



Full Length Research Article

CONSTRUCTION POLLUTION AWARENESS OF CONSTRUCTION PRACTITIONERS IN GWALIOR REGION

***Gagnesh Jain, Vaishant Gupta, Sohith Agrawal and Mukesh Pandey**

Department of Civil Engineering ITM University Gwalior, 474005

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ABSTRACT

Environment is hazard severely by too many activities construction is one of them. A construction project in all over the world is a serious cause concern of environmental degradation. It badly affects the environment and ecosystem. Increasing construction site pollution due to increasing construction activities has harmed the environment and human health. For knowing the awareness level of construction practitioners in Gwalior region; a questionnaire based survey in Gwalior region. This survey is conducted on different site engineers, architecture, managers and builders. On the phase of the survey many people haven't hear about the construction pollution. This survey shows that knowledge of construction practitioners about construction pollution is a very big redundant for reducing the construction pollution. If a national agencies help to increases the knowledge of construction practitioners about construction pollution than mitigate the construction pollution impact.

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INTRODUCTION

For the increasing population of the world continuously need to certain area for a livelihood the person and need proper spacing for person is needed to prepare temporary and permanent functional structures for sheltering. For proper structure erection needs to build a structure need proper construction workforce. This sector is used for planning and management of increasing population. But due to certain drawbacks of this sector is always in the news, which is known as construction impact on the environment. Construction impact on the environment has not a new topic, but its famous from the cities many countries like USA, Nigeria, Ghana, Gaza strip are shown in the previous study (Ayarkwa *et al.*, 2014; Ijigah *et al.*, 2013; Zolfgharian *et al.*, 2012; Li *et al.*, 2010 Enshassi *et al.*, 2014; Muhwezi *et al.*, 2012, Tam *et al.*, 2005). In these countries construction impact on the environment has the big cause of concern for many countries. Construction impact on the environment have different way like wastage of materials, uses of natural resources, loss of water during construction activities, loss of vegetation loss of

natural habitat (Ijigah *et al.*, 2013; rizqa *et al.*, 2014; Zolfgharian *et al.*, 2012; Li *et al.*, 2010 Muhwezi *et al.*, 2012). Construction site activities have a big source of generating dust and particulate matter pollution. Particulate matter and construction pollution is responsible for different types of diseases like irritation in eyes nose and throats, skin problem, allergies, sleeplessness hypertension, asthma (Gauderman *et al.*, 2007) , cough cold, increases mortality rate (Vichit-Vadakan *et al.*, 2001) premature death, high blood pressures (Kannan *et al.*, 2009) , cardio vascular diseases, (Health Effect of Particulate matter 2013) heart rate variability (Park *et al.*, 2010) and also increase the risk of mortality of diabetic's person (Brook *et al.*, 2013) problems are responsible for particulate matter. Construction site activities and the preprocessed activities are an important cause of increasing particulate matter in air pollution in the environment. Dust activities like production of cement processes, crushing of aggregates, handling of construction materials, blasting, site clearance, earthmoving, demolishing, and excavation (Ayarkwa *et al.*, 2014) are the main increasing particulate matter generation activities in construction. Site activities, manage by construction manager which headed all activities on the sites. If the study of find out the causes of increasing construction Pollution than there are so many causes like the

***Corresponding author: Gagnesh Jain,**

Department of Civil Engineering ITM University Gwalior, 474005.

awareness problem of construction practitioners, using orthodox technologies of construction, behavioral problem on site workers, using a defective instrument on sites, and budget problems are big redundant to reduce construction pollution on site. But the most effective cause of redundant is awareness of construction practitioners. If increases the awareness of construction practitioners than easily overcome the construction pollution impact. If a manager have a proper idea of the activities and knowledge of activities impact than he guided to the engineers which working on site than this minimize the construction impact. Most of the cases of increasing the impact from site activities responsible are construction practitioners

Environmental impacts from further studies

There are various works on finding the Environmental impacts most hazardous activities on the site. For Knowing and identifying most hazardous activities and impact level of activities, it is used to minimize the impact of construction. A study by WILLMOTT DIXON 2010 that the global pollution that can attrib through buildings are 23 % air pollution, 40% drinking water , 50% ozone depletion, 50% landfill waste, 50% climate changes through gases done by building activities. The condition is more drastic by nature. On this report also finds that the global resource used in buildings. On an approximation uses 45-50% energy uses in buildings, 80% agricultural land destroys for buildings, 60 natural materials are used in building and roads. Construction activities are also responsible for increasing global warming and the production of greenhouse gases. A study by Ayarkwa *et al.*, 2014 that hazardous activities on of construction. His works find that blasting activity is more severe on site and it has more impact on the environment other most severe activities on site clearance, earthmoving demolishing and exaction activities which are responsible for environmental degradation and also the cause of increase global warming for increasing greenhouse gases in the environment. A study by Zolfgharian *et al.*, 2012 that environmental impact assessment of construction sites. On this study, author has divided environmental impacts in to three categories public impacts, ecosystem impact and natural resource impact. In these categories also have sub categories. In this study transportation of natural resource has more severe impacts on the environment. On this category second most severe is production of noise from heavy machine and third most severe impact through dust generation from a construction site on Environment.

MATERIALS AND METHODS

For knowing the awareness level of construction practitioners on site about construction pollution a structured questionnaire survey is prepared and interview was conducted from 40 construction practitioners in Gwalior region. This is basic survey to known the awareness of construction practitioners who are working in Gwalior region. It is section in whole survey in Gwalior region. The normal question which are common from Ijigah *et al.*, 2013, Rizqa *et al.*, 2014; Zolfgharian *et al.*, 2012. The normal question which are question asking in survey are

- Q1. How much have you heard about construction pollution?
- Q2. How much have you done to reduce air pollution on the construction site?
- Q3. What do you think are the main causes of air pollution in your city? Please select all applicable?
- Q4. To what extent is the construction pollution affecting you?
- Q5. Are you aware of the effects we can get from construction pollution?
- Q6. In which of the following ways are you affected? Please select all applicable.
- Q7. Does your company or firm take into account the adverse impacts of construction on the environment?
- Q8. Does your company or firm has an environmental impact assessment system?
- Q9. Does your company or Firm attempt to find a proposal or a practical solution to mitigate the environmental impacts of construction?
- Q10. Have any labors or residents who are living beside the project ever harmed because of the impacts of construction on the environment?
- Q11. Do labors wear a protective respirator masks or proper equipment to protect the Pm 10, Pm2.5pollutants?
- Q12. Have any labors or residents ever complained because of the impacts of construction on the environment (noise-solid waste-dust)?
- Q13. Have you ever suffered personally from the adverse impacts of construction on the environment (noise-dust-pollution)?
- Q14. Are you suffering any of the diseases below?

On the basis of these questions in questionnaire identified the awareness of the construction practitioners which are working in Gwalior

RESULTS

In the survey have done on 41 construction practitioners 30 engineers and 11 architects in Gwalior region. In the questionnaire have 4 sections 1st general information Second and is based on awareness and third on the basis of construction Impact assessment and 4th section is based on construction measures. This paper is based on 2nd section for the awareness of construction practitioners.

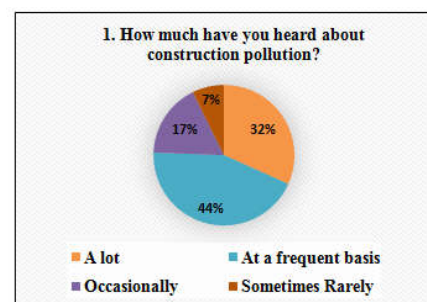


Figure 1.

Fig. 1. In the survey, 32% people have answered they have known more information about construction pollution. The majority of construction Practitioners has answered they know about the construction pollution only on a frequent basis. 17% people answered they know about the construction pollution only on occasionally.7% people say that know about it on rarely

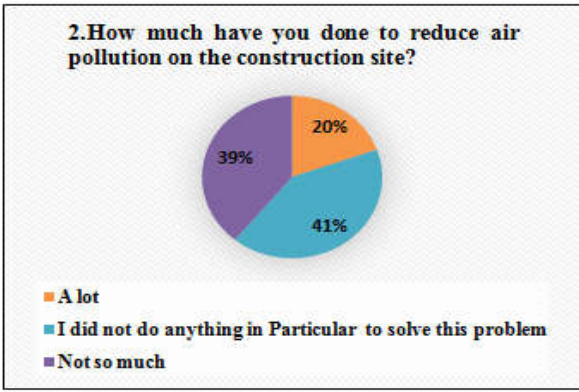


Figure 2.

Fig. 2. On the basis of response in question no.2 only 20% people say that they have lots of work done for reducing the air pollution on site. Majority of the people about 41% say that they did not do anything for reducing the construction air pollution on site. 39% have answered that they did not so much for reducing construction air pollution on site.

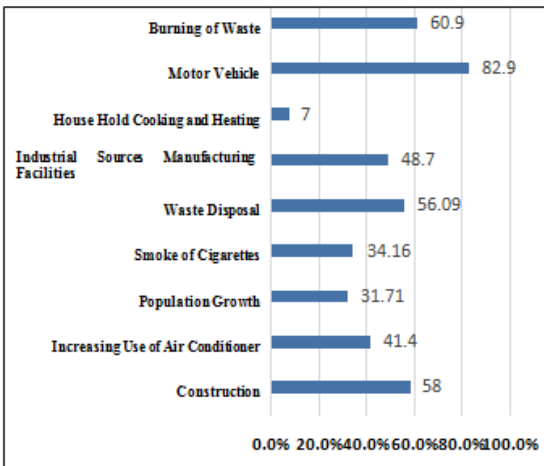


Figure 3.

Fig. 3. A majority of people 83% has answered that the motor vehicle is a source of pollution in Gwalior region. Only 59% people said that the construction is a source of pollution, 56% percent people answer waste disposal, 49% people answer industrial source manufacturing, burning of waste 61% people answered that. On the basis of survey construction is a third pollutant to increase pollution in Gwalior region.

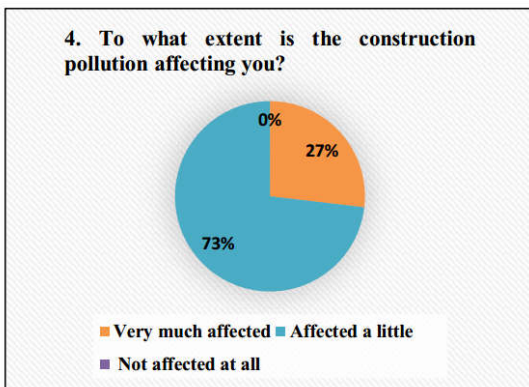


Figure 4.

Fig. 4. Only 23% practitioners have answered that the construction pollution is too much affected. Majority of the people 73% have answered it affected very little.

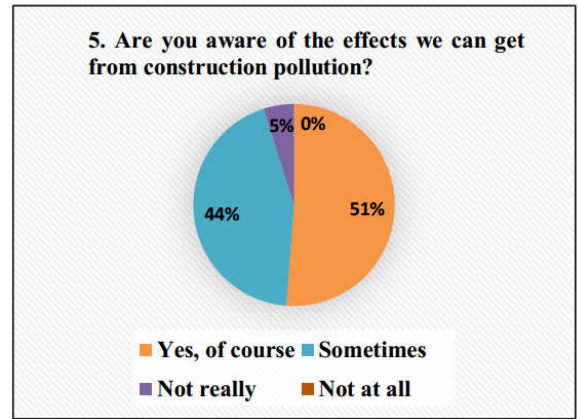


Figure 5.

Fig. 5. Majority of people have known the effects of the construction pollution 51% have answered that they know the effects of the construction Pollution. 44% people answered that it was only on sometimes.

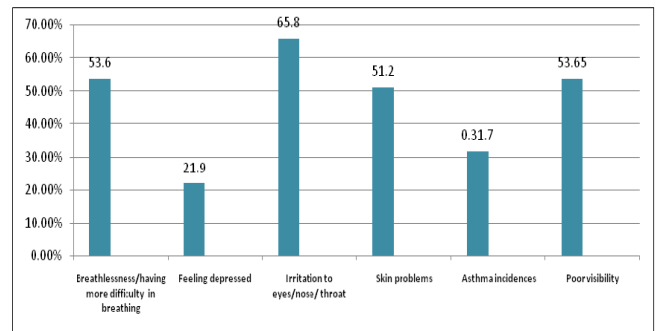


Figure 6.

Fig. 6. The majority of the people 66% have answered that construction pollution on their eyes, nose and throat infection, feeling breathless 54%, 51% people having a skin problem 54% people answered poor visibility symptoms from construction activities.

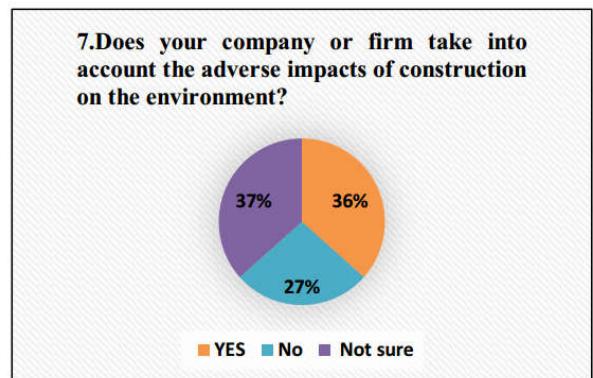


Figure 7.

Fig. 7. In the survey, 36% answered that their company have an account for adverse 4 impacts on the environment and 27% give the answer no and 36% people not sure about the account.

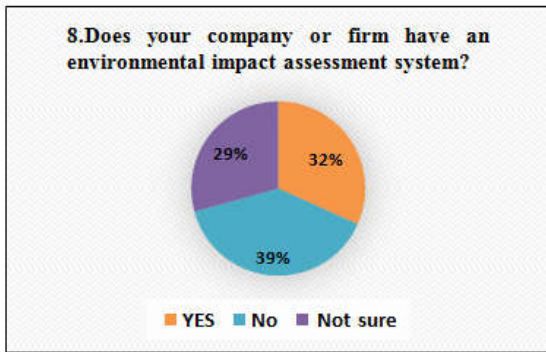


Figure 8.

Fig. 8. 32% people have answered that have an environmental Impact assessment in their company or firm 39% answered that there is no environmental impact assessment system in their company and 29% people have answered that they're not sure about this.

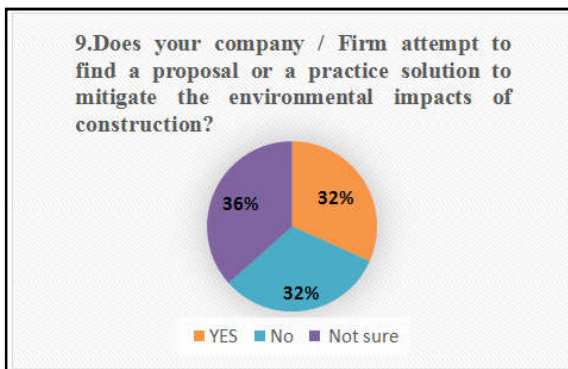


Figure 9.

Fig. 9. Majority of people 32% people is that there have attempted to find a proposal or practice solution to mitigate the environmental impacts of construction 32% people answered no 36% people have not sure about this.

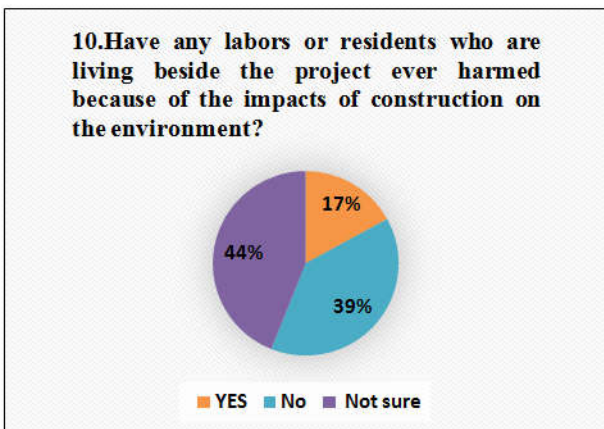


Figure 10.

Fig. 10. Only 17% people have answered yes the labor and resident have answered project harmed the construction pollution who are living beside the project 39% people answered "No" and 44% people have not sure about this.

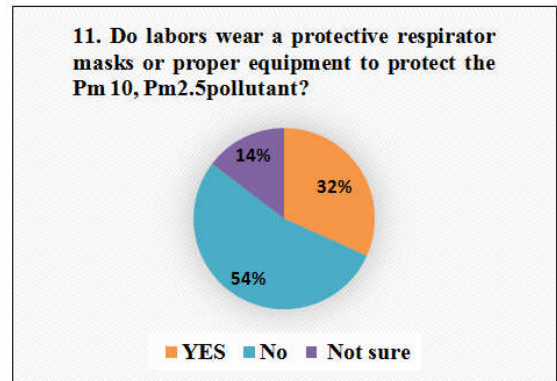


Figure 11.

Fig. 11. 32% people that there company provide the proper respiratory mask for the protection of PM10 and PM2.5 pollutant particle and 54% people have answered "No" and 14% people are not sure about this.

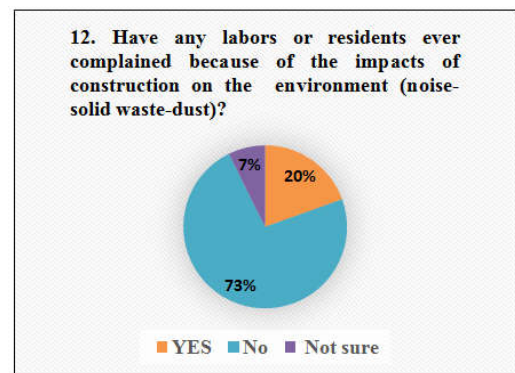


Figure 12.

Fig. 12. Only 20% people have answered yes the labor and resident have complained the impact of the construction pollution who are living beside the project 73% people answered "No" and 7% people haven't sure about this.

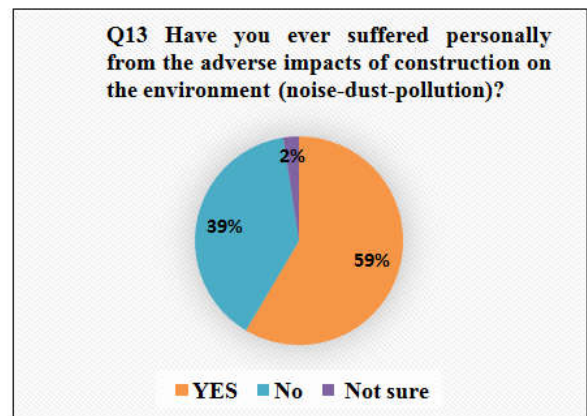


Figure 13.

Fig. 13. Result, 59% have answered that the construction noise, dust pollution is affecting the personally the construction pollution. 39% people have answered "No" that there is no adverse impact and 2% people haven't sure this.

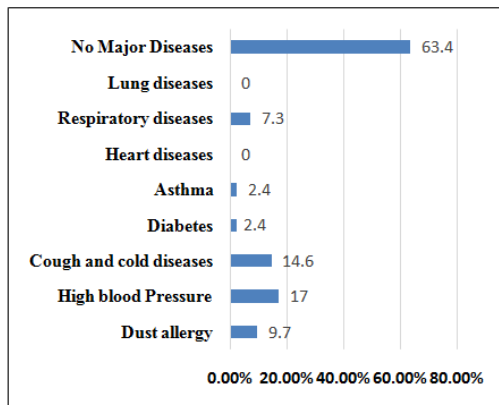


Figure 14.

Fig. 14. The majority of the people 63% have answered that there no major diseases and 17% people have answered that High Blood pressure problem in their body. 15% of people have cough and cold problems, 10% have answered that the dust allergy problems in their body.

DISCUSSION

In the above result clear that the people are irresponsible behavior about the environment only 32% construction practitioners have heard about the construction pollution and the rest of them have less interest in knowing about this. Only 20% construction practitioners have done an activity for reducing construction pollution on the site and 44% people haven't done anything for reduction of air pollution 39% people answered doing not so much work. The above result clear cut the people have less awareness of about the construction pollution impact on the environment and those are knowledge ho do not do their work. On the above figure 14 54% people answered, for no major diseases. Construction pollution impact is long term impact on the human body (Brook *et al.*, 2013; Chen *et al.*, 2015) it effect not a short period of time and their effect is not clearly identified easily these diseases also occurring due to stress and hormone problem and the construction pollution high impact shown on the labors and residents beside side (Bergdahl *et al.*, 2004). Most of the construction practitioners (Engineers, designer) are working office work and their time spent on the field is less. Labors and resident near beside side haven't know their rights and they have taken less medical prescription or check up by doctor so the data on the impact on labors haven't identifying from hospitals. On the case of complaining the people haven't know their rights about construction; so they haven't complain about pollution. In the most of the interview people have shown less interest for answers the question.

Framework for mitigating the impact of construction

In the above result have shown that the perfect picture of construction field practitioners on site.

They have little Knowledge about the impact of construction if the construction practitioner's awareness should be increased than reduces the impact of construction.

It is not an easy task of increasing the awareness of its practitioners need a proper framework for increasing awareness:

- National agencies are making a committee, which should aware the construction practitioner's time to time for the prospective seminars.
- Committee should aware the advance technologies of construction and force to reducing the orthodox method of that should minimize the construction.
- Committee should make proper guidelines and aware the construction practitioners that it is cost effective technology and this technology also help in reducing the impact of construction.
- Committee aware and provide knowledge to the construction practitioners suggested best cost effective method to reduce the impact of construction

Conclusions

In the above result have clear shown the picture of construction practitioners which have less aware of advance technologies and uses only orthodox technology on site. Practitioners haven't invested or less invests for adopting new technology on site. Most of the health related problem occurred mostly on-site labors and nearby residents. Construction pollution problem are skin problems, asthma and other long term diseases in their body. Construction effect shows long time. Its effect haven't identify easily it is particulate matter pollution effects or other effect. Construction pollutions have reduced due to adopted the advance technology of construction, also reduce the budget of construction and the impacts of construction on the environment. Orthodox technologies, using on site are big cause of increasing site pollution. IF companies have made the own environmental Impact assessment system and also made account the adverse impact of construction than it is more helpful for reducing construction pollution. If they construction practitioners should aware the impact of construction and follow such methods of construction which reduce the impact of construction than the adverse impact of construction on the environment. If the reduce the adverse impact of construction than firstly increases the awareness of construction firm / construction companies and construction practitioners. If the clearly monitoring construction site by national agencies and strictly follow all rules and regulation on sites than it also help reducing impact on the environment. Increasing awareness of construction Practitioners a new search method and must help to reduce the constructional Impact on the Environment.

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