



## **IMPACT OF CIVIL ENGINEERING PROJECT ON ENVIRONMENT**

### **(CASE STUDY OF MOHMAND DAM).**

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### ***Abstract***

*This study is about the effect of construction on environment. The Researcher has taken the Mohmand Dam as a case study for this research paper. The previous studies investigated and found that Environment greatly effect by the civil Engineering projects. The aim of the study was to find the impact of civil engineering construction projects on environment and socio economic of the society. The questionnaires were gathered from respondent and then analysis through statistical software. The analysis showed that civil project of engineering greatly impacts on environment and also affects the socio economic condition of the society.*

*So it's important to take safety measure before starting any construction project. Government should take it serious and find the way to resort the permanent solution of this problem.*

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**Key Words:** Civil Projects; Construction and Environment; Civil Projects

## **1. INTRODUCTION**

Environmental protection is an important issue in developed and developing countries [1]. Construction is not an environmentally friendly process by nature [2], indicated that building construction and operations have a massive direct and indirect effect on the environment. [3] stated that identifying the impacts of construction project on the environment is a task that needs to be accomplished to realize an effective environmental.

The construction is a main source of environmental pollution, compared with other industries [4]. They also maintained that any typical construction process involves using various construction equipment's and natural resources and generates many pollutants. [5], summarized these pollutants as noise, air pollution, solid and liquid waste, water pollution, harmful gases, and dust. Furthermore, construction projects have become one of the driving forces for the national economy, whose energy consumption, environmental emissions, and social impacts are significant [6].

It has been reported that very few contractors and private developers spend efforts in considering the environment and developing the concept of recycling building materials, because most of them ranked completion time as their top priority and pay little attention to the environment [7] concluded that the level of knowledge and awareness of project participants, especially project managers, with regards to environmental impacts of construction processes needs to be enhanced, at this point he claimed that enhancing the identification of the major environmental impacts of construction processes will help to improve the effectiveness of environmental management systems. Unfortunately developing countries are suffering from the limited scientific data about the impacts of building materials and technologies on the environment and it is difficult to make informed choices aiming at reducing such impacts [8]. This study aims to assess the environmental impacts due to civil projects activities in Mohmand Dam Khuber Pakhtunkhwa, Pakistan and to propose some ideas in curbing down these adverse impacts.

### **1.1. STATEMENT OF THE PROBLEM**

Environment play a vital role in success of any country because it's not only effect on human health but also effect the socio economic activities of a country, so construction project of civil engineering greatly impact the environment and it's the need of time to propose some ideas in curbing down these adverse impact.

### **1.2. RESEARCH QUESTION**

1. Does civil project impact on environment?
2. Does civil project impact on socio economic development in country?

### **1.3. SIGNIFICANCE OF THE STUDY:**

This study has great importance with respect to civil engineering projects. Such projects not only impact on human health but also adverse effect on socio economic development of a country. for example, it can disturb the ozone layers which is utmost important for agriculture and human beings, similarly such civil projects may produce noise pollution which is also harmful for human health. So the main purpose of the study is how to curb the adverse effect of civil project with reference to Mohamad dam of Khyber pakhtun khwa, Pakistan.

## **2. LITERATURE REVIEW**

### **2.1. Impact of Construction on the Environment:**

Any development project plan to improve the quality of life has some built-in positive and negative impacts. The development project should be planned in such a manner that it has maximum positive impacts and minimum negative impacts on the environment [9]. Prediction of the environmental impacts of construction in the early stages of projects, may lead to

improvements in the environmental performance of construction projects and sites [10]. It is expected that construction damages the fragile environment because of adverse impacts of construction. This impacts include resource depletion, biological diversity losses due to raw material extraction, landfill problems due to waste generation, lower worker productivity, adverse human health due to poor indoor air quality, global warming, acid rain, and smog due to emissions generated by building product manufacture and transport that consumes energy [11]. Environmental impacts are categorized into three safeguard subjects: ecosystems impacts, natural resources impact and public impacts [12].

## **2.2. Ecosystem impact**

In light of a large number of ongoing construction projects, the ecosystems impact of construction has become an important issue. These adverse environmental impacts like waste, noise, dust, solid wastes, toxic generation, air pollution, water pollution, bad odours, climate change, land use, operation with vegetation and hazardous emissions. Air emissions are generated from vehicular exhaust, and dust during construction [13]. This emission includes Co<sub>2</sub>, No<sub>2</sub>, and So<sub>2</sub> [14]. Noise emissions are generated as a result of various construction equipment's, air compressors and vehicles. The construction equipment's and other sources will generate noise within the range of 70 to 120 DB within the vicinity of construction. Wastes are generated from construction activities, labors camps, sewage treatment plant, and other sources. The solid waste generated during operational phase is categorized as biodegradable, recyclable, inert/ recyclable and hazardous. out of the total waste generated 50% of it would be biodegradable, 20% of the waste would be recyclable, 30% would be inert and it is assumed that a small quantity (0.3%) of it would be hazardous waste [15].

## **2.3. Natural Resources**

Various natural resources are used during any typical construction process, this resources include energy, land, materials, and water [16]. In addition, construction equipment operations consume a lot of natural resources, such as electricity and/or diesel fuel. Construction sector is responsible for consuming a high volume of natural resources and generation a high amount of pollution as a result of energy consumption during extraction and transportation of raw materials [17].

Construction sector generate worldwide substantial environmental impacts. It contributes to about half of the total energy consumption of high-income countries and is responsible of a major share of greenhouse gas emissions also in developing nations [18]. Some of the available statistics indicate that the construction and operation of the built environment accounts for: 12-16 % of fresh water consumption; 25% of wood harvested; 30-40 % of energy consumption; 40% of virgin materials extracted and 20-30% of greenhouse emissions [19].

#### **2.4. Public Impact**

Most construction projects are located in a densely populated area. Thus, people who live at or close to construction sites are prone to harmful effects on their health because of dust, vibration and noise due to certain construction activities such as excavation and pile driving [20]. During the construction phase of a project, construction dust and noise are regarded to be two major factors that affect human health [21], conducted a research about environmental impacts of construction in United States of America; they categorized the environmental impact into three safeguard categories: ecosystems, natural resources, and public impacts. Stated that health damage accounts for 27% of the total impact, which is less than the ecosystem damage (65%), but far beyond the resource depletion (8%), which justifies the necessity of performing health damage assessment. Confirmed that transportation resources, noise pollution, and dust generation with construction machinery are the riskiest environmental impacts on construction sites. Among the three environmental impacts, 'ecosystem impacts' has the greatest impact on the environment (67.5%) of total impacts. 'Natural resources impact' accounts for 21% of the total impacts, while 'public impact' consists of only 11.5% of the total impacts.

### **3. METHODOLOGY**

In order to unveil and determine the weightings of the environmental impacts of construction, a structured survey questionnaire will be adopted. A non-probability convenience sampling method will be used which involves choosing a sample that is accessible and willing to take part

in the survey. The questionnaire will design and base on previous studies. The questionnaire then sends to the construction/ organization owner and their employees.

#### **4. RESULT OF STUDY**

- The ambient air quality was exceeded at some of the city locations (road side and by a hotel premises) within the town.
- Results indicated that TSP around the flow station and neighborhood exceeded the FM ENV threshold limit value of 250 g/m<sup>3</sup> at only one locations (within the flow station facilities).
- All the points outside the flow station recorded levels that are below FEPA recommended limit of 90dB(A) for an 8 hour per day work exposure. Areas within the flow station showed levels that are quite above the FEPA limits. This showed that the activities of the flow station have negative impact on the environment.
- Results of the water microbial analysis revealed appreciable variations in the microbial loads of the water samples. Total heterotrophic bacterial count was observed to range from 10<sup>4</sup> to 10<sup>5</sup> cfu/ml. The observed bacterial densities fall within the range proposed for freshwater.

#### **5. CONCLUSION OF STUDY**

- Construction work involving excavation of soil should not be done at the peak of dry season in order to avoid excessive release of dust into the atmosphere thereby increasing suspended particulates above threshold limit.

- The efficiency of gas flares should be improved towards total combustion through regular maintenance for release of smokeless flares and reduction of the quantity of gas being flared, which is the ultimate goal of the upgrading exercise.
- Bush burning around the flow station should be avoided in order to prevent fire outbreak, which could lead to unexpected emergencies.
- All gas pipeline fitting must be tight fitted and maintained using the current technology in oil and gas industry.
- Safety rules must be displayed in all the designated hot places that could result in explosion and fire out break.
- Workers should be encouraged to wear appropriate PPE at designated locations in the flow station.
- Regular over hauling of the heavy equipment and reduction in particulate discharge using screener.



## **6. RECOMMENDATION**

Basis on the result it is recommended to the

The construction projects have massive direct and indirect impacts on environment. The construction processes will massive effect on ecosystem, resources, and public health. it will also effect the labors and those who are working in construction sector are the most slices of people exposing every day to health problems such as respiratory problems, liver, cancer, hearing impairment, hypertension, annoyance, sleep disturbance, and other cardiovascular adverse effects. Moreover construction impacts cause environmental degradation, including air, soil and water pollution, obscures vision, damage or dirty property and belonging and create unsafe working conditions. Therefore, there is an urgent need to control these adverse impacts of construction, to protect human, environment, and resources.dust appears as the greatest critical impact that affects the environment, managers should issue their instructions for the contractors

to use appropriate method to control dust by using one of the following techniques or a combination of them, such as using wet systems that use water sprays to prevent dust or capture airborne dust, enclosures to contain dust, and ventilation systems/exhaust systems to remove dust.

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