

ASSESSMENT OF URBAN PARKS WITH REGARD TO VARIOUS ECOSYSTEM SERVICES PROVIDED BY THEM

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ABSTRACT

Abstract: Urban parks play a vital role in modifying the quality of life. Green areas are cooler compared to non green areas because of the tree cover and many studies have found that air temperature inside the parks and beneath the trees is 2-3 degrees lesser. Besides aiding in services such as air and water purification, wind and noise filtering, they also provide social and psychological services, which are of crucial significance for the liveability of modern cities and the well being of urban dwellers. A park experience reduces stress, enhance contemplativeness, rejuvenate the city dweller, and provide a sense of peacefulness and tranquillity.

Keywords: Urban park; urbanisation; carbon sequestration; urban parks.

1. INTRODUCTION

Urban Park provides recreational areas for residents and helps to enhance the beauty and environmental quality of the neighbourhood. But with this broad range of recreational sites comes an equally broad range of environmental concerns. Just as in any other land uses, the way parks are managed can have good or bad environmental implications, from pesticide runoff, siltation from overused hiking and logging trails, and destruction of habitat. Lack of community and public access to safe open and green space is a critical area of concern for urban residents in India.

Green spaces such as parks and sports fields as well as woods and natural meadows, wetlands and other ecosystems, represent the fundamental component of any urban ecosystem. Green urban areas facilitate physical activity and relaxation, and form an absorbent from noise. Trees produce fresh oxygen, and help filter out harmful air pollution, including airborne particulate matter. Urban parks and gardens play a very critical role in cooling cities, and also provide safe routes for walking and cycling for transport purposes as well as sites for physical activity, social interaction and for recreation. Urban parks also are important to the mental health of humans. Having access to urban park can considerably reduce health inequalities, improve well-being, and aid in treatment of mental illness. Some analysis suggests that physical activity in a natural environment can help reduce mild depression and reduce physiological stress indicators. Benefits of urban parks in urban Indian cities:

1. **Temperature & Climate Change:** urban temperatures are typically 1-2° Celsius higher than the surrounding rural areas. This urban heat island (UHI) effect occurs because of the materials used to build towns and cities do absorb more of the sun's energy than the natural surfaces they replaced. Urban parks are on average around 1° Celsius cooler, during both the day and night time, than built-up regions in the same town or the city, and this cooling effect can extend beyond the green space itself, into its surrounding urban areas. During the summer this may reduce the need for air conditioning, and associated energy use, in the nearby buildings and places.

2. **Air Quality:** Urban air pollution consists of numerous tiny particles, known as particulate matter (PM), and gases such as ozone (O₃), nitrogen dioxide (NO₂) and sulphur dioxide (SO₂). These pollutants are primarily formed as a result of vehicle and industrial emissions. Poor and bad air quality is a serious threat to human health, causing problems for the respiratory system and cardiovascular diseases [1]. Current studies suggest that the presence of urban vegetation results in an overall reduction in air pollution [2]. For example, schools surrounded by green space have been observed to experience lower levels of traffic-related pollution in their classrooms. However, more research is required to fully understand the multiple ways in which urban vegetation can affect our air quality

3. **Flooding & Water Quality:** Urban parks store and filter lot of water, reducing the risks of flooding and improving water quality in streams, lakes and rivers. In urban areas, the impermeable materials used for roads and pavements mean that rain is not percolated and remains on the surface. During periods of heavy rainfall this water accumulates and when the drainage capacity of the area is exceeded, flooding will happen. A further consequence of high levels of surface water run-off is that rainwater washes pollutants away from the surfaces it falls onto, transporting them into other water courses. This can be detrimental to the water quality in streams, rivers and lakes and lead to high pollutant loading at water treatment facilities.[3]

4. **Wildlife & Habitats:** Our towns and cities are typically considered to host a less diverse range of plants, animals and birds as compared to nearby rural areas. However, urban parks can be home to numerous same species that are more commonly associated with rural settings, including those that are rare or threatened [4] For some species, urban areas

can provide a much more favourable habitat than intensively farmed countryside, suggesting that towns and cities could make an important contribution to the national conservation efforts.

5. Economic Impacts: The presence of green space affects the urban region in the many different ways described in this document; the economic impacts of which are not straightforward to quantify and estimates can differ widely. The creation, maintenance and management of these green space also generates employment opportunities, and may have indirect benefits to local economies by encouraging further investment and property development in the area.

6. Carbon sequestration: Plants, through their growing period, act as sink for atmospheric carbon. Therefore, growing vegetation can be a potential contributor in decreasing the concentration of CO₂ in atmosphere by its accumulation in the form of biomass. As trees grow and their biomass expands, they extract carbon from the air and store it in the plant tissues.

7. A park experience may reduce stress [18] enhance contemplativeness, rejuvenate the city dweller, and provide a sense of peacefulness and tranquillity [17].

According to The United Nation's 1987, Report of The World Commission on Environment Derivation from the Sustainable Development Goals targets, urban green space is part of the contributors to the sustainable development agenda and as a comprehensive tool to serve a long-term protection of environmental sustainability for the city [6]. It is the natural element that is responsible to ensure the quality of life in urban areas remains functional. Over the years, the urban parks within the cities play a role as the urban lungs, oxygen to reduce the city's heat, and the wall for harmful air pollution [7]. However, despite the benefits offered by the green space to city Environment enhancement, rapid urban development has led to the destruction of green space and driving in the city unsustainable [8]. Just as other land use activities, the way of green space preserved, control and manage can cause an environmental impact for Example flood, destruction of natural habitats and climate change [9]. Thus, it is very important for developing countries to race for the greenest city and to protect our mother earth in order to create such a great live able place for human to live in. One important aim of having greenery in urban plans is to prevent or at least limit the degradation of the environment to a minimum while increasing, as far as possible, „creativity“ in order to meet the developmental needs.

Objectives of the study:

1. To assess the area covered by urban parks in the study area.
2. To understand and study the importance of urban parks.
3. To examine the effect of these areas on the neighbourhood.
4. To suggest measures for restoring the urban parkss.

2. METHODOLOGY

The main question of this research is what the main terms of urban urban parkss are, how they can be defined, what does these spaces mean to the local inhabitants, why are the urban parkss declining and what measures can be taken to restore them. We decided to conduct semi-structured, qualitative interviews with experts about their general knowledge and ideas in order to gain a basic understanding. We attempted to choose experts who have experience enough to interact openly and reveal new information about this topic. The locals were also asked and responses recorded to the best of their knowledge, then discussed with experts.

STUDY AREA: Jammu is one of the fast developing cities in north India and is the winter capital of the UT of Jammu and Kashmir. This study is confined to Jammu city. Jammu city is located on the banks of the river Tawi and lies between 32° 38' and 32° 48' North latitude and 74° 47' and 74° 52' East longitude. The old city is situated on a hillock and the north-eastern parts of the city are sloping up towards the hills. It is surrounded by the Shivalik range to the north, east, and southeast and by the Trikuta Range surrounds to the northwest. Jammu city is a focal point for the pilgrims going to Vaishno Devi and Kashmir valley. Known as the city of temples renowned for its ancient temples and shrines, Jammu is the most visited place in the union territory. All the routes leading to Kashmir, Poonch, Doda and Ladakh start from Jammu city.

3. OBSERVATIONS

Semi-arid naturally growing shrubs dominate the vegetation of the urban parks in the study area. Distance or walking time from home has appeared to be the single most important precondition for use of the urban parks. People in close proximity to a green space use it much more frequently. Studies have shown that the location and distribution of urban parks in and around the city influences people's participation. A study in Helsinki, Finland, demonstrated that a good amount of green areas and easy access (i.e. short distance) to a recreational space increase the number of visits and people living close (<0.5 km) visited the urban parks more frequently (>4 times per week) [10]. A similar study conducted in Swedish cities showed that overall, people with immediate access to fine and verdant gardens or green

yards are also most likely to visit public urban parks. Indeed, those with gardens of their own also spend more time in public urban parks than those without a garden of themselves [11]. Public green space should be in the centre of the neighbourhood and not more than five minutes' walk for most residents, public buildings, business or shops. Therefore, the accessibility and proximity are very important factors to consider during planning and designing of any urban green space. The distance one walks or cycles should be adequately small as well as with limited obstructions along the trip. As such, some countries have set up numerous recommendations for the provision of accessible urban parks. For instance, England has standards such as an accessible natural green space less than 300 metres from homes; statutory local nature reserves provided at a minimum level of 1 hectare per thousand populations, at least one accessible 20 hectare site within 2 kilometres from the home; one accessible 100 hectare site within 5 kilometres of the house and one accessible 500 hectare site within 10 kilo-metres of home [12]. In the study area rapid urbanisation and unplanned constructional activities on a large scale are destroying the urban parks. Massive inflow of residents from neighbouring districts to Jammu city, has led to construction of hundreds of new houses which do not have greenery even in feet inside their premises. The study area is quickly moving towards becoming a concrete forest. Religious believes attached to certain places or trees can also help preserve and maintain a green space. Such is an example of vegetation cover around the temples at Jammu city.

4. CONCLUSIONS

Urban parks fulfil many functions in urban dwelling context that benefits people's quality of life. There is therefore a broad consensus about the importance and value of urban parks in Indian cities towards planning and constructing sustainable or eco-cities of 21st century. Steadily growing traffic and urban heat, especially in the developing countries like ours is not only damaging the environment but also incurring social and economic losses. The ecological benefits bestowed by urban parks which range from protecting and maintaining our biodiversity to helping in the mitigation of change cannot be overlooked in today's sustainable planning strategies. Inner-city urban parks are especially important for improving air quality through uptake of the pollutant gases and particulates which are responsible for many respiratory infections. Urban parks also help in reduction of the energy costs of cooling buildings effectively. Furthermore, due to their amenity and aesthetic, urban parks increase property value also. Examples are Gandhinagar and Channi areas of Jammu. However, the most sought out benefits of urban parks in a city are the social and psychological importance. Urban parks, especially public parks and gardens provide resources for relaxation and recreational activities. Ideally this helps in emotional relaxation (therapeutic) and physical relaxation. In order to meet social and psychological needs of citizens satisfactorily, urban parks in the city should be easily accessible and in adequately optimal in their quality and quantity. Urban parks need to be uniformly distributed throughout the residential city area, and the total area occupied by urban parks in the city should be large enough to accommodate the city population requirements. Cities are responsible for most of the consumption of the world's resources and are home to most of the world's citizens too. Bringing green space to the urban landscape can also promote and inspire a better relationship with the environment while supporting important services. The promotion and conservation of green space in cities is in the hands of the local and regional authorities. Integrative approach should not be discussed only in writings as a source of contributing instrument to environmental sustainability, but it is also important that how it could be fostered in developing countries in different social settings in which political and cultural factors can influence. And there are many intermediary factors such as lack of investment, proper management, designing an appropriate planning and public policy, and political instability, traditional values, economic circumstances influence to how and what extent the application of integrative approach in developing countries may contribute to environmental sustainability.

Suggestions:

1. Lack of afforestation programs is one of the major drawbacks of Indian cities. Urbanisation should be complemented with afforestation targeting specific increment in tree count.
 - Performance-based incentive programs encourage the competition and result in better output.
 - Since low-income residents tend to live in much denser neighbourhoods, special care should be taken to ensure provision of green walls and green/cool roofs. Such measures will prove very crucial in the cooling of microclimate and compensating for dearth of material resources.
2. Road traffic is one of the major sources of pollution in India. Impetus should be given to greening of the transport corridors to reduce atmospheric pollution.
 - The high density of Indian roadways can be utilised as green corridors for attenuating the atmospheric pollution, and inducing uniform cooling.
 - Evergreen plants should be selected for roadways to minimise accidents due to leaf shedding from deciduous varieties. This should be backed with guidelines for choosing of tree species and tree spacing.

- Special care should be given to ensure complete visibility at traffic intersections and rotaries.
 - In keeping with the National Forest Policy, trees should be planted and maintained along the railway lines, canals, and streams. Green belts should be raised in and around derelict lands.
 - Incorporation of permeable pavements such as grassed footpaths and greening of parking lots can help to decrease the proportion of paved areas, aid in storm water retention, and reduce surface heating.
3. The observed trend of alarmingly shrinking residential gardens needs to be checked.
- Strict enforcement of bye-laws regulating the size of home gardens, and imposition of penalty for disregard to public laws will help to follow discipline among locals.
 - The high percentage of flat-roofed buildings in India provides ample scope for development of beautiful roof gardens. The added benefit of rain water harvesting and storm water runoff collection may be amalgamated to solve acute water shortage in cities.
 - Since people remain more amenable to monetary benefits, tax abatements can be provided for maintenance of roof gardens, box plantations, and green terracing.
4. Public participation is a prerequisite for the success of any kind of urban development program and is significantly missing in India.
- Tree giveaways will help to develop a sense of responsibility towards protection of the natural environment.
 - Minimum threshold values for green cover per plot ratio should be designated in residential areas of Jammu city. Since wealthier neighbourhoods tend to have more plant-able areas, while low-income residents tend to live in denser neighbourhoods with lower possible stewardship, the minimum green cover per built-up area should consider the economic stratification.
5. Transport corridors and industrial belts are major contributors to the air pollution. Extensive green cover towards the north of Jammu city helps to maintain pollutant concentrations within permissible limits.
- Presence of greenbelts around islands of pollution such as industrial zones reduces the spread of pollutants.
 - Government database should provide information about the choice of tree species as per climatic requirements to ensure maximum efficiency at minimum cost.
 - The policy of “right place, right tree” as observed in London provides technical support towards the intelligent greening of cities.
 - The greening strategy should be climate driven, and responsive to site the demands. This entails potential to explore intra-city site variations for growth of varied variety of the flora. This will help to reduce stereotype, and stimulate creativity amongst the locals.
 - Identification of “champion trees”, i.e. trees of ecological importance due to its species richness or physical attributes and policies for their preservation will help to sustain species variety and richness.
6. Lack of tree databank providing detailed assessment of the physical, economical, and ecological value of city flora undermines probable afforestation of the Indian cities.
- Tree census should be initiated and must include a study of the physical attributes of trees, such as species variety, richness, health, age, girth etc.
 - Tree census should generate the information about the ecological value of species. The findings may be used to educate residents about the intangible benefits of trees.
 - Study on increasing property value due to the vegetative presence will provide an assessment of the economic value of city flora, and help to convince residents about the monetary benefits emanating from maintenance and development of green areas.

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