Pak. J. Agri. Sci., Vol. 53(4), 885-891; 2016
ISSN (Print) 0552-9034, ISSN (Online) 2076-0906
DOI:10.21162/PAKJAS/16.5128
http://www.pakjas.com.pk

ASSESSMENT OF ROADSIDE LANDSCAPE UP-GRADATION: A CASE STUDY OF CANAL ROAD, FAISALABAD

Junaid Iftikhar[1,*], Iftikhar Ahmad[1,*], Muhammad Asif[1], Muhammad Qasim[1], Atif Riaz[1] and Tanvir Ali[2]

[1]Institute of Horticultural Sciences, University of Agriculture, Faisalabad, Pakistan; [2]Institute of Agricultural Extension and Rural Development, University of Agriculture, Faisalabad, Pakistan.
[*]Corresponding author's e-mail: iftikharahmadhashmi@gmail.com; junaidiftikhar@outlook.com

A field and social survey was conducted to assess the effectiveness and visual quality of roadside landscape planning at canal road, Faisalabad, as landscape assessment is an important tool to check qualities and flaws of a landscape planning and proposed design for a place. In the field survey, previous and new vegetation was studied and an inventory of plantation was prepared, while for social survey, questionnaires were developed for residents and officials to acquire relevant information regarding their perceptions on environmental improvement, property value enhancement, encroachment control, health benefits, pollution control, and care and management of roadside plantation. The total sample size was 200 respondents, 100 from each side of canal, viz. east and west side. Collected data were analyzed statistically using Statistical Package for Social Sciences (SPSS; Version 11, 2003). Results of the study showed that majority of respondents, 94.5%, agreed that environment was improved in the vicinity, 68% of respondents agreed that pollution has reduced, 95.5% of respondents agreed that encroachment was controlled and 97% of respondents observed that property value was increased in the surroundings as a result of landscaping and plantation in roadside green spaces. Majority of respondents (91.5%) also believed that these improvements had positive impact on human health. Regarding public awareness about plantation, only 16.5% were aware and majority (83.5%) of respondents was not aware of type of plantation installed in the green spaces. About two-third (65%) of respondents noticed problems in the recently developed roadside green spaces, out of which majority assessed daily maintenance, development and management as major issues, while lack of irrigation system, labor, resources and machinery was reported by developers and landscape architects. However, the impact assessment of recent landscape improvements revealed that development of green spaces and proper plantation along the roads impart highly positive impact on environmental, social, health and economic status of an urban community.
Keywords: Green spaces, air pollution, conversant design, urban community.

INTRODUCTION

Landscape assessment refers to an evaluation to ensure landscape quality and proper planning before execution of a landscape project and its impact assessment afterwards, which is essential to know about the achievement of objectives according to plan and positive and negative aspects of the design. Landscape quality and viability of towns and cities is fundamentally dependent on the designing, execution, management and maintenance of the urban green spaces (Younis *et al*., 2002). Landscape impact on different aspects of human well-being is evident from a number of social, economic, ecological, physical and psychological benefits acquired by diverse landscape features (Roger, 1994; Iamtrakul, 2005; Riaz *et al*., 2012). Development of healthy and quality life in the communities of urban and rural areas is mainly influenced by a conversant design of urban and rural landscapes (Simonic, 2006).

Establishment of green spaces along traffic corridors gives natural character to our towns and cities with beautiful flowers, attractive colors and eye-catching shapes, forms and textures. A visual glance of continuance of greenery from countryside to city in the form of "Green Corridors" is given by roadside green spaces (Younis *et al*., 2008). Automobiles are the main reason of air pollution in the cities and green spaces along the roads can be effective to control air pollution, serving as wind breaks and reducing glare from oncoming headlights through dense plantation in central strips between major highways (Ahmad, 2000; Younis *et al*., 2008). A number of environmental benefits are provided through installation of such green spaces. Plantation of trees along the roads is proved to be helpful in trapping and absorbing pollutants, incorporating fresh air in the vicinity and minimizing temperature (Grahn and Stigsdotter, 2003). Green spaces in urban areas offer good health and well-being of community residents through improving quality of atmosphere, providing more chances for healthy activities in daily life and opportunities to come closer to the nature (Takano *et al*., 2002).

Green spaces along the countryside and green belts within the city offer numerous benefits for all aspect of human life and different biological, personal, communal and health benefits are resulted through human contact with nature (William and Jones, 1990). Guite *et al*. (2006) also concluded that environment of surrounding and mental wellbeing are strongly associated together and green spaces reduced stress and proved helpful as an escape facility from noise and overcrowding. People get pleasure in their leisure time from these landscaped areas, which provide recreation along with several other amenities to the nearby residents (Iamtrakul, 2005). Psychological effects of landscape are experienced across the world and it is proved to be an excellent tool in generating positive responses (Khan *et al*., 2005).

Faisalabad is the biggest revenue generator city of Pakistan (Younis *et al*., 2008). It is an industrial city and known as Manchester of Pakistan, mainly due to the presence of a large textile industry and market but due to industrialization and urbanization, this city is facing many problems including pollution, over population and health issues as well as significant city sprawl. Previously, there were a small number of green spaces in the city but with the passage of time; government started developing green spaces in the housing societies and along the roads. Canal road is one the busiest and important road of city as most of the educational institutes, offices of multinational companies, hotels and restaurants, banks, telecommunication brands and automobile showrooms are situated on this road as well as it connects the eastern side of the Faisalabad with the rest of city so a well-planned landscape was required to increase its aesthetic value. District government has improved the landscape designs with the collaboration of Institute of Horticultural Sciences, University of Agriculture, Faisalabad, for up-gradation of area's beautification.

The objectives of present study were to evaluate the current landscape development and its impact on neighboring community as well as significance of landscaping and roadside green spaces in social, environmental and economic uplifting of adjacent societies and delivering different health benefits to the human beings. Additional objectives were to be acquainted with the public preferences about plant selection for green spaces along the roads and their awareness about existing plant selection of recent landscape project, understanding the problems faced by the neighboring community in recently developed green spaces along the roads and their views about responsibility of development, care and maintenance of green spaces along the roadsides and to suggest some recommendations for further improvement of landscape and existing roadside plantation.

MATERIALS AND METHODS

***Study area*:** The present study was conducted at Faisalabad canal road starting from Nusrat Fateh Ali Khan underpass previously called Abdullahpur square up to Gatwala square, which is 11 km long two-way avenue. The reason of selecting this site was recent execution of landscape by City District Government in green spaces along this road after the extension of canal road up to three lanes and being among the very few premium roads of the city.

The study was accomplished in two phases; field survey and social survey. Field survey was carried out to be familiar with the present status of the landscaping and to evaluate the present conditions of the landscaped green spaces (inner and outer belts) along the road. An inventory of plantation along the roadside was also prepared to be aware of the planning and designing strategies of current landscape, while social survey was conducted with the help of a survey questionnaire.

***Sampling*:** The total sample size was 200 respondents, including 100 respondents from east canal road and 100 from west canal road. The respondents were interviewed on the basis of convenience sampling. Interviews were also conducted from government officials and Landscape architects/developers, were involved in this landscape project to further elaborate the designing strategies and planning of current landscape. Interviews were conducted using semi structured format.

***Data collection*:** Data were collected with the help of a structured questionnaire developed in English (also translated into Urdu) to gather required information, which contained both open as well as close ended questions. Questions asked from respondents were personal, liking/disliking, dichotomous, contingency, opinion and management questions about recent landscape execution along the road. The questionnaire was structured on the basis of questions regarding opinion of respondents about the present condition of the landscape, enhancement in property value, improvement in environment as well as significance of development and management of green spaces along the roads. Data were collected from residents in the early morning, noon and evening because majority of the respondents were available at different working hours of the day and it was stratified according to the following values: Age, profession, education, mode of travel on the road and frequency of visit.

***Pre-testing*:** To ensure reliability and validity, a preliminary test was conducted to examine the questionnaire. After pre-testing, questions were restructured and modified accordingly to enhance the workability of the tool.

***Data analysis*:** Data collected from respondents were statistically analyzed using SPSS (Statistical Package for

Social Sciences, Version 11, 2003). Chi-square test was used for non-parametric population and nominal variables and data were analyzed at 5% significance level. The obtained results were represented as tables, plates and graphs. Categories of data were also worked out in the present study. The percentages were calculated by following formula: Percentage = F / N * 100 (F = Absolute Frequency, N = Total number of respondents/cases). Chi-square test was applied to examine association between expected and observed response. Chi-square was computed by following formula: Chi-square = $\sum (O-E)^2/E$ (O = Observed value, E = Expected value, $\sum$ = Total sum).

RESULTS AND DISCUSSION

***Socio-economic characteristics*:** Human attitude towards the realities of life is significantly affected due to socio-economic characteristic such as age, sex, education and profession of the respondents. A considerable difference among opinions and perceptions of youngsters and people of other age groups was recorded. Similarly, the role of education and profession was also well accepted and documented. The studies revealed that 37.5% of the total respondents belonged to the age up to 25 years, 28% were between 26-35 years, 18% were between 36 to 45 years and remaining 16.5% were above 45 years of age (Table 1). For gender of the respondents, majority (94.0% of the total respondents) was male and only 6.0% were female due to the presence of business community in which role of women was limited. There was abundance of automobile showrooms and workshops, small merchant shops, property dealing agencies and trading offices, where owners and employees were male. Regarding education of respondents, none of the respondents were illiterate, 14.0% were primary-middle, 21.0% were matriculation, 21.0% were intermediate and 44.0% had graduation or higher education. The distribution of respondents according to profession indicated that 32.0% of respondents were doing private job, 2.0% were government employee, 40.2% had their own private businesses, 12.5% were students, 5.5% were unemployed and 7.5% of respondents were involved in other professions such as lawyers, vendors etc. (Table 1).

***Respondents' satisfaction with respect to environmental, health, social and economic benefits*:** Respondents were asked about their satisfaction level regarding different aspects contributing towards environmental up-gradation of the adjoining community. Their perception on impact of landscape up-gradation on surrounding community was studied through their opinion on present condition of green spaces, which was investigated as agreed or disagreed. Majority of respondents (94.5%) agreed that recent improvements in the landscape of roadside green spaces played an important role in environmental improvement in the vicinity, while 5.5% of respondents disagreed. Respondents' satisfaction was further analyzed through additional question on different environmental benefits, acquired as a result of these improvements. More than half of respondents (54.5%) claimed that greenery was increased or they were hopeful that it will increase in future as new plantation was smaller in size at present but after a few years, there will be maximum greenery along the roads, while 45.5% of respondents said that they do not see any increase in greenery. The reason behind this contradiction is cutting of previously planted trees in past, which were large enough to serve the purpose of shade while travelling on the road. This is the reason due to which 52.5% of respondents said that there is no increase in greenery and smoke trapping, while 47.5% said that they see improvement and increase in greenery along with smoke trapping. Majority (55%) of respondents were of opinion that there is no moderation in temperature due to cutting of previously planted trees, which has increased temperature in the surroundings, while 45% of respondents were of view that moderation of temperature was expected in upcoming years.

Table 1. Socio-economic characteristics of the respondents.

Characteristics/Category	Frequency	Percentage
Age of respondents (years)		
Up to 25	75	37.5
26-35	56	28.0
36-45	36	18.0
Above 45	33	16.5
Total	200	100.0
Gender		
Male	188	94.0
Female	12	6.0
Total	200	100.0
Education		
Primary-Middle	28	14.0
Matriculation	42	21.0
Intermediate	42	21.0
Higher education	88	44.0
Total	200	100.0
Profession		
Pvt. Job	64	32.0
Govt. employee	4	2.0
Pvt. Business	81	40.5
Student	25	12.5
Unemployed	11	5.5
Any other	15	7.5
Total	200	100.0

Over half of respondents (54.5%) agreed that glare was controlled, while 45.5% disagreed. Majority of respondents (97.5%) did not discuss any other aspect regarding environmental up-gradation, while 2.5% of respondents said that City District Government is still working on the landscape improvement and developmental work is under process and further improvements are expected in future. The results of this study are in line with the findings of Grahn and Stigsdotter (2003), who reported the similar in their study that a number of environmental benefits are provided through installation of such green spaces.

Majority of respondents (86.5%) agreed that beauty is enhanced in nearby community, while 13.5% disagreed. Moreover, 68% of respondents agreed that pollution is reduced and 32% disagreed. The results are also consistent with the findings of Younis *et al*. (2008), who stated that the development of green spaces along the roads was helpful in enhancing the beauty of area as well as it can also be effective in controlling air pollution, serving as wind breaks and reducing glare from oncoming headlights through dense plantation.

Respondents were asked about health benefits delivered in consequences of landscape up-gradation and results revealed that majority of respondents (91.5%) agreed that these improvements have positive impact on health of human beings, while 8.5% of respondents disagreed. Further questioning on health benefits revealed that according to 62.6% of respondents, roadside plantation was providing mental relaxation, 69.5% of respondents agreed that these improvements were a source of feeling fresh and 90.4% agreed that after these improvements, opportunity for jogging has been increased (Table 2). For promotion of healthy activities in the vicinity after these improvements, 55.6% of respondents agreed and 44.4% of respondents disagreed that up-gradation of landscape promoted healthy activities in the vicinity. These findings were also verified by Takano *et al*. (2002), who reported that green spaces in urban areas offer good health and well-being of community residents through improving quality of atmosphere, providing more chances for healthy activities in daily life and opportunities to come closer to the nature.

Respondents were asked about increase in residents' social interaction as a result of recent improvements in roadside green spaces. The results demonstrated that majority of respondents (69%) agreed that social interaction was increased between people living and working in neighboring communities and along the road. Khan *et al*. (2005) also reported that beautifully landscaped green spaces are an excellent tool in generating positive responses in behavior and health of human being and various psychological effects

Table 2. Respondents' satisfaction regarding various aspects of roadside green spaces development.

Aspects	Yes		No		Total	
	Frequency	%	Frequency	%	Frequency	%
Environmental Benefits	189	94.5	11	5.5	200	100.0
Increased greenery	109	54.5	91	45.5	200	100.0
Improved shade	95	47.5	105	52.5	200	100.0
Trapping smoke	95	47.5	105	52.5	200	100.0
Temperature moderation	90	45.0	110	55.0	200	100.0
Glare control	109	54.5	91	45.5	200	100.0
Other(s)	5	2.5	195	97.5	200	100.0
Beauty enhancement	173	86.5	173	86.5	200	100.0
Pollution control	136	68.0	64	32.0	200	100.0
Health benefits	183	91.5	17	8.5	200	100.0
Mental relaxation	117	62.6	70	37.4	187*	100.0
Feeling freshness	130	69.5	57	30.5	187	100.0
Opportunity for jogging	169	90.4	18	9.6	187	100.0
Promotion of healthy activities	104	55.6	83	44.4	187	100.0
Social benefits	138	69.0	62	31.0	200	100.0
Public walk/talk	100	50.0	100	50.0	200	100.0
Encroachment control	191	95.5	9	4.5	200	100.0
Improved lighting	175	87.5	25	12.5	200	100.0
Economic benefits	193	96.5	7	3.5	200	100.0
Increasing property value	194	97.0	6	3.0	200	100.0
Promoting business	170	85.0	30	15.0	200	100.0
Overall uplifting of area	181	90.5	19	9.5	200	100.0

*17 respondents disagreed with the positive impact of development and improvements in roadside green spaces on health of human beings.

of landscape are experienced across the world. Moreover, majority (95.5%) of respondents agreed that encroachment was controlled. Younis *et al*. (2008) also observed that majority of the respondents acknowledged that parks and green spaces are also very beneficial in controlling encroachment in the local communities. Majority of respondents (87.5%) had their perception that lightening was increased in the area. Respondents were also asked about increase in public walk and talk as a result of recent improvements in roadside green spaces. Half of respondents agreed that these improvements provided places for public walk (Table 2). These results are in line with the findings of Coley *et al*. (1994), who reported that green spaces provide opportunities for greater social interaction, territorial functioning, social relations, neighborliness and friendships.

The perception of respondents about economic improvement was explained by the fact that 96.5% of respondents agreed on economic uplifting of their area and 97% of respondents reported that property value was increased (Table 2). Bell *et al*. (2008) also found that the proximity of houses to the well-managed, aesthetically pleasing green spaces, woodlands and parks increase property values. Majority (85%) of respondents agreed that business was promoted along the roadside as a result of recent improvements in roadside green spaces, while 15% of respondents disagreed. Majority (90.5%) of respondents agreed that they perceive overall uplifting of their area (Table 2). The results of this study are in line to the findings of Harnik and Welle (2009), who reported that urban green spaces enhanced property value, amplified private and public sector business enterprises and significantly promoted investment trends in the city and attracted the financier to the city centers having beautiful and attractive landscapes in their vicinity.

***Respondents' preferences regarding kind of plantation for the roadside green spaces (inner and outer belts)*:** Respondents were asked about their preferences regarding kind of plants to be installed in the roadside green spaces adjacent to canal (inner belts). The results demonstrated that 88.5% of respondents preferred grassy plots in inner belts and 87% of respondents preferred trees, 70% preferred the presence of shrubs, while 77% wanted to see flowering plants in inner belts (Table 3). Results regarding preferences of respondents in outer belts demonstrated that 88.5% of respondents liked grassy plots in outer belts, 96% liked trees, 63.5% liked the shrubs, while 77% were interested to see flowering plants in the outer belts. Moreover, 65.5% of respondents wanted to see parking area in between the outer belts and 47.5% of respondents were interested to see sitting places in the green spaces of outer belts (Data not presented). The results of this study are in line to the findings of Riaz *et al*. (2012), who reported that a large number of people living in urban areas preferred evergreen plants, particularly shady trees along with fruit and flowering trees, while the people from rural areas preferred deciduous trees and fruit trees.

Table 3. Distribution of the respondents according to their opinion about the kind of plants to be installed in the inner and outer belts.

Kind of plantation	Yes		No		Total	
	Frequency	%	Frequency	%	Frequency	%
Preferences in inner belts						
Grassy plots	177	88.5	23	11.5	200	100.0
Trees	174	87.0	26	13.0	200	100.0
Shrubs	140	70.0	60	30.0	200	100.0
Flowering plants	154	77.0	46	23.0	200	100.0
Preferences in outer belts						
Grassy plots	177	88.5	23	11.5	200	100.0
Trees	192	96.0	8	4.0	200	100.0
Shrubs	127	63.5	73	36.5	200	100.0
Flowering plants	154	77.0	46	23.0	200	100.0

Table 4. Distribution of the respondents according to their opinion about who is responsible for the development, care and maintenance of the green spaces along the roadside.

Responsibilities	Private firms		Local government		Local community	
	Frequency	%	Frequency	%	Frequency	%
Establishment	58	29.0	196	98.0	35	17.5
Care and management	91	45.5	194	97.0	81	40.5
Cleaning	63	31.5	188	94.0	54	27.0
Security	56	28.0	185	92.5	25	12.5

***Respondents' opinion about responsibility of development, care and maintenance of the roadside green spaces*:** Respondents were asked that who is responsible in their opinion for development, care and maintenance of the roadside green spaces? Majority (98%) of respondents were of view that establishment was the responsibility of government. Similarly, 97%, of respondents perceived that care and management was the responsibility of local government, while 94% of respondents said that cleaning is also the responsibility of local government. Similarly, 92.5% of respondents were of views that security is also the responsibility of local government (Table 4). The results of this study are in line with the findings of Shaheen *et al*. (2002), who reported that local government along with local community participation can play important role in development and maintenance of green spaces. Olembo and Raham (1987) also reported that trees should be planted and looked after by the people themselves as active participation of the concerned population is the key to success.

***Respondents' opinion about problem(s) in recently developed green spaces along the roads in the study area*:** Respondents were asked about the nature of problems which they have noticed. In response, 9% of respondents said that there is management problem, 8% of respondents claimed that there are some developmental problems, 1.5% of respondents said that damage to public property was noticed, 13% of respondents told about traffic problems, 15.5% of respondents complained about daily maintenance, 10.0% of respondents indicated both management and development, 6.0% of respondents assessed management, development, traffic problem and daily maintenance and 2.0% of respondents talked about other problems (Table 5).

Table 5. Distribution of the respondents according to kind of problem(s) they noticed in recently developed area.

Kind of problems	Frequency	Percentage
Management	18	9.0
Development	16	8.0
Damage to public property	3	1.5
Traffic problems	26	13.0
Daily maintenance	31	15.5
Management and development	20	10.0
Management, development, traffic and daily maintenance	12	6.0
Other(s)	4	2.0

***Respondents' suggestions regarding further improvements in the landscape and existing roadside plantation*:** Respondents were asked about their suggestions about further improvement of this landscape and existing roadside plantation in response of which 24.5% of respondents said that more plantation should be done, 13.5% of respondents said that development should be faster, 7% of respondents said that sewerage line should be installed on both sides of canal road, 4% of respondents said that garbage disposal units should be covered, 4% of respondents said that public park should be established, 3.5% of respondents said that service road should be developed on both sides of canal, 2.5% of respondents suggested for daily maintenance, 2.0% of respondents suggested more traffic signals to be installed on the road, 2% of respondents said that number of bridges and turnover should be increased and 7% of respondents said that proper care and maintenance of landscape should be done. Moreover, respondents also talked about proper leveling of enclaves, installation of solar lights, plantation of shady trees in the green belts and establishment of playgrounds for children in wider outer belts (Table 6).

Table 6. Distribution of the respondents according to their suggestions for further improvement(s) of the landscape and existing roadside plantation.

Suggestions	Frequency	Percentage
More plantation should be there	49	24.5
Development should be fast	27	13.5
Sewerage line should be installed	14	7.0
Garbage disposable	8	4.0
Public park should be made	8	4.0
Service road development	7	3.5
Maintenance daily basis	5	2.5
Traffic signals	9	2.5
Care and maintenance of landscape	14	7.0
Number of bridges and turnover should be increased	4	2.0
Playgrounds for children	5	2.5
Proper leveling of enclaves	2	1.0
Shady trees should be planted	1	0.5
Solar light	4	2.0
Give no suggestion	47	23.5

***Conclusion*:** Landscape assessment of the study area identified actual impact during and after implementation and provided the information for improvement of future interventions and sustainable landscapes. The assessment in the present study have shown a significant positive impact of up-gradation of landscape on the adjacent community by increasing the aesthetic value and providing numerous benefits such as fresh and clean atmosphere, natural beauty, tranquility, psychological relaxation and decrease in temperature of surroundings, pollution control, property

value enhancement and source refreshment for people. Majority of the respondents were young and educated who showed keen interest in the study. Moreover, this research also pointed out many problems faced by community dwellers and landscape architects.

REFERENCES

Ahmad, A.M. 2000. Evaluation of landscape plantation to improve urban environment. M.Sc. Thesis. Institute of Horticultural Sciences, University of Agriculture, Faisalabad, Pakistan. pp.1-4.

Bell, S., V. Hamilton, A. Montarzino, H. Rothnie, P. Travlou and S. Alves. 2008. Green space and quality of life: A critical literature review. Green space, Scotland, Stirling.

Coley, R.L., F.E. Kuo and W.C. Sullivan. 1994. Where does community grow? The social context created by nature in urban public housing. J. Environ. Behav. 29:468-494.

Grahn, P. and U.A. Stigsdotter. 2003. Landscape planning and stress. Urban For. and Urban Gree. 2:1-18.

Guite, H.F., C. Clark and G. Ackrill. 2006. The impact of the physical and urban environment on mental well-being. Public Health 120:1117-1126.

Harnik, P. and B. Welle. 2009. Measuring the economic value of a city park system. Available online with updates at http://www.nrpa.org/NRPA/Parks

Iamtrakul, P. 2005. Walking and cycling behavior within the service area of public parks. J. East Asia Soc. 6:225-240.

Khan, M.A., A. Younis and M.N. Aslam. 2005. Impact of well-planned landscape on producing quality environment for prisoners. J. Agric. Soc. Sci. 1:69-70.

Olembo, R.J. and P.D. Raham. 1987. Urban forestry in two different worlds. Unasylva 39:26-32.

Riaz, A., A. Younis and S. Naveed. 2012. Impact analysis of urban and rural landscapes as perceived by respective communities: a case study of Faisalabad city, Pakistan. Acta Hort. 954:99-108.

Roger, U. 1994. Methods for investigating people plant relationships. People Plant Relationships: Haworth Press, Inc. New York.

Shaheen, I., M. Alamgir, M. Gul and A. Usman. 2002. Perceptions of community of Madina town towards the underdeveloped green space in Madina town. Pak. J. Appl. Sci. 2:1099-1101.

Simonic, T. 2006. Urban landscape as a restorative environment: Preferences and design considerations. Acta Agric. 87:325-332.

Takano, T., K. Nakamura and M. Watanabe. 2002. Urban residential environments and senior citizens' longevity in mega-city areas: The importance of walk able green space. J. Epidemiol. Commun. H. 56:913-918.

William, L.I. and P. Jones. 1990. Natural landscape, psychological well-being and mental health. Landsc. Res. 15:7-11.

Younis, A., A. Riaz, M. Qasim and S. Akhtar. 2002. Development and management of green spaces on Sumundri road, Faisalabad: a case study. Pak. J. Agric. Sci. 39:292-296.

Younis, A., M. Qasim and A. Riaz. 2008. Impact of a well-planned landscape in delivering quality of life to city dwellers. Acta Hort. 775:147-154.