

# **THE STATUS AND IMPROVEMENT OF VEGETATION ON EXISTING OPEN SPACES ON GREATER CAMPUS PESHAWAR**

**NOOR UL AMIN, MURAD ALI AND MUHAMMAD ALI KHAN**

*Department of Horticulture,  
NWFP Agricultural University Peshawar, Pakistan*

## **Abstract**

A research study was conducted at Greater campus including NWFP Agricultural University Peshawar, University of Peshawar, University of Engineering and Technology and other institutions on Peshawar university campus to analyze the existing conditions of open spaces and formulate suggestions for their maintenance and improvement. One hundred and sixty respondents of both genders were interviewed through questionnaires survey. The prime focus of the study remained on the areas such as soft & hard landscape of prevailing open spaces, roadsides & sport grounds plantation and suggestions for the improvement of these spaces in greater campus. The findings revealed that a combination of trees and shrubs grown in a single line along with provision of flowers are requested for roadside plantation whereas provision of shrubs is suggested at the boundaries of sport grounds. The use of gardens with variety of shrubs is favored for educational purposes while plantation of trees, shrubs, annual flowers and ground covers in combination is preferred at open spaces. Most of the respondents showed dissatisfaction over the existing maintenance of open spaces. Statues and water features such as water fall and fountain are suggested for open spaces as they may further facilitate the status of hardscape in the overall landscape. Proper plantation and management of softscape as well as hardscape are highly recommended which would optimistically improve the current status of the open space.

## **Introduction**

The greater University campus includes University of Peshawar, NWFP Agricultural University Peshawar, NWFP University of Engineering & Technology Peshawar and affiliated colleges such as Medical, Islamia Colleges (now Universities) and Pakistan Forest Institute. The greater campus is geographically located about 15Km to the west of Peshawar city on main university/Jamrud road. The University of Peshawar was established in 1950, other two universities (Agricultural and Engineering) which were constituent Faculties of Peshawar University were raised to university status in 1981. Very recently (2008) Medical College and Islamia College are upgraded to the status of independent universities. These are the only five campuses of the world, which are situated in one premises with clear line of demarcation. The greater campus has various departmental buildings, residential halls and colonies. The number of academic as well as residential buildings has increased tremendously over a period of time, which is further boost up in the last decade. Except Agricultural University all other universities are short of open spaces mainly because of their locations. The total area of the greater campus is approx. 1150 acres which comprises of 515 acres of academic buildings and 495 acres open spaces including sports grounds, lawns, gardens, parks and roads (Jabeen, 2001).

Open space and green belts are important features of any university to cater various needs. Brown *et al.*, (2009) experienced that open spaces are decreasing rapidly due to construction and infrastructural activities in a locality. Open spaces offer relief from the psychological stresses of institutional buildings. Active interactions with nature were related to improved psychological and physiological health, including increased self-

esteem and reduced stress levels (Cammack *et al.*, 2002; Waliczek *et al.*, 2005). The World Health Organization (Anon 2001) estimates that depression and depression-related illness will become the greatest source of ill-health by 2020. Wezle *et al.*, (1992) stated that open spaces provide opportunities for pleasure, recreation, human encounters, social activities and communal celebrations, thus playing a crucial role in welfare of the people who work and live there. Gadet (1992) reported that public spaces can be utilized for organizing different sport events, seminars, workshops and trainings ultimately contributing in the development of the community.

As the universities are expanding rapidly, the first victim to shrink are the open spaces. The once large open spaces on the greater university campus have been consumed by construction of academic and residential blocks. It is stated that poor green nature means reduced mental well-being, or at least less opportunity to recover from mental stress (Pretty *et al.*, 2004). A decrease in natural green environment is negatively effecting human well being. Simultaneously, the existing open spaces are also not maintained the way they deserve to be. Singh (1991) found that Lucknow is losing this image because of haphazard urban development due to non-sustainable development policies and lack of restoration through bio- aesthetic planning.

The current study aims to enquire from the students of greater campus about the present status of open spaces and to make recommendations for improving the existing open spaces for better environment.

## **Materials and Methods**

Students from all over the greater campus were randomly selected as respondents to represent the whole campus. Data was collected by means of questionnaire at mutually understood time in the premises of various departments and colleges. A total of 160 questionnaires were distributed among the respondents in the presence of the researchers and after a week time, they were recollected. 150 questionnaires out of 160 distributed were returned with a response rate of 94%. The respondents were already selected students from Departments of Botany, Environmental Sciences & Management, Zoology, Biotechnology, Horticulture, Agronomy, Soil & Environmental Science, Extension, Pakistan Forest Institute, University of Engineering, Home Economic College for Women, Khyber Medical College and Islamia College Peshawar. The main theme of the distributed questionnaires was to comment for different aspects as follows:

- a. Roadside Plantation: Preferred plants, seasonal flowering plants, preferred pattern of plantation and suggestions for the improvement.
- b. Sports Grounds: Preferred plants along the boundary and suggestions for the improvement of sport grounds.
- c. Gardens: Preferred hard features in open spaces, provision and types of statues in landscape and suggestions for the improvement.
- d. Soft Landscape: Provision of ground covers in green spaces, preferred type of flowers and suggestions for the improvements.

The data collected through questionnaire study was analyzed on percentage basis, which is presented in the form of tables and figures and discussed for further clarification.

## Results and Discussions

The results revealed are presented and discussed under following two major headings.

### A. Soft landscape

**a. Roadside plantation:** Plants grown on roadside not only add beauty but also reduce pollution caused by omission of vehicles. Table 1 reflects that 66.6% of the respondents preferred a combination of trees and shrubs followed by 24.6% of the respondents, who prefer only trees; while 8.6% of the respondents preferred shrubs along roadside. Human nature likes change in everything including green belts and a combination of different trees and shrubs were more satisfying. Parsons *et. al.*, (1998) revealed that plantation along road side improves recovery from stress while driving along highways. Similarly green spaces can also act as sink for various pollutants in the atmosphere (Roseland, 2005). Flowers were also liked by majority of the respondents (70%) along roadside whereas only 30% of the respondents showed reluctance to it. Flowers are always attractive and pleasing that improves mental health.

As for as planting pattern is concerned, it was seen that 46.66% of the respondents favored single line of plants on roadside while 42% desired a combination of plantation. Only 4.6% of the respondents like to have multi lines of trees and shrubs. This may be due to the reason that simple appearance of plantation in an area attracts more attention of the visitors than complex multi line plantation.

Proper plantation for open spaces improvement was suggested by 38% of the respondents; while 4.6% suggested plantation of hedges or fences for improvement and protection. Proper Plantation usually refers to Plantation which is always a monoculture over a large area and does not include extension, it also means that naturally occurring stands of plants that have economic value (Wikipedia, Encyclopedia). A combination of trees and shrubs dotted with flower beds will provide a better change and further improves the appearance of existing open spaces.

**b. Sports grounds:** Majority of the respondents (51.3%) advocated shrubs at the boundary of sport grounds (Table 2), followed by respondents percentage, who desires either for trees (20%) or a combination of both trees and shrubs (22.6%), while only 6.6% of respondents liked a mixture of trees, shrubs and flowers. It is obvious that ground borders need low height plants like shrubs that facilitate watching games from outside. Beer & Wezle (1992) stated that sensibly designed open space can give people a sense of identity and territory. In support Bolitzer & Netusil (2000) reported open spaces such as public parks, golf courses and sport grounds have a significant effect on the social status and property sale value of a locality.

Table 2 further indicates that proper plantation of shrubs at the boundary of sport grounds is suggested for improvement by a large number (55.4%) of the respondents while (33.3%) of the respondents proposed proper management for the improvement of plantation. Burgess *et al.*, (1998) identifies a great need for diversity of both natural settings and social facilities within green spaces to improve the quality of life of citizens. Thus growing shrubs on boundaries of sport grounds can improve the utility and uniformity of sport grounds.

**Table 1. Preference for type and Pattern of plants and flowers and suggestions for the improvement of existing roadside plantation.**

<b>Respondents views</b>	<b>No. of respondents (%)</b>
<b>Plants preference</b>	
Combination of shrubs and trees	100 (66.60)
Trees	37 (24.60)
Shrubs	13 (8.60)
<b>Total</b>	<b>150 (100)</b>
<b>Preferred pattern of planting</b>	
Single line of shrubs	70 (46.60)
No multi lines of shrubs	63 (42.00)
Multi lines of trees and shrubs	7 (4.60)
<b>Total</b>	<b>150 (100)</b>
<b>Provision of seasonal herbs</b>	
Yes	105 (70.00)
No	45 (30.00)
<b>Total</b>	<b>150 (100)</b>
<b>Suggestions for the improvement</b>	
Provision of proper plantation	57 (38.00)
Proper management	56 (37.30)
Provision of hedges or fences	7 (4.60)
No response	30 (20.00)
<b>Total</b>	<b>150 (100)</b>

**Table 2. Preference for plants and suggestions for the improvement of existing plantation around sports grounds.**

<b>Respondents views</b>	<b>No. of respondents (%)</b>
<b>Preferred plants</b>	
Shrubs only	77 (51.30)
Combination of shrubs and trees	33 (22.60)
Trees only	30 (20.00)
Tree + shrubs + flowers	10 (6.60)
<b>Total</b>	<b>150 (100)</b>
<b>Suggestions for the improvement</b>	
Proper plantation	83 (55.40)
Proper management	50 (33.30)
No response	17 (11.30)
<b>Total</b>	<b>150 (100)</b>

**c. Garden:** Table 3 depicts that shrubs were preferred by a large number (42%) of the respondents, followed by (34.7%) of the respondents showing taste for trees, 16.7% choose creeper roses while only 6.6% of the participants proposed tree roses at the boundary of gardens. The reason for preferring shrubs may be due to its low height, uniform shape and trimming in to desired shapes with better viewing from outside. Boyer *et al.*, 2002 recorded a significant improvement in quality of life, physical activity, social activity, and self-esteem for participants in the Texas Master Gardener program.

Majority of the respondents (56.7%) were of the opinion that garden can be best used for educational purpose i.e., students should take some of their classes in garden. Natural areas have a restorative effect on college students and improve their emotional well-being (Korpela *et al.*, 2001). This practice would not only help in providing an opportunity for relaxation and refreshment to the students but also strengthen their attitude towards studies. Least number of respondents (6.6%) argued that gardens should be close for all the visitors after specifying opening and closing times.

Proper management of the gardens were suggested by majority of the respondents (40%) and (25.3%) of the respondents desired for seating arrangements, 16% of the respondents asked for proper boundary plantation, 12.7% of the respondents requested for proper lighting (Table 3). Burgess *et al.*, (1998) concluded that the most highly valued open spaces are those which enhance the positive qualities of urban life providing a variety of opportunities, physical settings, sociability and cultural diversity. The facts reflecting the idea of growing shrubs at the boundary of gardens with seating and lightning arrangements and utilizing them for educational purpose. It would positively boost the efficacy and services of gardens for the visitors. If grass is not mowed regularly and other cultural practices such as weeding, irrigation, fertilization etc not undertaken properly, gardens will loose their attractiveness as well as users.

**d. Green spaces:** Table 4 shows that a combination of trees and shrubs are preferred by 44.6% of respondents in green spaces, followed by 34% preferring only shrubs and 21.3% of the respondents fancied only trees in green spaces. Provisions of ground covers are also appreciated by overwhelming majority (88.7%). Trees, shrubs and ground covers provide an assortment to the landscape that always attracts human nature by varietal display of plants. Nature and living things tend to make most people feel happy and attract them (Kellert & Wilson, 1993; Maller *et al.*, 2002). Another study have shown that people experience views of nature as beautiful and beneficial to their health (Ulrich, 1993). Annual flowers are proposed by 49.3% of the respondents in green spaces followed by 28% who opted for the provision of perennial flower and 22.6% of the respondents choose biennials. Annual flower provides a mass of colors and replicated every year in any desired place, color and type. Additionally their placing can also be changed as per season.

Table 4 further reveals that 34.6% of the respondents suggested proper management for improvement of green spaces followed by 20% of the respondents who asked the provision of more plantation as suggestion for further improvement. The percentage reflects a concept that there is enough plantation but management is lacking. A study explained that planting trees and using alternative ground cover in open spaces can enjoy lower water, energy, and maintenance costs (Roseland *et al.*, 2005). Thus there is a dire need to improve the existing green spaces. It was further suggested that proper fertilization, weeding, hoeing, irrigation might help in the improvement of open spaces.

## **B. Hard landscape**

Table 5 indicates that 54% of the respondents choose waterfall as a crucial hardscape feature, followed by 24.6% who desired for fountains and 10% preferred fish pond. Waterfalls are aesthetically visual and more attractive with sounding water, relieving mental tension by creating a pleasant cool satisfaction. Morinaga *et al.*, (2003) concluded that visual appearance and low sound frequency of waterfall makes the watersides the most attractive place in a landscape.

**Table 3. Preference for plant types at the garden boundary and suggestions for the best use and improvement of gardens.**

<b>Respondents views</b>	<b>No. of respondents (%)</b>
<b>Preferred plant types</b>	
Shrubs	63 (42.00)
Trees	52 (34.70)
Creeper roses	25 (16.70)
Tree roses	10 (6.60)
<b>Total</b>	<b>150 (100)</b>
<b>Suggestions for the best use</b>	
Educational purpose	85 (56.70)
No response	34 (22.70)
Commercial purposes	21 (14.00)
Timing of entrance	10(6.60)
<b>Total</b>	<b>150 (100)</b>
<b>Suggestions for the improvement</b>	
Proper management	60 (40.00)
Proper sitting places	38 (25.30)
Proper boundary plantation	24 (16.00)
Proper lighting	19 (12.70)
Construction of statues	09 (6.00)
<b>Total</b>	<b>150 (100)</b>

**Table 4. Provision of ground covers, preferred plant and flower type and suggestions for the improvement of green spaces.**

<b>Respondents views</b>	<b>No. of respondents (%)</b>
<b>Provision of ground covers</b>	
Willingness	133 (88.70)
Reluctance	16 (11.30)
<b>Total</b>	<b>150 (100)</b>
<b>Preferred plant type</b>	
Combination of shrubs and trees	67 (44.60)
Shrubs only	51(34.00)
Trees only	32 (21.30)
<b>Total</b>	<b>150 (100)</b>
<b>Preferred flower type</b>	
Annuals	74 (49.30)
Biennials	42 (28.00)
Perennials	34 (22.60)
<b>Total</b>	<b>150 (100)</b>
<b>Suggestions for the improvements</b>	
Proper management	52 (34.60)
No response	42 (28.00)
Proper plantation	30 (20.00)
More flowering shrubs and trees	20 (13.40)
Multi-color seasonal flowers	06 (4.00)
<b>Total</b>	<b>150 (100)</b>

**Table 5. Preferred hard features, construction of statues, statues types and suggestion for the improvement of hard landscape.**

<b>Respondents views</b>	<b>No. of respondents (%)</b>
<b>Preferred hard features</b>	
Water falls	81 (54.00)
Fountains	37 (24.60)
Fish ponds	15(10.00)
Lily ponds	05 (3.30)
Patios	04 (2.60)
Cemented structures	8 (5.30)
<b>Total</b>	<b>150 (100)</b>
<b>Provision of statues</b>	
Willingness	96 (64.20)
Reluctance	54 (35.80)
<b>Total</b>	<b>150 (100)</b>
<b>Preferred types of statues</b>	
Agricultural related statues	124 (82.60)
History related statues	26 (17.30)
<b>Total</b>	<b>150 (100)</b>

Provision of statues is recommended by 64.2% of the respondents while 35.8% disapproved the idea (Table 5). Agriculture related statues are proposed by 82.6% respondents in comparison to history related statues preferred by 17.3% respondents. It might be due to the reason that the agriculture related statues relates to nature and human psychic always respond to nature. The other possible reason might be that Agricultural students were more willing to make such suggestions as they see every thing from agricultural point of view. Furthermore statues used for worships in Hindu religion are forbidden in Islam and that's why it was not a preferred option. Thus analytically, application of waterfall, fountains along with normal statues would further develop the hard features of a landscape and additionally improve the status of open spaces.

### **Recommendations**

Following recommendations are suggested on the basis of the present findings for the improvement of open spaces on Greater Campus, Peshawar NWFP, Pakistan.

A combination of trees, shrubs and flower beds need to be grown along roadsides. Shrubs might be planted at the boundary of garden and sport grounds and the garden needs to be used for educational purpose. Provision of water features such as water fall and fountain along with statues at proper location are suggested through out open spaces in greater campus.

### **References**

- Anonymous. 2001. World Health Report. Geneva.
- Beer, A.R. and F. Wezle. 1992. Open space and the university: towards a new landscape strategy. Report. Department of landscape. University of Sheffield.
- Bolitzer, B. and N.R. Netusil. 2000. The impact of open spaces on property values in Portland, Oregon. *Jour. of Envir Management*, 59(3): 185-193.

- Boyer, R., T.M. Waliczek and J.M. Zajicek. 2002. The master gardener program: Do benefits of the program go beyond improving the horticultural knowledge of the participants? *HortTechnology*, 12(3): 432-436.
- Brown, T.J., Thompson and J. Colleti. 2009. Valuation of open space and conservation features in residential subdivision. *Jour. of Environmental Management*, 90(1): 321-330.
- Burges, J., C.M. Harrison and M. Limb. 1988. People, Parks and the Urban Green: A study of popular meanings and values for open spaces in the city. *SAGE Journals*. 25(6): 455-473.
- Cammack, C., T.M. Waliczek and J.M. Zajicek. 2002. The Green Brigade: The effects of a community-based horticultural program on the self-development characteristics of juvenile offenders. *Hort. Technology*, 12: 82-86.
- Cherwell District Council. 2006. Open space, sport and recreational facilities needs assessment audit and strategy.
- Gadet, J. 1992. Green and the recreational function of public spaces. *Green.*, 48(1): 0-13. (CAB Abst: AN: R04263).
- Kellert, S.R. and E.O. Wilson, (editors). 1993. *The Biophilia Hypothesis*. Washington, DC: Island Press.
- Korpela, K.M., T. Hartig, F.G. Kaiser and U. Fuhrer. 2001. Restorative experience and self-regulation in favorite places. *Environment and Behavior*, 33(4): 572-589.
- Maller, C., M. Townsend, P. Brown. 2002. *Healthy parks healthy people*. Melbourne: Deakin University and Parks Victoria.
- Morinaga, M., S. Aono, S. Kuwano and T. Kato. 2003. *Physiological evaluation of waterside space using Audio-visual information*. Baywood Publishing Company. Inc: 185-194.
- Nusrat, J. 2001. *Improvement of open spaces on university campus*. MSc Thesis. Department of Horticulture. NWFP Agricultural University. Peshawar.
- Parsons, R., L.G. Tassinary, R.S. Ulrich, M.R. Hebl and M. G. Alexander. 1998. The view from the road: Implications for stress recovery and immunization. *Journal of Environmental Psychology*, 18: 113-139.
- Pretty, J., M. Griffin and M. Sellens. 2004. Is nature good for you? *Ecos*, 24: 2-9.
- Roseland, Mark, Sean Connelly, David Hendrickson, Chris Lindberg, and Michael Lithgow. 2005. *Toward Sustainable Communities Resources For Citizens And Their Governments*. New York: New Society.
- Singh, S. 1991. Lucknow: A city of gardens in distress. *Tourism Recreation Research*, 16(2): 52-54.
- Ulrich, R.S. 1993. Biophilia, biophobia and natural landscapes. In: *The biophilia hypothesis*. (Eds.): S.R. Kellert & E.O. Wilson. Washington, DC: Island press.
- Waliczek, T.M., J.M. Zajicek and R.D. Lineberger. 2005. The influence of gardening activities on consumer perceptions of life satisfaction. *HortScience*, 40(5): 1360-1365.

(Received for publication 8 March 2009)