metre square with approximately 36,371 household units. The population of the Jimeta stood at 265,751 with male having 108,379 and female 91,295. The Jimeta metropolitan area is mainly used for housing, related commercial enterprises, administration, and Agricultural activities are predominantly undertaken keeping in mind few available industries, which is the part of income source of the metropolis. The existing infrastructural facilities and services that are found within the study area are international airport, postal facilities, educational facilities amongst others (Adebayo, 1997, 1999).

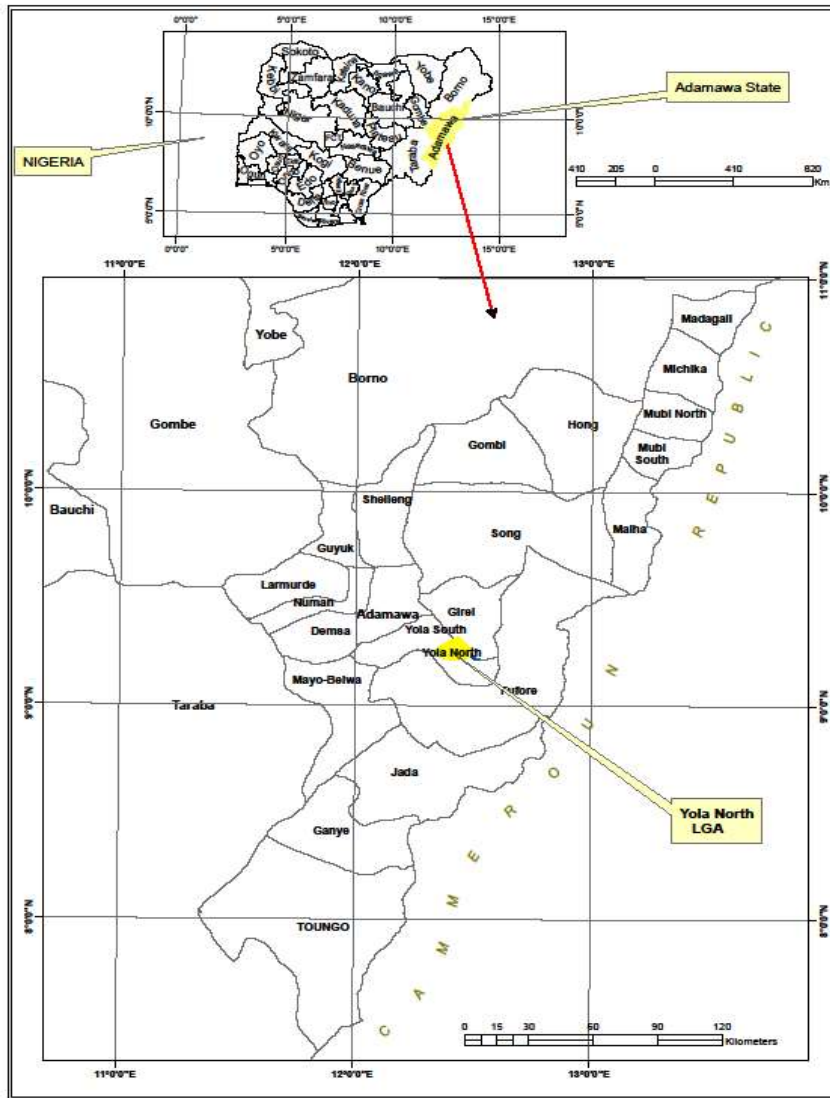


Fig 1: Yola-North L.G.A in the context of Adamawa State (Ministry of Lands and Survey Yola 2021)

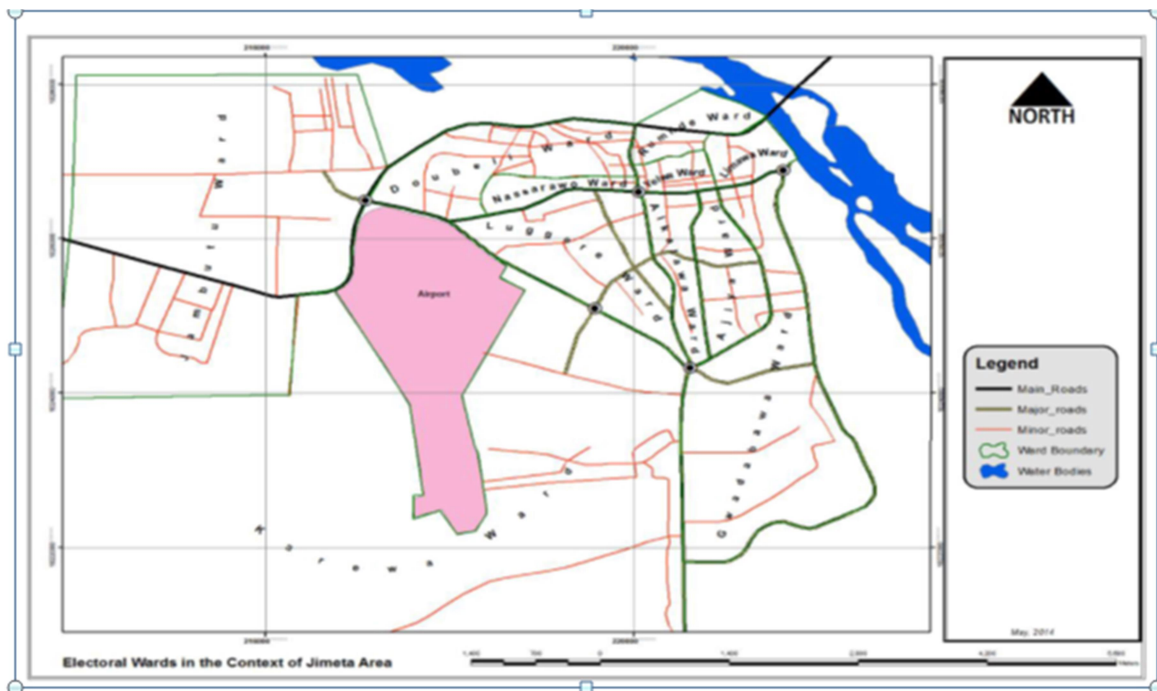


Fig 2: Yola-Jimeta (Ministry of Lands and Survey Yola 2021)

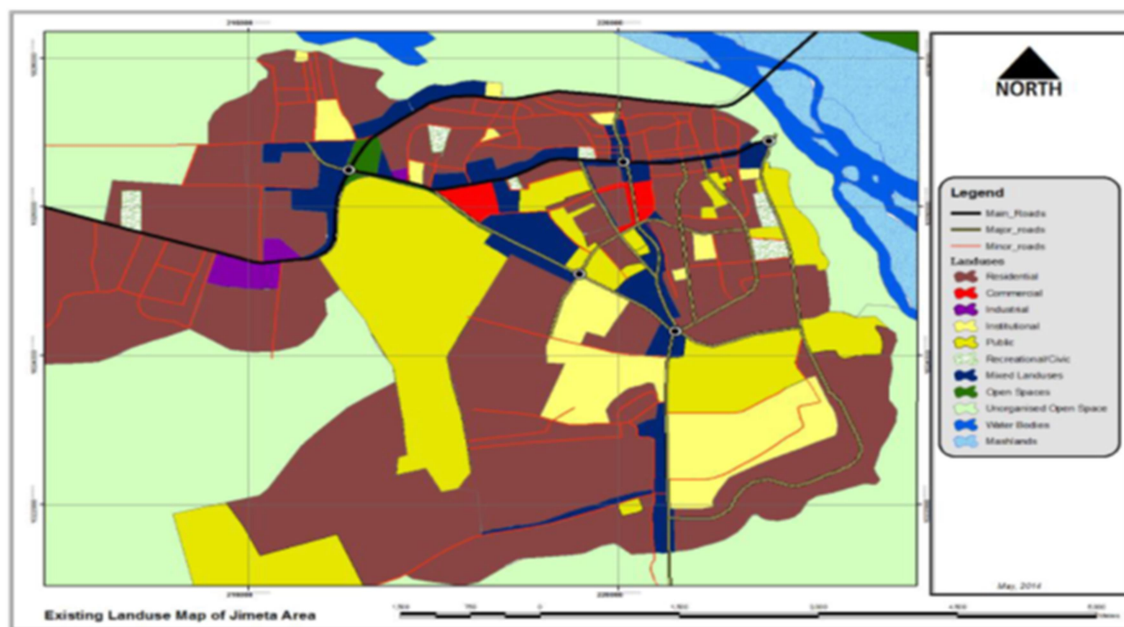


Fig 3: Existing Landuse of Yola Jimeta (Ministry of Lands and Survey Yola 2021)

### 3.0 Material and Methods

Spatial data was collected from Adamawa state Geographic Information Systems (ADGIS). These include the shape and boundary of the wards in Yola-Jimeta and the land cover classification comprising only developed area and green areas for Yola -Jimeta. Demographic data was also collected from primary health-care unit of Jimeta LGA and the National Population commission. The standard for green space requirement for urban residents was also collected from Natural England N.E which states that a population of 1000 urban residents require a 200m<sup>2</sup> of urban green space. Descriptive statistics was utilised for the analysis to explain the situation. This can be either a excess of space obtained or a short fall. The data was displayed in tables and maps.

### 4.0 Results and discussion

Table 1: Existing green space in Jimeta

Wards	Green areas in Jimeta (m <sup>2</sup> )				
	Total green area	Organized	Utilized	Unutilized	Abandoned
Alkalawa	2232	558	372	830	472
Ajiya	415	124.5	83	138.33	69.17
Doubeli	1661	498.3	332.2	553.67	276.83
Limawa	590	177	118	196.67	98.33
Rumde	480	144	96	160	80
Yelwa	310	93	62	103.33	51.67
Nassarawo	380	114	76	126.67	63.33
Jambutu	3290	493.5	329	1507.92	959.58
Luggere	510	153	102	170	85
Karewa	1690	507	338	563.33	281.67
Gwadabawa	1632	489.6	326.4	544	272
<b>Total</b>	<b>13190</b>	<b>3351.9</b>	<b>2234.6</b>	<b>4893.92</b>	<b>2709.58</b>

The table showed that a lot of the green space constituting 37.1% is unutilised. A total 25.42% and 16.94% of the green area are organised and utilised respectively. A total of 20.54% is completely abandoned. This signified that majority of the green space are lying fallow which can expose them to agents of denudation thereby reducing their existence and undermining its usefulness the urban populace.

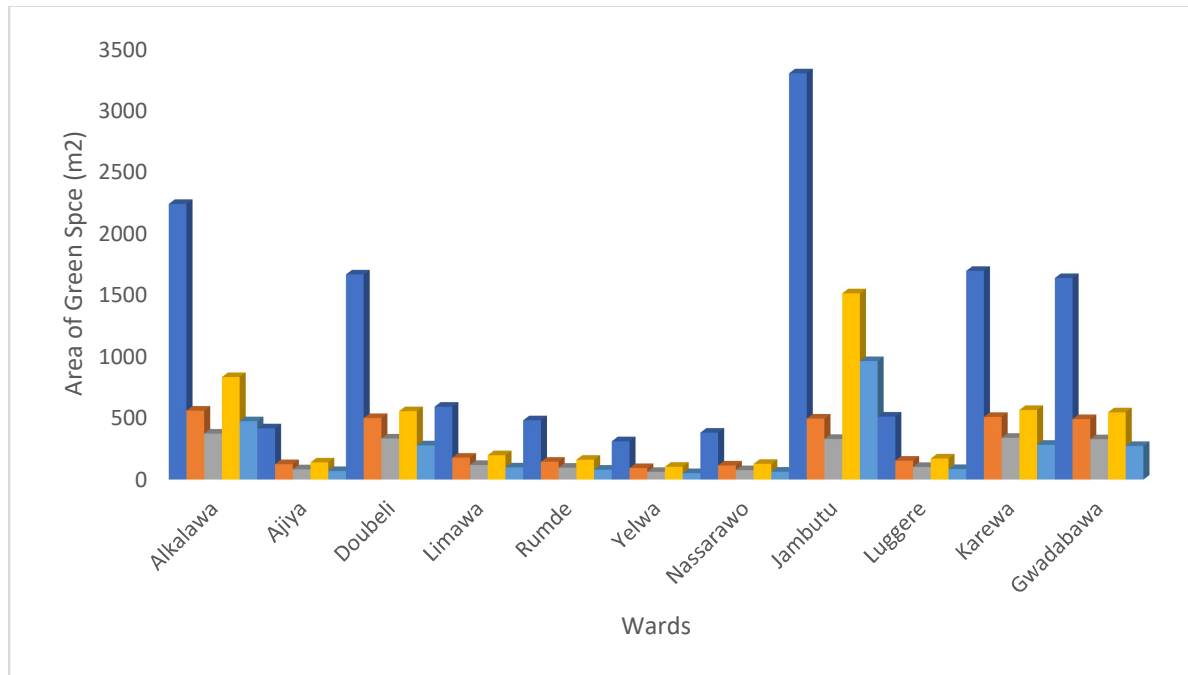


Fig 4. Existing green space in Jimeta

Table 2: Green Space Requirement for Urban Population

Wards	Existing green areas in ward (m2)	Ward population	shortfall population	shortfall green space	Percentage shortfall
Alkalawa	2232	28804	17644	17.644	9.7
Ajiya	415	17949	15874	15.874	8.7
Doubeli	1661	38846	30541	30.541	16.8
Limawa	590	18116	15166	15.166	8.3
Rumde	480	14366	11966	11.966	6.6
Yelwa	310	13359	11809	11.809	6.5
Nassarawo	380	19864	17964	17.964	9.9
Jambutu	3290	22476	6026	6.026	3.3
Luggere	510	19817	17267	17.267	9.5
Karewa	1690	27784	19334	19.334	10.6
Gwadabawa	1632	26511	18351	18.351	10.1
<b>Total</b>	<b>13190</b>	<b>247894</b>	<b>181944</b>	<b>181.944</b>	<b>100</b>

From the table above there is a general shortfall for the entire data distribution. Doubeli, Karewa and Gwadabawa wards have the highest space area requirements of 16.8%, 10.6% and 10.1% respectively needed to meet up with the green space requirement for the benefit of the urban residents. The other wards tend to have similar requirements for needed green spaces. This signifies that a great deal of green space is required to meet standard requirements. This is displayed in the table showing a total available green space of 131,90m<sup>2</sup> as against 181,944m<sup>2</sup> required.

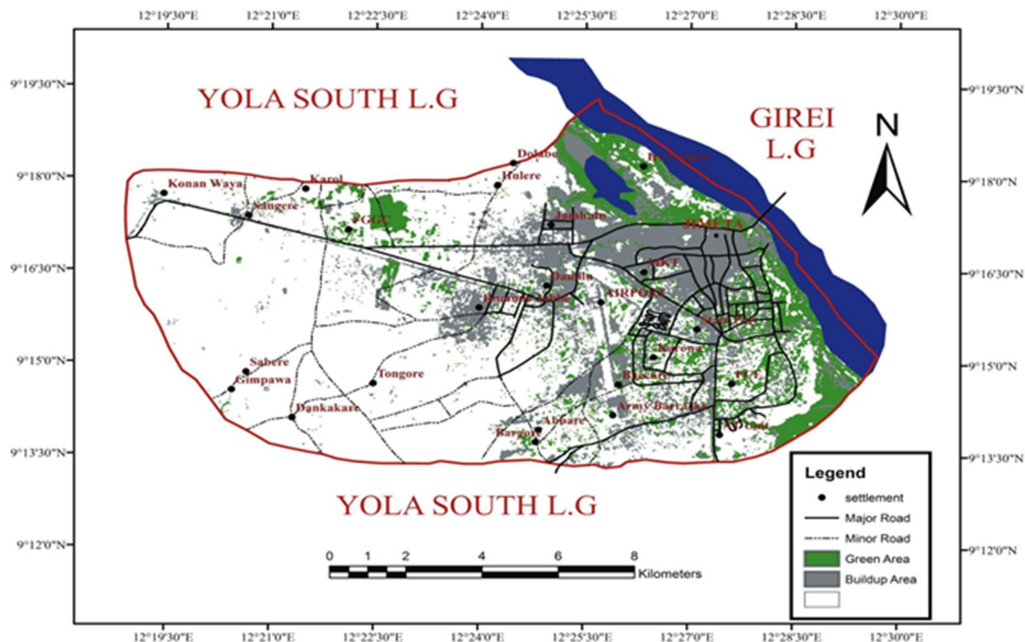


Fig 5: Existing Green Area in the Study Area (Sources: ADGIS, 2021).



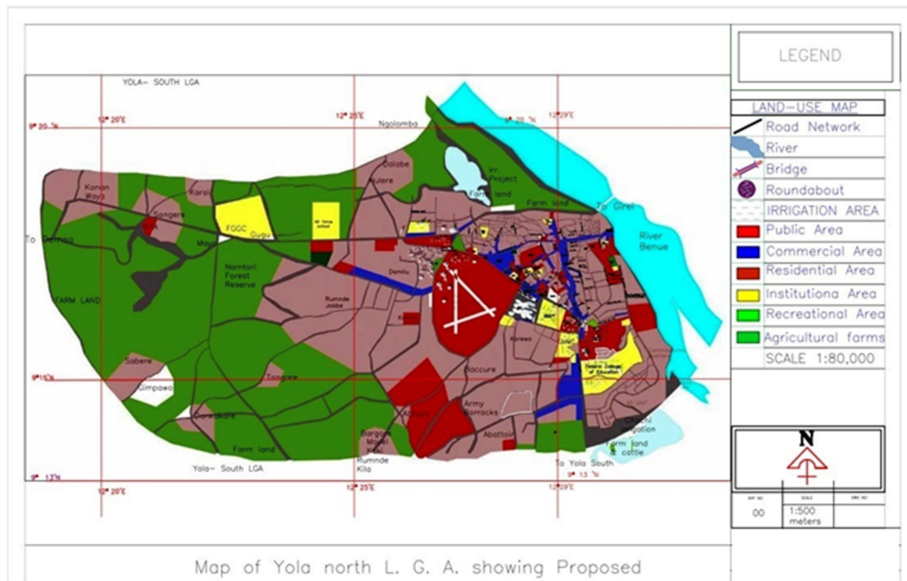


Fig 6: Land Use of Yola North L. G. A. (Source: Field Survey, 2021)

The green infrastructure, despite its wide popularity and acceptability in many nations, involves minimal cost compared with the grey infrastructure. The green infrastructure uses natural solutions to tackle environmental issues, thereby being both economically efficient and environmentally friendly, thereby reducing heat stress experience in the study area.

## 5.0 Conclusion and Recommendation

We clearly face a critical need to develop the infrastructure that will simultaneously support humans and nature in an uncertain future threatened by a changing climate, food insecurity, water shortages, and energy limitations. Urbanization coupled with population growth can have untold consequences for the development of town and cities. These negative scenarios have been the issues that have hindered the sustainable agenda of many countries. Nigeria as a nation is faced with rapid urban development that undermines the quality of life of its populace. The rate at which Nigerian forest is being converted to other uses severely distances urban residents from green spaces.

This work demonstrates that urban green spaces fulfil many functions in urban context that benefits people's quality of life. The benefits bestowed in green spaces cannot be overlooked in today's sustainable planning. Green spaces also reduces the energy costs of cooling buildings effectively. Furthermore, due to their amenity and aesthetic benefit, green spaces reduce heat stress, increase property value. However, the most sought benefits of green spaces in urban area are the social and psychological benefits. Life in urban area is full

of stress, indeed, presence of plants in working areas has been found to increase work output and working capacity.

The provision for trees and greeneries along both sides of road network, to plant small size trees in road dividers and channelization devices, encourage tree plantation in the car parking space, provision of sufficient open space in and around buildings. It is suggested that, stopping trees felling, and decorating spaces with greenery, flowering plants, and adorning playgrounds and educational institutions with green infrastructures will help ensure sustainable urban development.

The study also recommends strong green infrastructural plan that requires a multi-scale approach. That should involve all stakeholder groups in decision-making, with special consideration for engaging underrepresented groups. Planning for and managing green infrastructure must be broad and truly representative to help guarantee that, environmental change benefits all social groups, including historically disadvantaged and underrepresented populations. The study strongly recommends developing policies at the state and local government level and through guidelines produced by State Government, statutory bodies, environmentalist, planners and NGOs on green infrastructure as part of government policy.

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