



# CAPITAL DEVELOPMENT AUTHORITY



## Environmental Impact Assessment of Development of Sector I-12 Islamabad Project

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### **Project Procurement International (PPI)**

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# Executive Summary

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## Introduction

This report presents the findings of "Environmental Impact Assessment (EIA) of Development of Sector I-12 Islamabad Project".

The EIA study aims at the identification of the possible environmental and social impacts of the proposed project on its immediate surroundings on both a 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 situated in the South-Western limits of Islamabad. Sector I-12 is surrounded by H-12 in the North, Rawalpindi in the South and West, and I-11 in the East.

## Name of Proponent and Organization Preparing the Report

Capital Development Authority (CDA) is the proponent of the project.

M/s Project Procurement International, an Environmental and Management Consultancy Firm, Islamabad, has prepared Environmental Impact Assessment of Development of Sector I-12 Islamabad Project.

## Outline of the Project

Capital Development Authority intends the Development of Sector I-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.

Sector I-12 has been planned on the same grid pattern as the other residential sectors of Islamabad. The entire area of the Sector consists of 745.87 acres. The streams and depressions have not been crisscrossed unnecessarily. Instead, the principal of cul-de-sac, i.e., returning street, has been adopted. The residential plot sizes include 3, 5, 6 & 7 Marla. The total number of residential units approximately would be 6040.

The infrastructure works include the development of service roads, leftover major roads & head structures, drainage system, water supply, sanitary sewer system, landscaping, streetlights, and allied works. The underground electrification, Sui gas will be executed through the respective IESCO & SNGPL departments.

The total estimated cost of Development of Sector I – 12 is Rs. 8,638.041 million and is expected to be completed in 3 years.

## Environmental Baseline Conditions

In order to work out the impacts and related mitigation measures, baselines environmental conditions of physical, ecological and 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 the Potohar Plateau. The Potohar Plateau has uneven land and is gradually rising in elevation from



500 to 600 meters above 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 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 the 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 clay 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: Currently, the predominant land use of the project site is agricultural land. The proposed site where Sector I – 12/2 and I – 12/3 will be developed is currently in use by Afghan Refugees. In the proposed site where Sector I – 12 Markaz will be developed is completely filled with solid waste.

Surface Water: A drainage nullah runs from North-West to Southeast of the project site. Surface water samples were taken from the project site and tested at Pak EPA approved laboratory. The surface water result indicates that the surface water parameters were within limits.

Ground Water: Ground Water table at the project site is available at a depth of 280 – 350 ft. and is used for drinking and other domestic purposes. The ground water quality at the project site has been tested at EPA approved laboratory, i.e., Environmental Services Pakistan. The groundwater quality results indicate that the quality of groundwater, which is currently being used for drinking purpose in the project site, is within the National Environmental Quality Standards (NEQS) limits for drinking water. However, the concentration of Total Dissolved Solids (TDS) was 1045 mg/L whereas the NEQS limits are <1000 mg/L. The NEQS limit is <1000 mg/L.

Climate: Islamabad has distinct seasons marked by wide variation in temperature. Rainfall in April and May is occasional, but the heaviest rain is in July and August. The temperature ranges from -1 °C to 46 °C. The coldest month is January when the mean maximum temperature is 18.3 °C and the mean minimum 3.8 °C. The highest temperature is reached in May, when the mean maximum temperature remains 39.1 °C. The average daily wind speed is 3.78 Km/h, while average relative humidity remains 60.5%. Islamabad receives 114.57 mm rain on an average monthly basis.



**Air Quality:** The ambient air and noise level monitoring was conducted from 28<sup>th</sup> September to 29<sup>th</sup> September 2020 for 24 hours at the project site Sector I-12, Islamabad.

The concentrations of SO<sub>2</sub>, CO, NO, NO<sub>2</sub>, O<sub>3</sub>, PM<sub>10</sub>, PM<sub>2.5</sub>, (i.e., 21.8 µg/m<sup>3</sup>, 1.3-1.5 mg/m<sup>3</sup>, 15.2 µg/m<sup>3</sup>, 23.4 µg/m<sup>3</sup>, 2.6-15.1 µg/m<sup>3</sup>, 127 µg/m<sup>3</sup>, 25.4 µg/m<sup>3</sup>) and CO concentrations meet the NEQS limits (i.e., 120 µg/m<sup>3</sup>, 5 mg/m<sup>3</sup>, 40 µg/m<sup>3</sup>, 80 µg/m<sup>3</sup>, 130 µg/m<sup>3</sup>, 120 µg/m<sup>3</sup>, 35 µg/m<sup>3</sup>).

**Noise and Vibration:** There is very low traffic and no industry in the project area. However, occasionally, there is noise due to agricultural machines, e.g., Tractors working in the fields, but vibration does not exist as there is no heavy machinery or industry in the project area. The noise level at the Project Site was measured which is within acceptable limits. The noise level data for daytime was 46.33 dB and 41.76 dB at nighttime. The average sound level was noted as 44.05 dB for the 24 hours period.

## **Ecological Environment**

### **Flora**

The vegetation of Islamabad is a representative of Dry Subtropical Scrub Forest which is dominated by *Acacia modesta* (Phulai), *Ziziphus mauritiana* (Ber), *Ziziphus nummularia* (Mullah), etc. Other associates existing in varying proportions include *Prosopis cineraria* (Jand); *Melia azadirachta* (Dharek); *Morus alba* (Mulberry-Shahtoot); *Dalbergia sissoo* (Tahli-Shisham); *Acacia nilotica* (Kiker). In the undergrowth *Cannabis sativa* (Bhang), *Calotropis procera* (Desi Ak), *Parthenium hysterophorus* (Gandi Booti) and *Ocimum bacilicum* (Niazbo) are predominant.

It is observed that there are around 345 trees of different floral species that exist at the project site and in the villages around the project site, including, Dreakh, Shisham, Simbal, Shehtoot, Jaman, Ber, Phulai, Kikar, Bergad, Althanis, Paper Mulberry, Kachnar, Injeer, Safaida, Poplar, Malta and Amrood. **Fauna**

The region of Islamabad in general and the project area has rich and eve-fauna species. These birds are surviving and flourishing due to a reasonable level of green belts and dense forest cover. Most bird species and waterfowls reside in the Margalla Hills National Park and in the surrounding Rawal Dam, Simly Dam, and other smaller water reservoir in Islamabad. The bird species also inhabit in the project side, except waterfowls.

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

The socio-cultural and socio-economic conditions of the villages and housing located in the surroundings of the project area, namely Bokra, are described in the report. These are the localities, which may get direct positive or negative impacts from the development of Sector I-12 Islamabad.

### **Public Consultation**

During this process, several inhabitants of the project area were met. Different aspects and impacts of the proposed project were highlighted regarding 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 located and added in the EIA report.



Generally, the people of the project area are in favor of the project and stated that this project would create employment opportunities for the locals and nearby people during its construction as well as operational phase. However, they inquired about the status of the solid waste that is daily dumped in the proposed sector and what arrangements will be carried out to relocate the solid waste and rehabilitate the project site before development activities.

In addition to the local community, many institutions/offices such as Capital Development Authority, Pakistan Environmental Protection Agency (Pak-EPA), National University of Science Technology (NUST), International Islamic University, Islamabad (IIUI), Islamabad Electric Supply Company (IESCO), Metropolitan Corporation Islamabad (MCI), Real Estate Dealers, and World Wildlife Fund Pakistan (WWF-Pakistan) were approached for consultation. Their viewpoint regarding the project was solicited. The main concerns of these organizations were regarding removal of trees, source of water supply, treatment of wastewater and proper relocation and closure of solid waste dumping at Sector I-12. Other concerns included the proper disposal and treatment of solid waste during the construction and operation phase.

## 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.

Approximately 1.2 million tonnes of solid waste have been dumped in this sector over the last eight years. Metropolitan Corporation Islamabad is currently dumping the solid waste at Sector I-12, but efforts are being carried out to develop a scientific engineered sanitary landfill in Islamabad or Rawalpindi.

It is estimated that 24.97 tons per day of solid waste will be generated from residential and commercial areas of Sector I-12.

Land-use change is expected during the construction phase, one at the burrow areas and the other 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<sub>x</sub>), Oxides of Nitrogen (NO<sub>x</sub>) 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 ground water 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.

Untreated Solid Waste at Sector I – 12: Since 2011, Capital Development Authority has been dumping around 500 tons of solid waste daily in Sector I – 12 sites. This untreated dumping of solid waste is a major environmental risk and has the potential to contaminate ground and surface water in the project site. The solid waste is being dumped in the southern and south-eastern part of the Sector I-12; having an area of 10 acres (750' x 580') which falls between the IJP road and the nullah that passes through the Sector. This part of the sector has been allocated for Markaz of Sector I-12 after the removal of the temporarily dumped solid waste.

**Mitigations:** 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 rosa Sinensis* etc. Vehicles and equipment will not be repaired at 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. The hazardous waste should be kept separate and handled according to the nature of the waste. While storing, hazardous waste should be marked.

CDA will construct Sewerage Treatment Plant for the sewerage generated by Sector I-12 at Sector I-12/4. Construction machinery and vehicles will be kept in good working condition and properly tuned to minimize exhaust emissions. Fugitive dust emissions will be minimized by spraying water on the soil, where required and appropriate.

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

Relocation of untreated Solid Waste: Remediation of the existing solid waste must be carried out before the development of Sector I – 12. CDA needs to prohibit the dumping of solid waste and relocate the solid waste to a proper engineered sanitary landfill site.

The proposed land use of Sector I-12 is in line with any other residential sector in Islamabad. However, it can only be achieved after the proper disposal of the mountains of garbage to a new site.

Solid Waste Wrapping Machine is a specific apparatus allowing the bandage with the automatic plastic film of bales of waste. It is normally installed along with a continuous press to obtain in real time a packaged product of great quality and reliability.

Wrappers are used to wrap bales of waste of various kinds with plastic film. Wrapping avoids all the problems associated with the storage of waste and its transfer from city centers to the landfill. They are needed to allow storage in open areas. Bandaging the blocks of waste, these can remain outdoors for long periods without giving problems of leachate, and odours remain isolated. The birds and rats are not so attracted by the waste, and the ecosystem is not altered.

The only way to cope with the issue of groundwater, air, and soil contamination due to open dumping of solid waste is to have an Integrated Solid Waste Management Plan for Islamabad. The waste collected by Metropolitan Corporation Islamabad should be disposed of at a proper engineered sanitary landfill site.

- Proper rehabilitation and relocation of Solid Waste Study should be conducted.
- Open dumping of solid waste must be prohibited, and the idea of having temporary dumping sites must not be part of the waste management policy.
- Government should make awareness programs on the national level to inform people about the consequences of improper disposal of solid waste and make each individual responsible for appropriate disposal of his/her waste.
- CDA intends to construct the Sewerage Treatment Plant at Sector I-12 (I-12/4), which will treat all the sewage generated by Sector I-12.

**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 fuel wood for the camp. There are around 345 trees of various species at the project site, which may need to be cut in construction phase of the project during the land clearing and leveling activity. However, appropriate mitigation measures have been suggested in this EIA report to minimize the loss and to compensate for the unavoidable loss of vegetation as part of the proposed project.

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 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, the wildlife may be disturbed by illumination and the mere presence of the people.

**Mitigations:** A plantation cover of appropriate trees/bushes, preferably evergreen, will be raised within the open green areas and along avenues, as well as medians. Unless the performance of an exotic species is put to repeated tests, it is always safe to plant indigenous trees. However, considering the extremely slow growth of some of the major native tree species viz, Phulai (*Acacia modesta*); Wild Olive (*Olea ferruginea*), Jand (*Prosopis cineraria*), as well as the aesthetic value, a selection from both indigenous and exotics is required to be made in a discreet manner. In this connection, the choice of species will also be governed by local site factors. A record will be maintained for any tree cutting. For every tree cut, as many as 10 trees should be raised/planted.

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 should not be undertaken at the site for excavation purposes. The 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 a boon to maintain ecological balance. Developmental activities and colonization of the project site would be a positive step to keep down the number of these 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. In addition, the mountains of solid waste openly dumped at the proposed Sector I-12/1 and I-12 Markaz will also pose environmental as well as health issues. The workers transferring the solid waste to a new site might be exposed to harmful gases and injuries as well. Injuries could happen primarily by occupational-related accidents, sharps in solid waste, animal, or insect bites, etc. Activities such as solid waste picking and transferring, 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 on the land being acquired for the project at Sector I-12. However, in case any artifact of such significance is found during the construction activities, the Archeology Department, Government of Pakistan will be informed.

**Mitigations:** For compensation, CDA should ensure timely payments to the local peoples to facilitate their migration.

Eye and respiratory diseases should be mitigated through routine health screening and training of contractor's employees. Detailed remediation along with a solid waste relocation study should be conducted by Capital Development Authority. The solid waste should be compacted and wrapped in a plastic film as bales of waste and transported. Solid Waste Wrapping Machine is a specific apparatus allowing the bandage with the automatic plastic film of bales of waste. Wrapping avoids all the problems associated with the storage of waste and its transfer from city centres to the landfill. 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.

### **Positive Impacts of the Proposed Project**

Capital Development Authority is committed to developing its project in a sustainable way. The following sustainable features have been provided in this project:





- The planning & design of the Development of Sector I-12 Project will be carried out, keeping in mind the natural topography, sun and wind direction.
- A total of 57 ground recharging wells are planned to be installed along the nullah/drainage system to facilitate the recharging of the aquifer.
- CDA has allocated 8.88 % (66.25 Acres) for open spaces, parks, and playground. A plantation plan has been recommended to be implemented at Sector I-12, Islamabad.
- CDA will develop 14.96 km of dedicated cycle track.
- CDA will encourage the residents to use Oxo-biodegradable D<sub>2</sub>W plastic bags.
- CDA will install Sewerage Treatment Plant in Sector I-12
- CDA will make necessary arrangements for the management of solid waste during the construction as well as operational phase of the project.
- Water Filtration Plants will be installed at various locations within Sector I-12 to provide the residents with clean and safe drinking water.

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

The purpose of the Environmental Mitigation Plan (EMP) is to minimize the potential environmental impacts due to the proposed project. The EMP reflects the commitment of the Development of Sector I-12 Islamabad project to safeguard the environment as well as the surrounding population.

The 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 contractor will prepare a Quarterly Environmental Monitoring Report of project activities carried out during the construction phase of the project. These reports will be submitted to Pakistan Environmental Protection Agency for their review and consideration. The total Environmental Mitigation & Monitoring Cost is **Rs. 255 million**.

### **Conclusion and Recommendations**

On the basis of the overall impact assessment, more specifically, the nature and magnitude of the residual environmental impacts identified during the present EIA, it is concluded that the Development of Sector I-12 Islamabad Project can only be carried out after the existing solid waste at the project site specifically in the proposed Sector I-12/1 and I – 12 Markaz have been relocated to an Engineered Sanitary Landfill.

All other construction and operational phase 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.

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