



## **Environmental Impact of Newly Constructed Road (A case study of Jamrud bypass Road Khyber Pakhtunkhwa - Pakistan)**

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**Abstract:** Jamrud is the main town located in Tribal District Khyber. Increase in traffic has created traffic congestion problems on the main road traversing through Jamrud town. Construction of this road (Jamrud bypass) can cause short-term and long-term negative impacts on environment in different ways if it is not well planned and appropriately maintained. In this research, environmental damages along a 7 km road in Jamrud Khyber Tribal District were evaluated. All of the road construction operations were monitored during the construction period. The road construction was evaluated according to the appropriate methods and standards. Along the 7 km road, forested area impacted was about 4,915 m<sup>2</sup> while the number of trees cut were 295. 19 houses, 4 shops and 1 graveyard were also damaged during the construction phase of the road. A comprehensive Environmental Management Plan (EMP) was developed and implemented during construction and operation phase of the newly constructed road which has reduced negative impacts on the environment and local area.

### **I. INTRODUCTION**

The Environmental Impact Assessment study includes collection and scrutinizing of data related to physical, biological and socio-economic environment of the project area and to prepare the baseline environmental profile. It also aims at the identification, prediction and evaluation of the possible environmental impacts of the proposed project on its immediate surroundings on both short and long-term basis. Based on the nature and levels of those impacts, appropriate mitigation measures along with the cost have been incorporated in this Environmental Impact Assessment report. Currently the project is in planning and design phase and the consultant has visited the site for condition/reconnaissance survey. The road ROW has been marked and the site areas for quarries, asphalt and batching plant, and for establishing the camps has been selected and is owned by the Government.

Government of Pakistan, has initiated "Rehabilitation of Damaged Infrastructure in FATA", with the financial support of the USAID. Jamrud Bypass sub project forms part of the Project. The construction of this road will divert the heavy traffic from Peshawar-Torkhun and Bara-Jamrud roads.

### **II. LITERATURE**

The Environmental Impact Assessment (EIA) of Bus Rapid Transit (BRT) is done by Peshawar Development Authority (PDA) in 2017. Their findings were that the project will have significant resettlement impacts on 535 households due to execution of 117 kanal private arable land. The project demolish of permanent structure of 2 underpass markets having 84 shops, 4 commercial toilets, 3 kiosks and 12 stores, a horizontal structure of 14 shops, one store room of a business, and two mosques. There will be temporary impacts on mobility and access of general public during construction of BRT. Greenhouse gases will be reduced, job opportunities will increase. BRT project will also increase the quality life of 40,000 individuals.

The Environmental Impact Assessment (EIA) of road transport traffic of Laai road network by Alina Mahaela Nicuta in 2016. Their findings were that the project will have an impact on a number of public utilities including relocation of electricity pylons and poles with transmission lines, transformers, water supply stations, drainage systems, and telecommunications infrastructures. Traffic control, time saving and job creation are its valuable impacts.

The Environmental Impact Assessment (EIA) of forest stands damages caused by excavation during road construction in Beech forest by K.Meleze in 2014. Their findings were that this road construction will have impact on 24915 m<sup>2</sup> forest area and have approximately 1495 trees to be cut down also its positive impacts are timber saving recreational purposes.

### III. METHODOLOGY

#### **Orientation:**

Meetings and discussions were held among the group members and the project supervisor. This activity was aimed at achieving a common ground of understanding of various issues of the study.

#### **Collection Planning Data:**

Subsequent to the concept clarification and understanding obtained in the preceding step, a detailed data acquisition plan was developed for the internal use of the EIA. The plan included identification of specific data requirements and their sources, determined time schedules and responsibilities for their collection and indicated the logistics and other supporting needs for the execution of the data acquisition plan.

#### **Data Collection:**

In this step, primary and secondary data were collected through field observations, environmental monitoring in the field, concerned departments and published materials to establish baseline profile for physical, biological and socioeconomic environmental conditions. Following activities were performed for data collection:

- Site Reconnaissance
- Analysis of Maps and Plans
- Literature Review
- Desk Research
- Public Consultations
- Field Observations & Studies

#### **Analysis:**

Analysis of physical environment, soil nature, topographical condition, hydrology and drainage, air quality and noise, water quality, biological parameters and flora and fauna environmental impacts of all these were deeply analysed.

### IV. EXPERIMENTAL WORK

#### **Physical Environment:**

Information was collected on the existing physical environment, particularly as related to geology, topography, soils, hydrology and drainage, water quality, air quality and noise.

#### **Geology, Topography, Soils:**

Data related to geology, topography and soil was collected to establish the baseline of the project area and further to find out the impacts of the Project during the construction and operational phases.

#### **Hydrology and Drainage:**

Data related to hydrology and drainage was collected to identify the elements of the hydrological cycle that are likely to have impacts on the project and the possible impacts that the project could have on the hydrological regime. Field assessments included a determination and verification of all the existing inflows into the drain, assessment of drainage issues, interviews with local community members, and roundtable discussions with stakeholders.

#### **Air Quality:**

Ambient air quality measurements are essential to provide a description of the existing conditions, to provide a baseline against which changes can be measured and to assist in the determination of potential impacts of the proposed construction on air quality conditions.

#### **Noise:**

Noise level measurements were taken at one sampling point for continuously 24 hours and hourly average data was reported.

#### **Water Quality:**

The objective of the water quality monitoring was to determine the water quality situation before construction. It has been observed that the surface water and air quality are the most important environmental variables to be affected in the road project. The extent of surface water and groundwater contamination in the project area was assessed based on the test results of chemical and microbiological parameters for surface and groundwater.

#### **BIOLOGICAL ENVIRONMENT:**

The status of the flora and fauna of the study area were determined by an ecological survey, review of literature relevant to the area, and an assessment of terrestrial environment.

#### **Flora:**

The vegetative communities were identified and classified into community types. Identification was carried out of dominant tree species.

assessment of stage of growth (mature or sapling) and assessment of canopy cover.

**Fauna:**

Information on fauna was gathered from existing literature on reported species as well as observations in the field.

**Socio-Cultural Environment:**

The Consultants utilized a combination of desk research, field investigations, census data, structured interviews, maps, reports to generate the data required for description of the existing social environment and assessment of the potential impacts due to the construction of the proposed project. Data was collected on the following aspects given below:

- Land use and Municipal Status
- Traffic, Transportation and Access Roads.
- Demographics
- Livelihoods
- Poverty
- Education
- Health
- Social Setup
- Community Facilities
- Recreational Activities
- Archaeological and Cultural Heritage.

**Identification and Evaluation of Environmental Impacts:**

The impacts of the road project on the physical, biological and socio-economic environment prevalent in the project area are visualized at the design, construction and operational phases.

**Mitigation Measures and Implementation Arrangements**

The adequate mitigation measures and implementation mechanisms are proposed so that the Proponent could incorporate them beforehand in the design phase.

**V. CONCLUSIONS:**

- As per research during the Construction of this road (Jamrud bypass) can cause short-term and long-term negative impacts on environment in different ways if they are not well planned and appropriately maintained.
- Some negative impacts which are mentioned bellow:
  - Forested area which was impacted about 4,915 m<sup>2</sup>.
  - The number of Tree Cut down=295
  - Houses=19
  - Shops=4
  - Graveyard=1

**VI. RECOMMENDATIONS:**

Few impacts were identified attributable to the project, most of which are localized and temporary in nature and easy to mitigate. The improvement of road in shape of Bypass will not affect the settlement as the most the land is barren and with this bypass the nearest land cost will be increased and benefit the local community in term of business development in the area.

Bypass road is not located inside or adjacent to any environmentally sensitive areas. The significant environmental impacts attributable to the project pertains to tree cutting, temporary deterioration of environmental attributes/ambient conditions due to construction and site clearance activities, earthworks, borrowing and quarrying, operation of hot mix plants, deterioration of surface water quality due to silt run-off and spillage from vehicles and discharge from labour camps, health impacts from labour camps;, disruption to access/traffic and occupational health and community safety. These impacts can be mitigated by adopting good construction practices and effective implementation of Environmental Management Plan (EMP)

During operation stage, the main impacts are increase in mobile emissions, noise level, accident risk to motorist, pedestrian and animals. Road safety measures are proposed. Retaining walls has been proposed where ponds are abutting to avoid seepage into subgrade and erosion of road embankment

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