



BAHRIA TOWN

**BAHRIA TOWN (PVT.) LTD.**

## **Environmental Impact Assessment of Bahria Enclave II Agro-Farming Scheme, Islamabad**



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**Final Report**



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## Executive Summary

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### Introduction

This report presents the findings of "Environmental Impact Assessment (EIA) of Bahria Enclave II Agro Farming Scheme, Islamabad".

The EIA study aims at the identification of the possible environmental and social impacts of the proposed project on its immediate surroundings on both short and long-term basis, suggesting mitigation measures and identifying the responsible agencies to implement those measures.

### Location of the Project

The project site is located at Mouza Bobri Pretha and Sakreela, Zone-IV (D), Islamabad. The proposed project site is accessible via Angoori Road connected to Murree-Islamabad Expressway.

### Policy, Legal and Administrative Framework

The Project has been reviewed against the environmental legislation applicable in Pakistan. However, the laws and acts, particularly for the proposed project, include:

- Pakistan Environmental Protection Act, 1997.
- Pakistan Environmental Protection Agency (Review of IEE/EIA) Regulations, 2000
- National Environmental Quality Standards (NEQS)

Bahria Town (Pvt.) Ltd., being the proponent of the project, will ensure that the design, construction and operational phases of the project are in accordance with the recommendations made in the EIA report and the Environmental Management Plan will be implemented.

### Description of Project

Bahria Town (Pvt.) Ltd. intends to develop an agro farming scheme in Mouza Bobri Pretha and Sakreela, Zone –IV (D), Islamabad. Bahria Town Pvt. Limited acquired the Environmental Approval of Bahria Enclave II Agro Farming Scheme spread over an area of 2046.70 Kanal in Mouza Bobri and Sakreela, Zone-IV (D), Islamabad from Pakistan Environmental Protection Agency dated 07<sup>th</sup> January 2013.

Now, there has been an extension of the project after the approval of the area of 442.68 kanal from CDA at the North-East side of the project site as previously it was considered to be under the Rawalpindi Development Authority (RDA).

The revised and extended layout plan approval from Planning Wing, Capital Development Authority has been acquired for an area of 2,489.38 Kanal.



The objective of the proposed project is to provide developed agro farming plots for agriculture productions, i.e., fruit and vegetable to meet the demand of residents of Rawalpindi and Islamabad.

Bahria Enclave II Agro Farming Scheme will have 53 agro farming plots of 110 ft. x 200 ft. size and 164 agro farming plots of size more than 4 Kanals.

There will be 276 commercial plots of 30 ft. x 40 ft. The project will have 1,104 one-bedroom apartments and 1,694 two-bedroom apartments. Maximum covered area allowed for Agro-Farm is 9000 Sq.ft.

The development works of Bahria Enclave II Agro Farming Project includes provision of roads, culverts, water supply network, sanitary sewerage network, stormwater drainage works, sewerage treatment plant, electrification network, natural gas distribution network, lying of telephone lines, street lights, overhead and underground water tanks, construction of tube wells etc. Furthermore, Bahria Town Pvt. Ltd will provide schools, hospital, mosques, graveyard and other amenities at Bahria Enclave II Agro Farming Scheme.

The project will be completed in four years, and the total estimated cost of the Bahria Enclave II Agro Farming Scheme is Rs. 2,646.86 million.

### **Environmental Baseline Conditions**

In order to assess and evaluate the impacts and related mitigation measures, at the project area existing conditions of physical, biological and the socio-economic environment were studied as under:

#### **Physical Environment**

Topography: Bahria Enclave II Agro Farming Scheme is bounded by Kathar Reserved Forests in North and South and in the East, Mangal Reserved Forest. Bahria Golf City to the North and Mouza Bobri in West is accessible via Angoori Road at a distance of 2.5 km and 500 m respectively.

Geology and Soil: The project area of Bahria Enclave II Agro Farming Scheme is undulating low-lying mountain. The composition of sub-soil stratum consists of medium to light brown silt clay with boulder sandstones.

According to the electrical resistivity survey carried out in the project area, shale and sandstone are major lithologic units.

Land Use: The project site is comprised of undulating low-lying mountains. The project site is mostly filled with shrubs.

Surface Water: Surface water in the project area is available from springs, nullahs and streams.

Ground Water: The groundwater table of the project area has great variation. In some localities, the water table is shallow while in others, it is at a considerable depth. The



bore-wells are common in the project area for drinking and household water consumption. The average depth of water ranges between 60-80 feet.

Climate: Islamabad has distinct seasons marked by the wide variation in temperature. The climate remains very salubrious from April to October, but the winters get very cold due to snowfall in Murree and surrounding areas. The coldest months are December, January and February. The hottest months are June and July. Rainfall in April and May is occasional, but the heaviest rain is in July and August.

The temperature of capital territory Islamabad ranges between  $-1^{\circ}\text{C}$  to  $46^{\circ}\text{C}$ . The coldest month is January when the mean maximum temperature is  $18.3^{\circ}\text{C}$ , and the mean minimum is  $3.8^{\circ}\text{C}$ .

From February to May the temperature rises at the rate of  $5.0^{\circ}\text{C}$  per month. The highest temperature reached in May when the mean maximum temperature remains  $39.1^{\circ}\text{C}$ .

Air Quality: Major anthropogenic source of air pollution in the project area is the light traffic at Angoori Road. Moreover, there is no industry near the project site. The project site is covered mostly with shrubs and herbs.

The time-averaged (24h) concentrations of  $\text{SO}_2$ ,  $\text{NO}$ ,  $\text{NO}_2$ ,  $\text{CO}$ ,  $\text{O}_3$ ,  $\text{PM}_{2.5}$ ,  $\text{PM}_{10}$  and SPM were found to be  $20.29\ \mu\text{g}/\text{m}^3$ ,  $11.07\ \mu\text{g}/\text{m}^3$ ,  $30.42\ \mu\text{g}/\text{m}^3$ ,  $0.83\ \text{mg}/\text{m}^3$ ,  $2.70\ \mu\text{g}/\text{m}^3$ ,  $29.72\ \mu\text{g}/\text{m}^3$  and  $116.63\ \mu\text{g}/\text{m}^3$  respectively. The ambient air quality for all the parameters monitored is below the NEQS limits.

Noise and Vibration: There is low traffic on Angoori Road. The noise level at the project site was 53 dBA during daytime and 51 dBA during nighttime which was found to be within limits of NEQS.

## Biological Environment

The biodiversity of the project area is rich and has diverse flora and fauna, i.e. the foothills of Himalaya. The low-lying parts of the project area can be classified as a sub-tropical, humid scrub forest ecosystem.

### Flora

The dominant flora species of the project area include Kao, Phulai and Sanatha. Important grass species are *Heteropogon contortus*; *Aristida cynantha* and *Themeda anathera*. The artificially planted species include *Bougainvillea*; *Salix tetrasperma* (Willow) and *Yucca spp.* The vegetation cover in its North-west of the project site comprises of *Dedonea viscosa*, *Olea ferruginea* and *Cassia fistula* (Amaltas). The entire project area comprises of a rural landscape.

The dominate tree species include Chir pine (*Pinus roxburghii*), along with Kahu/ wild olive (*Olea ferruginea*) and Phulai (*Acacia modesta*). Among shrubs, species of Sanatha (*Dodonaea viscosa*), Garanda (*Carrissa carandas*) and Bakerh (*Justicia adhatoda*).

Wild trees are rare in the project area, but vegetation cover dominated by sanatha (*Dodonaea viscosa*), followed by garanda (*Carissa carandas*), pattaak, (*Maytenus royleanus*) and phulahi (*Acacia modesta*) is present.



## Fauna

In original form, Dry Subtropical Scrub Forest served as a host of animals and birds. Major bird species in the area include: Black partridge (*Francolinus francolinus*); Chinese dove (*Streptopelia chinensis*) and Magpie (*Dendrocitta formosae*), while the major mammals found in the area include; Barking deer (*Muntiacus muntjak*), Wild Boar (*Sus scrofa cristatus*); Yellow-throated marten (*Martes flavigula*) and Common leopard (*Panthera pardus*).

**Wetlands:** Rawal Lake/Dam is a reservoir which is located in the South-West of the project site and provides domestic water supply for Islamabad and Rawalpindi. It is also an important winter refuge for migratory waterfowl, an important recreational area, a buffer against flooding and a source of irrigation water for local farms.

## **Socio-Economic and Cultural Environment**

The socio-cultural and socio-economic conditions of the village and housing schemes located in the surroundings of the project area, namely Mouza Bobri, is described in the report. These are the localities, which may get direct positive or negative impacts from the development of Bahria Enclave II Agro Farming Scheme.

Religious and Archeological Sites: There are mosques and graveyards at different locations in all the village. There is a shrine at 2.5 km from the project site in Mouza Bobri, named as "Jheera Sahrif". There is no other site reported for archaeological or historical significance at the project site. However, in case any artefact of some significance is found during the construction activities the Archeology Department, Government of Pakistan will be informed.

## **Public Consultation**

During this consultation, a number of residents of the adjoining village were consulted. Different aspects of the proposed project were highlighted along with their impacts on the physical, biological, and socio-economic environment of the project area. Stakeholders concerns regarding various aspect, existing environment, and impacts of the project were noted, and mitigation measures are proposed in the EIA report.

Generally, the people of the project area are in favour of the project and stated that this project would create employment opportunities for the locals during its construction as well as operational phase. The locals expressed their concerns regarding the potential dust, noise and protection of local infrastructure due to the project activities, and they emphasized that all mitigation measures should be implemented.

In addition to the local community secondary stakeholders' consultation was conducted with many institutions/departments such as PMAS Arid Agriculture University Rawalpindi, National University of Sciences and Technology (NUST), Punjab Wildlife Department Rawalpindi, IESCO, CDA, environmental practitioner, Estate Dealers and their point of view regarding the project was solicited. Main concerns of these organizations regarded the preservation of flora and fauna in the surrounding areas of the project site, a robust buffer zone between the Bahria Enclave



II Agro Farming Scheme and the surrounding forest and the arrangements made for the treatment of wastewater.

## Impacts and Mitigation Measures

### Physical Environment

**Impacts:** Soil related issues include soil erosion, slope stability, and soil contamination. Land clearing, levelling and grading, excavation and filling, construction activities and maintenance of equipment/vehicles may create these issues. Soil may be contaminated because of fuel/oils/chemical spillage and leakage, and inappropriate waste (solid as well as liquid) disposal.

It is estimated that 9.2 tons per day of solid waste will be generated from residential and commercial areas of the proposed project. Land-use change is expected during the construction phase.

Construction machinery and project vehicles, small crush plants will release exhaust emissions, containing Carbon Monoxide (CO), Oxides of Sulphur (SO<sub>x</sub>), Oxides of Nitrogen (NO<sub>x</sub>) and Particulate Matter (PM). These emissions may deteriorate the ambient air quality in the immediate vicinity of the project site for short term duration. Furthermore, construction activities such as excavation, land levelling, filling and vehicular movement on unpaved tracks may also cause fugitive dust emissions.

Noise and vibration will be generated by construction machinery and vehicles. Surface and groundwater resources of the project area may be contaminated by solid waste disposal, sewage disposal, and equipment/vehicles maintenance, spillage/leakage of fuels, oils and chemicals, and campsite sanitation facilities.

**Mitigations:** Soil erosion will be minimized by properly executing land clearing, levelling and grading. The cut and fill involved will be balanced. However, excavated slopes will not be left untreated/unattended for long durations. Appropriate slope stabilization measures will be taken as per the design (i.e. stone pitching, Breast walls).

The plantation plan includes the plant species of ornamental values, food and shade and plants which will help to stabilize the soil. Vehicles and equipment will not be repaired in the project site. If unavoidable, impervious sheathing will be used to avoid soil and water contamination. For the domestic sewage from the work force's camp, septic tanks with soakage pits will be constructed having adequate capacity.

Waste oils will be collected in drums and sold to the recycling contractors. The recyclable waste from the project site (such as cardboard, drums, broken/used parts, etc.) will be sold to recycling contractors, or where appropriate it will be reused/recycled. The hazardous waste will be kept separate and handled according to the nature of the waste. While storing, hazardous waste will be marked.

In order to minimize the exhaust emissions construction machinery and vehicles will be kept in good working condition and properly tuned. Fugitive dust emissions will be minimized by spraying water on the unpaved track, where required and appropriate.



Careful selection and management of the burrow areas, to avoid adverse impacts and to avoid obvious scars and blemishes on the landscape will be carried out. Re-vegetation and landscaping of burrow areas and disposal sites consistent with acceptable aesthetic values for the surrounding landscape will be done.

### **Biological Environment**

**Impacts:** The site preparation and construction activities may necessitate the removal of the natural vegetation from the areas where road infrastructure and public buildings will be constructed. Damage and/or loss of vegetation and clearing of other indigenous and introduced species, as well as undergrowth species, comprising of bushes, grass, etc. will also be lost.

The loss of natural vegetation discussed above, and other project activities will potentially have an impact on the faunal resources and habitat of the area as well. Smoke, chemicals, dust particles, and noise generated by heavy machinery are a scaring factor for wildlife. Rodents, hedgehogs, porcupines would lose their abode. In addition, wildlife may be disturbed by illumination and the mere presence of the people.

**Mitigations:** The record of tree cutting will be maintained during the construction phase, and for every tree cut, as many as 10 trees will be planted.

The measures to restore natural vegetation loss in the area will benefit the area's fauna as well. The project staff will not be allowed to indulge in any hunting or trapping activities. Nighttime construction works will not take place. Illumination levels at the site will be minimized, as far as possible. Appropriate diffusers will be used to restrict the illumination within the project site. Proper safety and security measures will be ensured in the process.

### **Socio-Economic Environment**

**Impacts:** The land for Bahria Enclave II Agro Farming Scheme has already been acquired by Bahria Town (Pvt.) Ltd. Hence, there is no issue of land acquisition or resettlement of the community due to the proposed project.

The project is located close to the community may pose some safety hazards in the vicinity of the project. Construction workers may be susceptible to the eye and respiratory diseases due to their routine exposure to dust and exhaust emissions on the project site. Injuries could happen primarily by occupational-related accidents, animal bites, etc. Activities such as land clearing, earthwork, and construction works do present occupational health and safety hazards to the workers on site.

**Mitigations:** Eye and respiratory diseases will be mitigated through routine health screening and training of the workforce. The physical injury will be mitigated through the provision of appropriate awareness and emergency response procedures. Protected fencing will be fixed around the construction site. Unauthorized access within the construction area will not be allowed. A mobile dispensary with a medical doctor will be available round the clock.



## **Environmental Management Plan (EMP)**

For effective implementation and management of mitigation measures, an Environmental Management Plan has been proposed; The EMP reflects the commitment of Bahria Town (Pvt.) Ltd to safeguard the environment as well as the surrounding population.

The EMP provides a delivery mechanism to address potential impacts of project activities, to enhance project benefits and to introduce standards of good practice in all project activities.

The EMP has been prepared with the following objectives:

- Defining legislative requirements, guidelines and best industry practices that apply to the project;
- Defining mitigation/monitoring plan required for avoiding or minimizing potential impacts assessed by the EIA;
- Defining roles and responsibilities of the project proponent and the Project Manager; and
- Defining requirements for environmental monitoring and reporting.

An Environmental Monitoring and Mitigation Cost has been proposed for construction and operational phases of the proposed project which will be implemented. The environmental monitoring cost during the construction phase is Rs 17.702 million.

## **Conclusion and Recommendations**

On the basis of the overall impact assessment, more specifically, nature and magnitude of the residual environmental impacts identified during the present EIA, it is concluded that Bahria Enclave II Agro Farming Scheme is likely to cause environmental impacts mainly during its construction and operational phase. However, these impacts can be mitigated, providing that the proposed project activities are carried out, as mentioned in the report, and the mitigation measures included in this report are completely and effectively implemented.

There are no remaining issues that warrant further investigation. This EIA is considered adequate for the environmental and social justification of the project.



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