International Journal of Trend in Scientific Research and Development (IJTSRD)
Volume 4 Issue 5, July-August 2020 Available Online: www.ijtsrd.com e-ISSN: 2456 – 6470

Tree Protection on Construction Site - Knowledge and Perception of Polish Professionals

Sakshee Singh[1], Rakesh Sakale[2], Hirendra Pratap Singh[3]

[1]Research Scholar, [2]Professor & HOD, [3]Asisstant Professor,
[1,2,3]Department of Civil Engineering, School of Research & Technology,
People's University, Bhopal, Madhya Pradesh, India

ABSTRACT

The construction industry is the second largest industry of the country after agriculture. Construction activity is an integral part of country's infrastructure and industrial development and is poised for further growth on account of industrialization, urbanization, economic development and people's rising expectations for improved quality of living. It includes hospitals, schools, townships, offices, houses and other buildings; urban infrastructure (including water supply, sewerage, drainage); highways, roads, ports, railways, airports, power systems; irrigation and agriculture systems, telecommunications, etc. Building foundations, sidewalks, sewer lines, and roads can cause numerous changes in the environment. Post construction landscaping such as installing underground sprinklers, laying sod grass, and planting flowers and shrubs can further change the environment. Many of these changes can be devastating to trees. Appropriate engineering and natural (compensation) solutions can often prevent the common problems of tree damage, dieback or removal and are essential during the execution of construction works that expose trees to particular stresses.

The discussion of engineering solutions, such as isolation of the root system zone, education of workers, etc. is provided in this paper. In this case study, the major focus is on the awareness of the people for tree protection at construction site and a survey to know the thoughts of experts, experienced, students over in the form of a survey.

KEYWORDS: *Construction industry, engineering, formal education, trees protection, survey*

How to cite this paper: Sakshee Singh | Rakesh Sakale | Hirendra Pratap Singh "Tree Protection on Construction Site - Knowledge and Perception of Polish Professionals" Published in International Journal of Trend in Scientific Research and Development (ijtsrd), ISSN: 2456-6470, Volume-4 | Issue-5, August 2020, pp.760-762, URL: www.ijtsrd.com/papers/ijtsrd32995.pdf

IJTSRD32995

I. INTRODUCTION

The construction industry is the infrastructure of the infrastructure industry. Construction industry consumes 40-50% of the National Plan outlay and contributes 20% of GDP. Besides, the construction industry generates substantial employment and provides a growth impetus to other sectors through backward and forward linkages. It is essential, therefore, that, this vital activity is nurtured for the healthy growth of the economy[1]. The construction industry comprises establishments that are primarily engaged in the construction of buildings or engineering projects (e.g. highways and utility systems). This may include new work, additions, alterations or maintenance and repairs. Civil engineering is a wide profession that comprises of several specializations including construction, structural, transportation, and environmental engineering[2]. Expertise of each discipline is usually utilized in the accomplishment of projects related to the other disciplines of civil engineering. The construction industry in India and especially in the Madhya Pradesh, by its inherent nature and tremendous infrastructure, is susceptible to potentially dangerous conditions that affect the safety of all personnel working on construction projects and the company. Thus there has been an increase in the number of accident, death and injury during years. Generally, the image of the construction industry in India needs improvement. That is why many native India people do not like working in the construction industry; hence the majority of construction workers are imported from many other countries[3].Safety is one of the obstacles in the direction to developing the construction industry in India. The concern should be addressed along the way to improve the safety performance in the construction industry.

II. Methodology

This paper focuses on the awareness of protection and planning of trees that faces threat due to construction at that place. There are many studies done with regards to the method and steps to take care of the trees and their planning. These studies are from worldwide and focus on different challenges. Several methods are provided to implement proper management regarding this and steps to follow in order to protect trees at construction site. In this case study, the major focus is on the awareness of the people for tree protection at construction site and a survey to know the thoughts of experts, experienced, students over in the form of a survey in which a questionnaire being asked from them. The major objectives to be achieved through this are described below:

- To know and identify the different conditions of construction site and how the number of trees around

them affects the overall project from the experience holder in this field.

- To check for the awareness regarding deforestation due to urban sprawl among the living people from the inexperience few students and experts as well. In this survey locals play a major role along with the experts.
- To suggest possible solution and steps to be taken regarding cutting and protection of trees at construction site.
- To survey and identify the perception of people toward cutting of tress at construction site. In what ways, it affects them, or if there is no impact.

III. Result

In this study, respondents were chosen from the building construction site in four randomly chosen building construction sites of public funded projects in Bhopal district. The 72 respondents whose surveys were used in the study included 40 experienced officials expert in tree protection on construction sites, 10 students of landscape architecture and 22 locals around the construction site. The experienced specialists were further divided according to their profession: officials, work contractors, designers and arborists. The final division of 72 respondents was as follows: students (14%), experienced person (55.5%) which consists of officials (27.77%), work contractors (25%), arborists (2.8%) and locals (30.5%).Below Figure: 1 illustrate the Distribution of respondents

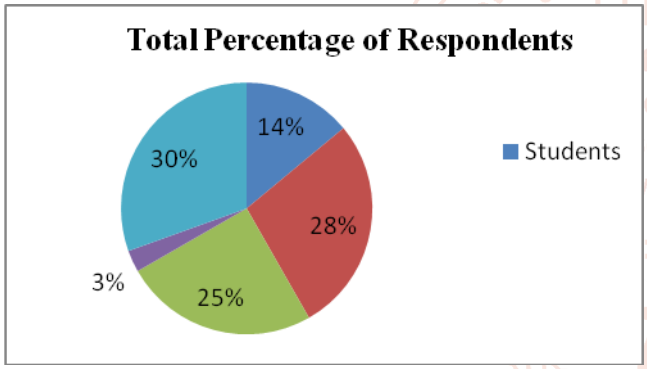

Figure 2: Distribution of respondents

This part of the survey was addressed to the group of 40 respondents having experience in construction projects. In the judgment of 63% of them, any technique of tree protection was applied in less than 60%, and in the estimates of 37% of respondents, in less than 40% of projects in which they took part. Moreover, in the judgment of 50% of the questioned professionals, in over 55% of projects the tree protection applied was insufficient. Below figure 2: illustrated the judgment of 40 experienced officials.

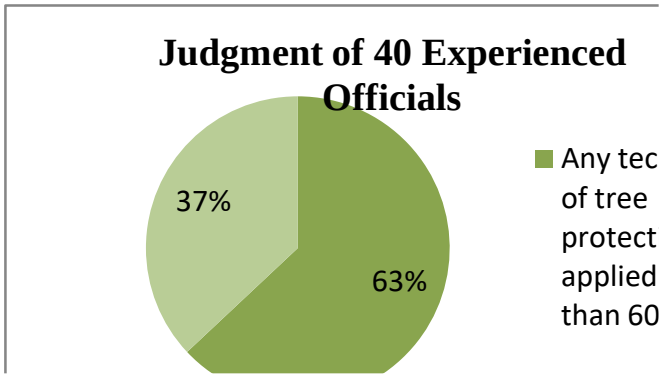

Figure 2: Judgment of 40 Experienced Officials

The mean respondents' estimates of the effectiveness of various methods used to promote tree protection during construction projects are shown in Table 1. The methods which obtained significantly higher responses were "effective enforcement through appropriate penalties system for non-compliance with local or state guidelines", "technical assistance and support of a specialist" and "government incentives such as tax relief". The least effective but still appreciated methods, according to the respondents, were formal (such as studies) and non formal (such as courses, articles in the specialist press) education and "local or state regulations and legal acts".

Table1: Mean assessment of respondents on the areas in which an increase in knowledge would bring them the most benefits.

Area of benefit	Mean estimate of benefit
Design solutions that reduce the negative impact of investments on trees	4.72
Tree protection techniques on the construction site (in the executive phase)	4.72
The condition of trees and its relation to construction work	4.48
Soil condition necessary for the health of the tree	4.36
The cost of protecting the trees	4.28
Benefits of trees / advantages of trees	3.92

Formal education is the only means of promoting tree protection that had different average scores from different professions. This form of passing on knowledge on tree protection is most highly valued by students (mean score 4.17) and least valued by officials (3.41). The mean scores of designers (3.74) and work contractors (3.50) could not be significantly distinguished from either the students' or the officials' scores.

IV. Conclusion and Future Scope

There are many studies done with regards to the method and steps to take care of the trees and their planning. These studies are from worldwide and focus on different challenges.

The conclusions from the research are that the professional maintenance of trees and supervision, which is necessary to provide urban ecosystem services, demands in Bhopal a broad institutional reform and increased funding. The current level of tree protection is not near to satisfactory, which is due to three main factors:

- Firstly, due to a lack of adequate awareness of the value and benefits of trees among homebuyers, developers and professionals involved in the construction process.
- Secondly, due to the general legal regulations and low fines for the destruction of trees.
- Thirdly, due to a lack of sufficient technical knowledge about tree protection on construction sites. It is worth to underline that urban forest management is not consistent. They often face situations when trees, damaged years ago because of construction works, must be felled due to safety reasons.

Further regarding future scope; this study was based on 72 respondents. Therefore, number of respondents can be increased and quality can be improved by taking in more number of professionals and arborists.

REFERENCES

[1] O. State University Extension, "Tree Protection on Construction and Development Sites A Best Management Practices Guidebook for the Pacific Northwest," no. December, pp. 1–18, 2009.

[2] B. Ames and S. Dewald, "Working proactively with developers to preserve urban trees," *Cities*, vol. 20, no. 2, pp. 95–100, 2003, doi: 10.1016/S0264-2751(02)00117-8.

[3] D. P. Purohit, D. A. Siddiqui, A. Nandan, and D. P. Yadav, "Hazard Identification and Risk Assessment in Construction Industry," *Int. J. Appl. Eng. Res.*, vol. 13, no. 10, pp. 7639–7667, 2018, [Online]. Available: http://www.ripublication.com7639.

[4] A. K. Koeser and E. T. Smiley, "Impact of assessor on tree risk assessment ratings and prescribed mitigation measures," *Urban For. Urban Green.*, vol. 24, pp. 109–115, 2017, doi: 10.1016/j.ufug.2017.03.027.

[5] T. Guo, J. Morgenroth, and T. Conway, "Redeveloping the urban forest: The effect of redevelopment and property-scale variables on tree removal and retention," *Urban For. Urban Green.*, vol. 35, pp. 192–201, 2018, doi: 10.1016/j.ufug.2018.08.012.

[6] J. B. Kirkpatrick, A. Davison, and A. Harwood, "How tree professionals perceive trees and conflicts about trees in Australia's urban forest," *Landsc. Urban Plan.*, vol. 119, pp. 124–130, 2013, doi: 10.1016/j.landurbplan.2013.07.009.

[7] C. Y. Jim, "Protection of urban trees from trenching damage in compact city environments," *Cities*, vol. 20, no. 2, pp. 87–94, 2003, doi: 10.1016/S0264-2751(02)00096-3.

[8] E. G. McPherson, J. R. Simpson, Q. Xiao, and C. Wu, "Million trees Los Angeles canopy cover and benefit assessment," *Landsc. Urban Plan.*, vol. 99, no. 1, pp. 40–50, 2011, doi: 10.1016/j.landurbplan.2010.08.011.

[9] D. Mercker, "Protecting Trees during Construction," *Fish.*, no. 7, pp. 1–4.

[10] A. K. Koeser, R. W. Klein, G. Hasing, and R. J. Northrop, "Factors driving professional and public urban tree risk perception," *Urban For. Urban Green.*, vol. 14, no. 4, pp. 968–974, 2015, doi: 10.1016/j.ufug.2015.09.004.

[11] J. M. Grove, D. H. Locke, and J. P. M. O'Neil-Dunne, "An ecology of prestige in New York City: Examining the relationships among population density, socio-economic status, group identity, and residential canopy cover," *Environ. Manage.*, vol. 54, no. 3, pp. 402–419, 2014, doi: 10.1007/s00267-014-0310-2.

[12] T. Bowman and J. Thompson, "Barriers to implementation of low-impact and conservation subdivision design: Developer perceptions and resident demand," *Landsc. Urban Plan.*, vol. 92, no. 2, pp. 96–105, 2009, doi: 10.1016/j.landurbplan.2009.03.002.

[13] C. Y. Jim, "Impacts of intensive urbanization on trees in Hong Kong," *Environ. Conserv.*, vol. 25, no. 2, pp. 146–159, 1998, doi: 10.1017/S0376892998000198.

[14] G. Janse and C. C. Konijnendijk, "Communication between science, policy and citizens in public participation in urban forestry-Experiences from the Neighbourwoods project," *Urban For. Urban Green.*, vol. 6, no. 1, pp. 23–40, 2007, doi: 10.1016/j.ufug.2006.09.005.

[15] R. Hauer, R. Miller, and D. Ouimet, "Street tree decline and construction damage," *J. Arboric.*, vol. 20, no. 2, pp. 94–97, 1994, [Online]. Available: http://www3.uwsp.edu/forestry/Documents/hauer/Publications/Street Tree Decline and Construction Damage.pdf.

[16] M. Suchocka, P. Jankowski, and M. Błaszczyk, "Perception of urban trees by polish tree professionals vs. nonprofessionals," *Sustain.*, vol. 11, no. 1, pp. 1–22, 2019, doi: 10.3390/su11010211.

[17] R. Hasan, N. Othman, and R. Ahmad, "Tree Preservation Order and its Role in Enhancing the Quality of Life," *Procedia - Soc. Behav. Sci.*, vol. 222, pp. 493–501, 2016, doi: 10.1016/j.sbspro.2016.05.140.

[18] M. Błaszczyk and M. Suchocka, "The Tree Valuation Method as a Tool for Supporting Greenway Planning and Development . Case study : Section of Central Highway in Gliwice , Poland," *Urban Agric. Hortic.*, vol. 5, no. 1, 2016.