



Capital Development Authority



Environmental Impact Assessment of Development of Sector E-12 Project, Islamabad

Final Report

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Project Procurement International (PPI)

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Executive Summary

Introduction

Capital Development Authority intends the Development of Sector E-12 Islamabad Project.

The project aims at providing residential accommodation for the general public as well as for federal government employees.

Policy, Legal and Administrative Framework

The Project has been reviewed against the environmental legislation applicable in Pakistan, however the laws and acts related to the proposed project include:

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

The CDA, being the proponent of the project, will ensure that the construction and operational phases of the Project are in accordance with the recommendations of the EIA report and the Environmental Management Plan will be implemented. The Environmental Management Plan will be made a part of the agreement to be signed between CDA and the Contractor for the construction of the Project.

Need for the Project

The prices of houses in Rawalpindi & Islamabad have increased manifold during the last many years. The rent of houses is also high and a large number of people are unable to get shelter.

The project will address the housing problems directly and its linkage with the construction industry will rotate the economy of Pakistan. Additionally, the project will reduce the pressure on already overcrowded housing in Rawalpindi & Islamabad.

Project Description

Capital Development Authority intends the development of Sector E-12 Islamabad.

The objective of the project is to provide small size residential plots for low-income groups in the city. Islamabad is facing an acute shortage of housing and the proposed project will improve the housing situation considerably.

The development of Sector E-12 has been proposed on a piece of land measuring 745.87 acres (5,967 kanals) in series next to Sector E-11.

The Project will have a total of 4,430 residential plots of various sizes. The commercial plots will be built on an area of 45.45 acres out of the total 745.87 acres. The Project will also incorporate open spaces, parks, educational institutes, hospitals, graveyards, nullahs and Roads.

For the development of Sector E-12, the essential infrastructure works include Service Roads, Major Roads & Vehicular Roads, storm drainage network, sanitary sewerage system, water supply network lines, box culverts, drainage works of service roads, distribution of power supply and street lights complete underground electrification network including grid station, overhead and underground water reservoirs and sumps with pumping system, tube wells as alternate water sources, ducts for all underground services etc. CDA will also provide parks, playground and other facilities in the sector.

The total estimated cost for infrastructure development in Sector E-12 is Rs 6,630.21 Million. The project will be completed in four years.

Analysis of the Alternatives

No Project Option: If we consider no project option then we will lose all positive impacts that will be caused due to the project; like providing residential plots to all income groups, loss of potential employment and business opportunity.

Secondly, if the demand for the housing sector is not met through government schemes. The private sector will spring up residential housing societies in the suburbs and rural areas to meet the demand.

The “No Project Option” does not appear reasonable given the above facts. However, the expected negative impacts can be minimized by adopting appropriate mitigation measures.

Change in the Location: Change of the project site location is one of the alternatives to avoid some negative impacts like land-use change, damage to flora and fauna etc. However, sector E-12 is in accordance with the Master plan of Islamabad and will be located at their respective site.

Build-As-Proposed-Option: Development of Sector E-12, Islamabad Project is in accordance with the Islamabad Master Plan and its location has already been agreed upon. However, the negative impacts due to the project construction and operation can be minimized, controlled or eliminated if the proposed mitigation measures as suggested in the EIA report are effectively implemented.

Environmental Baseline Conditions

In order to work out the impacts and related mitigation measures, baselines environmental conditions of physical, ecological and the socio-economic environment of the project area were studied as follows;

Physical Environment

Topography: Islamabad is located on the Northern edge of the track known as Potohar Plateau. The Potohar Plateau has an uneven land and is gradually rising in elevation from 500 to 600 meters above the sea level and the highest point is 1,600 meters above mean sea level. The land gradually slopes towards the South. The land is composed either of alluvium (clay or silt) or of gravel caps. A large part of the area is undulating and at various places it is badly dissected by gullies and ravines. The Kurang stream has been dammed at a place named Rawal to form the Rawal Lake. Another dam has been built on the Soan River to form the Simly Lake.

Geology and Soil: The Potohar region has a complex geological history of mountain formation, alluvial-loessic depositions, and erosion cycles. Limestone is the characteristic rock of Margalla range. In age it ranges from the Jurassic to Triassic. It is usually reddish or bluish-white in colour mixed or alternating with its beds of red or bluish clay or shades or sandstones. The deposits contain small-sized rounded pebbles of sandstone, quartzite or granite and sand mixed or alternating with clayey deposits. They have been described as alluvial deposits, but it is equally probable that they have a glacial origin.

The soil in the Potohar region is shallow clayey of low productivity. Mostly, on the Southern and Western aspects of the Potohar plateau, the soil is thin and infertile. Streams and ravines cut the loose plain, affected by gully erosion and steep slopes. Such land is unsuitable for cultivation. However, large patches of deep fertile soil are

found in the depressions and sheltered localities supporting quality small forests (Rakh) and rain-fed agriculture. The soil formed by the disintegration of shells, clay and sandstone occurs in scattered places.

Land use: The majority of land in Sector E-12 is in rain-fed agricultural use with numerous mature trees. The sector is covered by trees and shrubs. Crops including wheat, maize, millet, and oats as well as vegetables are cultivated. There are villages and small human settlements which reside on the project site include Dhreak Mohri, Bhaiker Fateh Bukhsh, Bhaiker Akku, Bara Dari, Seri Seral and Golra Sharif.

Surface Water: There are several natural springs originating from Margalla Hills.

There is a perennial nullah originating from Margalla Hills and passes through the Sector E-12. All the parameters for surface water were within the NEQS limits according to the lab tests performed by ESPAK.

Ground Water: Ground Water of the project site is available at a depth of 60-100 ft. and used for drinking and other domestic purposes. Boreholes are dug to access groundwater. The groundwater was investigated and the parameters tested were within NEQS limits.

Climate: Islamabad has distinct seasons marked by wide variation in temperature. The climate remains very salubrious from April to October but the winters get very cold. 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°C to 46°C . The coldest month is January when the mean maximum temperature is 17°C and the mean minimum is 9°C . From February to June the temperature rises at the rate of 7.0°C per month. The highest temperature reached in June when the mean maximum temperature remains 41°C .

Air Quality: There are no major anthropogenic sources of air pollution in the project site. Presently, the development of Sector E-12 has a low population with low traffic. The ambient air and noise level monitoring was conducted from 29th September to 30th September 2020 for 24 hours at the project site Sector E-12, Islamabad.

The concentrations of SO_2 , CO , NO , NO_2 , O_3 , PM_{10} , $\text{PM}_{2.5}$, (i.e., $20.872\ \mu\text{g}/\text{m}^3$, $1.1-1.4\ \text{mg}/\text{m}^3$, $13.016\ \mu\text{g}/\text{m}^3$, $22.466\ \mu\text{g}/\text{m}^3$, $1.84-15.19\ \mu\text{g}/\text{m}^3$, $77.39\ \mu\text{g}/\text{m}^3$, $20.398\ \mu\text{g}/\text{m}^3$) meet the NEQS limits (i.e., $120\ \mu\text{g}/\text{m}^3$, $5\ \text{mg}/\text{m}^3$, $40\ \mu\text{g}/\text{m}^3$, $80\ \mu\text{g}/\text{m}^3$, $130\ \mu\text{g}/\text{m}^3$, $120\ \mu\text{g}/\text{m}^3$, $35\ \mu\text{g}/\text{m}^3$).

Therefore, it is concluded that presently, there is no air pollution at the project site, and the site is suitable for the living purpose. Proper plantation on open spaces of the project site will help to enhance and maintain the air quality of the area in future.

Noise and Vibration: The heavy traffic on Margalla Road is a minor source of noise and vibration in the project area. Moreover, occasionally, there is noise due to the movement of vehicles in nearby villages such as Dhreak Mohri, Golra Sharif and Bhaiker Akku.

Ecological Environment

Flora: An estimated 372 trees of different species have been observed in Sector E-12, Islamabad during the tree count carried out by PPI team. CDA estimates that during the initial stage of development of major roads of the sector, 60 trees will need

to be cut. Cutting a tree will be the last resort and as a compensation CDA will plant 10 trees against each cut tree.

It is observed that different floral species exist on the project site, including mature trees of shisham, kachnar, bakain, mulberry, poplar, siris, paper mulberry and bischofia etc. Moreover, there are some shrubs and grass species are spread all over the project site.

The local shrubs include *Dodonaea viscosa* (Sanetha); *Sachhrum munja* (Sarkanda); *Thevetia peruviana* (Peli Kaner); *Carissa carandas* (Granda); and *Ziziphus nummularia* (Jungli Bher).

Fauna: The region of Islamabad in general and the project area in particular has rich and eve-fauna species. These birds are surviving and flourishing, due to reasonable level of green belts and dense forest cover. Most of birds species and water fowls, reside in the Margallah Hills National Park, and in surrounding of Rawal Dam, Simly Dam and other smaller water reservoir, in Islamabad.

Among small mammals species golden Jackal, Red fox, Pangolin, Porcupine and rats are reported to reside in surrounding of the project area. The snake, Russell's viper and lizards also inhabit in the project site. The black rat (*Rattus rattus*), also known as the ship rat, or roof rat or house rat, is a common long-tailed rodent. Porcupines are rodents with a coat of sharp spines, or quills that protect against predators. The Cape hare (*Lepus capensis*), also called desert hare, and sometimes observed in the project area.

Margalla Hills National Park: The Park is situated in the North of the Project area. Margalla Hills National Park is rich in biodiversity and many plants and animals are remnants of communities from the great Himalayan ecosystem comprising of Subtropical Chir Pine Forest type and Dry-Subtropical Semi-evergreen Scrub Forest type.

Pinus roxburghii (Chir) occupies the apical sites in the Margalla Hills while in the lower elevations, main species of trees and bushes are *Olea ferruginea* (Wild olive), *Acacia modesta* (Phulai); *Bauhinia variegata* (Kachnar); *Carissa opaca* (Granda); *Ziziphus mauritiana* (Beri); *Ziziphus nummularia* (Mallah); *Punica granatum* (Wild pomegranate); *Dodonea viscosa* (Sanatha); *Justicia adhatoda* (Bhekar); etc.

Important faunal species in the Margallah Hills National Park include *Macaca mulatta* (Rhesus monkey); *Sus scrofa cristatus* (Wild Boar), *Muntiacus muntjak* (Barking deer); *Nemorhaedus goral* (Goral); *Lepus nigricollis* (Wild hare); *Canus aureus* (Jackal), *Butastur teesa* (White-eyed buzzard); *Falco biarmicus* (Lannar falcon); *Elanus caeruleus*; (Black winged kite), *Lophura leucomelana* (White crested Kalij Pheasant); *Francolinus pondicerianus* (Grey partridge); *Francolinus francolinus* (Black partridge); *Taccocua leschmaultii* (Sirkeer cuckoo); *Caprimulgus indicus* (Jungle nightjar); *Alectoris chukar* (Chakor); *Garrulus lanceolatus* (Lanceolated Jay); etc. Amongst the Reptiles *Veranus monitor* (Monitor Lizard); *Vipera russelli* (Russel's viper); *Naja naja* (Indian cobra); *Echis carineta* (Saw Scaled viper), are common.

Socio-Economic and Cultural Environment

The present socio-economic and cultural environment of Dhreak Mohri, Bhaiker Fateh Bukhsh, Bhaiker Akku, Bara Dari, Seri Seral and Golra Sharif has been assessed. The localities which may get direct positive or negative impacts from the development of Sector E-12, Islamabad Project as follow:

Population: The Dhreak Mohri village is located in Sector E-12 which consists of 50 houses accommodating approximately 300 inhabitants. Bhaiker Akku is a small human settlement in Sector E-12, consisting of 8 houses with 60 inhabitants.

The present population of Bhaiker Fateh Bukhsh and Seri Seral is approximately 75 inhabitants and it consists of 10-15 houses. Golra Sharif has a population of 900 people with approximately 150 houses.

Ethnic Structure: Main ethnic groups in Dhreak Mohri and Bhaiker Fateh Bukhsh are Syed, Raja, Malik and Pathan. Common language of the area is Potohari. While in Bhaiker Akku and Bara Dari cha the major population belongs to Malik and Pathan. In Golra Sharif, most of the people are Pathan and Syed. The common language in the project area is Pashtu and Potohari.

Agriculture: The majority of land in sector E-12 is agricultural land. The land is rain-fed and the agricultural production is not high. Crops including wheat, maize, millet, and oats as well as vegetables are cultivated. .

Education: There are two primary government schools in Dhreak Mohri. No high schools are present in the area. Absence of schools compels students to move to Rawalpindi and Islamabad for higher education.

Public Health: Shifa Hospital is the only Health Clinic situated in the region, with its own medical store and medical staff.

Drinking water Supply: The groundwater is used for domestic uses. Water depth in the project area ranges from 80-200 ft. People get water manually by digging wells or boreholes.

Employment: Most of the population of Dhreak Mohri, Bhaiker Fateh Bukhsh and Bhaiker Akku are engaged in construction labour. Rest of the population has either government jobs or own businesses or private jobs. Dairy, farming and agricultural work are common among Seri Seral and Golra Sharif.

Religious and Archaeological Sites: The whole population in the project area is Muslim. No combine/centralize graveyard system exists in the villages.

Public Consultation

During this process, a number of personals and inhabitants of the project area were consulted. Different aspects of the proposed project were highlighted like 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 located and added in the EIA report.

Generally, the people of the area stated that this project would create employment opportunities for them during its construction and operational phases. They were of the view that the proposed project will also provide facilities like hospitals, commercial markets and schools and a better road network. However, few of the local inhabitanace showed dissatisfaction with the compensation process against their property.

In addition to the local community, many institutions/offices such Capital Development Authority Islamabad, National University of Science and Technology (NUST), Pakistan Environmental Protection Agency (Pak-EPA), World Wildlife Fund Pakistan (WWF-Pak), Institute of Urbanism, Metropolitan Corporation Islamabad, Islamabad Electric Supply Corporation (IESCO), International Islamic University Islamabad (IIUI) and Real Estate dealers located in Islamabad/Rawalpindi were visited and their viewpoints regarding the project were solicited.

Generally, these organizations are in favour of the project and stated that this project would reduce the housing crisis in the twin cities. The main concerns of these organizations were threats to wildlife of MHNP, and solid waste management during the construction and operational phase of the project.

Furthermore, they recommended CDA to establish a buffer zone around MHNP with proper demarcation should be carried out. Moreover, they urge to introduce renewable energy resources in the operational phase of the proposed project which includes rainwater harvesting and solar panels for street lightening.

Impacts and Mitigation Measures

Physical Environment

Impact: 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 cause 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 18 tons per day of solid waste will be generated from residential and commercial areas of the Sector E-12.

Land-use change is expected during the construction phase, one at the borrow areas and others where the spoil or mucking material will be disposed of.

Construction machinery and project vehicles will release exhaust emissions, containing Carbon Monoxide (CO), Oxides of Sulfur (SO_x), Oxides of Nitrogen (NO_x) and Particulate Matter (PM). In addition, various burning activities involved in roads construction will cause air pollution. These emissions can deteriorate the ambient air quality in the immediate vicinity of the project site. 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 can be contaminated by solid waste disposal, sewerage disposal, and equipment/vehicles maintenance, spillage/leakage of fuels, oils and chemicals, and campsite sanitation facilities.

Mitigations: Soil erosion can be minimized by properly doing land clearing, levelling and grading. Excavated slopes will not be left untreated/unattended for long durations especially around Nullahs. Appropriate slope stabilization measures will be taken per the design (i.e. stone pitching).

Temporary measures, such as the construction of temporary walls reinforced with brick lining bordering the construction areas to contain debris and spoil, will also be undertaken to avoid soil erosion and water contamination. The stone and gravel will not be extracted from the areas around Nullahs.

To prevent soil erosion at slopes vegetation should be planted like *Buddleia asiatica*, *Cassia artemisooides*, *Ballerina cristata*, *Lantana indica*, *Hisbiscus rosasinensis* etc.

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 contractor's camp, septic tanks with soaking 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.) should be sold to recycling contractors, or

where appropriate reuse/recycle it. The hazardous waste should be kept separate and handled according to the nature of the waste. While storing, hazardous waste should be marked.

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

Careful selection and management of the borrow areas to avoid adverse impacts and to avoid obvious scars and blemishes on the landscape. Re-vegetation and landscaping of borrow areas and disposal sites consistent with acceptable aesthetic values for the surrounding landscape.

Ecological Environment

Impacts: The site preparation and construction activities may necessitate the removal of the natural vegetation from the areas where road, culverts and other buildings will be constructed. Damage and/or loss of vegetation and clearing of other indigenous and introduced species, as well as undergrowth species, which comprising bushes, grass, etc. will also, lost. The construction crew can also indulge in tree/shrub cutting to obtain fuelwood for the camp.

The loss of natural vegetation discussed above, and other project activities will potentially have adverse impacts on the faunal resources and habitats of the area. 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, the wildlife may be disturbed by illumination, and the mere presence of the people.

Mitigations:

CDA's standard Plantation Plan would be implemented in E-12 Sector of Islamabad.

A plantation cover of appropriate trees/bushes preferably evergreen will be raised within the open green areas and along avenues, as well as medians.

For providing a healthy environment and to enhance the aesthetic value of the project area, the entire layout of the Sector E-12, a proper landscape plan will be devised and implemented.

To save the MHNP from anthropogenic activities, CDA should establish check posts at regular intervals along the Margalla Avenue. This will reduce the human activities inside the park and keep a check on residents dumping their solid waste inside MNHP area.

It is imperative for CDA to prepare a detailed map showing the exact location of MHNP as well as install fixed benchmarks at the site in order to avoid any encroachments later on into the national park territory from the proposed developments.

The measures to restore natural vegetation loss in the area will benefit the area's fauna as well. The project staff should not be allowed to indulge in any hunting or trapping activities. Nighttime construction works not be undertaken. Illumination levels at the site should be minimized, as far as possible. Appropriate diffusers should be used to restrict the illumination within the project site. Blasting will not be undertaken at the site for excavation purposes. Porcupine population has increased, as it is not palatable because of its quills. Destruction of habitat and consequent check on the population of this pest may prove to be boon to maintain ecological balance. Developmental

activities and colonization of the project site would be a positive step to keep down the number of this undesirable species at the desirable level from the human point of view.

Socio-Economic Environment

Impacts:

The project is located close to the communities may pose some safety hazards to the local population living nearby by the project components/activities pose a varying degree of the safety hazard. Although, it is pointed out that the majority of people have already left the area after obtaining compensation from the CDA.

Construction workers may be susceptible to the eye and respiratory diseases due to their routine exposure to dust and exhaust emissions on site. Injuries could happen primarily by occupational-related accidents, animal bites, etc. Activities such as land clearing, tree felling, earthworks, and construction of facilities present various occupational hazards to the workers on site.

There are no reported sites of archaeological or historical significance at E-12 sector. However, in case any artifact of such significance is found during the construction activities, the Archeology Department, Government of Pakistan will be informed. There is a shrine of Baba Shah Sikander in the proposed Sector E-12/3 which will be kept untouched during the construction phase of the proposed project.

Mitigations:

The landowners living in Sector E-12 will be compensated as per CDA's notified land-sharing award of 2008.

Eye and respiratory diseases should be mitigated through routine health screening and training of contractor's employees. The physical injury should be mitigated through the provision of appropriate training and emergency response procedures. Protected fencing will be fixed around the construction site. Unauthorized access within the construction area will not be allowed. Vehicle speeds of 50 km/hr at the project site will be implemented. Appropriate light diffusers and reflectors will be used, if required, to minimize the public nuisance caused by light pollution.

Environmental Management Plan (EMP)

The purpose of the Environmental Mitigation Plan (EMP) is to minimize the potential environmental impacts due to the proposed project. EMP provides a delivery mechanism to address the adverse environmental impacts of the proposed project during its execution and operation, to enhance project benefits and to introduce standards of best practices to be adopted for all phases of the project.

The cost estimates for implementing environmental monitoring & mitigation measures during the construction phase for the proposed project is Rs 85.025 Million.

Conclusion and Recommendations

On the basis of the overall impact assessment, more specifically, nature and magnitude of the residual environmental impacts identified during present EIA, it is concluded that the Development of Sector E-12, Islamabad Project is likely to cause environmental impacts mainly during its construction phase. However these impacts can be mitigated provided the proposed activities are carried out as mentioned in the report, and the mitigation measures included in this report are completely and effectively implemented.

The EIA has made the following recommendations:

- The CDA should implement an Integrated Solid Waste Management Plan for the sector which should include;
 - Collection of solid waste from residential and commercial buildings
 - Segregation of solid waste into recyclable, biodegradable and non-biodegradable wastes. The recyclable wastes will be given away to recycling contractors: the biodegradable waste will be composted at the site to produce green manure; and the remaining waste will be transported to the waste disposal site. The infectious hospital waste should be separately collected and disposed of properly.
- CDA should procure tree spade / transplantation equipment for the relocation of trees.
- The implementation of the Environmental Monitoring Plan should be ensured by the contractor and proponent during the construction phase.
- Recruitment of Environmental Engineer/HSE officer for the construction phase of the Project.

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